

Building a Toolkit for the Protection of Desert Waters

Arizona Land and Water Trust



Table of Contents

| | |
|--|---------|
| Introduction..... | 2 |
| Acknowledgements..... | 2 |
| AMP Insights Memo..... | 3 – 17 |
| Introduction..... | 3 |
| Methodology..... | 3 – 4 |
| Summary of Findings..... | 4 – 5 |
| Water Related Challenges..... | 5 – 8 |
| Solutions to Successful Integration of Water Resource Protection..... | 8 – 13 |
| Conclusion and Suggested Next Steps..... | 13 – 14 |
| Appendix 1 – Conservation Easement Water Right Language Examples | 14 – 17 |
| Arizona Land and Water Trust Internal Strategy Document..... | 18 – 20 |



Introduction

Building a Toolkit for the Protection of Desert Waters is an important step in strengthening the capabilities of the Arizona Land and Water Trust (The Trust), and other land trusts across the southwest, for conserving this region's precious and dwindling water resources. Made possible by a grant from the Land Trust Alliance through their Western Innovation Grants Program and the expertise of AMP Insights, this report will provide practitioners and decision-makers with a diverse toolkit and insight into cutting-edge water conservation practices. The result of which will be improved project selection, outcomes, and advocacy efforts in support of water conservation across the desert Southwest.

In order to understand the current state of water conservation and the tools land trusts need to be more effective AMP Insights conducted a literature review and interviewed land trusts and other conservation organizations across the Southwest. AMP Insights has drafted a memorandum of their findings including: challenges in the water conservation sphere, tools for water conservation, and suggested next steps. This memorandum informed the internal policy document which lays out a roadmap for the Trust to continue effectively conserving water resources in Arizona. The referenced AMP Insights memorandum and Trust policy documents are found on the following pages.



Since 1978

Arizona Land and Water Trust is an accredited land trust committed to protecting southern Arizona's rural heritage of working farms and ranches, wildlife habitat and the water resources that sustain them.

- Helped lead the effort to create Arizona's conservation easement enabling legislation.
- Have protected over 70,000 acres in Arizona.
- Over 31,000 acres of these held in conservation easement with our landowner partners.



AMP Insights is a small consulting firm working with clients on the most vexing water, economic, and natural resource management issues in unique, creative, and energizing ways. Their vision is to develop and inspire creative solutions which support positive environmental, economic, and social outcomes.



The Land Trust Alliance's mission is to save the places people need and love. accomplish this by empowering and mobilizing land trusts in communities across America to conserve land — and connect people to the land — for the benefit of all.

MEMORANDUM

Authors: Amanda Cronin, Amy McCoy and Alex Ehrens, AMP Insights

INTRODUCTION

This memo is a deliverable to Arizona Land and Water Trust (the Trust) from AMP Insights to support the Trust on an Integrated Land - Water Conservation Toolkit project. Funding was provided by the Land Trust Alliance. The memo focuses on challenges faced, and solutions and strategies used by land trusts in protecting both land and water resources. Protecting water resources brings nuances that are distinct from land conservation and takes many forms. The purpose of this research was to explore how land trusts are working to protect water quantity particularly for ecosystem benefit. The research is intended to inform the Trust's Desert Rivers Program by understanding what tools and strategies are employed by other organizations working at the nexus of land and water conservation.

METHODOLOGY

The memo is supported by a literature review and interviews with organizations working at the nexus of land and water protection. The memo begins with a brief introduction and approach, a summary of findings followed by a discussion of water related challenges, solutions to these challenges and a short wrap-up of potential next steps. An appendix includes examples of conservation easement language involving water rights and water features.

To understand the dynamics of other land trusts working at the nexus of land and water, we interviewed staff at eight different nonprofit land trust/conservation organizations. The groups and staff members interviewed included:

1. **Texas Agricultural Land Trust (TALT)**: James Oliver, Director of Engagement and Darren Clark, Director of Land Conservation
2. **Western Rivers Conservancy (WRC)**: Nelson Matthews, Vice President and Josh Kling, Conservation Director
3. **New Mexico Land Conservancy (NMLC)**: Ron Troy, Southern New Mexico Program Manager
4. **Palmer Land Conservancy (PLC)**: Rebecca Jewett, CEO
5. **Ogallala Land and Water Conservancy (OLWC)**: Ladona Clayton, Executive Director
6. **Ojai Valley Land Conservancy (OVLC)**: Vivon Crawford, Restoration Program Manager
7. **Colorado Open Lands (CO)**: Sally Wier, Conservation Project Manager
8. **Rio Grande Headwaters Land Trust (RiGHT)**: Susan Pierce-Platais, Executive Director and Laura Cusick, Land Protection Director

We also reached out to the following groups but did not receive a response to our request for an interview: American Prairie, Colorado Cattleman's Association. Informal interviews were conducted primarily via videoconference and focused on understanding how each organization views water resource protection as part of their mission or program areas, what specific tools they use, challenges they have faced in protecting water resources and recommendations they have for organization seeking to better protect water resources. Our interview questions are listed in **FIGURE 1**.

FIGURE 1. LIST OF INTERVIEW QUESTIONS

| Interview Questions |
|--|
| Is protection or conservation of water resources integral to your organization’s mission? If so, please elaborate. |
| Does your organization integrate language about water rights, water use, or water resources into conservation easements? If so, what forms does this take? |
| Can you share any examples of conservation easement language related to water rights or water resources? |
| What types of projects have you implemented that protect both land and water resources? Example could be conservation easements with water rights CEs focused on protecting stream, wetland, lakes, rivers; restrictions on water use in CEs; etc. |
| What challenges or barriers has your organization faced in trying to integrate water resource protection into land easements? |
| Do you have any recommendations for organizations seeking to better protect water resources through land conservation? |
| Are there any tools or policies you would like to see improved or changed to better address water and land protection jointly? |

A brief literature review was conducted prior to drafting interview questions to determine key areas of interest and emerging tools in the land trust community. The findings below reflect the limited resources that we found in our literature review but are primarily guided by feedback from practitioners during the interviews. Emergent tools are often not represented in the literature and conversations with practitioners are the best way to understand the challenges and solutions employed by the conservation community.

SUMMARY OF FINDINGS

The organizations interviewed were selected because they were known to be either actively working towards both land and water conservation or focusing on working lands with a recognition of the importance of water resource conservation in arid western landscapes. The list of organizations was generated through recommendations from the Trust as well as AMP Insights’ experience in the field of land and water conservation.

Among the interviewees, there was variability in how each organization views water conservation as it relates to their vision, mission and programs. All the organizations emphasized the importance of water resources on the western landscape. We interviewed five organizations – TALT, RiGHT, SNMLC, PLC, and OVLC – with primary goals to protect working landscapes from development, keep rangeland in production and preserve open space. These organizations spoke to the importance of maintaining water rights for out of stream use to protect working agricultural landscapes. Interviewees noted that water is integral to land protection in the West and you can’t talk about land protection without talking about water. Some of the working lands focused organizations had mobilized to protect water rights with the

land to keep water from being sold for other uses, others spoke about how a poorly managed ranch is better than the best laid out subdivision and the impact of impervious surfaces on the water cycle. One example of an innovative land water partnership was implemented by the Palmer Land Conservancy and the City of Pueblo Colorado. Palmer Land Trust is working in Pueblo, Colorado to protect a major irrigation ditch (the Bessemer Ditch) and some of the most productive produce lands (e.g. chiles, melons, etc) in Colorado. The City of Pueblo purchased a significant portion of the water rights on the ditch to support future city development, but in the meantime, Palmer is working with the producers and Pueblo to find ways to create more efficient irrigation practices to keep ag land in production and preserve the water rights Pueblo purchased. This is an example of an integrated land and water conservation project that prioritized protecting water rights for agricultural use with a secondary benefit of conserving water for instream or out of stream uses.

For the organizations focused on working lands conservation, all prioritized the protection of riparian and wetland areas under their conservation easements but were not generally focused on legally protecting water rights for anything other than out of stream use. One exception is a recent strategic shift by the Ojai Valley Land Conservancy (OVLC) on the central coast of California to focus more on water protection for the environment as well as for working lands. OVLC is currently exploring ways to acquire and protect instream water rights from savings earned through their existing land conservation strategies, which include agricultural land conversion (“oranges to oaks”), removal of invasive and water-intensive *Arundo donax* (an invasive reed) from riparian areas, and agricultural land acquisition and retirement. OVLC has recognized that these activities also have water conservation benefits and is seeking to quantify those benefits and protect them for instream flow in the context of an ongoing threatened adjudication of their watershed.

For those organizations working at the forefront of agricultural land conservation (TALT, RiGHT, SNMLC, PLC, and OVLC), protection of the integrity of water resources and aquatic habitat was often a secondary or ancillary objective to working land protection. There was generally a strong recognition that protecting open space and ranch lands also protects riparian areas, wetlands and springs for both ecological and agricultural benefit. Interviewees mentioned the importance of healthy floodplains and wetlands for water storage and water quality and overall ecosystem health. Easements on working lands were seen as an umbrella conservation measure under which riparian, spring and wetland restoration may also occur. However, for this subset of organizations, protection of water features did not include protection of water quantity.

In contrast to the organizations focused on protecting working lands, the Ogallala Land and Water Conservancy (OLWC) has been primarily driven by the desire to protect aquifer levels in the Ogallala aquifer in southeastern New Mexico. OLWC’s primary tool has been paying landowners not to pump groundwater for irrigation and to shift to dryland crops instead. Since the groundwater protection tool was proven successful, the organization has been expanding its toolkit to include land conservation easements which will initially be held by a partner organization (TALT).

WATER RELATED CHALLENGES

There are a host of challenges cited for those organizations working at the nexus of land and water conservation that can be attributed to the complexity of water rights and water law as well as funding, outreach and administrative hurdles which are further discussed below.

Complexity of water rights and water law

The complexity of water law and lack of understanding of water rights by water right holders themselves and/or program staff was a challenge faced by all of the land trusts we interviewed. Water rights holders may not have a clear understanding of their water right or state water law, which can lead to misunderstandings about how to manage water rights or the value of water rights. In addition, the complicated nature of state water statutes, laws around abandonment and forfeiture and differences between types of water rights comes with a steep learning curve, especially for organizations more accustomed to working on land conservation.

Once transactions have been negotiated to protect land and water via easement, lease purchase etc. there are additional challenges. Transaction timing can present difficulties given the time it takes to finalize instream water dedications (several months to several years generally). Another timing element to keep in mind is applicable state laws requiring use of water rights to avoid relinquishment (in many states at least once every five years). Given the time it takes to complete land and water transactions, each transaction needs to be structured and planned to avoid any threat to loss of a water right due to nonuse during the transaction process.

Difficulty monitoring water rights transactions

Monitoring protected water rights can be daunting given the movement of water through the landscape. This challenge was noted in an interview with Ojai Valley Land Conservancy, in regard to their exploration of quantifying and protecting water savings from their existing land conservation strategies. When working with a landowner to convert their irrigated orchards or remove invasive vegetation from their property, OVLC would need to enter into an agreement with the landowner to acquire the amount of water saved from these activities. Any sort of forbearance agreement for the amount of water saved through conservation activities would require ongoing monitoring to ensure landowner compliance, which is a difficult and costly task, particularly when dealing with paper water rights. As a land trust, OVLC wishes to hold the acquired instream water right but not to act in the role of watermaster. Conversations are ongoing around the potential role for a regional conservancy or agency which could handle monitoring requirements for all future agreements. In the Columbia Basin, where there are number of active water trust actively engaged in leasing and purchasing water rights there is an established monitoring protocol for instream water right transactions.

Water right valuation challenges

All of these complications lead to the difficulty in valuing water rights and the lack of standards around water right valuation and appraisals can be a barrier for obtaining funding. The lack of active water markets in many areas of the West also makes it hard to use comparable sales to values water rights. Some funders were also not willing to take the value of water into account when valuing a conservation

easement. Often separate appraisals are required of both land and water and the appraisal of land with water is different than the appraisal of land without water. Ideally it is best to complete a land appraisal with water rights and then complete a water transaction.

Funding Challenges

Funding difficulties were encountered by most of the organizations. Securing funding for conservation easements and for non-program related operating expenses was challenging. In some areas, landowners have opportunities to sell their water rights for new out of stream or out of basin uses. Water market pressures can make it harder to keep water rights with the land for agricultural use and to protect water rights for ecosystem use. In Texas, water for fracking is a significant need and drives TALT to make sure that water rights are protected on working lands for future agricultural use. The presence of a water market, where water rights are changing hands frequently, can also help motivate landowners to be interested in protecting land and appurtenant water rights as has been the case in the Rio Grande headwaters in Southern Colorado. Active water markets can include out of stream or instream environmental buyers. In basins with active water markets there is generally a higher awareness of the value of land and water and comparable sales to rely on for water rights transactions. These factors can motivate landowners to enter into conservation easements or sell land and water for conservation or non-conservation purposes.

Finding willing sellers and identifying projects

For those organizations working directly on protecting water rights for both out of stream and ecological benefit there are further challenges. Outreach to water right holders and identification of willing water right sellers is one of the biggest barriers. Landowners may not feel an urgency or motivation to conserve water. The OLWC has relied heavily on groundwater data and studies produced by the New Mexico Bureau of Geology and Mineral Resources showing dramatic declines in the Ogallala aquifer to convince landowners and community members and the local Air Force Base that there is a dire water shortage in their area. The OLWC has approached this by providing lots of data and recognizing that relationships take time to build and must be built on trust. Sometimes external factors such as a looming adjudication, the threat of litigation, pressure to protect endangered species or out of basin water transfers also served as a motivating force for water rights holders to engage in conversation related to using or managing their water rights differently.

For organizations that are actively working in the land and water conservation fields there is a general acknowledgment that high priority properties for land acquisition do not usually overlap with the highest priority properties for conservation focused water right acquisitions. If the land conservation goals are driven by ecological value and/or open space preservation those properties are unlikely to also have the most desirable water rights for environmental benefit. The reverse is also true, that the highest priority water rights for acquisition for instream benefit are not usually on the highest priority conservation properties. These high environmental benefit water rights (senior priority date, good history of beneficial use, solid legal standing and location appropriate for critical species or instream benefit) are also not on properties that have a high conservation benefit. High environmental benefit water rights are usually appurtenant to properties that are being irrigated. For those working on

irrigated agricultural land preservation there may be overlap of water and land benefits, however, keeping those working lands in production often requires preserving the water rights for irrigation (TALT, RiHT, SNMLC). In areas where dryland agriculture is viable there are more opportunities for win-win projects that conserve working lands while protecting water instream. Both the Ogallala Land and Water Trust and Washington Water Trust (based in Washington State) have completed transactions that involve protecting water rights for instream flow while allowing land to remain agriculturally productive without irrigation.

SOLUTIONS TO SUCCESSFUL INTEGRATION OF WATER RESOURCE PROTECTION

Despite the host of barriers to tackling water resource conservation and land conservation simultaneously there are tools, strategies and creative solutions that have been proven successful across the arid West. We grouped these solutions into three primary categories including projects involving environmental water transactions, projects that provide legal protection to water resources via land easement language and projects that couple land protection with aquatic resource restoration. The three approaches are discussed broadly below.

Pathways to Environmental Water Transactions

The Trust is familiar with environmental water transactions (EWTs), our working definition from the Environmental Water Transactions Handbook is as follows:

An environmental water transaction is any agreement (or set of related agreements) by which a water right holder, contractor, or user commits to a change in their water use and/or water right leading to legal or de facto protection of additional water in a waterway or water body to serve environmental purposes (Aylward 2013).

EWT’s can be categorized into four broad strategies or pathways for creating water benefits. **TABLE 1** provides a summary of the strategies and applicability in Arizona.

TABLE 1. FOUR CATEGORIES OF ENVIRONMENTAL WATER TRANSACTIONS IN ARIZONA

| Category | Strategy | Overview |
|-----------------------------|-----------------------|---|
| Reducing Consumptive Use | Water Right Leases | Temporary transfer of an existing water right to another use (including environmental) through a legal/administrative process, where available (*not a viable option in Arizona at this time) |
| | Water Right Transfers | Permanent transfer of an existing water right to another use (including environmental) through a legal/administrative process, where available (*not a viable option in Arizona at this time) |

| | | |
|--|-----------------------------|---|
| Mix of Consumptive Use and Water Management Inefficiency Reduction | Water Use Agreements | Includes a range of project types that do not involve formal legal/ administrative processes and are instead accomplished through private contracting; can include both consumptive use reduction projects and projects that reduce water management inefficiencies |
| Reducing Water Management Inefficiencies | Conserved Water Dedications | Includes a range of projects that increase efficiency of water diversion, delivery, transmission and/or use and subsequent dedication of “conserved” water to another use (including environmental) through a legal/administrative process where available |

Note: This table was created for the Trust REPI report (Cronin and McCoy 2020).

Water transactions are generally categorized by those that reduce consumptive use and those that reduce non-consumptive use. Consumptive use of water is a critical driver of a watershed’s overall water budget. Because it represents water that is removed from the watershed, consumptive use has the single most important impact to a given water source. Correspondingly, strategies that reduce consumptive use are powerful tools to address water use imbalances, environmental water deficiencies, and other water management issues. At a high level, there are three basic strategies that reduce consumptive water use: water right leases, water right transfers, and water use agreements. The term “water use agreements” is a catchall term that refers to a range of different project types including both projects that reduce consumptive water use and projects that reduce water management inefficiencies. The common thread is that water use agreements that lack legal protection for resulting benefits and can be implemented regardless of the underlying state legal framework.

Common forms of water use agreements include forbearance (essentially water leases without official approval and legal protection), diversion reduction (contracts to reduce the amount of water diverted with or without a corresponding reduction in consumptive use), and minimum flow (agreement to ensure a minimum flow instream below a diversion). Water management inefficiencies range from diversion infrastructure that is incapable of variable water withdrawals during times when less water is needed at the end use, to leaking ditches and pipes used to transport water from a diversion to an end use, to applying more water to crops than can be consumed. The common thread among all of these inefficient practices is that some amount of water diverted is not needed by the end use. The fate of diverted but unneeded water depends on local hydrologic factors, but in general, water that is not consumed will either percolate into local groundwater systems or return to surface streams through over land or underground channels or be lost to the atmosphere through evaporation.

Arizona lacks a legal mechanism for protecting water instream so traditional water right leases and purchases are not an option. However, the Trust has successfully implemented forbearance agreements in the Lower San Pedro and Upper Gila watersheds in the past and could certainly utilize this tool in other geographies assuming there is opportunity with existing water users to cease or decrease water use. Finding willing sellers takes time and investment in relationships but there are many successful

examples of water right transactions in Arizona and across the West for the Trust to build on and learn from.

The Trust is already a leader among land trusts that also tackle water resource protection. Many of the organizations that we interviewed were either not focused on water quantity protection for environmental benefit or were aspiring towards more water quantity protection. The Western Rivers Conservancy, Palmer Land Trust and the Ogallala Land and Water Conservancy were the only organizations that had completed multiple transactions to protect both land and water. One approach used by land trusts who are more focused on land transactions but who want to ensure that appurtenant water rights are protected for environmental benefits is to partner with an EWT focused group such as a state water trust. Western Rivers Conservancy regularly partners with Trout Unlimited and Colorado Water Trust on projects involving water rights transfers and Trout Unlimited has provided funding, administrative and legal support for transferring water rights instream on a permanent basis in various western states.

Groundwater Conservation Easements

One additional tool worth considering in more detail are groundwater conservation easements which depending on their purpose are a type of EWT. Groundwater conservation easements have the benefit of helping to restore depleted aquifer levels to benefit instream and out of stream resources. Individual easements can be tailored to the needs of a specific water rights holder, so that they can reduce, rather than retire their groundwater use (Colorado Open Lands and Rio Grande Headwaters Land Trust 2022). Easements could be placed on either the water rights alone, or water rights together with the land on which they've historically been used. Groundwater easements couple permanence and flexibility to address groundwater depletion while maintaining a community's agricultural economy and the wildlife habitat it sustains. In addition, groundwater conservation easements may be eligible for unique sources of funding, including state and federal tax benefits, and allow for perpetual groundwater conservation.

The groundwater conservation easement tool was developed, and pilot tested, by Colorado Open lands and Rio Grande Headwaters Trust in collaboration with agricultural users in southern Colorado's San Luis Valley. The tool was developed in response to a state mandate to restore the depleted aquifers of the San Luis Valley – it served as a voluntary way to achieve groundwater use reductions to avoid regulatory action from the state to shut down wells and take land out of production (Wondra 2022). In July 2023, U.S. Senators Michael Bennet (Colorado), Jerry Moran (Kansas) and Martin Heinrich (NM) introduced the Voluntary Groundwater Conservation Act (VGCA) which would create a Voluntary Groundwater Conservation Easement Program at USDA to expand the implementation of this conservation tool. The sponsors of VGCA hope that the bill will become part of the next farm bill. VAGA creates a pathway for agricultural groundwater users to receive financial compensation for groundwater conservation in western States. The program is designed to be entirely voluntary and allow groundwater rights holders to enroll and choose how much to reduce groundwater use while continuing dryland or other non-irrigated agricultural use of their property. The act would set up a new program of NRCS under the USDA and allow for different NRCS minimum deed terms that focus groundwater management restriction on

water rights, rather than land, and allow for valuation based on water saved for the aquifer (Bennet 2023).

Outside of Colorado, the Ogallala Land and Water Conservancy has been piloting groundwater easements in eastern New Mexico. As mentioned above, the Ogallala Land and Water Conservancy formed in 2021 initially focused on water transactions – compensating farmers for not irrigating from a critical groundwater source (referred to as paleochannels by the OLWC). The land under each Conservancy agreement can remain in production but the use of groundwater is limited by the term of a groundwater conservation easement. While the groundwater rights are not changed through a state administrative process the water rights holder under easement is legally bound to abide by the terms of the easement not to use all or a portion of the groundwater. The OLWC has completed transactions with 10 landowners protecting roughly 1 billion gallons or 3,000 acre feet of groundwater (Ladona Clayton, 2023).

This is an approach that could also be used by the Trust and would be best targeted in a groundwater management area such as the Tucson, Douglas (San Pedro) or the Santa Cruz Active Management Area. One of the driving forces for conserving groundwater in the Ogallala aquifer paleochannels is to ensure a sustainable water supply for Cannon Air Force Base. This example has parallels to the Trust's work in the San Pedro watershed and collaboration with the Fort Huachuca Military Base. Similar to the Trust, OLWC's work has been supported by the Department of Defense REPI program and OVLC is currently seeking a Sentinel Landscape designation for Cannon Air Force base through USDA and the Department of Defense. Data showing declines of two feet annually in the Ogallala aquifer compelled OLWC to begin active outreach to groundwater right holders and has been motivation for 10 large landowners to participate in short-term transactions forbearing groundwater use. Like Arizona, New Mexico lacks the legal ability to transfer existing water rights instream for beneficial use temporally or permanently. OLWC has worked with this lack of legal framework by focusing on the voluntary transactional nature of their agreements.

Currently, there is a high degree of anxiety and uncertainty surrounding water use and management in Arizona's San Pedro watershed, particularly in the context of the settlement of SPRNCA water rights and the looming basin adjudication. A groundwater conservation easement program could provide a pathway to conserve water for the San Pedro River and critical ESA listed species and provide much needed long-term certainty to the Fort Huachuca area.

[Easement language protecting water rights and water resources](#)

Organizations working at the nexus between land and water conservation easements generally address water rights within their conservation easements (or purchase and sale agreements). Some common provisions include that water rights are to be maintained for agricultural use, avoid relinquishment or abandonment by state statute and the prohibition of selling the appurtenant water rights off the property. However, there are some exceptions, Rio Grande Headwaters Trust sometimes includes language that allows landowners to lease their water to other agricultural users in the valley but prohibits the sale or lease of the water rights outside of the valley. This provision is in response to market forces that put pressure on water being transferred out of the valley. Less common elements of

conservation easements pertaining to water resources include the ability to use the water rights for mineral production (Texas Agricultural Land Trust).

It is also common for organizations to prohibit activities that would negatively harm water quality and riparian, spring and wetland features on the properties under conservation easement. Generally, conservation easements allow for the enhancement or restoration of water features such as riparian areas, springs and wetlands, as well as the preservation of open space to support habitat for migratory and resident species. The Trust currently holds some land easements with ecologically important water features including the Babocomari Ranch (Babocomari River), Circle Z Ranch (Sonoita Creek), Tombstone Ranch (Whitewater Draw), Sandhill Farm (supplemented wetland for Sandhill Crane habitat), Pyeatt Ranch (3 springs), and 47 Ranch (multiple springs). While protection of these important water features was not the primary motivation for the conservation easements the Trust could choose to focus on protecting lands via conservation easements in the future with an emphasis on the ecological value of water features. This could provide a different lens for the Trust to select conservation properties and could allow the Trust to access funding opportunities focused on riparian wetland or spring protection. The scale of conservation properties with critical water features may tend to be smaller acreages than the large ranchlands typically protected under easement by the Trust. Another angle worth considering would be to partner with a group like Western Rivers Conservancy on critical river or stream land and water protection.

Lastly, it may also be worth exploring how the designation of protected farmland in Active Management Areas by Arizona Department of Water Resources might be used in conjunction with water conservation practices or transactions. If a property is within an AMA and encumbered by a conservation easement the landowner can apply to the Arizona Department of Water Resources for designation of the land as protected farmland. Once designated as protected farmland, the irrigation water duty that is in effect at the time of designation remains, and the land isn't subject to future reductions in water use (Arizona Revised Statute 45-483).

Environmental Restoration Approaches

For organizations focused on conservation of working lands, many have included restoration of riparian habitat, wetlands or springs. For example, TALT worked on a ranch under conservation easement with a spring that contributed flow to the Rio Grande, which required remediation to restore it to a more natural state. The OVLC has several projects that include converting formerly irrigated orange groves to native oak habitat and restoring native riparian habitat by removing of *Arundo donax* – an invasive reed which grows along riparian corridors and consumes significant amounts of water (estimated 20 acre-feet per acre).

Examples of land trusts engaged in aquatic habitat restoration abound and funding for habitat restoration is generally readily available. It is beyond the scope of this memo to fully describe land trusts working on habitat restoration and certainly the Trust has partnered with organizations engaged in this type of work and could do so in the future. In the Babocomari watershed, the Trust holds over 11,200 acres of conservation easements and, while there is likely very little irrigation occurring, there may be opportunities for adjusting stockwater practices, domestic use or even restoration of cienegas/wetlands.

As discussed in previous memos for the Trust by AMP Insights, there may be opportunities to install check dams, gabions, and other erosion control structures along key tributaries to slow down flow and promote infiltration (Cronin and McCoy 2020).

CONCLUSION AND SUGGESTED NEXT STEPS

Working at the crux of land and water is a critical but challenging approach to conservation. However, all of the challenges discussed in this memo from funding to valuing water to navigating the legal complexities of water rights have solutions and there are plenty of organizations that serve as great models for protecting water resources. There are fewer organizations protecting both water instream and land and in that sense Arizona Land and Water Trust is at the forefront. Those conservation organizations that are working jointly to protect both land and water resources tend to be larger scale like the Nature Conservancy or Western Rivers Conservancy and even the Nature Conservancy often keeps its land and water conservation projects separate. There are fewer smaller state or regional organizations working to protect both land and water. Potentially conflicting missions of protecting water for agricultural land use and for instream benefit is one explanation yet there are examples where it is possible to achieve both.

As the Trust has demonstrated in the past, protecting working lands and water quantity for instream benefits can be done simultaneously. Sometimes this is completed through separate projects, other times a single project can have both land and water conservation benefits. In addition to the solutions discussed above, a few suggested next steps are listed below.

- **Build out water transactions by learning from existing water trust organizations:** The Trust could build on their success of implementing short-term forbearance agreements in the San Pedro by seeking opportunities for more short-term and long-term forbearance agreements. The Trust could learn more about developing, implementing and funding water transactions from existing nonprofit organizations engaged in water transactions.
- **Explore a groundwater easement program:** Conservation easements are gaining national attention and are actively being implemented in Arizona's neighboring states. It is worth exploring in more detail where in Arizona a groundwater conservation easement program might be most feasible from legal, cultural, financial and political perspectives. The Trust could learn more about groundwater conservation easements from the Colorado Open Lands and Ogallala Land Conservancy.
- **Consider partnerships with restoration focused organizations:** The Trust could actively seek out water resource restoration on lands currently under conservation easement or prospective projects.
- **Foster mutually supportive partnerships:** The Trust could explore the potential to build partnerships between municipalities interested in purchasing water rights and agricultural producers to invest in increased on-farm irrigation efficiencies, habitat restoration, and water supply security for both growing communities and agricultural operations.

The Trust has an ambitious mission to preserve Southern Arizona’s vanishing western landscape and protect Arizona’s desert rivers and streams by working with willing landowners on incentive-based agreements. These shared goals require a unique but accessible toolbox that sets the trust apart from organizations working solely on land protection. This comprehensive approach to conservation is what is needed now more than ever given shifting land use patterns, altered hydrographs and climate change.

REFERENCES

Aylward, Bruce, ed. 2013. *Environmental Water Transactions: A Practitioner’s Handbook*. Bend, OR: Ecosystem Economics.

<https://static1.squarespace.com/static/56d1e36d59827e6585c0b336/t/577c8f60c534a5bc31221f68/1467781084671/Handbook+Combined.pdf>.

Bennet, Michael. 2023. “Bennet, Moran, Heinrich Introduce Bill to Create New Tool for Farmers and Ranchers to Combat Drought.”

Colorado Open Lands and Rio Grande Headwaters Land Trust. 2022. “Groundwater Conservation Easements for Aquifer Recovery in the San Luis Valley.”

Cronin, Amanda, and Amy McCoy. 2020. “Water in the Fort Huachuca Sentinel Landscape: A Review of Six Years of Work under the REPI Grant Program.” AMP Insights.

Wondra, Jan. 2022. “First In-the-Nation Conservation Easement Partnership to Protect San Luis Valley Groundwater.” *Ark Valley Voice*, December 17, 2022. <https://arkvalleyvoice.com/first-in-the-nation-conservation-easement-partnership-to-protect-san-luis-valley-groundwater/>.

APPENDIX 1 -CONSERVATION EASEMENT WATER RIGHT LANGUAGE EXAMPLES

The following example of conservation easement and purchase and sale agreement language were shared by the organizations listed below individual water right and property details have been omitted to protect landowner privacy.

Rio Grande Headwaters Land Trust Example

The Parties agree that it is appropriate to encumber certain water rights beneficially used on the Property in the Easement pursuant to C.R.S. §38-30.5-102. The "Water Rights" consist of all of Landowners' right, title, and interests in and to the water and water rights described in Exhibit C, together with all associated canals, ditches, laterals, headgates, springs and spring rights, reservoir and storage rights, groundwater rights, and other rights in and to the use of water historically used on or otherwise appurtenant to the Property (collectively, the “Water Rights”).

The Parties intend and desire that the obligations and restrictions set forth in this Paragraph be enforceable pursuant to C.R.S. §§38-30.5-101 through 38-30.5-111, inclusive, in as much as the same relate hereto. In the alternative, the Parties intend and desire that the obligations set forth in this Paragraph be enforceable as a restrictive covenant or equitable servitude.

(1) Permitted Water Uses

The Parties agree that the Water Rights are hereby dedicated and restricted exclusively for uses consistent with the terms of this Easement (the "Permitted Water Uses"). The Permitted Water Uses are continued irrigation or other historical use of the Water Rights, and Landowner shall have the paramount right to use and enjoyment of the Water Rights on the Property consistent with recent historical practices and the adjudicated use of the water. The Parties acknowledge that the Permitted Water Uses and the Water Rights provide a substantial benefit to the Property's Conservation Values, by, among other things, providing return flow to riparian and wetland areas on the Property.

Landowner shall have the right, without Land Trust's prior written approval, to maintain, repair, and if necessary, reconstruct or replace any existing structures or equipment associated with the Water Rights (such as ditches, wells, irrigation equipment, reservoirs, sloughs and impoundments), so long as any activity does not materially impair or interfere with the Conservation Values.

Notwithstanding the provisions herein, and only with the prior written approval of Land Trust in accordance with Paragraph 7, Landowner may lease the Property's surface (ditch) Water Rights to public corporations, persons, mutual ditch companies, water users' associations, and other private or public corporations for irrigation, or in-stream flows off the Property but only in the Rio Grande basin in Colorado, provided any such lease shall comply with current law, does not permanently separate the Water Rights from the Property, and such lease shall authorize use of the Water Rights off the Property only in years where there is excess water not necessary to preserve the Conservation Values. Landowner shall not construct, or permit others to construct, any new water-diversion or storage facilities upon the Property for the purpose of using the water off the Property.

(1) Protection of Water Rights

Landowner shall not abandon or allow the abandonment of, by action or inaction, any of the Water Rights. In the event that Landowner fails, after written notice from Land Trust, to defend or protect the Water Rights or any portion thereof against injury or risk of abandonment, the Land Trust may, but shall not be required to, assert such defenses, seek to change such Water Rights, or take any other reasonable actions at Land Trust's sole cost and expense to avoid the loss or diminution of the Water Rights, or to maintain the historic use of the Water Rights.

Landowner shall promptly comply with all requirements and pay, when due, all assessments, charges and fees of any kind for continued ownership, delivery and use of the Water Rights. If Landowner fails to comply with any such requirements or to pay assessments when due, Land Trust may comply with any such requirements and pay any such assessments on behalf of the Landowner, and thereafter to collect any such amount, together with interest, reasonable attorney fees, staff time, and court costs from the Landowner.

a. Water Features

Landowner shall not act to materially alter, impair, materially modify, or adversely affect any existing ponds, wetlands, stream channels, or other water features currently located on the Property absent the prior written approval of Land Trust in accordance with Paragraph 7. If an emergency exists, Landowner

may commence work provided that Landowner gives Land Trust notice within ten (10) working days of the emergency and describes the alteration or modification performed on the water feature to address the emergency. Any alterations or modifications to existing ponds, wetlands, streams, channels or other water features shall be conducted in compliance with all applicable statutes and regulations.

Texas Agricultural Land Trust

5. Water Rights. The Parties agree and hereby acknowledge that all water rights on the Property are encumbered by this Easement. Landowner further recognizes that riparian systems and groundwater supplies are important to the agricultural viability and ecological health of the Property and the watershed in which the Property is located, and that these systems and supplies shall be managed accordingly by Landowner. Landowner shall retain and reserve, as part of the Property, the surface water, groundwater, and all related rights and facilities (the “**Water Rights**”), for domestic use and for use in present or future agricultural production on the Property, and Landowner shall not transfer, lease, sell, abandon, divert for use off-site, or otherwise sever the Water Rights from title to the Property. Activities or uses that are detrimental to water quality, including, but not limited to, degradation or pollution of any surface or subsurface waters, are prohibited. Notwithstanding the above, Landowner and its lessees are permitted to use water for mineral production on the Property in conformity with the requirements of this Easement and the use of water for mineral production on the Property conducted by severed mineral owners or their mineral lessees shall not be considered a violation of this Easement by Landowner. Landowner must provide Land Trust with notice of any legal proceedings involving the Water Rights that have the potential to affect the Property within thirty (30) days of Landowner’s discovery of same. Land Trust must be notified of any action to be initiated by Landowner at least thirty (30) days before Landowner files any legal proceeding involving the Water Rights or the development of new water rights on the Property.

Western Rivers Conservancy (Purchase and Sale Agreement) for property with water rights being transferred instream in perpetuity:

I. RECITALS

A. Protected Water. Grantor is also the holder of one Groundwater Certificate and sixteen Surface Water Certificates appurtenant to its fee-owned real property. As part of this Conservation and Restoration Easement transaction and the Riparian and Conservation Agreement with [REDACTED], has filed transfer applications with Oregon Water Resources Department (“OWRD”) for changes in place of use and purpose of use, where the net effect will enable the permanent transfer of [REDACTED] irrigated acres (approximately [REDACTED] cfs) of surface water instream for the conservation, maintenance, and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat, and other ecological values (“Protected Water”). Grantor is also reserving certain water rights (“Reserved Water Rights”). Both Protected Water and Reserved Water Rights are described further in Sections II.E (process) and II.H.1.

II. AGREEMENT

A. Protected Water (and Reserved Water Rights) Process. Grantor, in partnership with [REDACTED], has filed transfer applications with OWRD for a change in the Place of Use and Purpose of Use for one Groundwater Certificate and four supplemental reservoir storage certificates associated with McKay Reservoir (related to Grantor's Reserved Water Rights, as further described in subsection II.D.1, II.H.1, and legally described in Exhibit E (Legal Description – Reserved Water Rights)), and a change in Purpose of Use for eleven Surface Water Certificates (*see* Exhibit C), where the net effect is to maintain Grantor's Reserved Water Rights for irrigation within the Grantor's Secondary Residential Building Envelope and enable the permanent transfer of [REDACTED] irrigated acres (approximately [REDACTED] cfs) of Protected Water instream for the conservation, maintenance, and enhancement of aquatic and fish life, wildlife, fish and wildlife habitat, and other ecological values.

1. Process for Reserved Water Rights. To remove surface water diversions from Birch Creek while accomplishing Grantor's Reserved Water Rights allowing for [REDACTED] acres of primary irrigation within Grantor's Secondary Residential Building Envelope, steps include:

a. Transferring the Place of Use for 1.0 acre of Groundwater [REDACTED]), which is not hydraulically connected to Birch Creek or the Umatilla River such, that the use will not diminish flows, to make it appurtenant to the Grantor's Secondary Residential Building Envelope within the Protected Property;

b. Transferring the Purpose of Use for [REDACTED] acres of Groundwater Certificate [REDACTED] from "supplemental irrigation" to "irrigation," which will enable groundwater to be used as the primary irrigation source on the Grantor's Secondary Residential Building Envelope; and

c. Transferring the Purpose of Use for [REDACTED] acres of Surface Water Certificate [REDACTED] (part of Grantor's Reserved Water Rights defined in Section II.H.1) from "irrigation" to "supplemental irrigation," which will remove surface water as the primary source of irrigation within the Grantor's Secondary Residential Building Envelope.

2. Process for Transfer of Protected Water. To permanently transfer and restore [REDACTED] cfs of instream flow in Birch Creek and the Umatilla River, steps include:

a. Transferring the Purpose of Use for Surface Water Certificates [REDACTED] [REDACTED] which are appurtenant to the Protected Property and when combined are [REDACTED] irrigated acres, from "irrigation" to "instream use."

3. The Final Orders Nos. NUMBERS finalizing the above changes were issued by OWRD on DATES, and were not challenged within the 30-day timeframe allowing for legal challenges.

Arizona Land and Water Trust Strategy Document

“Desert water—our streams and rivers, springs, ponds and pools—allows both human and natural communities to survive in the arid Southwest. The working landscapes that span our watersheds are part of an intricate system of natural and man-made elements that define our way of life by supporting and protecting rural communities, biodiversity, cultural resources and sweeping western vistas. Arizona Land and Water Trust believes that even in the face of prolonged drought, growth pressures and a changing climate, we can work together to sustain this intricate system... we look to partner with willing landowners who are strengthening a system that is fragile but still in place: locally produced food, rural communities, and vast, protected working landscapes. This is a system that also produces effective groundwater recharge, protects water quality and water supplies, and provides wildlife habitat. Thus, it protects our quality of life in Arizona.” (DRP Handbook).

Originally published in 2010, the words and goals of the Trust’s Desert Rivers program (DRP) are still relevant today and define our continued mission to integrate the conservation of land and water resources into a single process. The addition of this memorandum from AMP Insights based in research and the experiences of other southwestern land trusts will allow the Trust to incorporate forward thinking and action-oriented techniques into its water conservation toolbox.

This internal policy document is meant to set broad but strategic goals for the Trust’s water conservation efforts in the coming years. It will first describe the current state of these efforts followed by a review of the memo’s findings identifying tools and practices which apply to the Trust. Finally, it will pinpoint areas which need further development and/or advocacy to be viable tools.

Currently the Trust conserves and protects water resources through two overlapping avenues, land conservation and our Desert Rivers Program. The Trust has a longstanding land conservation program and protecting water resources in conjunction with traditional land conservation tools is relatively straightforward. In the arid Southwest, water flowing on the surface is only half the story and in some locations beneath the perennial, intermittent and ephemeral waters that flow across our landscape, shallow groundwater aquifers both contribute to and receive flow from surface waters. Because of this connectivity between surface water and groundwater sometimes the most effective means of sustaining desert rivers and riparian habitats in general is protecting the lands around them.

Land Project Selection and the Transaction Process

- Prioritize projects with riparian habitats and lands which support them such as uplands and ephemeral tributaries.
- Prioritize projects on land which support groundwater such as mountain front recharge zones, floodplains, and lands with water rights.
- Include common sense easement terms such as prohibiting new wells when possible, developing the land, protecting water rights, and negatively impacting riparian habitats.

Stewardship in Perpetuity

- Monitor important riparian resources like springs.
- Engage with the landowner to improve efficiency of water use wherever possible.
- Engage with local, state, and Federal partners to provide up-to-date support to the landowner such as new funding programs and resources.

- Invest time to bring new landowners up to speed the state of their land and stewardship processes and goals. Also, learn about their goals for the property and provide input and support.

Since its inception in 2008, the DRP program has always sought to conserve water resources in Southern Arizona through forward-thinking methods. It began in response to inquiries from landowners who wanted to conserve water on their property without risking the loss of their water rights. Early efforts led to the creation of a handbook meant to educate our landowner partners on the complex nature of water rights and law, options to conserve water alongside working landscapes, and practical guidance for landowners interested in these tools.

Surface Water Tools

- Instream flow permits – a surface water permit to leave water in-channel to benefit the riparian habitat.
- Sever and Transfer – existing surface water rights can be changed to an instream-use which benefits riparian habitats while retaining the original priority date.
- Forbearance agreements – surface water uses can be suspended or limited through short-term contracts which can be initiated in dry years.

Groundwater Water Tools

- Retirement and Extinguishment – Landowners can stop pumping groundwater and retire any associated groundwater permits when water pumped from these wells is no longer needed, thereby reducing stress on the aquifer.
- Well -Spacing Agreements – Utilizing water resources more efficiently by changing the location of wells or controlling the location of new wells. Well locations affect the timing and intensity of impacts on stream–aquifer interactions and associated riparian vegetation.
- Contracting Groundwater Use – Incentives may be available to reward landowners who limit the amount of groundwater they pump. A non-pumping agreement is a private contract with landowners or water rights holders to suspend their water use temporarily or permanently.

In recent years the Trust has worked to address our changing climate through every aspect of our work. In the realm of water conservation, this has meant the addition of restoration work to our DRP toolbox. Conducting restoration projects on our lands under conservation easement can increase their resiliency to stressors such as prolonged drought and increased heat. Simultaneously, they conserve water resources by slowing the flow of water across the landscape, improving infiltration, reducing sediments and increasing the water available to riparian vegetation. A healthy landscape is more resilient and better able to absorb precipitation leading to improved riparian habitats and increased infiltration into aquifers. Our restoration tools include:

- Erosion Control using loose rock infrastructure such as one-rock dams, zuni bowls, and media lunas.
- Native plantings in and around this infrastructure.
- Fuels reduction to decrease the risk of catastrophic wildfire.
- Grassland restoration through removal of water intensive invasive plant species

Based on the findings in the memo from AMP Insights, the Trust is already pursuing or has prior experience in all but one of the recommended pathways to water conservation. Our task now is to continue integrating land and water conservation and expanding the resources the Trust devotes to building and utilizing these tools and partnerships.

- Environmental Water Transactions – The Trust has prior experience in successfully completing EWTs. The Trust should dedicate staff effort towards reinvigorating the Trust’s EWT project portfolio.
 - Staff should conduct outreach to landowners and partners in order to build support for EWTs.
 - Research and improve the Trust’s existing portfolio of EWT types.
- Groundwater Conservation Easements – To our knowledge this tool has not been used in Arizona. The Trust should consider exploring this both as a stand-alone tool as well as a tool that can be used in combination with the others listed in this document.
 - Pursue groundwater conservation easement enabling legislation through a collaborative approach with a diverse group of stakeholders.
 - Staff should establish further contact with the noted land trusts who have completed Groundwater Conservation Easements in neighboring states.
 - Work with the above partners and legal counsel to develop draft template language.
 - Conduct outreach with existing landowner partners and new landowner inquires to gauge interest in utilization of such a tool.
- Conservation Easement Terms – The Land Programs team should continue to refine and incorporate where possible easement terms which more effectively protect water rights and resources, especially in relation to our changing climate.
 - Staff should build partnerships with land trust partners and legal experts to source existing easement terms, refine existing terms and draft new terms as needed, and review such for effectiveness and legality.
 - Outreach should be conducted to review and test the reception of these easement terms with landowners.
- Restoration Projects – The Trust should continue to play the role of catalyst in building a restoration network in Arizona which is well funded, has high participation from regional partners, and is based on mutual goals.
 - Staff should continue to secure and direct funding to our local partners who construct and maintain restoration projects. Long-term funding will support these organizations in building their capacity.
 - Continue to pursue categorical exclusions for restoration work in Southern Arizona. Close collaboration with our local and federal partners will be crucial in drafting terms which support holistic projects with positive ecosystem benefits that also aid landowners.
 - Collaborate with local partners such as the University of Arizona to conduct research which quantifies the effects of restoration, targets future needs, and identifies areas for improvement.