

# Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona

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A Proposal Submitted to the  
Bureau of Reclamation  
WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018)  
Task B: Watershed Restoration Planning

January 31, 2018

Applicant:

Altar Valley Conservation Alliance  
PO Box 27906  
Tucson, Arizona 85726  
[www.altarvalleyconservation.org](http://www.altarvalleyconservation.org)

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# Executive Summary

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## **Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona**

January 31, 2018

Applicant: Altar Valley Conservation Alliance (AVCA)  
Tucson, Pima County, Arizona

AVCA seeks a 2-year \$100,000 grant from the Bureau of Reclamation WaterSMART: Cooperative Watershed Management Program to create a watershed restoration plan. The project will commence October 1, 2018, with completion projected for September 30, 2020. This project does not take place on a Federal facility. During the course of this 2-year Phase I project, AVCA will expand support of its existing Watershed Working Group of collaborative partners to develop a watershed restoration plan. AVCA seeks funding to develop a watershed restoration plan for the Altar Valley Watershed, including “15% project plans” for 15-20 high priority projects, supported by all parties of the Watershed Working Group and willing landowners. The restoration plan will focus on two large watershed issues: (1) channel incisement/erosion and (2) mesquite encroachment. Restoration goals include increasing water infiltration, reducing sediment transfer, and enhancing ecological site condition. AVCA will use grant funds to facilitate collaboration between expert partners and contractors in hydrology and engineering, rangeland management, climatic trends, watershed management, and natural resource management. More specifically, grant funds will be used to: compensate AVCA staff for its support services, contract hydrologic engineers to complete technical portions of the restoration plan, contract geographic information system specialists to provide analysis services and mapping, and contract facilitation services to conduct four Watershed Working Group meetings. The final product, The Altar Valley Watershed Restoration Plan, would outline current watershed conditions and needs with 15-20 specific project descriptions (15% plans) that include preliminary engineering design, costs, permitting requirements, and timelines (15% of an entire project plan). During the past two years, significant new information and analysis has been produced, such that AVCA and partners are well positioned to produce a watershed restoration plan. This foundational knowledge includes: a contracted report by JE Fuller Hydrology & Geomorphology, Inc. describing the need for watershed work in the uplands of the Altar Valley, a Pima County contracted sediment modeling project by the University of Arizona, Dr. Mary Nichols’ article on “The geomorphic legacy of water and erosion control structures in a semiarid rangeland watershed,” AVCA’s online GIS mapping database, and a finalized Watershed Framework outlining the vision and direction for watershed restoration in the Altar Valley. AVCA will use these tools to focus on complex restoration problems and formulate a restoration plan that synthesizes watershed knowledge with private and government landowner goals to describe a tangible path forward for restoration of the Altar Valley Watershed.

# Background Data

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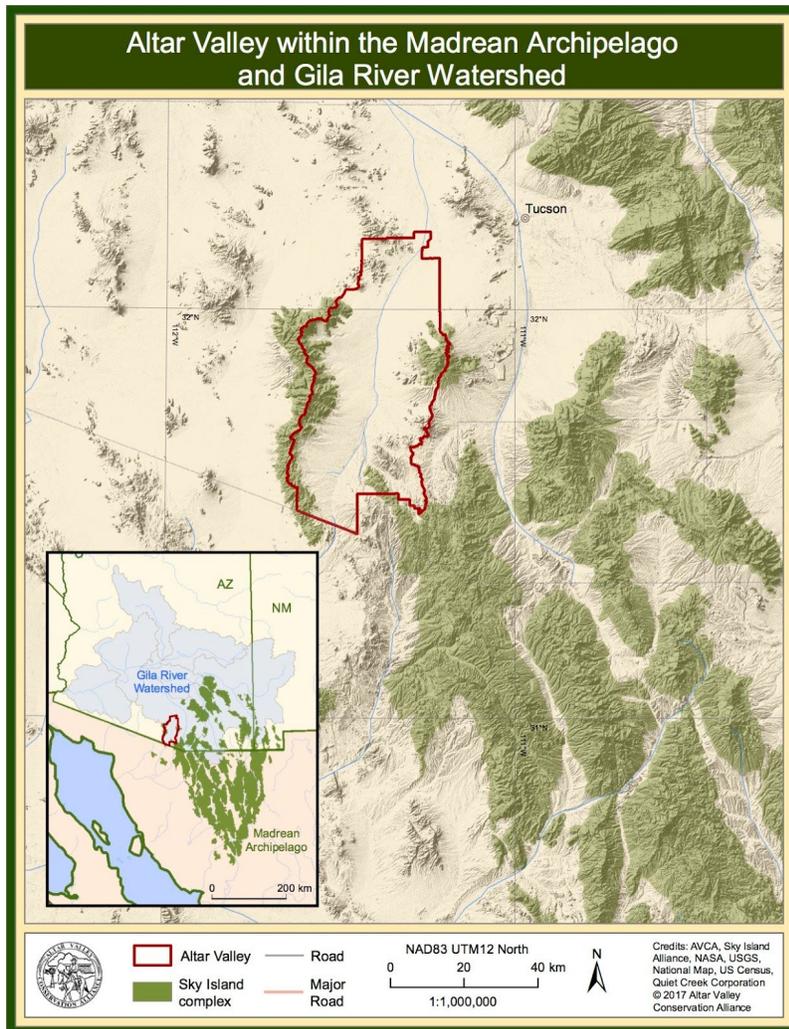
The Altar Valley is a 580,000-acre Sonoran desert grassland and mountainous working landscape southwest of Tucson, Arizona. The Altar Valley is a productive contributor to the agricultural economy of Arizona, and it is a place of historic and contemporary cultural richness and biodiversity. The valley is home to cattle ranches, several active beekeeping businesses, a small vineyard, two guest ranches, and an active farm located adjacent to the north end of the valley. The Buenos Aires National Wildlife Refuge (BANWR) and a significant portion of Pima County's *Maeveen Behan Conservation Land System* are located within the watershed. Perhaps most importantly, although close to a dozen ranches have been on the market in the last 20 years, none have yet been sold to real estate speculators or developers. The conversion of ranches into subdivisions, so characteristic of Western watersheds, has not occurred in the Altar Valley, thus maintaining the possibility for future generations to continue agricultural and ecological stewardship in a large working landscape unfragmented by exurban development.

Historical accounts of the Altar Valley indicate that the Altar Valley was a broad and heavily grassed valley with little to no woody shrubs, and water flows that were broad and shallow (Sayre 2002). By 1920, the valley bottom had transformed into an entrenched channel, (today known as the Altar Wash), followed by the deepening and straightening of tributaries. This pattern of arroyo cutting has been documented in many watersheds in the southwest and has been attributed to overgrazing, climate change, irrigation diversions, railroad embankments, road diversion and capture, and fire suppression, along with other reasons. Ultimately, it appears that the arroyo cutting and channel incisement of the Altar Wash have caused the drainage of the floodplain into a narrow channel causing a replacement of grasses with brush and mesquite (JE Fuller 2016).

A distinguishing feature of most of the Altar Valley is its absence of perennial surface water, with Arivaca Creek drainage as the exception. Most of the valley was not actively used for agriculture or grazing purposes until the late 1800s/early 1900s, when people were able to install deeper wells. There are three small communities along the edges of the watershed (Three Points/Robles Junction, Sasabe, and Arivaca), but the majority of the valley remains sparsely populated and utilized predominantly for ranching or habitat conservation. Thus, current water use today is primarily agricultural (livestock) with water rights held by ranches or other public entities. On the northern end of Altar Valley planning area, the City of Tucson purchased and retired a large farm in order to utilize the converted irrigated groundwater rights for municipal waters supply. Historically several agricultural operations utilized irrigation systems along the once fertile Altar Wash floodplain, but today irrigation is limited to two operations (the Anvil Ranch and the Buckelew Farm).

There are two predominant issues within the Altar Valley including 1) channel incisement and downcutting of the Altar Wash and its major tributaries and 2) mesquite encroachment on historically open semi-desert grassland.

# Location



The Altar Valley, about 30 miles southwest of Tucson, Arizona, is a watershed area in Pima County that stretches from the US-Mexico border north to the Ajo Hwy/Route 86 and between the Baboquivari Mountains, the Arivaca Creek Drainage, and the Sierrita Mountains. It is located in the Brawley Wash Hydrologic Unit Code 15050304. The Altar Valley is, importantly, the upper watershed for agricultural producers and towns downstream near Marana and the larger Santa Cruz watershed, which flows into Gila River watershed and eventually the lower Colorado River.

## Technical Project Description

### Applicant Category

The Altar Valley Conservation Alliance is seeking funding as an existing watershed group to develop a watershed restoration plan. AVCA convened in 1995 as agricultural landowners in the valley came together, and in 2000 AVCA became a legal charitable not-for-profit corporation recognized by the Internal Revenue Service. The AVCA Board of Directors consists of agricultural landowners within the watershed, as well as community members. AVCA accomplishes its work through collaboration with dozens of partner organizations. AVCA is not a membership organization, and considers citizens and organizations who volunteer or financially support the organization to be “stewards”.

AVCA was initially formed by valley landowners due to concern about the potential loss of open agricultural grazing land to development and the desire to return fire to the landscape as a

management tool to combat woody vegetation (primarily mesquite). For decades, many of the local ranches and the Pima Natural Resource Conservation District (Pima NRCD) had championed the idea of tackling the significant erosion issues of the Altar Wash drainage, characterized by severe and large-scale channelization and lateral migration of head cuts and the almost complete loss of once-fertile Sacaton grassland along the Altar Wash floodplain. AVCA joined forces with the Pima NRCD to continue work on this complex agenda for what partners now call the “main stem” of the Altar Wash and its major tributaries. AVCA has successfully gathered partners to work on smaller-scale erosion control and watershed restoration projects in the “upland” portions of the system, primarily with the use of (1) low-tech rock or wood structures designed to decrease water velocity and encourage water infiltration, encourage sediment deposition, and increase vegetation growth and diversity, as well as (2) harvesting water from miles of ranch roads that otherwise contribute to local erosion problems. Much of this work has been designed according to principles described by Bill Zeedyk and Van Clothier in *Let the Water Do the Work: Induced Meandering, an Evolving Method of Restoring Incised Channels* (The Quivira Coalition, 2009).

The past two decades of collaborative conservation lead by AVCA have been as rich and complex as the landscape itself. Notable accomplishments include: the Altar Valley Watershed Resource Assessment (2000), the Palo Alto Pima Pineapple Cactus Mitigation Bank Stewardship (2002), the Altar Valley Fire Management Plan (2008), two major National Fish and Wildlife Foundation grants (2010 and 2013) to plan and implement prescribed fire and watershed projects and three grants from Freeport-McMoRan Copper & Gold Foundation for watershed projects (2010, 2012, 2015), the formation of an AVCA Science Advisory Board (2011), the installation and monitoring of the Elkhorn/Las Delicias Demonstration Project (ongoing since 2012), the formation of an Altar Valley bibliography collection within the Rangelands West/Global Rangelands database, the advocacy and monitoring of the Sierrita Pipeline (ongoing since 2012), and the *Altar Wash Restoration Conceptual Evaluation of Alternative Methods* (JE Fuller 2017). In 2017, AVCA and its partners reached another milestone: the finalization of project called the *Altar Valley Watershed Vision and Framework* (Framework) (Appendix A), which documents the shared vision and goals for the watershed.

The start of the third decade of AVCA’s collaborative conservation work is focused on capitalizing on strong partnerships to apply successful upland watershed enhancement treatments across the planning area, and tackle the much more complex and large-scale issues related to the main channel of the Altar Wash and its major tributaries. To launch this more ambitious agenda, AVCA and Pima NRCD sponsored a 3-day retreat in December 2015 to discuss watershed management of the Altar Valley watershed in Pima County, Arizona (Appendix B). It was attended by 43 individuals representing 22 public and private entities. A significant outcome of that retreat was the decision to formally convene both long-standing and new partners into the Altar Valley Watershed Working Group (WWG). At the December 2015 AVCA Board Meeting, the Board approved a draft charter for the WWG, and the WWG began work on February 24, 2016 (Appendix C). The WWG’s charter ensures that AVCA invests in expert facilitation services for the WWG to assure productivity, encourage diverse views and creativity, and strive towards consensus-style decisions.

AVCA’s operational capacity has been expanding to include a full-time staff member, a growing volunteer Science Advisory Board (SAB), and a contracted GIS/Unmanned Aerial Vehicle

(UAV) mapping specialist. In 2016, AVCA expanded its staff to add its first full-time employee, a *Conservation and Science Coordinator*, in anticipation of expanding the scope, scale and complexity of watershed work. AVCA's Science Advisory Board members are experts in a wide variety of fields, including ranchers, university professors, range management professionals, and Pima County personnel who work with the County's Sonoran Desert Conservation Plan and its Multi-Species Habitat Conservation Plan. Additionally, the information management capacity of AVCA has grown exponentially over the past year by contracting GIS data management and UAV mapping to the Quiet Creek Corporation, who is now available at an on-call basis. This core group of staff, supporters, and experts, along with the WWG, have helped steer both long-time and new partners into a more formal collaboration focused on conservation in the Altar Valley.

AVCA and its partners face complex questions about watershed restoration, including where we should work, what techniques should be used, how to prioritize work, and how to complete work that benefits watershed-wide function. Four important projects have been completed recently by AVCA and partners: (1) the *Altar Wash Restoration Conceptual Evaluation of Alternative Methods* report (produced by JE Fuller Hydrology and Geomorphology, Inc. under contract by AVCA) which concludes a recommendation for upland watershed work, (2) sediment modeling of the Altar Valley by Dr. Jennifer Duan at the University of Arizona contracted by Pima County, which empirically shows an increase in the number of channels and the straightening of once longer and shallower channels, as well as identified areas of highest sediment loss within the watershed for prioritization of watershed work, (3) *The geomorphic legacy of water and erosion control structures in a semiarid rangeland watershed* by Dr. Mary Nichols, and (4) the *Altar Valley Watershed Vision and Framework*, which is the product of years of collaborative effort to describe the vision and goals for the Altar Valley, guides the current and future steps of conservation in the valley.

### **Eligibility of Applicant**

AVCA, its SAB, and the new WWG, meet the definition of watershed group as a 501(c)(3) non-profit located in Arizona, representing Altar Valley stakeholders involved in livestock grazing, agriculture, irrigated agricultural production, recreation and tourism, the environment and potable water purveyors and private property owners that are significantly affect or will be affected by the quality or quantity of water in a watershed. AVCA, as the existing watershed group, will lead the Watershed Working Group in the creation of the Watershed Restoration Plan. AVCA is capable of promoting the sustainable use of water resources through its WWG, publicly through its online bibliography and Rangelands West/Global Rangelands database, and through outlets managed by its Community Outreach and Education Coordinator, including social media, email, and website.

### **Goals**

- **Further develop the Watershed Working Group as a means of accomplishing collaboration:**
  - Maximize productivity and creativity via use of expert facilitators for 2 years
  - Meet work deadlines and quality expectations by providing staff support for 2 years

- Achieve consensus to the extent that it is pragmatically possible
- **Develop a watershed restoration plan by September 2020:**
  - Describe the current state of the Altar Valley watershed
  - Describe realistic restoration goals and alternative treatments to achieve those goals
  - Outline 15-20 projects, including preliminary description, timeline, and cost estimate with professional technical advice (“15% project plans”)
  - Map the projects with professional services using GIS database information and unmanned aerial mapping where appropriate
  - Describe cost-effective monitoring techniques that measure progress towards project goals

## **Approach**

AVCA will address Task B: Watershed restoration planning. AVCA will complete Task B with the development of a watershed restoration plan by building on its already formed Watershed Working Group and the recently completed JE Fuller report and Dr. Duan’s Altar Valley watershed sediment modeling. In 2018, Dr. Duan’s sediment modeling is continuing onto Phase 2, with \$80,000 in funding from Pima County. The goal is to provide a comprehensive basin-wide erosion control strategy, along with quantifying design parameters for instream grade control and bank protection structures for subwatersheds that have already been prioritized as part of her previous work. The WWG will continue to work with Dr. Duan during the completion of this work and will play a large role in developing the watershed restoration plan.

In year 1 of the proposed project, the WWG will focus on continuing development by hiring a facilitator to assist in stakeholder outreach, meeting organization, information gathering, continued GIS database development and mapping, and preplanning for watershed restoration plan development. The WWG will begin immediately on the watershed restoration plan by creating a needs assessment and an outline (including benchmarks) for the restoration plan. Facilitation of the meetings will include surveying the WWG members made up of landowners, federal agencies, and local government agencies to determine criteria about what projects would improve the watershed. This will include an evaluation of best management practices. By the end of the first year, the group will draft a technical description of the watershed, refine restoration goals, and determine potential restoration sites.

In year 2, the WWG will complete the watershed restoration plan that includes 15-20 high priority project descriptions - “15% project plans” that describe approximately 15% of an engineered erosion control project or vegetation treatment with specifics about how, where, why, costs, timelines, and the type of treatment. These 15% project plans will allow for quick and efficient planning and completion of projects with future funding. The projects will be mapped, relevant data analysis conducted, and watershed-specific best management practices will be reviewed. AVCA will contract the completion of these technical, site-specific 15% plans.

# Evaluation Criteria

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## **Evaluation Criterion A: Watershed Group Diversity and Geographic Support**

### **Sub-criterion A1. Watershed group diversity**

Watershed organization diversity is demonstrated by the Altar Valley Partners list (Appendix D) and WWG participant lists (Appendix C). The WWG is made up of nearly every stakeholder within the Altar Valley Watershed, and includes private landowners, federal governmental agencies, and local government agencies. The majority of Altar Valley ranching families choose to be represented on the AVCA Board of Directors, several ranchers serve on the Science Advisory Board and WWG, and are involved project planning. All major public landowners in the Altar Valley regularly participate, including: Buenos Aires National Wildlife Refuge, Arizona State Land Department, City of Tucson, Pima County Regional Flood Control, and Pima County Natural Resources Parks and Recreation. Arizona Game and Fish Department and US Fish and Wildlife Service – Tucson Field Office are also active. US Natural Resources Conservation Service is a critical partner and many ranches are formal NRCS cooperators. Partnership with the USDA Agricultural Research Station and USGS is evolving. Approximately two dozen people attend semi-annual fire coordination meetings in the valley. Ties with the University of Arizona have grown much stronger with the participation of two university faculty on the Science Advisory Board and the and the inclusion of university staff and faculty in the WWG. The Nature Conservancy is a strong mentor. Organizations with whom AVCA and the Altar Valley Watershed Working Group intend to develop more active partnerships include: US Army Corps of Engineers, US Bureau of Reclamation, and Arizona Department of Environmental Quality, and Sky Island Alliance. AVCA has numerous programs in place to inform an increasingly broad audience, many of whom observe from outside the watershed, via a website ([www.altarvalleyconservation.org](http://www.altarvalleyconservation.org)), e-news, social media and an annual Community Meeting routinely attended by 50 – 75 people. AVCA will use this project to strengthen current relationships built over 20 years of hard work, and to encourage new entities to participate in watershed enhancement through the development of the watershed restoration plan and the continued dialogue of on-the-ground work planning.

### **Sub-criterion A2. Geographic Scope**

The Altar Valley watershed study area occupies the southern portion of the Brawley Wash Hydrologic Unit Code (HUC) 15050304. From a watershed planning perspective, the north and south portion of the Brawley HUC should be considered separately because the fluvial and geomorphic processes that define the channel are very different. The Altar Valley upstream of Three Points is dominated by broad, extensive alluvial fans that constrict the Altar Wash. The Altar Wash itself is highly incised and headward erosion is propagating along the tributaries and into the alluvial fans. Below Three Points, the valley is considerably wider, the channel is not influenced by the constriction of alluvial fans, the channel slope decreases and the channel changes from a well-defined incised arroyo, to a distributary flow pattern.

## Altar Valley Conservation Alliance Geographic Scope



- Geographic Scope
- Brawley Wash (HUC:15050304)

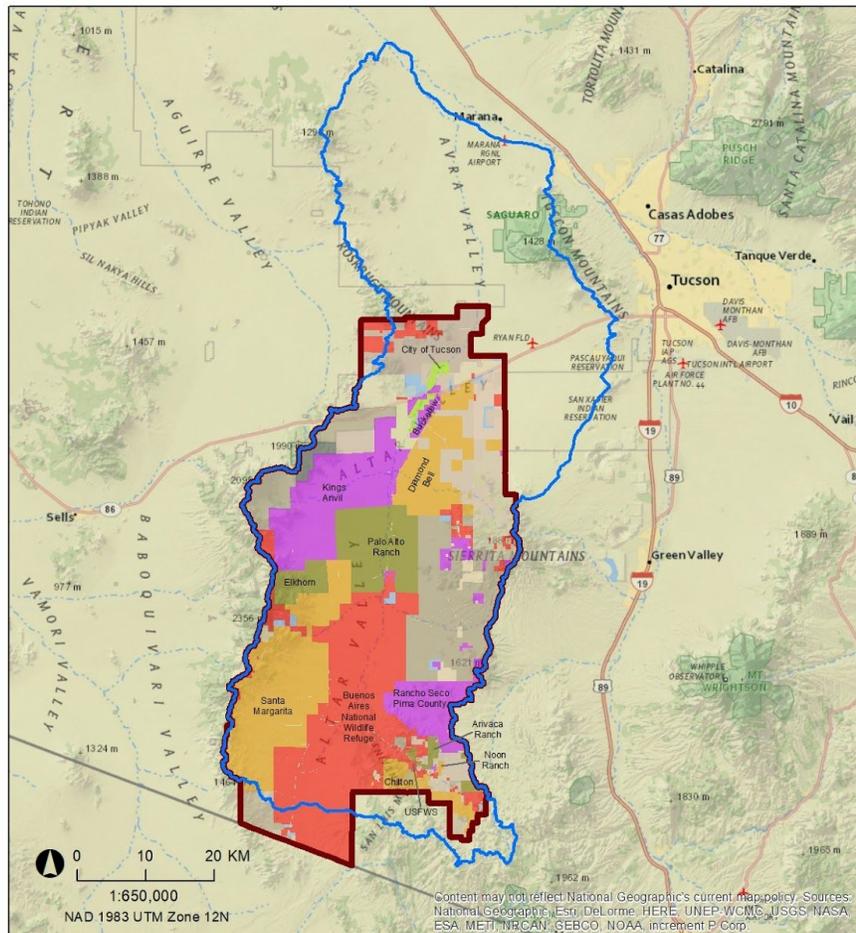
### Stakeholders

- Private\*
- Federal
- Az State Land Department unleased
- Pima County & private partnership
- Municipal

\*May contain significant Arizona State leases

Robert Davis, CMS, Quiet Creek Corporation  
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Sources: USGS, ESRI, Delorme, National Geographic



Since its inception, AVCA has strived to represent the full geographic scope of the Altar Valley watershed. The watershed geography of the Altar Valley, defined by the US-Mexico border, Ajo Hwy/Route 86, the Baboquivari Mountains, the Arivaca Creek Drainage, and the Sierrita Mountains, drew together the neighbors that formed AVCA and continue to serve on its Board of Directors. The undeveloped nature of this area and potential for ongoing and enhanced conservation activities inform the study area. Northern portions of the HUC, north of Ajo Hwy/Route 86/Three Points Area have experienced more development, increased mixed land use, and higher population density. It should also be noted that while this project focuses on the southern portion of the Brawley HUC, active WWG participants include major landowners and stakeholders (namely Pima County and the City of Tucson) that own land in the northern portion of the HUC and their representatives on the WWG routinely consider the broader scope of the Brawley HUC; management plan elements will consider the entire HUC and/or be transferable.

The WWG already consists of representatives from every major stakeholder in the watershed, including private landowners, federal agencies, and local government agencies (Appendix C). The Bureau of Land management (BLM) is the only notable absence, but this is because of the limited land within the watershed. AVCA plans to solicit more involvement from the BLM via contacts that regularly attend semi-annual fire coordination meetings. Additionally, AVCA hopes to increase the involvement of other local environmental groups such as the Sky Island

Alliance. One of the members of their Board of Directors is also a member of AVCA's Science Advisory Board.

## **Evaluation Criterion B: Addressing Critical Watershed Needs**

### **Sub-criterion B1. Critical Watershed Needs or Issues**

The critical watershed issues that the restoration plan will address are (1) channel incisement and downcutting of the major drainage - the Altar Wash and its major tributaries and (2) mesquite encroachment on historically open, semi-desert grassland. The Altar Wash and its tributaries are deeply incised with active lateral head-cut migration. Land use research conducted for the AVCA Resource Assessment completed in 2000 summarized historic baseline conditions: Broad floodplain of the valley was un-incised and dominated by Giant sacaton (*Sporobolus wrightii*); uplands were dominated by native perennial grasses; mesquite (*Prosopis velutina*) was confined to drainages and the margins of the floodplain, increasing in density at lower elevations; wildfire played an important role in maintaining the grassland aspect of the watershed; and natural surface water sources were absent in the main portion of the valley, and limited in the surrounding mountains. Dramatic changes occurred in the first half of the 20<sup>th</sup> century, directly or indirectly related to combined effects of drought and excessive livestock grazing: Formation of an arroyo in valley bottom floodplain, beginning in 1905 and rapidly growing through the 1950s; shift from sacaton to Johnson grass in the floodplain vegetation, gradually supplanted by mesquites and shrubs as the arroyo lowered the shallow alluvial water table; dominance of mesquite and shrubs; development of artificial water sources for livestock, and stock tanks and dams also used to mitigate erosion; extensive fuel wood cutting; and virtual elimination of fire due to absence of fine fuels and aggressive suppression.

Throughout the 20<sup>th</sup> century, and particularly since the 1970s, Altar Valley ranchers and land managers worked to mitigate the damage of this early period and improve conditions, and the Resource Assessment of 2000 concluded that the Altar Valley as a whole was in better condition than at any time in the past 75 years. Nevertheless, it was not in its most desired condition, with two factors identified as serious obstacles: (1) the incised Altar Wash arroyo; and (2) mesquite encroachment in upland areas (See Appendix E. Resource Condition Map). AVCA, NRCS (as lead agency) and other partners developed a fire management plan in 2008 to facilitate return of prescribed fire to the watershed, as a means of addressing mesquite encroachment. One prescribed fire was accomplished in 2014 and another in 2017, with plans for additional fires and brush control methods in progress.

### **Sub-criterion B2. Developing Strategies to Address Critical Watershed Needs or Issues**

#### **Stakeholder Outreach and Partnership Building:**

AVCA takes pride in hosting meetings and events that are designed and facilitated to encourage collaboration. The organization fosters collaboration among stakeholders by gathering teams to do projects at conservation action sites (Appendix F), and hosting regularly scheduled events including: quarterly Board of Directors meetings (with open invitation to partner points-of-contact), an annual Community Meeting, semi-annual fire coordination meetings, and the Altar Valley Watershed Working Group. Gathering people in the field and accomplishing tangible work has inspired much of the commitment and interest. AVCA also maintains a

website ([www.altarvalleyconservation.org](http://www.altarvalleyconservation.org)), a Facebook page, a Twitter account, and an e-news system to share news. Watershed information is archived and available to the public via the “Altar Valley Collection” in collaboration with the University of Arizona (found here: <http://globalrangelands.org/collection/61318>). AVCA has been acknowledged as a leader in collaborative conservation as exemplified by an invitation Colorado State University’s Collaborative Conservation Workshop (spring 2018) and visits from students and researchers from colleges and universities across the United States, Europe and China, as well as many natural resource management professional organizations.

### **Watershed Restoration Planning:**

AVCA will build on JE Fuller’s *Altar Wash Restoration Conceptual Evaluation of Alternative Methods* report and Dr. Duan’s sediment modeling of the Altar Valley as the foundation for the watershed restoration plan. JE Fuller’s report points to restoration work in the uplands as the highest priority and Dr. Duan’s report uses detailed sediment modeling to describe 15 subwatersheds within the Altar Valley as priorities for restoration work. These 15 subwatersheds were determined by the modeling process to be the most highly erosive sub-basins and most critical for prioritization of restoration work. AVCA will use these reports and continued research by Pima County Regional Flood Control (PCRFC) and the University of Arizona to determine the techniques and engineering requirements for restoration in the 15 prioritized subwatersheds, as well as best management practices applicable across the entire watershed.

The WWG is built on several decades of relationship building and facilitated meetings to overcome conflicts between watershed stakeholders and today, partnerships are strong. Focusing on work that all parties see as high priority and finding common ground on divisive issues have fostered these relationships. Professionally facilitated meetings have provided a forum that can allow all parties to participate in working toward commonly shared goals, such as water and soil conservation.

The watershed restoration plan proposed as the outcome of this project will be created with already completed work by WWG members, ongoing research, and contracted technical work. Baseline information for the plan will be written by AVCA staff and adapted from already created materials. New technical information and engineering designs in the plan will be contracted to experts. The Watershed Working Group will then synthesize and provide technical review during facilitated discussions. Prioritization of projects has already begun with Dr. Duan’s sediment modeling, which has outlined the areas of greatest need. Currently, PCRFC and Dr. Duan are working to build on this work and are already looking to the Altar Valley Watershed Working Group as partners in their next steps.

### **Watershed Management Project Design:**

The watershed restoration plan will contribute to the management of critical watershed issues and needs by outlining specific projects and engineering costs in subwatersheds that have been prioritized by Dr. Duan’s work. These projects will include erosion projects such as small-rock structures, along with larger, engineered structures such as gabions or cement grade-control structures within larger tributaries of the Altar Wash. The projects will also include vegetation restoration, such as mesquite removal.

Analysis will be done to prioritize areas for work. This has already been completed in part by Dr. Duan's work, but the WWG will further analyze the best course of action for restoration. Building on Dr. Duan's modeling, the WWG will analyze specific projects within the prioritized subwatersheds to determine the highest priority sites. This will be completed with the expertise of the group members, shared and discussed through facilitated meetings. Site-specific project designs will be contracted to experts in targeted areas who will produce 1-2 page outlines of the projects, including cost and time estimates. These profiles will also include an outline of environmental and cultural compliances needed at project sites. The WWG will work with the BOR and federal, state, and county landowners to help determine what type of site-specific environmental compliance will be necessary for the project upon implementation.

During the first facilitated meeting after funding, the WWG will create a timeline and outline milestones already determined in this proposal.

## **Evaluation Criterion C: Implementation and Results**

### **Sub-criterion C1 – Understanding of and Ability to Meet Program Requirements**

AVCA intends to complete proposed work within a 2-year time frame, beginning in October 1, 2018 and ending September 30, 2020. A project implementation schedule and milestone goals are summarized below.

#### Year 1 – Continued Watershed Working Group development and watershed restoration plan creation

- October 2018: Assemble project team - \$13,186.85
- October - December 2018: Plan outline and needs assessment - \$10,873.71
- January - March 2019: Draft technical description of watershed and refine restoration goals - \$19,950.56
- March - October 2019: Determine potential restoration sites and prioritization strategy - \$81,571.13

#### Year 2 – Complete watershed restoration plan, including site-specific project designs

- October 2019 - March 2020: Develop 15-20 high priority project descriptions - \$81,571.12
- April - September 2020: Produce final watershed restoration plan - \$47,131.12

### **Sub-criterion C2 – Building on Relevant Federal, State or Regional Planning Efforts**

Pima County's *Sonoran Desert Conservation Plan* (2005) and related *Multi-Species Habitat Conservation Plan* (2016) have the broadest ramifications for the Altar Valley. (Also see the Pima County letter of support.) AVCA and the WWG are committed to helping the Buenos Aires National Wildlife Refuge support its watershed management programs currently in development, and have already begun that effort with a 5-day field reconnaissance in April 2016 conducted by watershed consultant Bill Zeedyk, AVCA staff, and Refuge staff.

Discovering and applying connections between Altar Valley watershed planning and other water related planning efforts has not occurred to date, and represents an area of expanded activity for AVCA that will be facilitated by the WWG. Areas to target for enhanced coordination include:

- Pima County/Federal Emergency Management Agency plans to re-map the Brawley Wash floodplain within the northern portion of the Brawley HUC, in which case the Altar Valley planning would be used during discovery to establish upper watershed conditions for hydrologic purposes;
- Management of City of Tucson lands, purchased to consolidate water rights for municipal supply;
- Pima County *Drought Management and Water Wasting Ordinance*; and
- Pima County's *Municipal Separate Storm Sewer System (MS4) Permit* from the Arizona Department of Environmental Quality.

#### **Evaluation Criterion D: Nexus to Department of the Interior Initiatives**

The development of the WWG does not directly benefit a basin where a reclamation project or facility is currently located, and we believe this is a good opportunity for funds to be invested in an area that the BOR is not currently working. The further development of the WWG and watershed restoration plan will directly impact complementary initiatives on the US Fish and Wildlife Service's Buenos Aires National Wildlife Refuge (BANWR). AVCA and BANWR currently work closely together with the important acknowledgement that work within the watershed benefits the entire system and BANWR staff are active members of the WWG. The development of a watershed restoration plan for the Altar Valley will indirectly positively impact federally threatened or endangered species within the watershed with increased watershed functionality. This potentially includes the threatened yellow-billed cuckoo and endangered masked-bobwhite quail that are found within the Altar Valley watershed.

In this era of drought and diminished winter rains, the riparian vegetation represented in the Altar Valley's ephemeral drainages of all scales play an ever more important role relative to watershed condition, habitat productivity, and resilience to drought. The continued development of the WWG will support the Department of Interior Drought Resiliency Partnership by developing a watershed restoration plan that encourages every drop of rainwater to linger as long as possible on the land, move soil minimally, and grow native vegetation. This vital combination of water, soil, and vegetation is the critical foundation of all resource management. The bonus of watershed conservation is that it provides fertile ground for collaboration, creating relationships and shared commitment to a place that binds communities together when addressing more contentious issues.

The continued development of the WWG and watershed restoration plan will benefit the Tohono O'odham Nation (TON) through increased watershed functionality and associated benefits to TON agriculture downstream. Benefits also include improved fire management on both the Altar Valley and TON side of the Baboquivari Mountains through increased vegetation management on the Altar Valley side. Currently, there are no TON members on the WWG, however, there are several cooperative neighbors from the Baboquiviri Peak District, Tohono O'odham Nation that have visited AVCA's Elkhorn/Las Delicias Demonstration Project restoration site, and TON members participate in the twice annual Fire Coordination Meetings, along with AVCA's annual Community Meeting. AVCA will continue to reach out through

these contacts to solicit TON members to the WWG. The learned knowledge from the WWG and the creation of the watershed restoration plan will be openly shared with the TON.

## Environmental and Cultural Resources Compliance

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No on-the-ground work will be completed in this Phase 1 project. However, AVCA and the WWG will consult with federal agencies to determine what National Environmental Policy Act (NEPA) requirements would be necessary to complete each of the 15% plans included in the watershed restoration plan. Along with investigation into NEPA requirements, AVCA will also include consultation of local government agencies regarding requirements and cultural resource clearances under the Arizona State Historic Preservation Act (SHPA).

## Required Permits and Approvals

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This project is for administrative and planning purposes only, so no activities will require permits. Interview and site visits would only be conducted with approval or invitation of willing landowners; and data held by ranches or by the US Natural Resources Conservation Service would be utilized only with approval from landowner.

# Project Budget

## Budget Proposal

The total estimated project budget for this project is \$254,284.50. This proposal requests \$100,000 from Bureau of Reclamation WaterSMART, which would be augmented as follows:

- \$120,000 cost-share for contractual services by Pima County;
- \$10,284.50 in-kind for staff support and travel by AVCA; and
- \$24,000 in-kind from partners for WWG participation.

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity type	Total Cost
	\$/unit	Quantity		
<b>Salaries and Wages</b>				
1 Conservation & Science Coord (FT)	\$25.00	2,080	\$25/hour	\$52,000.00
2 Executive Director (PT)	\$25.00	240	\$25/hour	\$6,000.00
3 Community Outreach & Education Coord (PT)	\$22.50	240	\$22.50/hour	\$5,400.00
<b>Fringe Benefits</b>				
1 Full-Time Employees	16.00%	52,000	16% total cost	\$8,320.00
2 Part-Time Employee	16.00%	6,000	16% total cost	\$960.00
3 Part-time Employee	16.00%	5,400	16% total cost	\$864.00
<b>Travel</b>				
	\$0.57	10,000	.565 / mile	\$5,650.00
<b>Equipment</b>				
				\$0.00
<b>Supplies and Materials</b>				
				\$390.50
<b>Contractual / Construction</b>				
Hydrology / engineering	\$109,200.00	1	Project quote	\$109,200.00
Facilitation contractor	\$1,750.00	4	Cost / meeting	\$7,000.00
Geographic information system contractor	\$45.00	100	\$45 / hour	\$4,500.00
Unmanned aerial imagery contractor	\$1,250.00	16	\$1250 / 200 acres	\$20,000.00
<b>Other - WWG Partner Contribution</b>				
	\$60.00	400	\$60 / hour	\$24,000.00

<b>TOTAL DIRECT COSTS</b>				\$244,284.50
<b>INDIRECT COSTS</b>	10%	100,000		\$10,000.00
<b>TOTAL ESTIMATED PROJECT COSTS</b>				\$254,284.50

## Budget Narrative

### Salaries and Wages

Project staff support will be provided by the AVCA staff, which consists of a part-time Executive Director, full-time Conservation and Science Coordinator, part-time Community Outreach and Education Coordinator, and part-time Program Administrator.

Project Manager services provided by AVCA Executive Director Mary Miller

\$1000 / monthly salary based on 40 hours per month at \$25 / hour

¼ time over two years - project / contractor oversight, WWG participation, and plan preparation

Total cost \$6000 shared by grantor and AVCA = \$3000 grant, \$3000 AVCA

Project management services would be provided by the AVCA part-time Executive Director, who would spend approximately ¼ time supervising staff and contractors, participating in WWG meetings, and co-authoring the actual plan (with AVCA's Conservation & Science Coordinator).

Project Coordinator services provided by AVCA Conservation and Science Coordinator Kyle Thompson

\$52,000 annual salary based on 40 hours per week at \$25 / hour

½ time over two years - point of contact for contractors and partners, WWG participation, field work, landowner coordination, and plan preparation

Total cost \$52,000 provided by grantor = \$52,000 grant

Project coordination services would be provided the AVCA's full-time Conservation and Science Coordinator, would spend approximately ½ time serving as the day-to-day point of contact between all project team members and partners, conducting field work, planning and participating in WWG meetings, and substantially contributing to the synthesizing of data and concepts, and co-authoring the actual plan.

WWG Support and Public Information services provided by AVCA Community Outreach and Education Coordinator Sarah King

\$22.50 / hour for approximately 40 hours per month

¼ time over two years - WWG participation, public affairs support, and technical writing

Total cost \$5400 shared by grantor and AVCA = \$2700 grant, \$2700 AVCA

WWG logistical coordination and public information services would be provided the AVCA part-time Community Outreach and Education Coordinator, who would spend approximately ¼

*Bureau of Reclamation WaterSmart Proposal by the Altar Valley Conservation Alliance, January 31, 2018*

*Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*

time serving as the point of contact with the facilitation contractors, participating in the WWG meetings, sharing information about the planning process, and editing the actual plan.

Project administration services provided by AVCA Program Administrator Sherie Steele  
\$22.50 / hour for approximately 40 hours per month  
¼ time over two years - project finance and partner contribution management  
Total cost \$5400 included in Indirect Costs component of grant.

Project administration services would be provided by the AVCA part-time Program Administrator, who would spend approximately ¼ time administering contracts, tracking project finances and providing overall administrative support. The cost of this role would be included in the project’s indirect costs.

Total salaries and wages for project	\$57,700 grant,	\$5700 AVCA
16% fringe benefits on salaries and wages	\$ 9232 grant,	\$912 AVCA
Total salary and wages plus fringe	\$66,932 grant,	\$6612 AVCA

**Fringe Benefits.** Employee Related Expenses (fringe benefits) are determined at an overall average of 16% of gross for planning purposes. This percentage includes all Federal, State and local taxes, workers compensation premiums and paid leave for any project staff members. The fringe benefits costs for this project will be \$11,144 (based on total wages of \$63,400), with \$9232 included in the grant request and the remaining \$912 provided by AVCA.

**Travel.** Local travel for staff, all of whom utilize personal vehicles, is reimbursed at \$0.565/mile. This grant proposal includes 10,000 miles of travel or 416 miles per month over the 2 year project.

**Equipment.** This proposal does not include requests for any equipment. AVCA already owns tools such as a video projector, sound amplifier, meeting tools such as easel.

**Materials and Supplies.** AVCA is requesting \$390.50 for meeting and field supplies which could include, but are not limited to, copying, flip chart paper, field marking tape or pin flags.

**Contractual Services.** AVCA plans to utilize three separate contractors for this project to provide the following services: (1) hydrology and engineering, (2) facilitation, and (3) GIS and aerial imagery collection. It is significant to note that Pima County proposes to provide cost-share resources of \$120,000 to support contractual services for the project.

The hydrology and engineering contractor would participate in WWG meetings and would produce approximately 15-20 “15% project plans”. A well respected local firm, with previous experience working in the Altar Valley and with the WWG, has provided AVCA with an estimate totalling \$109,200. This project cost would be covered by the Pima County cost-share contribution to the project. This contractor will be acquired based on AVCA’s contractor procurement procedure based on non-discrimination, non-conflict of interest, best price, and knowledge and experience working in the Altar Valley.

The facilitation contractor would plan, facilitate and produce detailed meeting notes for a total of four WWG meetings throughout the 2 year project. A well respected local facilitation firm, with previous experience working with AVCA and the WWG and acquired through AVCA's procurement procedure, has provided AVCA with an estimate of \$7000 for 4 WWG meeting, averaging \$1750 per meeting. This project cost would be included in the grant request.

AVCA has an existing on-call services contract acquired through AVCA's procurement procedure with a firm that provides GIS and unmanned aerial imagery services. This firm has developed and maintains a GIS system using ESRI technology that enables AVCA and its partners to easily access and augment data generated by AVCA and integrate it with many other data sources. The negotiated rate is \$45 per hour for GIS work, with an estimated 100 hours budgeted for this project, totalling \$4500. Unmanned aerial imagery rates are also negotiated on a per acre fee, such that a 200 acre area would cost \$1250. The project is budgeted to include 16 200-acre flights, for a total of \$20,000. The combined cost of GIS and flights would be \$24,500; \$9200 would be included in the grant, and the Pima County cost-share would cover \$10,800.

**WWG Partner Contribution.** Partner participation in four WWG meetings is very conservatively valued at \$24,000. This value is based on an average of 25 people valued at \$60 per hour, devoting 4 hours to each of the four WWG meetings. AVCA can track this participation via sign-in sheets at WWG meetings. In reality, communication and technical assistance provided in between meetings will significantly increase this value, but it is not realistic to track this involvement.

**Indirect Costs.** Ten percent of the \$100,000 grant request is attributed to indirect costs. Indirect costs will include approximately ¼ of the cost of the AVCA Program Administrator position for two years (\$5400), fringe benefits for the Program Administrator, insurance costs, copying, postage, and other administrative costs.

## LETTERS OF SUPPORT

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Letters of support, attached as Appendix H, have been received from 19 entities:

Pima County, County Administrator's Office, County Administrator, Chuck Huckelberry ; City of Tucson, Tucson Water Department, Timothy Thomure, P.E., Director; Arizona Game and Fish Department, Raul Vega, Regional Supervisor, Region V; Arizona Department of Forestry and Fire Management, Jeffrey C. Whitney, Arizona State Forester; Pima Natural Resource Conservation District, Cindy Coping, Chair; Western Landowners Alliance, Lesli Allison, Executive Director; US Fish and Wildlife Services, Arizona Ecological Services Office, Steven Spangle, Field Supervisor; US Fish and Wildlife Service, Bueno Aires National Wildlife Refuge, William Radke, Project Leader; Southwest Watershed Research Center, Philip Heilman, Research Leader; The University of Arizona, School of Natural Resources and the Environment, Larry Fisher, Research Professor; The University of Arizona, College of Engineering, Jennier G. Duan, PhD, PE; The University of Arizona, School of Natural Resources and the Environment,

George Ruyle, Professor and Extension Specialist; Rangeland Hands, Steve Carson; Wildvisions Arizona, Kerry Baldwin; King's Anvil Ranch, Joseph W. King; Robinett Rangeland Resources LLC, Dan Robinett; Santa Margarita Ranch, Walter Lane; The Nature Conservancy, Damian Rawoot; Mary Miller Elkhorn Ranch

## OFFICIAL RESOLUTION

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An official resolution and an eVote motion from the Board of Directors of the Altar Valley Conservation Alliance is attached as Appendix G. The resolution is planned to be passed by February 28, 2018.

# APPENDICES

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

**Updated: November 4, 2017**

*Produced by the Altar Valley Science Advisory Board and Altar Valley Conservation Alliance Partners  
Contact: AVCA Science and Conservation Coordinator Kyle Thompson, [kyle@altarvalleyconservation.org](mailto:kyle@altarvalleyconservation.org)*

### **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.

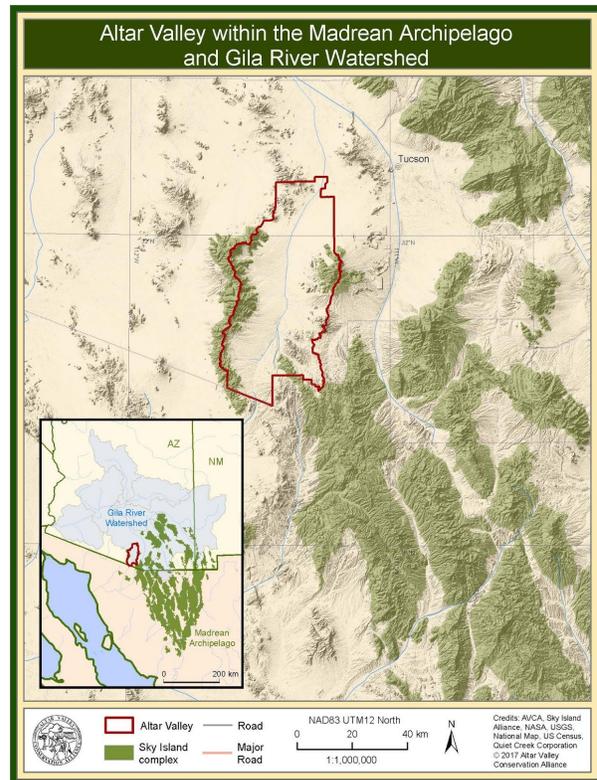
## Historical Perspective

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

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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 *Bureau of Reclamation WaterSmart Proposal by the Altar Valley Conservation Alliance, January 31, 2018 Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*

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 totalling 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* 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 well being 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 well being** 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

***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.***

herbaceous species, where appropriate.

***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 WELL BEING 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 Game and Fish Department
Arizona Land and Water Trust
Arizona State Forestry and Fire Management Department
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

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## IMPORTANCE MANAGEMENT GUIDANCE PERTAINING TO ALTAR VALLEY WATERSHED

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*Bureau of Reclamation WaterSmart Proposal by the Altar Valley Conservation Alliance, January 31, 2018*  
*Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*

## ALTAR VALLEY WATERSHED RESTORATION RETREAT

*Sponsored by*

**Altar Valley Conservation Alliance and Pima Natural Resource Conservation District**

**December 3-5, 2015**

**Elkhorn Ranch in the Altar Valley, Pima County, Arizona**



### SUMMARY

#### Overview

#### Retreat objectives:

- *Refine overall goal:* Restore or enhance floodplain function by stopping head cut formation and movement, increasing sediment deposition, and growing native dry riparian vegetation.
- *Action Plan:* Design a 5-10 year phased plan of action that can be implemented by AVCA and its partners
- *Research Agenda:* Define a research agenda that addresses the most significant unknowns (technical, regulatory, environmental, economic and social) to determine if the goals can be achieved or need to be modified.

**Participants:** 43 (see list on page two)

#### Agenda:

- Day 1 (field tour): Participants toured five sites in the Altar Wash to gain a better understanding of the current condition in the watershed, and discuss past interventions and possible future initiatives.
- Days 2 & 3 (workshop): Participants worked together to identify the overall goal and objectives, possible interventions for selected areas in the watershed, and developed a process/plan for moving forward on priority actions. Participants worked in three groups: North of Palo Alto (NAWA), South of Palo Alto (SAWA), and a group focused on comprehensive assessment and information management. These groups discussed intervention options, data/research needs, and criteria for identifying and prioritizing interventions.

#### Outcomes

##### A. North Altar Wash Area

The group decided on an integrated, three-pronged approach to improving the active floodplain, while at the same time working towards the longer-term goal of getting water back onto the historic floodplain. These efforts will proceed in parallel:

1. Pursue a big structure in the Altar Wash (longer-term goal). The first step will be to complete a pre-feasibility study with an engineering firm.
2. Begin the planning and permitting process to promote the construction of smaller structures in the channel to get more water, and vegetation, onto the active floodplain. The first step includes a pilot project on 98 Ranch, coordinated through the 98 Working Group.
3. Pursue out of channel interventions. The first priority site will be north of 98 Ranch on State Trust Land. Work through the 98 Working Group.

Next steps:

- First: Approach Pima County about both a pilot project in the wash on the 98 Ranch and the area out of the channel on State Trust Land. Pima County Flood Control may be able to cover the costs of the engineering and facilitate the permitting on the 98 Ranch pilot project. At the same time it may be possible to do the same for additional low-tech projects in the channel (*Coordinate through 98 Working Group*)
- Approach an engineering firm (CMG is recommended) about conducting the pre-feasibility study for the big structure, and secure necessary input on the pilot project in the wash on the 98 Ranch.
- Geomorphic survey of the NAWA area – Coordinate with the assessment working group
- Look into possible funding options

## **B. South Altar Wash Area**

The group worked on an approach to identify and prioritize areas in the watershed where interventions are most needed, and a process for identifying appropriate interventions and specific locations. This approach is applicable to the whole watershed, not just the southern area.

- Approach for developing intervention plan
  - Create a project management team of technical experts and local situation experts who know vegetation, weather, etc.).
  - Organize a team meeting, using maps and information; develop common criteria and identify priority locations and interventions.
  - Organize site visits with team members and with others who know the site
  - Conduct a second level screening to further evaluate area and narrow the site selection
  - Develop a draft plan: Where, when, practical considerations (e.g. Gunnison sage grouse used this approach)
- Pilot Area: The group identified a possible pilot area in Pozo Nuevo, and went on an initial site visit to investigate. The group concluded, however, that this site is not suitable as an initial pilot site

## **C. Watershed Assessment**

The group developed a plan to establish a watershed assessment and information management working group.

- Working group goal: Draft a comprehensive, scientific assessment of the watershed that compiles and integrates all existing information, identifies gaps and needs for further information. This information will provide a framework for decision-making and recommendations for priority sites where conservation interventions are needed. The group would support landowners and land managers, and have a strong service-oriented approach.
- Scope: Altar Watershed, from the Ajo Bridge, including all tributaries
- Convened/coordinated by the new AVCA science coordinator position
- Members: A variety of potential members were suggested, including all relevant federal, state and local agencies, University of Arizona, and non-profits.

### Next steps:

- A small group was identified to draft a charter and scope of work for the working group (now completed). The draft scope of work will be distributed to the AVCA board for review and comment)
- Work with the new AVCA Conservation and Science Coordinator to plan and organize the first meeting of the working group (January, 2016)

### **Retreat Participants**

**Altar Valley Conservation Alliance** -- Sarah King, Mary Miller, Sherie Steele  
**Anvil Ranch** -- John King, Pat King, Joe King, Sarah King, Micaela McGibbon  
**Arizona Game and Fish Department** – Kristin Terpening  
**Arizona Nature Conservancy** – Peter Warren  
**Arizona State Land Department Emeritus** – Stephen Williams  
**Audubon Appleton-Whittell Research Ranch** – Linda Kennedy  
**City of Tucson / BKW Farms** – Harold Maxwell  
**Elkhorn Ranch** – Charley Miller and Mary Miller  
**Pima County Natural Resources Parks and Recreation** – Kerry Baldwin  
**Pima County Office of Sustainability and Conservation** – Julia Fonseca and Brian Powell  
**Rangeland Hands** – Steve Carson  
**Riverbend Engineering** – Chris Philips  
**Robinett Rangeland Resources** – Dan Robinett  
**Santa Margarita Ranch** – Walter Lane  
**Southwest Decision Resources (facilitation)** – Tahnee Robertson and Colleen Whitaker  
**University of Arizona** – Larry Fisher, Chuck Hutchinson, Damian Rawoot, Tom Sheridan, Don Slack, Bob Webb  
**University of California Berkeley** – Nathan Sayre  
**US Fish and Wildlife Service (USFWS) Regional Office, Albuquerque, Water Resources** – Andrew Hautzinger  
**USFWS Buenos Aires National Wildlife Refuge** – Sally Flatland, Ann Steffler, Dan Peterson, Stan Culling  
**US Geological Survey** – Chris Magril  
**US Natural Resources Conservation Service** – Kristen Egen, Katie Cline, Lou Catallini  
**USDA – ARS Southwest Watershed Research Center** – Phil Heilman and Mary Nichols  
**Zeedyk Ecological Consulting** – Bill Zeedyk

**ALTAR VALLEY CONSERVATION ALLIANCE  
CHARTER**

**ALTAR VALLEY WATERSHED WORKING GROUP**

**A collaborative partnership focused on watershed data management, applied research, conservation site identification and prioritization, and monitoring methods and evaluation.  
Draft April 2, 2016**

**Goal**

To align partners in support of science-based restoration work in the Altar Valley by:

- (1) Providing information necessary for the development of project proposals and plans
- (2) Identifying priority sites for interventions to enhance landscape-scale ecosystem function, and
- (3) Monitoring and evaluating the performance of those interventions over time.

**Members**

The Working Group is convened and staffed by AVCA, and is composed of a diversity of partners involved in work and research in the Altar Valley. The Working Group has two primary types of members: (1) information providers, or those organizations who hold the mandate to generate these data, and (2) information consumers, or those have either (a) an active stake in seeing that AVCA meets its conservation goals, or (b) wish to explore the nature, function and outcomes of collaborative conservation. The Working Group is an informal gathering of professionals and practitioners that will meet on an as-needed basis to serve the needs of its members and users. As currently outlined, the Working Group will include:

- AVCA – *Mary Miller, Sarah King, Pat King, Kyle Thompson, Stephen Williams*
- AVCA Science Advisory Board – listed below with \*
- City of Tucson / BKW Farms – *Harold Maxwell*
- Arizona Department of Game and Fish – *Kristin Terpening, Rana Tucker*
- Arizona State Land Department – *Josh Grace*
- Pima County
  - Regional Flood Control District – *Lynn Orchard, Eric Shepp, Kenneth Maits*
  - Natural Resources, Parks and Recreation – *Elisabeth Van Der Leeuw*
  - Office of Sustainability and Conservation – *\*Brian Powell*
- Rangeland Hands – *Steve Carson*
- Robinett Rangeland Resources – *Dan Robinett*
- The Nature Conservancy – *Peter Warren*
- US Department of Agriculture
  - Agricultural Research Service – *Mary Nichols*
  - Natural Resources Conservation Service – *Kristin Egen, Lou Catallini*
- US Department of the Interior
  - US Bureau of Land Management – *Unfilled*
  - US Fish and Wildlife Service
    - Ecological Services – *Scott Richardson*
    - Buenos Aires National Wildlife Refuge – *Bill Radke*
  - US Geological Survey – *Chris Magirl*
- University of Arizona

- o Agriculture and Biosystems Engineering – *Don Slack*
- o Hydrology and Water Resources who?
- o Institute of the Environment who?
- o Natural Resources and the Environment – *\*Larry Fisher, \*Chuck Hutchinson*
- o Southwest Center – *\*Tom Sheridan*

### **Management and Communications**

The Working Group will be convened and staffed by the AVCA Conservation and Science Coordinator with oversight by the AVCA Science Advisory Board. Participation by members is voluntary. Work will be accomplished through monthly teleconferences and a minimum of two face-to-face meetings per year, one of which will be field oriented.

Documents will be shared via a set of Dropbox folders open to active members. Between meeting communication will be primarily through email. Meeting notes will be posted to the Dropbox folders.

### **Geographic Scope**

The area of consideration will include the entire Altar Valley Watershed south (upstream) of the Highway 86 Bridge.

### **Roles and Work Plan**

Much of the data and information that is required already exists. Some of this is in the form of published documents that describe the region and its history, as well as research results that have been generated in comparable environments. Moreover, various agencies have generated geographically explicit data (i.e., maps and point samples or monitoring sites).

- 1) Existing Data - The first phase of work for the Working Group will be to assemble existing data, including:
  - Published reports and data
  - Historic photos/stories
  - Historic improvements/interventions (dikes and berms; AVCA)
  - Land use/ownership
  - Soils
  - Rangeland condition
  - Vegetation
  - Altar Valley Resource Assessment (2000)
  - Infrastructure (e.g., roads, power/telephone lines, buildings)
  - LIDAR and aerial photography
  - Fire map
  - Cultural resources
  - Precipitation (rainlog.org)
  - Hydrologic data
  - Altar Valley Collection, housed in the UA Global Rangelands database
  - Wildlife related data: T&E species, critical habitat, Pima County MSCP

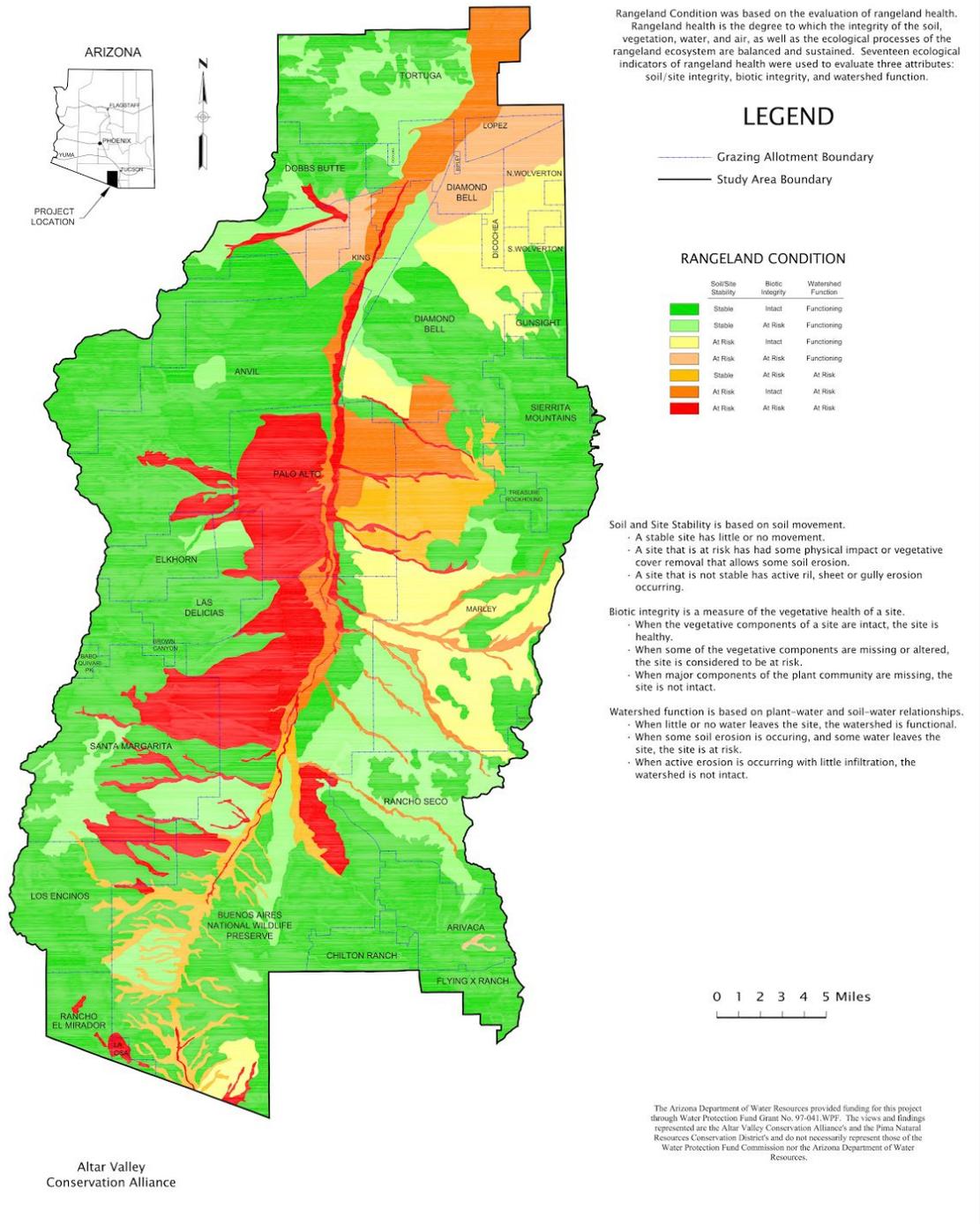
- 2) Data Management - Development of a data management process and protocols that will address:
  - How data is stored and shared
  - Collaborative data editing
  - Who can access data, and privacy controls for sensitive data
  - Long term data maintenance
  - Identification of data priorities and data gaps
  
- 3) Analytic Products - The second phase of work will include generating second order analytic products including, *inter alia*:
  - Basin-wide hydrology and sub-basin areas and peak discharge
  - Hydraulic mapping
  - Aggrading/degrading tributaries and/or reaches within tributaries
  - Sediment transport
  - Climate change scenarios
  
- 4) Siting of and Strategy for Interventions - In parallel, information will be gathered that would be useful in evaluating the value and potential siting for proposed interventions, including:  
feel like we're missing something here re the question of what we do???
  - Willing landowners/partners/agencies
  - Regulatory framework
  - Cost/benefit
  - Physical access
  - Strategic need for intervention
  - Probability of success
  - Infrastructure protection
  
- 5) Guidance and support for RFPs - The working group will help develop and respond to relevant RFPs, review submissions and make recommendations, as appropriate, for proposed or planned work in the Altar Valley.
  
- 6) Guidance and support for monitoring – The working group will make recommendations, as appropriate, regarding monitoring strategies and review monitoring results as resources permit.

## APPENDIX D

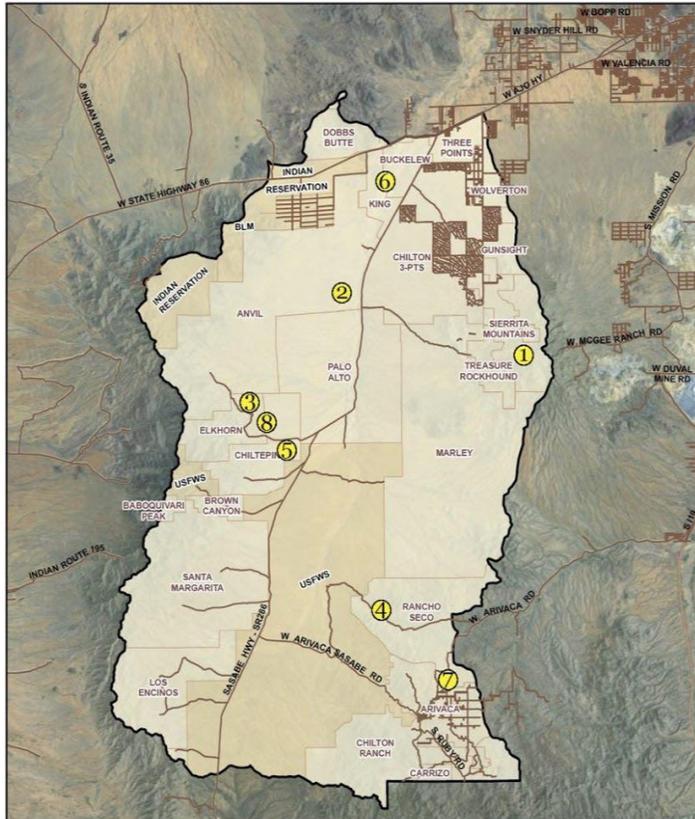
Altar Valley School District	Pima Natural Resource Conservation District
Arivaca Fire District	Quiet Creek Corporation
Arivaca Boys Ranch	Quivira Coalition
Arizona Association of Conservation Districts	Rancho de La Osa
Arizona Department of Agriculture	Rancho Santa Lucia
Arizona Department of Environmental Quality	Rancho Seco
Arizona Game & Fish Department	Rangeland Hands, Inc.
Arizona Land & Water Trust	Robert Schmalzel
Arizona Revegetation & Monitoring Co.	Robinett Rangeland Resources
Arizona State Forestry	Santa Margarita Ranch
Arizona State Land Department	Sierrita Mining & Ranching Co.
BKW Farms	Sky Island Alliance
Buckelew Farms	Southern Arizona Rangeland Honey
Buenos Aires National Wildlife Refuge	Southwest Decision Resources
Cascabel Conservation Association	Stockwell Honey Company
Chilton Ranch	The Loft Cinema
City of Tucson Water Department	The Nature Conservancy
Commotion Studios	Three Points Fire District
Coronado National Forest	Tohono O'odham Nation Fire Department
Cross-Watershed Network	Tucson Interagency Fire Center
Cuerca Los Ojas Foundation	U of A CALS Communications and Technologies
Diamond Bell Ranch	U of A CALS Cooperative Extension
Elkhorn Ranch	U of A Little Chapel of All Nations
Freeport McMoRan Copper & Gold Foundation	U of A School of Natural Resources and the Environment
Global Rangelands	U of A Southwest Center
Jarillas Ranch	U of A Tierra Seca Club
JE Fuller Hydrology & Geomorphology, Inc.	U of A Wildcat Research and Conservation Center
King's Anvil Ranch	US Border Patrol
King's 98 Ranch	US Bureau of Land Management
Larry Humphrey	USDA Agricultural Research Station Southwest Watershed Research Center
Lower San Pedro Watershed Alliance	US Fish and Wildlife Service Arizona Ecological Services

Malpai Borderlands Group	US Fish and Wildlife Service - Partners for Fish and Wildlife Program
Marley Ranch	US Forest Service
National Fish and Wildlife Foundation	US Geological Survey - Ecologist Southwest Biological Science Center
Noon Ranch	US Natural Resources Conservation Service
Old Hayhook Ranch	Volunteers for Outdoor Arizona
Palo Alto Ranch and Baboquivari Peak Ranch	Western Landowners Alliance
Pima County Natural Resources, Parks and Recreation	Western Sustainable Agriculture Research & Education
Pima County Office of Sustainability and Conservation	Westland Resources, Inc.
Pima County Regional Flood Control District	Zeedyk Ecological Services

# RANGELAND CONDITION WITHIN ALTAR VALLEY



## Altar Valley Conservation Action Sites



- ① Keystone Peak      F W
- ② West Mill      F W
- ③ Pig Mountain      F W
- ④ Rancho Seco      F W
- ⑤ Las Delicias      F W
- ⑥ Northern Altar Wash Area      F W
- ⑦ Noon Ranch      F W
- ⑧ Elkhorn/Las Delicias  
Demonstration Project      F W

<b>KEY</b>	
<b>F</b>	= Fire
<b>W</b>	= Watershed Enhancement
<span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black;"></span>	= Plan in progress
<span style="display: inline-block; width: 15px; height: 15px; background-color: #FFD700; border: 1px solid black;"></span>	= On hold
<span style="display: inline-block; width: 15px; height: 15px; background-color: #ADD8E6; border: 1px solid black;"></span>	= Complete
<span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black;"></span>	= No plan intended

RESOLUTION  
of the  
ALTAR VALLEY CONSERVATION ALLIANCE  
BOARD OF DIRECTORS

A Resolution authorizing the Submission of a Grant Proposal to the  
Bureau of Reclamation 2018 WaterSmart Grant Cooperative Watershed Management Program

WHEREAS, the Altar Valley Conservation Alliance (AVCA) is a local non-profit corporation whose mission is to work through a strongly collaborative, science-based, community driven and integrated approach to:

- CONSERVE healthy and productive working landscapes, including soil and water conservation, wildfire management, habitat conservation and protection of endangered species, and other environmental initiatives;
- PROMOTE a thriving agricultural economy by encouraging improved ranching and farming practices, diversification and innovation, and by supporting programs and policies that support more effective, long-term economic development;
- SUSTAIN a resilient rural community by retaining and renewing cultural and historical traditions;

WHEREAS, according to the By-Laws of AVCA, the President of AVCA has the authority to enter into contracts or other instruments authorized by the Board of Directors which are necessary or appropriate to the purposes and activities of the Corporation; and  
WHEREAS, the President of AVCA has the authority to name a designee to perform certain tasks required in the administration of operations of the Corporation;

BE IT RESOLVED, that the AVCA Board of Directors has reviewed and supports the grant application to the Bureau of Reclamation WaterSMART Grant for Cooperative Watershed Management Program 2018 and has authorized Mary Miller, AVCA’s Executive Director, to be the key contact with grant administrators for this Cooperative Watershed Management Program. Said support was duly voted upon and passed unanimously by the members of the Board of Directors via electronic mail, and said vote shall be ratified at the next regular meeting of the Board of Directors on March 12, 2018.

BE IT FURTHER RESOLVED, that AVCA has the capability and capacity to provide the amount of funding and in-kind contributions specified in the budget proposal.

BE IT FURTHER RESOLVED, that AVCA will work with the Bureau of Reclamation to meet established deadlines for entering into a cooperative financial assistance agreement.

DATED this \_\_\_\_ day of January, 2018, on behalf of the Altar Valley Conservation Alliance

\_\_\_\_\_ date

Patricia King, President

EVote motion to support the Resolution of Support for the Submission of the Bureau of Reclamation Grant Proposal, January 31, 2018.

I, \_\_\_\_\_(board member), move to approve the submission of the 2018 grant proposal of the Bureau of Reclamation, as presented in concept by staff at the December 11, 2017 Board meeting. Should this eVote be approved, I further instruct staff to place ratification of this eVote onto the next regular Board meeting agenda, March 12, 2018.

Above motion seconded by \_\_\_\_\_(board member)

# Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona

A Proposal Submitted to the  
Bureau of Reclamation  
WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018)  
Task B: Watershed Restoration Planning

## APPENDIX H - LETTERS OF SUPPORT

January 31, 2018

Applicant:

Altar Valley Conservation Alliance  
PO Box 27906  
Tucson, Arizona 85726  
[www.altarvalleyconservation.org](http://www.altarvalleyconservation.org)



United States Department of Agriculture

Research, Education, and Economics  
Agricultural Research Service

Mr. Darren Olson  
Bureau of Reclamation  
Financial Assistance Operations Section  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225  
(through AVCA)

January 18, 2018

Re: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ*

Dear Mr. Olson,

Mary Nichols and I (both scientists with the USDA-ARS Southwest Watershed Research Center) attended the retreat when the Altar Valley Watershed Working Group (AVCA) was formed. We have been impressed by the work done to date and the activity level of the AVCA. Consequently, I am writing today to express our support for the AVCA application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*.

In many ways the Altar Valley is a model watershed representative of similar watersheds across the Southwest. The changing climate, incised channel causing geomorphic disequilibrium, headwater impacts on downstream values, and public/private land considerations are problems that face many watersheds. Watersheds with active management groups, especially if they attract attention from a larger research community are the ones where we would like to work.

Mary Nichols has already started a research program in valley, primarily focused on the Buenos Aires National Wildlife Refuge together with the USGS and the Agricultural and Biosystems Engineering Department at the University of Arizona. One recent publication from that work can be found here: <https://www.tucson.ars.ag.gov/unit/publications/PDFfiles/2359.pdf>. My interest is in seeing how remotely sensed imagery could be used both to track vegetation change and inform current management in the valley.

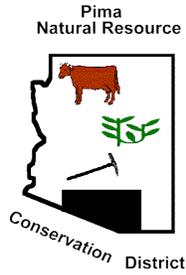
In summary, we believe this is a worthwhile project. Your funding would make our collaboration even more likely to bear fruit. Please let me know if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Philip Heilman".

Philip Heilman, Research Leader

Southwest Watershed Research Center  
2000 E. Allen Rd., Tucson, AZ 85719-1520  
Voice 520.647.9202 Fax 520.670.5550 Cell 520.982.2841 E-mail phil.heilman@ars.usda.gov  
USDA is an Equal Opportunity Employer



Pima Natural Resource Conservation District  
Pima Center for Conservation Education, Inc.  
NRCS Plant Materials Center  
3241 N. Romero Road  
Tucson, AZ 85705  
(520) 971-2962

January 20, 2018

U.S. Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

***RE: Collaborative Watershed Restoration Plan (CWMP) for the Altar Valley Watershed, Pima County, AZ***

Dear CWMP Review Committee:

I am writing today to express the support of the Pima Natural Resource Conservation District (District) for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled, "Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona."

The Pima Natural Resource Conservation District (District) operates under Chapter 6 of Title 37 of the Arizona Revised Statutes as a hybrid of a state agency funded under the Arizona State Lands Natural Resources Division *and* as an independent local unit of Arizona government.

The expertise of the District and all other Natural Resource Conservation Districts in Arizona, is recognized by Arizona statute 37-1054 (A) as follows:

*"This state recognizes the special expertise of the districts in the fields of land, soil, water and natural resources management within the boundaries of the district."*

The District works together with and represents "cooperators" who are persons having natural resources under their control and who have each voluntarily signed an agreement to pursue soil and water conservation efforts in cooperation with the District.

The District's mission, as defined by statute, is to provide for restoration and conservation of lands, water and soil resources, preservation of water rights, and control and prevention of soil erosion; and thereby conserve natural resources and wildlife, protect the tax base, protect private, State and federal lands, protect and restore the District's river's streams and associated riparian habitats, including livestock, fish and wildlife dependent on those habitats, in such a manner as to protect and promote public health and safety, and the general public welfare.

The Altar Valley watershed lies within the District's geographic boundaries. Many AVCA members are also active District cooperators. The mission of the AVCA aligns perfectly with the mission of the District. We consider the AVCA highly professional in their efforts, and one of our most effective and well-organized partners with a strong record of measurable accomplishments.

Large scale erosion in the Altar Wash, which resulted from a catastrophic combination of events that occurred in the 19<sup>th</sup> and early 20<sup>th</sup> centuries, is a primary concern of the District. The creation of a Watershed Restoration Plan is of critical importance as the next step in addressing that soil erosion.

Through research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group, the AVCA and its partners have laid a strong foundation to facilitate a collaborative approach to development of a Watershed Restoration Plan to achieve our mutual goals.

The District strongly endorses the AVCA proposal and anticipates that the Bureau of Reclamation will become a valuable new partner should this grant application succeed.

Sincerely,

Cindy Coping

A handwritten signature in black ink, appearing to read "Cindy Coping". The signature is fluid and cursive, with the first name "Cindy" being more prominent than the last name "Coping".

Chair, Pima Natural Resource Conservation District  
Chair, Pima Center for Conservation Education, Inc.

**January 21, 2018**

Bureau of Reclamation  
Financial Assistance Operations Section  
Attn: Mr. Darren Olson  
Denver, CO  
Delivered via Grant Proposal

Re: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ*

Dear Mr. Olson:

I am writing to express our support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Further develop an existing watershed group, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*.

The Altar Valley Conservation Alliance is a well-respected leader in landscape-scale collaborative conservation. At a time when conflicts over land use often result in gridlock, AVCA is helping illuminate an important and highly productive path forward in the West.

In December 2015, the board and guests of the Western Landowners Alliance visited AVCA to learn about the many projects underway there to restore the Altar Valley watershed. We were but one of a series of groups visiting AVCA that fall to learn and collaborate. During that visit, we had the opportunity to see first hand the tremendous and innovative work underway to reduce erosion and restore the hydrologic function of the watershed. The work that the ranchers in AVCA are doing clearly generates positive benefits far downstream and can serve as a model for others around the West.

We strongly encourage the Bureau of Reclamation to help carry this important work forward.

Sincerely,



Lesli Allison  
Executive Director

This is second page content



New Mexico License #56670

**Watershed Restoration Services**

46 County Road 84A, Santa Fe New Mexico 87506

Office/Home 505-455-0012 / Cell 470-3542 / Email: [rangehands@gmail.com](mailto:rangehands@gmail.com)

1/22/2018

**Letter in Support of the Collaborative Watershed Plan, Altar Valley, Pima County Arizona grant proposal to the Bureau of Reclamation.**

**I have been working in the Altar Valley of southern Arizona as a geomorphologist field practitioner since 2005 providing contract services to the Altar Valley Conservation Alliance. I have had the pleasure to assess, design and implement a number of uplands watershed restoration project for the AVCA. I have also done a number of valley wide watershed condition recon assessments. These assessments were conducted using aircraft, horseback, foot travel and motorized vehicles. In doing so I have developed a good working knowledge of the watershed conditions in the Altar Valley and the related problems.**

**Base on my experience in the Altar Valley I strongly support the grant applications to do a watershed based plan that focused on incised channels and mesquite enchantment along with other associated degraded conditions in the uplands. Such a plan will enable the valley's partners to focus and prioritize the work that needs to be conducted to stabilize this degraded watershed.**

**Steve Carson  
VP Rangeland Hands, Inc.**



# United States Department of the Interior

## Fish and Wildlife Service Arizona Ecological Services Office

9828 North 31<sup>st</sup> Avenue

Phoenix, Arizona 85051

Telephone: (602) 242-0210 Fax: (602) 242-2513



AESO/SE

January 23, 2018

Bureau of Reclamation  
Financial Assistance Operations Section  
Attn: Mr. Darren Olson  
Denver, CO  
Delivered via Grant Proposal

Re: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ*

Dear CWMP Review Committee:

The U.S. Fish and Wildlife Service (Service) is providing this letter in support of the Altar Valley Conservation Alliance's (AVCA) application to the Bureau of Reclamation's WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*.

The Service has worked with the AVCA for many years as partners in the conservation of the unique desert grasslands, oak woodlands, and Sonoran Desert communities found in the Altar Valley of southern Arizona. The Altar Valley is an area that supports some of the highest biodiversity in the United States, including species protected under the Endangered Species Act. The AVCA is a committed group of ranchers supported by a wide variety of agencies and non-governmental organizations. The AVCA has worked cooperatively for many years with a wide range of partners to maintain and restore the Altar Valley as a functioning ecosystem. The Service is the Federal agency charged with the implementation of the Endangered Species Act, and is specifically interested in local land use and planning activities for landscapes and habitats important to the conservation of listed species. The Service's Buenos Aires National Wildlife Refuge is located in the Altar Valley and the AVCA has been an important partner in working with the Refuge to meet its objectives.

The Altar Watershed provides habitat for listed species, as well as an important landscape linkage for a number of other important waterways and mountain ranges that surround the Altar Valley. This entire watershed provides valuable resources for wildlife. We are also very concerned about the large-scale erosion problems of the Altar Wash and its major tributaries. The AVCA has shown great initiative by implementing new and realistic technology in the

restoration of the Altar Watershed. Members of the AVCA have made steady progress in controlling erosion and returning natural processes to this unique landscape. In addition to the excellent on-the-ground work accomplished by the AVCA, they have worked hard to educate and inform the general public in our community regarding the value of a functioning Altar Valley landscape to critical resources such as water, as well as an improved quality of life. The AVCA was instrumental in forming the Altar Valley Watershed Working Group which is working cooperatively to develop a watershed restoration plan for the benefit of all who have a stake in the improved function of the Altar Valley watershed.

The AVCA has always emphasized cooperation and collaboration. The AVCA is active in the community and the Elkhorn/Las Delicias Watershed Restoration Demonstration Project (Demo Project) has promoted ongoing collaboration within the community, region, and state. Funding through the Bureau of Reclamation's Water SMART grant program would enhance the ability of the AVCA to continue their excellent efforts to support continuing efforts for ecosystem restoration, and build community support and understanding for the valuable environmental resources found in the Altar Valley. Grant funding would allow them to work with their partners to gather data and work together to resolve how best to address the issues affecting this watershed.

The resources under the Service's management authority have benefitted from the ongoing conservation work being planned and implemented by the AVCA. We fully support their application for funding through the Bureau of Reclamation's WaterSMART program. The AVCA is a group deserving of this funding and we are confident that their use of the funding will benefit community priorities related to the Altar Valley watershed and environment. We appreciate your consideration of the AVCA for this grant funding. We feel that the Bureau of Reclamation will become a valuable new partner in these efforts should this grant application be successful.

Thank you again for considering the AVCA's application for funding through your program. Please contact Scott Richardson (520) 670-6150 (x242) if we can be of any further assistance.

Sincerely,



Steven L. Spangle  
Field Supervisor



January 22, 2018

Bureau of Reclamation  
Financial Assistance Operations Section  
Attn: Mr. Darren Olson  
Mail code: 84-27814  
P.O. Box 25007  
Denver, CO 80225  
Delivered via Grant Proposal

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ

Dear Mr. Olson:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.*

Arizona Revised Statute (ARS) §17-102 codifies state ownership of wildlife in Arizona. The Arizona Game and Fish Department (Department) has public trust responsibility and primary authority to manage and regulate take of wildlife as a public resource within the state of Arizona irrespective of landownership, excepting those wildlife existing on tribal lands. In order to effectively meet our trust responsibility, we work closely with numerous federal and state agencies, non-governmental organizations, and private partners.

The Department began working with the AVCA about 17 years ago on a variety of wildlife and recreation projects throughout the Altar Valley. In addition to planning and collaboration efforts with the AVCA, the Department has provided funding to a number of AVCA projects through our Habitat Partnership Committee (HPC) and Access Programs. The Department was among the first AVCA partners to assist with funding for prescribed burning. Most recently the Department is working with the Buenos Aires National Wildlife Refuge (an AVCA member) and private ranches in the Altar Valley to fund and assist habitat enhancement activities for grassland habitats and wildlife. Department representatives regularly participate in AVCA watershed planning committee efforts.

We share AVCA's concerns about large-scale erosion problems in the Altar Wash and its tributaries. We believe that the creation of a Watershed Restoration plan is the next step in solving some of these problems.

[azgfd.gov](http://azgfd.gov) | 520.628.5376

TUCSON OFFICE: 555 N. GREASEWOOD ROAD, TUCSON AZ 85745

GOVERNOR: DOUGLAS A. DUCEY COMMISSIONERS: CHAIRMAN, JAMES R. AMMONS, YUMA | JAMES S. ZIELER, ST. JOHNS | ERIC S. SPARKS, TUCSON  
KURT R. DAVIS, PHOENIX | EDWARD "PAT" MADDEN, FLAGSTAFF DIRECTOR: TY E. GRAY DEPUTY DIRECTOR: TOM P. FINLEY

Mr. Darren Olson

January 22, 2018

2

The AVCA and partners have laid the foundation to facilitate a collaborative approach to development of a Watershed Restoration Plan via research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group. By building on the relationships AVCA has created and with the support of their partners, AVCA will be able to create a watershed plan that reflects stakeholders' goals. The Department strongly endorses this proposal and is confident the Bureau of Reclamation will be a beneficial new partner should this grant application be successful.

Sincerely,

A handwritten signature in black ink that reads "Raul A Vega". The signature is written in a cursive style with a large, stylized 'V' at the end.

Raul Vega  
Regional Supervisor, Region V

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

January 19, 2018

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed

Dear CWMP Review Committee:

I'm writing to convey my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation's WaterSmart: Cooperative Watershed Management Program (FY 2018), for its project: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ.

As a member of AVCA's Science Advisory Board, I've worked closely with AVCA staff and partners to develop this important project proposal. The proposal is the result of extensive groundwork, collaborative research with University of Arizona programs and agency partners, and commissioned professional analysis focused on landscape scale restoration efforts in the Altar Valley. Erosion issues are a major challenge for the sustained management of the Altar Valley, and watershed restoration has been one of the key initiatives addressed through on-the-ground projects sponsored by AVCA.

AVCA and partners have developed a strong information base through this research collaboration, including the development of a GIS database, the formation of a Watershed Working Group, along with the experience and support from area ranchers. Through this solid analytical foundation and the strong collaborative approach, AVCA will be able to implement a solid and enduring watershed restoration plan. These AVCA-coordinated partnerships are essential to overcoming the large-scale erosion problems of the Altar Wash and its tributaries.

I'd like to underscore my strong support for this proposal, and my personal commitment to work with AVCA in implementing this important initiative. Financial support from the Bureau of Reclamation would be a critical contribution to helping make these plans a reality, and to seeing tangible, long-term impact on the land and resources of the Altar Valley.

Sincerely,



Larry A. Fisher, Ph.D.  
Research Professor  
School of Natural Resources and the Environment  
University of Arizona  
N217 Environment and Natural Resources 2  
Tucson, AZ 85721  
Phone: 520-909-1605 (C)  
Email: [lafisher@email.arizona.edu](mailto:lafisher@email.arizona.edu)  
Skype: fisher.nusa  
Web page: <http://www.snre.arizona.edu/>



January 19, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ

Dear CWMP Review Committee:

This letter is to support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.

I serve on the AVCA Science Advisory Board and strongly share AVCA's concerns about large-scale erosion problems in the Altar Wash and its tributaries. To that end, I believe that the creation of a Watershed Restoration plan is the next step in solving some of these problems.

The Altar Valley Conservation Alliance and their partners have provided a foundation of research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. By building on these relationships AVCA will create a watershed plan that reflects stakeholders' goals and will address real problems on the landscape. I strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,



George Ruyle, Professor and Extension Specialist  
Marley Endowed Chair for Sustainable Rangeland Stewardship



Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, Colorado

January 17, 2018

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.

Dear CWMP Review Committee:

This letter is being submitted to you as my strong support for the project being submitted by the Altar Valley Conservation Alliance (AVCA) in the WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018).

For well over the past decade, I have interacted with the members of AVCA on landscape level conservation efforts in the Altar Valley. Most of the time as the Natural Resources Division Manager for Pima County Natural Resources Parks and Recreation but since my retirement from the County, as a member of the AVCA Science Advisory Board. The Altar Valley is one of the least developed of the southern Arizona Valley watersheds. The Altar valley has been designated by Pima County as a significant bioreserve and significant lands for conservation have been acquired in the Valley as mitigation under a USFW/Pima County section 10 permit in place. In spite of historic impacts and current ecological challenges in the Valley, the system is on the radar screen of NGOs, federal and state agencies as a place where conservation investments will pay off. Considerable interest exists in the erosional problems and impacts of the Altar Wash and its tributaries. What is lacking from the equation is a detailed organizing restoration planning effort to pull together and prioritize further efforts.

Much preliminary work has already gone on and plan elements and support technical expertise has been identified. Now, the AVCA effort needs support to pull all the elements together and institutionalize the vision across all the conservation partners actively involved in the Valley. AVCA has pulled together and funded a GIS based database that stands as a model for such an organization of its size and they have a dedicated Watershed Working group in place to facilitate a collaborative approach to and planning effort. They have helped sponsor and, or, fund numerous watershed related research efforts specific to the Valley. All of the major stakeholders living in or having management authorities in the Valley have had ample opportunity to participate in efforts to date. That approach is fundamental to how the AVCA works.

I strongly encourage the review committee look closely at the AVCA application. They have the major elements covered to ensure any effort funded will be successful. They have a base environment in need of ecological restoration and the land available to support small scale to landscape level projects. They have a proven cadre of technical, public and landowner partners

committed to restoring the Valley fundamental watershed health. They have the long vision and have been hard at work learning the Valley needs and growing an organization for over 20 years now. So, they have both the organizational and visionary capacity to make the project as outlined in the application a success. With over 40 years in conservation management I have seldom run across a small local NGO equipped and in the right place at the right time to support.

I appreciate your careful consideration of the grant application and endorse it as strongly as I can.

Sincerely,

**Kerry Baldwin**

Kerry Baldwin  
Wildvisions Arizona



Douglas A. Ducey  
Governor

## Office of the State Forester

Arizona Department of Forestry  
and Fire Management



Jeffery C. Whitney  
State Forester

January 18, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ

Dear CWMP Review Committee:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.*

We share AVCA's concerns about large-scale erosion problems in the Altar Wash and its tributaries. We believe that the creation of a Watershed Restoration plan is the next step in solving some of these problems.

The Altar Valley Conservation Alliance and partners have laid the foundation via research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. By building on the relationships AVCA has created and with the support of their partners, AVCA will be able to create a watershed plan that reflects stakeholders' goals. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,

A handwritten signature in blue ink that reads "Jeffery C. Whitney".

Jeffery C. Whitney  
Arizona State Forester

**Duty ♦ Respect ♦ Integrity**



# United States Department of the Interior

Fish and Wildlife Service

Buenos Aires, Leslie Canyon, & San Bernardino National Wildlife Refuges

P O Box 109

Sasabe, Arizona 85633



Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

January 19, 2018

Dear CWMP Review Committee:

The U.S. Fish & Wildlife Service (Service) protects and manages important upland at Buenos Aires National Wildlife Refuge. This refuge was established to restore, conserve, and manage the natural abundance and diversity of wildlife and habitat utilizing strategies that focus on environmental and biological integrity. For many years, the Service has worked closely with private landowners and the Altar Valley Conservation Alliance (AVCA) to study and develop recommendations for managing and restoring various landscape attributes. Additionally, the Service has an existing positive working relationship with the Bureau of Reclamation (Bureau) conducting various monitoring and research activities on the refuge.

Because a major goal of the Service is effective conservation of natural biological diversity through perpetuation of dynamic healthy ecosystems, the application being submitted by AVCA to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona, is exactly the type of program the Service would like to encourage, support, and assist with.

Productive partnerships between local landowners, the Service, and other stakeholders currently exists because AVCA had the foresight to reach out and build relationships and facilitate a collaborative approach to developing a Watershed Restoration Plan. Additional opportunities to build upon the foundation of research that helped generate the Altar Valley GIS database, formed a Watershed Working Group, and initiated other proposals will help address and reduce damaging erosion, protect groundwater levels, and help us learn more about the complex ecological relationships existing here. The Service is strongly supportive of this application, and I look forward to working together with AVCA and the Bureau in this effort.

Sincerely

William R. Radke  
Project Leader

# 4

King's Anvil Ranch  
14990 South Sasabe Road  
Tucson, Arizona 85736

January 18, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225  
*Delivered via grant proposal*

Re: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed,  
Pima County, AZ*

Dear CWMP Review Committee:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*.

The King's Anvil Ranch has been in our family since 1895, and our concern and care for the future of the Altar Valley stems from our long past in the valley. The land that comprises our ranch is essential to the economic success of our operation, but is also integrated into our family's history. We view ourselves as caretakers of the land for future generations, which is a foundation upon which the Altar Valley Conservation Alliance was founded. We are founding members of the Alliance, and are incredibly proud of the work that has been done over the last twenty-one years in the Altar Valley by the organization.

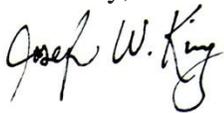
AVCA has been essential to sharing the present and future of conservation with ranchers in the valley. Incredible work has been done on the ground in the valley, including the building of low-tech arroyo restoration structures to help heal the landscape and the harvesting of water from ranch roads. Notably, the Alliance has also been a force that facilitates bringing together partners with a multitude of interests and stakes in the valley to work on a common goal: the health of the watershed. It is this combination of on-the-ground work that makes the Alliance such an essential force in the Altar Valley.

We are delighted that AVCA has invested substantial time, money and other resources in creating conversations about the large-scale erosion problems of the Altar Wash and its major tributaries. The Altar Wash runs through our ranch, and cuts between our buildings and the majority of the rest of the ranch. When it floods, we are directly confronted by the massive amounts of water moving through the wash, both in an immediate sense (as the river cuts us off from the rest of the ranch) and in a broader

sense, as it is a clear picture of how much water is being lost from the landscape and quite literally passing by us. The Altar Valley Working Group convened by AVCA includes partners with the abilities to work through the issues that must be resolved before healing can begin in the main stem of the Altar Wash. This work is essential to the overall health of the Altar Valley Watershed, and is the next logical step to follow up on all of the work that AVCA has already invested in the Altar Valley.

We wholeheartedly endorse this proposal and hope that the Bureau of Reclamation will become a new partner as the Altar Valley Conservation Alliance and partners work on the future of collaborative conservation in the Altar Valley.

Sincerely,

A handwritten signature in black ink that reads "Joseph W. King". The signature is written in a cursive style with a large, stylized "K" at the end.

Joseph W. King  
King's Anvil Ranch

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ

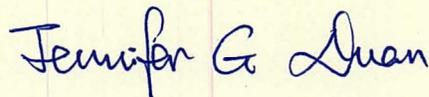
Dear CWMP Review Committee:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.

My research team at the University of Arizona (UA) has worked with Pima County Regional Flood Control District on watershed erosion issues in the Altar Valley watershed. Our research found increased stream density, upland erosion, and channel incision in Altar Wash and its tributaries throughout the basin. Computational models as well as field observations identified 15 sub-watersheds having the highest erosion rates in the past two decades. Because of soil loss and channel incision, mesquite has encroached broadly in the basin. The Altar Valley Conservation Alliance (AVCA), the local rancher association, concerned about the large-scale erosion problems in the basin, especially in the Altar Wash and its tributaries. The alliance decided to create a Watershed Restoration plan for guiding stake-holders and ranchers to adaptively mitigate erosion and preserve native vegetation.

The AVCA and partners have laid the project foundation based on the research at UA, the development of an Altar Valley Geographic Information System database, and the formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. By building on the relationships, AVCA has created and with the support of their partners, AVCA will be able to create a watershed plan that reflects stakeholders' goals. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,



Jennifer G Duan, PhD, PE  
Associate Professor  
Director, Graduate Study Program





## COUNTY ADMINISTRATOR'S OFFICE

PIMA COUNTY GOVERNMENTAL CENTER  
130 W. CONGRESS, FLOOR 10, TUCSON, AZ 85701-1317  
(520) 724-8661 FAX (520) 724-8171

C.H. HUCKELBERRY  
County Administrator

January 29, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

Re: **Collaborative Watershed Restoration Plan (CWMP) for the Altar Valley Watershed,  
Pima County, AZ**

Dear CWMP Review Committee:

Pima County strongly supports the Altar Valley Conservation Alliance (Alliance) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*. Our support includes a commitment to the goals of the project, staff time commitment, and a cost-share match commitment for consultant services of up to \$120,000.

At over 700,000 acres, the Altar Valley has diverse communities of flora and fauna, some of the most productive grasslands in southern Arizona, and a rich cultural history. Given its geographic position, recharge in the watershed provides groundwater to the City of Tucson's potable water supply. Despite its relative close proximity to Tucson, the watershed has remained remarkably unfragmented, a fact that allowed family ranching to maintain viability and environmental conditions in some areas of the watershed to remain in relatively stable condition.

The Altar Valley is a key focal area in Pima County's widely acclaimed Sonoran Desert Conservation Plan (SDCP), which seeks to promote development activities while sustaining and respecting the natural and cultural capital of our diverse landscape. In the information gathering stage of the SDCP, the extraordinary natural and cultural capital values of the

NAME Bureau of Reclamation Mr. Darren Olson

Re: **Collaborative Watershed Restoration Plan (CWRP) for the Altar Valley Watershed, Pima County, AZ**

January 29, 2018

Page 2

Altar Valley became clear, leading the way for Pima County to invest over \$50 million from 2004-2009 to protect the watershed by acquiring land. Since our land purchases, our commitment to the Altar Valley has grown to include a range of restoration actions aimed at improving watershed conditions. At every stage of the process – from land purchases to restoration and planning – the Alliance has been an indispensable partner by leveraging our commitments, bringing together a diverse partner set, and bringing local voices into the planning process.

Despite our conservation efforts and those of the Alliance, problems continue to exist in the Altar Valley that threaten both the family rancher and environmental stability. A persistent and severe drought, erosion and soil loss, encroaching shrubs in the grassland, and development are key threats. The environmental and social impacts of these threats will only be exacerbated in a hotter and drier climate future. Of significant concern to Pima County and the Alliance is the scale of erosion and soil loss occurring in the valley. For example, the Altar Wash is highly incised along much of the upper watershed and substantial gully and arroyo formation is occurring in tributaries to the Altar Wash. In the lower reaches of the wash the channel has become highly braided and ill-defined, thereby creating flood hazards that present management challenges to County floodplain managers.

Pima County believes that the creation of a watershed restoration plan is a critical next step in addressing the valley's erosion problems before they become intractable. Over the past few years, the Alliance and its partners have put in place a range of foundational elements of the watershed plan including research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group.

To support the watershed plan and the WaterSmart proposal, Pima County Regional Flood Control District has funded the University of Arizona to prioritize the most at-risk sub-basins in the watershed for restoration. This and other work will result in a commitment to a cost-share match of \$120,000, which will be used to determine appropriate structures and other measures to address erosion problems.

Pima County's commitment to advancing conservation in the Altar Valley is unwavering and we are confident in the Alliance's ability to lead the watershed planning effort. The Alliance has been a leader in taking both direct action and in pursuing financing to facilitate needed studies. Though small in size, the Alliance is highly regarded for its ability to find common ground among a diverse group of stakeholders and achieve outcomes that are far greater than many think possible for the size of the organization. Their vision, approach, and determination are inspiring, yet their ability to achieve positive outcomes is currently limited by their capacity. By awarding a Cooperative Watershed Management grant to the Alliance, the Bureau of Reclamation would help grow the capacity of the organization, thereby leading to the development of this much-needed watershed restoration plan and continued facilitation of site-specific restoration projects.

NAME Bureau of Reclamation Mr. Darren Olson

Re: **Collaborative Watershed Restoration Plan (CWRP) for the Altar Valley Watershed, Pima County, AZ**

January 29, 2018

Page 3

By building on the relationships fostered for over 20 years and with the support of their partners, the Alliance is well positioned to create a watershed plan that reflects stakeholders' needs. Pima County is confident that a grant awarded to the Alliance is a sound investment in a watershed planning group with past accomplishments and an even brighter future. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,



C.H. Huckelberry  
County Administrator

CHH/

c: Mary Miller, Executive Director, Altar Valley Conservation Alliance  
Suzanne Shields, Director, Regional Flood Control District

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

1-20-18

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ

Dear CWMP Review Committee:

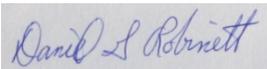
I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation Water Smart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.

I've worked in the Altar Valley as a natural resource conservationist for 45 years. I retired 11 years ago from a career with Natural Resources Conservation Service and now work as a consultant in rangeland management. I'm active in the AVCA as a member of the Science Committee and working as a consultant on projects in the area.

I share AVCA's concerns about large-scale erosion problems in the Altar Wash and its tributaries. We believe that the creation of a Watershed Restoration plan is the next step in solving some of these problems.

The Altar Valley Conservation Alliance and partners have laid the foundation via research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. By building on the relationships AVCA has created and with the support of their partners, AVCA will be able to create a watershed plan that reflects stakeholders' goals. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,  
Dan Robinett, Robinett Rangeland Resources LLC

A handwritten signature in blue ink that reads "Dan Robinett". The signature is written in a cursive style and is placed on a light blue rectangular background.

**Santa Margarita Ranch, Inc.**

P.O Box 37018  
Tucson, AZ 85740

January 18, 2018

Bureau of Reclamation  
Financial Assistance Operations Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

Dear Mr. Olson:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018). Task B: Watershed Restoration Planning, for its project titled: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.

We ranch on the western side of the Altar Valley and have been ranching in this area since 1983. I serve on the AVCA Board of Directors and on its Science Advisory Board and am very interested in the future of this watershed. We feel that watershed conservation practices are very beneficial to the entire Altar Valley and hope to continue work towards this end.

The AVCA and its partners have laid the foundation via research, development of an Altar Valley Geographic Information System database and formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful partner should this grant application be successful.

Sincerely,



Walter Lane

January 24, 2017

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

Re: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ

Dear CWMP Review Committee:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona.

We share AVCA's concerns about large-scale erosion problems in the Altar Wash and its tributaries. We believe that the creation of a Watershed Restoration plan is the next step in solving some of these problems.

The Altar Valley Conservation Alliance and partners have laid the foundation via research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. By building on the relationships AVCA has created and with the support of their partners, AVCA will be able to create a watershed plan that reflects stakeholders' goals. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,



Damian Rawoot  
Land and Water Protection Manager  
Southern Arizona  
(520) 547-3421  
[damian.rawoot@tnc.org](mailto:damian.rawoot@tnc.org)



CITY OF  
TUCSON  
TUCSON WATER  
DEPARTMENT

January 19, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
P.O. Box 25007  
Denver, CO 80225

**RE: Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, AZ**

Dear CWMP Review Committee:

I am writing to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart: Cooperative Watershed Management Program (Fiscal Year 2018), Task B: Watershed Restoration Planning, for its project titled, *Collaborative Watershed Restoration Plan for the Altar Valley Watershed, Pima County, Arizona*.

We share AVCA's concerns about large-scale erosion problems in the Altar Wash and its tributaries. We believe that the creation of a Watershed Restoration plan is an important step in solving some of these problems.

The AVCA and partners have laid the foundation via research, development of an Altar Valley Geographic Information System database, and formation of a Watershed Working Group to facilitate a collaborative approach to development of a Watershed Restoration Plan. By building on the relationships AVCA has created and with the support of their partners, AVCA will be able to create a watershed plan that reflects stakeholders' goals. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely,

Timothy Thomure, P.E.  
Director  
Tucson Water





27000 WEST ELKHORN RANCH ROAD ... TUCSON, ARIZONA 85736  
520.822.1040 ... WWW.ELKHORN RANCH.COM

January 29, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
Mail Code: 84-27814  
PO Box 25007  
Denver, CO 80225

Re: *Collaborative Watershed Restoration Plan for the Altar Valley Watershed*

Dear Mr. Olson:

I am writing today to express my support for the Altar Valley Conservation Alliance (AVCA) application to the Bureau of Reclamation WaterSmart program.

Our family has ranched in the Altar Valley since 1945. Conservation of watershed basics – soil, water and vegetation – is critical to our ranching operation. I serve on the Altar Valley Conservation Alliance Board of Directors and on its Science Advisory Board, and participated in the December 2015 retreat that led to formation of the Altar Valley Watershed Working Group. Through AVCA, we have learned about and installed conservation practices such as water harvesting from ranch roads and low-tech rock arroyo restoration structures to arrest head-cuts and encourage water infiltration, soil deposition, and vegetation growth. We hope that the projects that have benefited us may serve as examples and inspiration to other landowners throughout the Altar Valley watershed.

We are also very concerned about the large-scale erosion problems of the Altar Wash and its major tributaries. We believe that it is very important for AVCA and its partners to gather data and work together to resolve how best to address these issues. The Altar Valley Working Group includes people with the skills, talent and dedication to work through these complicated issues. We strongly endorse this proposal and feel that the Bureau of Reclamation will become a helpful new partner should this grant application be successful.

Sincerely, Charley Miller