



DESCHUTES RIVER BASIN

BUILDING FORMAL COLLABORATIVES TO LEVERAGE FEDERAL FUNDING

Watershed Context

The Deschutes River watershed is located in the high desert of north central Oregon, on the eastern side of the Cascade Mountain range. More than a century ago, federal and state policies encouraged the settlement of central Oregon by facilitating access to land and irrigation water. The water made possible the diverse agricultural sector that shaped the region along with timber harvesting and milling. However, this water development also resulted in the alteration of many rivers and streams that were left with low or altered flows. Over the past quarter century, irrigation districts, governmental entities, the Confederated Tribes of Warm Springs and conservation groups have collaborated to implement projects and transactions that restored significant flows to basin rivers and streams and that aide groundwater users (through establishment of a pioneering groundwater mitigation program). This effort has been centered around the Deschutes River Conservancy, a nonprofit conservation group established in 1996 with the goal of restoring streamflow and water quality in the watershed using proactive, collaborative, and market-based approaches.

Characterization of the Watershed

At 10,400 square miles, the Deschutes River basin is the second largest watershed in Oregon after the Willamette Basin on the opposite side of the Cascade Mountains to the west. The basin is 170 miles long in a north-south direction and 125 miles wide at its longest east-west extension. The mainstem Deschutes collects snowmelt runoff from tributary streams originating in the Cascades as well as from tributaries flowing from the Ochoco Mountains, in particular the Crooked River, and from the Columbia Plateau. Groundwater also significantly contributes to the mainstem Deschutes and some tributary flow – springs originating from the basin’s unique geology historically kept streamflows almost steady throughout the year. The Deschutes Basin narrows to only a few miles at its mouth where it discharges into the Columbia River. (“Deschutes River Basin” 1961)

The high desert plateau and floodplains of the Deschutes Basin are generally privately owned with the headwaters and uplands typically under federal ownership. The US Forest Service holds about 32% of the land in the watershed and the US Bureau of Land Management (BLM) holds another 14%. The reservation of the Confederated Tribes of Warm Springs makes up about 10% of the basin, located in the lower Deschutes. (“Deschutes River Basin” 1961)

Even though the Deschutes is a snowmelt driven system, the geological setting of the upper basin results in significant infiltration of precipitation and large groundwater contributions to river flows that tend to moderate seasonal variations in flows relative to other rivers in the western United States. Despite this moderating influence, variations in weather and other contributions did result in some seasonal and inter-annual variability, with mainstem summer flow ranging from approximately 300 to 800 cubic feet

per second (cfs), depending on hydrologic conditions. (Basin Study Work Group 2019)

The hydrology of both the upper Deschutes and Crooked rivers was substantially altered by the construction of federally authorized storage reservoirs in the early 20th century to hold and supply water for downstream agricultural use managed by multiple irrigation districts. More specifically, in the upper Deschutes, a dam was placed on the existing Crescent Lake and both Crane Prairie and Wickiup reservoirs were constructed. In the Crooked River, Ochoco and Prineville reservoirs were constructed. (Basin Study Work Group 2019)

The Upper Deschutes River basin (upstream of Lake Billy Chinook Reservoir) is the focus of this case study and was also the subject of a Bureau of Reclamation Basin Study completed in 2019 (Figure 1). Through this study, local stakeholders identified water needs for “the three legs of the stool” required to support achievable and sustainable water management in the Upper Deschutes. These three legs are agricultural water uses by eight irrigation districts, instream water needs for ecological objectives that are affected by low and altered streamflows that result from storage of water and diversions for agricultural uses, and municipal and quasi-municipal water users that generally rely on groundwater sources. (Deschutes County, home to both the cities of Bend and Redmond, is one of the fastest growing counties in the United States.) (Basin Study Work Group 2019)

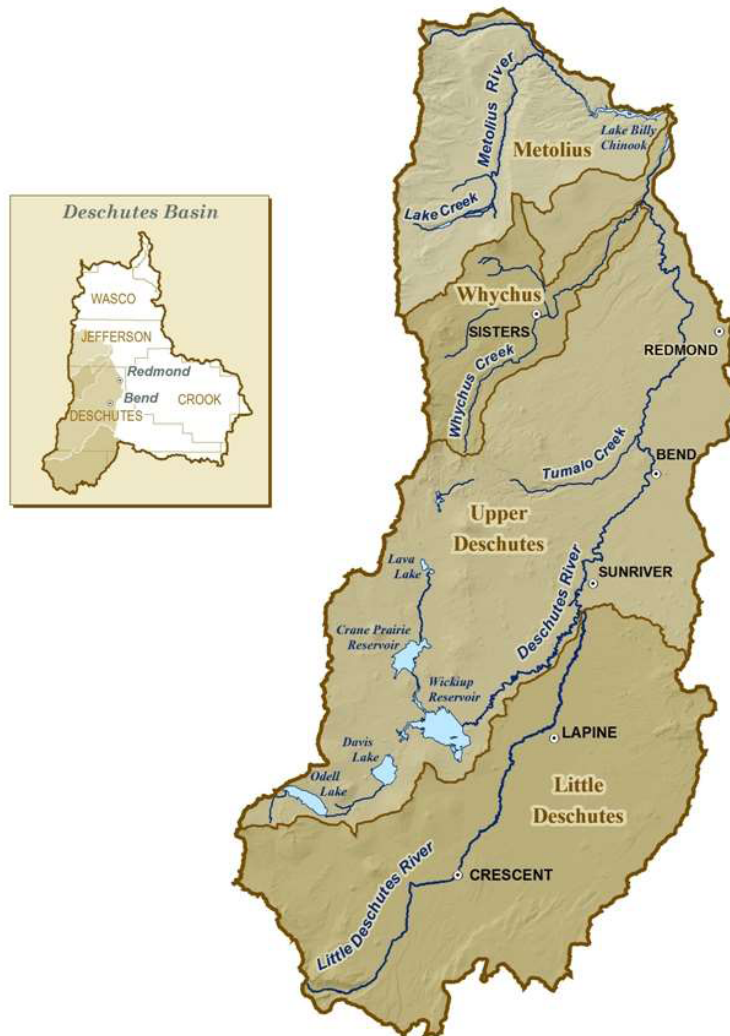


Figure 1. Map of the Upper Deschutes River watershed upstream of Lake Billy Chinook.

The focal species of conservation efforts in the Deschutes Basin include bull trout, redband trout, summer steelhead, Chinook Salmon and the Oregon Spotted Frog. Flow targets for these species and their habitats are prescribed in the Deschutes River Basin Habitat Conservation Plan. In particular, stakeholders are focused on meeting the instream water needs for ecological objectives associated with these species that are affected by low and altered streamflow. With the installation of improved fish passage around the dam complex at Lake Billy Chinook and a robust reintroduction program, anadromous fish species have reestablished historical habitat in the Upper Deschutes. (Basin Study Work Group 2019)

Through the recently completed Basin Study, stakeholders both characterized water supply and demand conditions, as well as defined and described water management options for meeting the three legs of the stool into the future. Three main water management options (and related tools) were evaluated for addressing identified water shortages. These were water conservation, market-based approaches for reallocation of supply and enhanced/relocated storage. As shown in Figure 2, the Basin Study included an assessment of water management option scenarios for meeting all demands, including rough budget estimates. (Basin Study Work Group 2019)

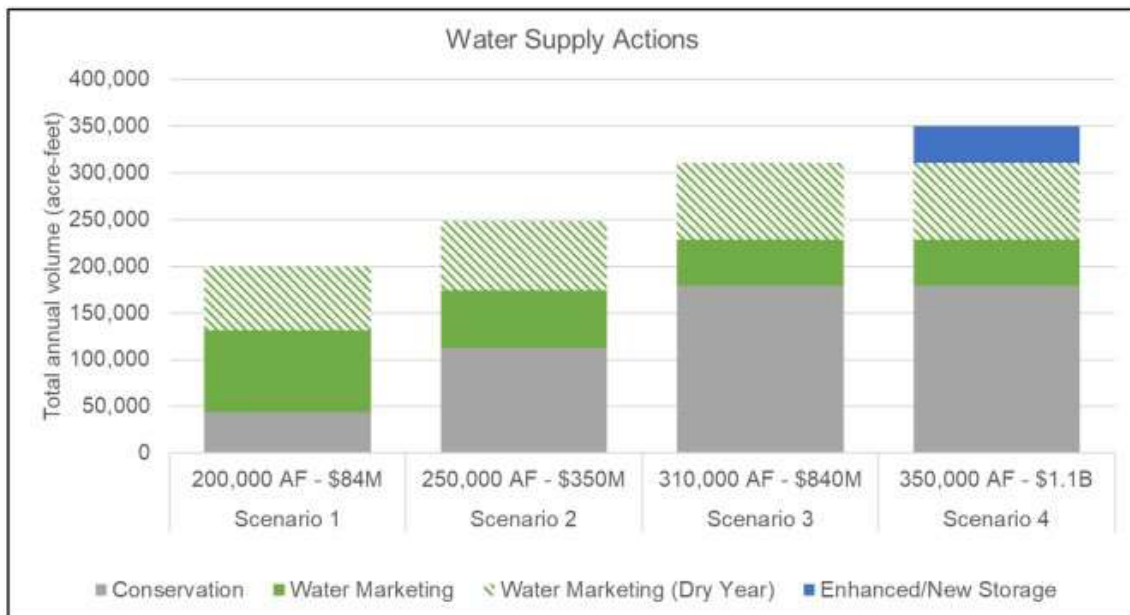


Figure 2. Water Management Scenarios (Volume and Cost). Source: Deschutes Basin Study

Agencies / Entities Interviewed

Deschutes River Conservancy (DRC) is a non-profit organization based in Bend, Oregon. Founded in 1996 as a collaborative, multi-stakeholder organization, the DRC’s Board of Directors makes decisions by consensus and is comprised of key public and private interests including agriculture, local government, state and federal government, hydro-power, tribes, and environment. The DRC is dedicated to restoring streamflow and improving water quality in the Deschutes River Basin. Its board and staff embrace the values of justice, equity, diversity and inclusion, recognizing that a healthy environment and inclusive communities are deeply interconnect. (Deschutes River Conservancy n.d.)

Deschutes Land Trust (DLT)’s mission is to conserve and care for the lands and waters that sustain Central Oregon, so local communities and the natural world can flourish together for generations to come. The land trust works with willing landowners who voluntarily want to conserve their land. The land trust also cares for more than 17,000 acres in Central Oregon for now and into the future.

Coalition of Partners

Collaboration is an important principle of the land and water restoration work that DRC and the DLT do in the Deschutes Basin. They work with broad categories of partners – from private landowners and irrigation districts to municipalities and public agencies.

Local Agricultural Partners Given its focus on flow restoration, DRC’s most critical partners are the eight irrigation districts in the Upper Deschutes, including individual patrons, board members and staff. DLT’s primary agricultural partners are individual landowners that individually irrigate in the floodplain of tributary streams such as Whychus Creek (a subwatershed of particular interest to the DLT). (Fitzpatrick and Bellis, Natasha 2022)

Tribal Partner As the original peoples of the Deschutes Basin, the Confederated Tribes of the Warm Springs is at the heart of efforts to restore and protect the watershed. The Warm Springs are represented on the boards of directors of both DRC and DLT and are active in restoration efforts both on and off of their reservation. (Fitzpatrick and Bellis, Natasha 2022)

Public Agency Partners DRC and DLT partner with a wide range of federal, state and local agency partners in the Deschutes. At the federal level, the Bureau of Reclamation and Natural Resources Conservation Service work closely with irrigation water managers and individual agricultural producers, investing federal funds into water conservation actions and projects. The Forest Service and BLM are active in uplands restoration on both public lands and adjacent private lands. The US Fish and Wildlife Service and National Marine Fisheries Service have jurisdiction for recovery of listed species in the watershed, including both anadromous and resident fish as well as the Oregon Spotted Frog. Numerous state agencies are active in the Deschutes, including the Oregon Department of Environmental Quality (water quality) and Water Resources Department (water quantity). The Oregon Watershed Enhancement Board invests significant state funds into land and water restoration activities in the watershed. At the local level, the city of Bend and other municipal water providers are active partners of both the DRC and DLT. (Fitzpatrick and Bellis, Natasha 2022)

Other Partners In addition to working broadly with irrigation districts private landowners and a diverse array of public agencies, both DRC and DLT collaborate with a number of other stakeholders with an interest in the basin. One of the most significant of these partners is Portland General Electric (PGE). The private utility holds a co-license to generate hydroelectric power from the Lake Billy Chinook reservoir with the Warm Springs Tribes. PGE invests substantial earnings into restoration efforts as part of a mitigation agreement that is part of the license issued by the Federal Energy Regulatory Commission. Other important partners include both the Crooked River and Upper Deschutes River watershed councils, the Deschutes Soil Water Conservation District (SWCD), conservation groups like Trout Unlimited and WaterWatch of Oregon and several local angler and recreation groups. A number of these entities actively participate in various forums that are building on the Basin Study to develop and implement a place-based plan for future water management and reallocation. (Fitzpatrick and Bellis, Natasha 2022)

Priority Conservation Issues and Efforts

Conservation Issues The primary conservation issue that drives much of the work in the Deschutes River watershed is the population decline of various species due to the storage, alteration and use of the natural hydrograph. This substantial modification of natural flows, combined with the impacts of climate change on snowpack, runoff and aquifer levels, has resulted in water shortages inadequate to meet the current and future needs of agriculture, municipalities or important species. Under the Basin Study, participating stakeholders determined that overall median annual water supply shortages totaled 135,000 acre-feet, increasing to 350,000 acre-feet in dry years. When higher flows for the Oregon Spotted

Frog are included, shortages are more in the range of 200,000 to 500,00 acre-feet. Because most water rights in the Deschutes are for irrigation, the shortage is most acute for instream flow needs as shown in Figure 3. Nonetheless, water supply is inadequate to meet the needs of junior priority irrigation rights, many of which are held by the most productive agricultural lands located in Jefferson County, Oregon adjacent to Lake Billy Chinook. Due to a groundwater mitigation plan in place to protect flows in the lower Deschutes River, Central Oregon municipalities cannot obtain new groundwater rights to increase supply without purchasing a mitigation credit that is generated through restoration of instream flows in the Upper Deschutes Basin. Thus, a portion of the supply needed by important aquatic species will also enable municipalities to satisfy their future demand.

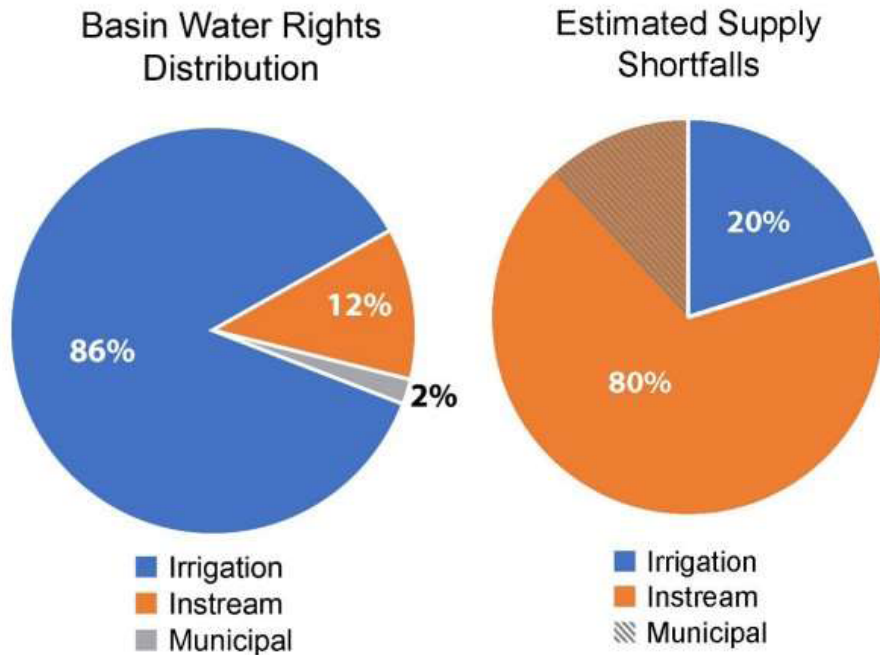


Figure 3. Water Rights Distribution and Estimated Supply Shortfalls in Deschutes Basin. Source: Deschutes Basin Study

The DLT works to address conservation needs indirectly related to the issue of inadequate streamflow. From their perspective, the conservation issues that drive much of our work is habitat alteration associated with channelization (usually tied to ag production) and habitat loss due to development. In particular, they are acquiring and restoring riparian and upland habitats that are critical for improving the degraded hydrograph, particularly given the impact of climate change on snowpack and runoff. They are also focused on conserving and connecting large landscapes to protect topographically diverse ranges of habitats to ensure species survival and ability to migrate in a climate-changed future. The local watershed councils work closely with the two federal land holding agencies to support implementation of restoration projects on public lands.

Strategic Approach In addition to quantifying current and future water supply and demand, the basin study working group (BSWG) was also tasked with developing analyzing potential strategies that could address identified imbalances and evaluate potential water management tools, and combination of tools, in terms of effectiveness, cost, environmental impact, risk, stakeholder response, and other factors. The BSWG also defined broad goals for water management strategies in the basin and arrived at the so-called “three legs of the stool”:

- Increase streamflows and improved water quality for the benefit of fish, wildlife, and people;

- A reliable and affordable water supply to sustain agriculture; and
- A safe, affordable and high-quality water supply for municipal and quasi-municipal water users.

Importantly, the BSWG endorsed the concept that all three of these broad goals should be valued and pursued in parallel. (Basin Study Work Group 2019) The BSWG evaluated water conservation options, market-based incentives, options involving new or enhanced water storage, and other more focused approaches when proposing various strategic options for meeting future water demands through reallocation and other mechanisms. Water conservation options included piping canals, piping privately-owned irrigation laterals, and upgrading on-farm infrastructure. All are proven as effective tools for saving water in the Deschutes, though significant project costs and coordination needs affects what projects can actually be implemented and when. The BSWG estimated that 200,000 acre-feet could be saved through canal piping (at \$5,000-6,000/acre-foot), 35,000 acre-feet from private lateral piping (at \$1,000/acre-foot), and 64,000 acre-feet through on-farm improvements (at \$9,700/acre-foot). (Basin Study Work Group 2019)

Market-based water management options involve the use of price incentives to change water use behavior through actions such as leasing and water right transfers. The effectiveness of this type of approach for restoring flows in the Middle Deschutes River below Bend has been demonstrated by transfers that have resulted in 50 cfs permanently instream. Market-based options include temporary leasing and the transfer of water rights by fallowing lands, as well as voluntary reductions in the volume of water used per acre. These tools are tested approaches and are available for use in the near-term and at relatively low costs (ranging from \$91-\$910/acre-foot). It was estimated that an additional 160,000 acre-feet annually could be reallocated at an average cost of \$400/acre-foot. (Basin Study Work Group 2019)

The BSWG also evaluated potential approaches for managing water storage for existing reservoirs in the Upper Deschutes and the possibility of relocating or enhancing storage facilities to help address water supply shortages. The primary objective of these storage options was to increase operational flexibility that could benefit instream flow conditions. While this strategy was not ruled out, it is of secondary priority due to relative cost and complexity of implementing. BSWG prioritized the most viable storage options as saving up to 40,000 acre-feet at an average cost of \$5,000/acre-foot. (Basin Study Work Group 2019)

Project Types and Scale Despite being the most expensive strategy, the eight irrigation districts have prioritized canal piping to both improve their water management abilities and reallocate water savings to help meet both instream and junior priority agricultural water demands. While the DRC has been supporting irrigation district piping projects for decades, these projects have been accelerated through a partnership with the Farmers Conservation Alliance (FCA), a nonprofit organization based in Hood River, Oregon. FCA works with irrigation districts throughout the west to modernize water delivery systems in pursuit of water management outcomes that benefit both agriculture and the environment. FCA launched its irrigation modernization program in 2015, taking a comprehensive approach to modernizing irrigation conveyance systems, from developing the piping strategy, getting it funded, and helping implement the project. Canal piping projects are authorized through approved watershed plans that are required to receive funding through the NRCS Watershed Protection and Flood Prevention Program (PL-566). (FCA writes these detailed plans for its partner irrigation districts.) To date, the participating districts have invested over \$50M in canal piping projects that have yielded over 50 cfs in water savings for reallocation. These numbers grow if all the past projects pre-FCA are included as well. The districts anticipate expending upwards of \$400M to pipe over 500,000 linear feet of open canal.

Concurrently, the DRC has been working with the largest irrigation district in the Deschutes Basin, the Central Oregon Irrigation District (COID), to demonstrate the efficacy of building off of the large canal piping projects to tie in private lateral piping and on-farm water application efficiency projects that save more water. DRC and COID also tested a voluntary market-based water market in 2022 that builds on the

long-term annual water leasing program for patrons seeking to put their water rights to another beneficial use in lieu of active irrigation. DRC's priority is to work with the irrigation districts to significantly expand use of these tools given that they are much more cost-effective than piping and will be easier to manage as the canals become pressurized.

Funding

Stakeholders in the Deschutes Basin, led by the DRC, have been at the forefront of securing a broad range of both state and federal public funding sources, as well private funding from major donors and foundations, in support of their land and water restoration efforts (Table 1).

Program	Federal Source(s)	State Source(s)	Other Source(s) - Private, Foundation, Local	Example Project	Funding Received
Water Conservation	NRCS - RCPP, EQIP; American Rescue Plan Act	OWEB	Portland General Electric - Pelton Round Butte Fund	On-Farm Efficiency Water Conservation Investment project	\$1,450,000
Irrigation Modernization	NRCS - PL-566, RCPP	n/a	n/a	Smith Rock Irrigation Modernization and Conservation Project	\$2,600,000
Water Marketing	BPA - Columbia Basin Water Transactions Program; BOR - WaterSMART: Water Marketing Strategy Grants	OWEB	Portland General Electric - Pelton Round Butte Fund	Deschutes Basin Streamflow Restoration (CBWTP)	\$249,828
Basin Study	BOR - WaterSMART: Basin Studies	OWRD	n/a	Upper Deschutes Basin Study	\$1,500,000
Water Quality Improvement	US EPA - Clean Water State Revolving Fund	ODEQ (through EPA Section 9), OWEB	Portland General Electric - Pelton Round Butte Fund, Patagonia	Lower Deschutes Water Quality Study	\$2,650,000 (total from Pelton Fund, for 57 projects)
Wildfire Prevention & Restoration	USFS - Collaborative Forest Landscape Restoration Program	n/a	n/a	Deschutes Collaborative Forest Project	\$673,000

Table 1. DRC funding source summary with example projects and funding amounts.

Federal Funding Sources In its early years, DRC was authorized to receive direct congressional appropriations through the Bureau of Reclamation. The authority expired after the first decade or so but was recently taken back up by DRC. Oregon Senator Jeff Merkley introduced legislation in February of 2022 that would reauthorize DRC to directly receive congressional appropriations. Despite the lack of this authority in recent years, DRC and others have secured substantial federal funding for their efforts.

DRC and partners have received funding from Bureau of Reclamation, USFS, USFWS, NRCS and Bonneville Power Administration (through NFWF). Reclamation money has primarily come through a variety of WaterSMART programs, including Water and Energy Efficiency Grants, Water Marketing Strategy Grants, Basin Studies, Drought Resiliency and Cooperative Watershed Management Program. Reclamation has also provided substantial in-kind services to the Deschutes through technical support and assistance. These grants have allowed Deschutes stakeholders to both advance planning and implement projects. DRC also plans to submit a proposal for another grant through Reclamation's new Environmental Water Resources Projects program. USFWA funding has been awarded to the Upper Deschutes Watershed Council for restoration project implementation.

Substantial NRCS funding has been invested into irrigation district canal piping through the PL 566 program, with eligibility requirements satisfied by the Farmers Conservation Alliance. NRCS has also awarded a Regional Conservation Partnership Program in the Deschutes to support on-farm irrigation improvements to tie into canal and private lateral piping projects. NRCS has provided substantial Environmental Quality Incentive Program payments through the Deschutes SWCD to landowners to improve on-farm irrigation practices. The US Forest Service, another Department of Agriculture agency,

has also provided support to the Upper Deschutes Watershed Council for restoration project implementation. Increasingly, US Forest Service funding for fire prevention and restoration practices on both public and private lands has been made available through the Deschutes Forest Stewardship Collaborative.

For the past two-decades, DRC has received significant annual programmatic funding support from the Bonneville Power Administration (Department of Energy) through grants made by the National Fish and Wildlife Foundation under the Columbia Basin Water Transactions Program. DRC has also been eligible to apply for funding to support landowner payments for water transactions and has successfully secured several million dollars for this purpose over the past 20 years.

State Funding Sources The Oregon Water Resources Department (OWRD) provided \$750,000 to match Reclamation's investment of an equal amount of funding to support development of the basin study. OWRD has supported other planning processes and both external and internal capacity to generate a place-based water management plan that is currently under development in the Deschutes Basin. Basin stakeholders have received some funding from the Oregon Department of Environmental Quality (through EPA's section 9 program) to fund water quality improvement projects in the Crooked River Basin and see this funding source as ripe for expanding for use throughout the Upper Deschutes. The Oregon Watershed Enhancement Board has invested substantial state funding into habitat, water quality and water quantity projects in the Deschutes Basin over the past 25 years, both through a focused investment program in the Deschutes and for directly for individual projects and water transactions.

Other Funding Sources - Private, Local, Foundation Being at the center of a rapidly growing community that is surrounded by natural splendor has allowed DRC and DLT to tap into funding from local businesses, private donors and regional foundations. Part of their approach to fundraising is to demonstrate to funders the coordinated approach to watershed restoration being undertaken by many diverse stakeholders in a coordinated manner. They also present private funders with the opportunity to leverage substantial amounts of public funds.

Challenges, Opportunities, and Lessons Learned

Water management issues in the Deschutes Basin are no different than most other western water watersheds; they are complicated, sometimes contentious, and always of great importance to many community members and entities. The DRC demonstrates the impact that a well-established and respected organization, at the center of water management in a basin for a long period, can have on progress and impact. Most significantly, DRC and its partners have shown that a commitment to community-based assessment and planning can illuminate a clear direction forward and attract substantial public and private funding for project development and implementation.

Like other locally based conservation organizations, DRC started slow upon its founding in 1996. Given that it was a multi-stakeholder collaborative, early leaders took the time to build a common vision for future restoration of the watershed. They also, started slow on project development and implementation, deferring to other entities to do the on-the-ground work while it established a workable mission and role in the watershed. Beginning in the late-1990s, DRC began developing flow restoration projects and transactions with individual ranchers as well as irrigation districts in the basin. These efforts accelerated after the creation of the CBWTP brought substantial funding to DRC starting in 2002, resulting in progress by select irrigation districts to begin piping their open canals in order to save water that could be reallocated to critical reaches of the Deschutes River and its tributaries.

However, a result of increased irrigation district capacity to pursue funding to implement high-profile and expensive canal piping projects was a balkanization of flow restoration efforts in the Deschutes, with the DRC losing its center role. This also meant the waning of a coordinated vision for how best to achieve

balanced water management in the basin. Fortunately, a Basin Study Work Group starting in 2014, which was accelerated by Reclamation and OWRD funding for a water conservation assessment, brought all stakeholders back to the table to systematically assess supply and demand needs and develop strategies for balancing future allocations. This collective step forward means that DRC and other stakeholders are more strategically pursuing funding for implementation of a common vision rather than simply chasing funds for individual projects. Other western watersheds would benefit from taking such a coordinated and strategic approach, recognizing that it takes time and trust that can best be generated by having an entity at the center of the action for a consistent and long-period of time.

References

Basin Study Work Group. 2019. "DRAFT FINAL Upper Deschutes River Basin Study." Bureau of Reclamation. <https://www.deschutesriver.org/PROVISIONAL%20Draft%20Final%20Report%20U%20Deschutes%20Basin%20Study%2020190701.pdf>.

"Deschutes River Basin." 1961. State Water Resources Board.

Deschutes River Conservancy. n.d. "Middle Deschutes River." Deschutes River Conservancy. Accessed January 11, 2021. <https://www.deschutesriver.org/what-we-are-doing/focus-reaches/middle-deschutes/>.

Fitzpatrick, Kate, and Bellis, Natasha. 2022. Personal Communications, Deschutes River Conservancy and Deschutes Land Trust.





RUSSIAN RIVER BASIN

BUILDING FORMAL COLLABORATIVES TO LEVERAGE FEDERAL FUNDING

Watershed Context

The Russian River watershed, on the California coast just north of San Francisco, is home to 360,000 people and a diverse and productive agricultural economy known primarily for grape and wine production. It historically supported abundant populations of steelhead, Coho, and Chinook salmon. Today, these species are listed as endangered or threatened at the federal and state levels. This is due to habitat degradation and insufficient streamflow as a result of alterations and diversions of surface flows in the watershed, as well as prolonged periods of severe drought. The Russian River Coho Water Resources Partnership – a coalition comprised of Sonoma Resource Conservation District, Gold Ridge Conservation District, Trout Unlimited, Sonoma Water, NFWF, California Sea Grant, and the Occidental Arts & Ecology Center’s WATER Institute – was formed to develop a strategy for addressing the most significant ecological threats to watershed health. These efforts, which are primarily focused in the middle and lower sections of the watershed, are driven in large part by the objective of protecting and restoring instream flows to enhance conditions for its endangered salmonid species.

Characterization of the Watershed

The Russian River flows south from its headwaters near Redwood and Potter valleys and discharges into the Pacific Ocean near the town of Jenner. The watershed drains an area of about 1,500 square miles, covering most of Sonoma County and part of southern Mendocino County.

Santa Rosa, with a population of 178,127, is the largest city in the watershed. Sonoma Water provides naturally filtered Russian River water to more than 600,000 residents in portions of Sonoma County and adjacent Marin County. The watershed is also home to dozens of Native American Tribes, who have lived alongside its river systems and managed their lands for millennia (Mendocino County Resource Conservation District 2012).

Roughly 90% of the land in the watershed is privately-owned. Of the public lands, about 5.5% is federal, 2.5% is state, and 2% is owned by local communities. Despite the number of distinct Native American communities, tribal lands make up only 0.08% of the watershed area (Mendocino County Resource Conservation District 2012). Wine grape cultivation is the most significant land use in the middle portion of the watershed. The lower reaches are predominantly mixed agriculture, rural residential, and recreational tourism (Mendocino County Resource Conservation District 2012). Agriculture is the most significant sector of the Russian River watershed economy, with the wine industry making up 40% of the county’s gross domestic product.

The watershed has a Mediterranean climate characterized by mild, wet winters and dry summers. These conditions necessitate active irrigation for crop production during the growing season that substantially

impacts what is naturally the low-flow part of the annual hydrograph. It also creates ripe wildfire conditions, particularly during the end of the dry season or during periods of extended winter drought.

Russian River hydrology is best characterized as seasonally “flashy”. During the winter wet season, the river experiences rapid, short-term high flow periods in response to extreme rainfall events (increasingly from atmospheric rivers). Flows during the summer and fall dry season are generally lower and are supported on the mainstem primarily by reservoir releases (Center for Western Weather and Water Extremes n.d.). These releases include water diverted into the Russian River from an adjacent watershed. Reservoir operations result in mainstem flows that are higher than natural during the summer months and lower than natural during the winter months, outside of major storm events (Mendocino County Resource Conservation District 2012).

The Russian River partnership is primarily focused on restoration of flow and habitat conditions on five tributary watersheds to the mainstem Russian that have been identified as flow impaired and critical for coho recovery. These are Mark West Creek, Mill Creek, Grape Creek, Green Valley Creek, and Dutch Bill Creek. The upper portion of Mark West watershed has relatively intact habitat of high biological value for coho salmon recovery, but the lower watershed is highly urbanized. Most of the upper watershed was impacted by a wildfire in 2017 and subsequently in 2020. Mill Creek watershed contains some of the best summer rearing habitat in the Russian River watershed, but its hydrology has been heavily impacted by unsustainable historic logging practices, and much of the watershed was also impacted by wildfire in 2020. Flow in Grape Creek has been altered by diversions for wine cultivation and barriers to fish passage. In recent years, Green Valley Creek has experienced extremely low flows during the summer and fall dry season that have caused some critical reaches to be disconnected or go completely dry for weeks at a time. Withdrawals of water for irrigation in Dutch Bill watershed have caused similar problems with pool disconnection and streambed drying.

Agencies / Entities Interviewed

AMP interviewed representatives from Sonoma Resource Conservation District (RCD), Gold Ridge RCD, and Trout Unlimited (TU) to gather information on their collaboration, conservation priorities, projects, and utilization of federal and other funding sources.

Resource Conservation Districts (RCDs) are established under California state law to conserve soil and water, control runoff, prevent and control soil erosion, manage watersheds, protect water quality, and develop water storage and distribution. They are locally governed agencies with independent boards of directors that are accountable to their communities. Unlike municipalities, RCDs have nominal tax base, and thus must rely on grant money for programs and operations. RCDs serve as a vital link between federal, state, and local conservation programs.

Sonoma RCD was established in 1946 and has a mission of bridging the needs of the community and natural resources by empowering people through reliable expertise and action to strengthen the resilience of Sonoma County. They strive to employ “voluntary, cooperative, and scientifically sound methods to ensure that the natural resources of the watersheds within the District are sustained, conserved, restored, and protected within a landscape of productive agriculture, growing cities, and wild lands” (Sonoma Resource Conservation District n.d.). Sonoma RCD covers most of Sonoma County.

Gold Ridge RCD was the first RCD established in Sonoma County, in 1941. It covers 134,000 acres of western Sonoma County and contains parts of the lower Russian River watershed. Their mission is to provide “technical assistance, access to funding, education, community facilitation, natural resources planning, voluntary natural resources monitoring, and efficient and impactful use of public funding cooperation with others, in partnership with landowners, land managers, and all other members of our community” (Gold Ridge Resource Conservation District n.d.).

Trout Unlimited - California (TU) has been involved in the Russian River watershed as a founding member of the Russian River Coho Water Resources Partnership. TU is a national organization that works collaboratively to protect, reconnect, and restore coldwater fisheries. TU's California Program works in areas of the state with viable coldwater fisheries habitat.

Geographies of Focus The Partnership has focused its work to date in select subwatersheds of the Russian River determined to be flow impaired and critical to coho recovery. These have included Mark West Creek, Mill Creek, Grape Creek, Green Valley Creek, and Dutch Bill Creek. Over time, Porter Creek has been added as a subwatershed of focus due to increasing flow restoration work (Figure 1). In Mark West, Mill, and Grape Creek subwatersheds, recent conservation efforts have been in response to wildfire. Fires have caused significant changes in land ownership and a migration out of the watershed, particularly for owners that keep their properties as a second home. A core community has remained, however, and is the focus of current post-fire restoration efforts. These include erosion control, forest management work, and rainwater capture projects.

Work in the other subwatersheds can most generally be categorized as flow enhancement through water release, conservation, and off-channel storage and forbearance projects. Storage and forbearance projects are intended to divert water from winter flows and store it off-channel for use during the dry season to offset summer and fall water diversions. Flow release projects involve releasing water directly into creeks from either agricultural ponds or other storage facilities. Grape Creek has utilized water storage and water conservation projects designed to reduce or eliminate water use for frost protection and irrigation. Mill Creek has primarily had water storage projects, with one flow release and one conservation project mixed in. Mark West Creek has had water storage projects, and projects designed to slow runoff and sink water into the ground to support base flows. Both Green Valley and Dutch Bill subwatersheds have employed a mix of all three project types (Gold Ridge Resource Conservation District et al. 2022a). More recently, the focus of conservation in these geographies has shifted towards broader solutions for repairing the modified hydrologic function at the subwatershed scale.

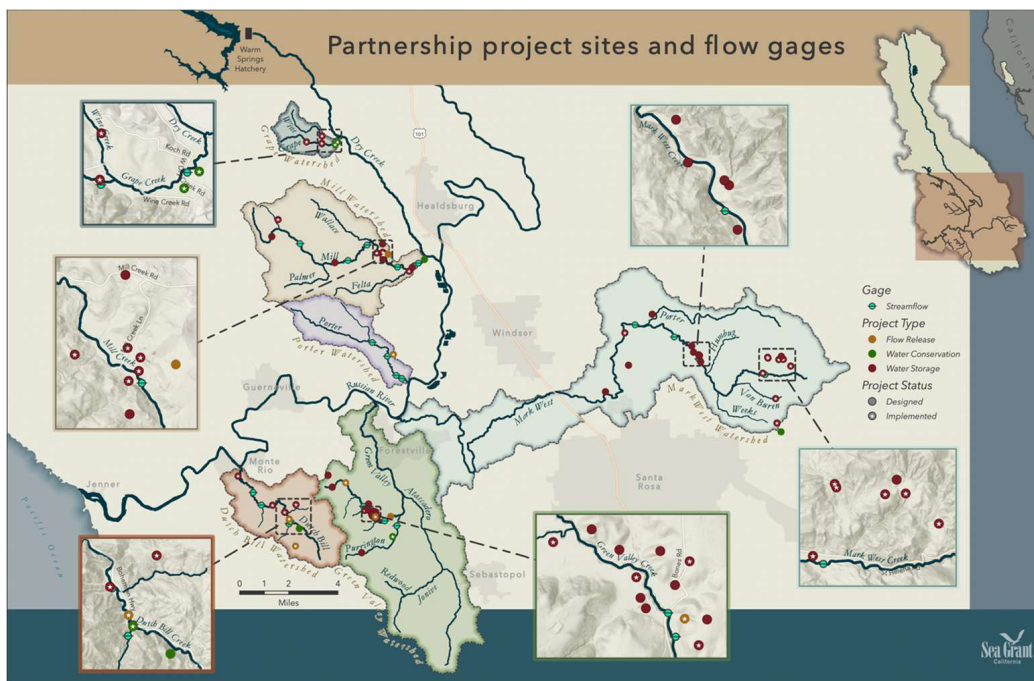


Figure 1. Focal subwatersheds. Source: Coho Partnership Glossary Final Report.

Coalition of Partners

The core partners of the Russian River Coho Water Resources Partnership are Gold Ridge RCD, Sonoma RCD, Trout Unlimited, Sonoma Water, NFWF, California Sea Grant, and Occidental Arts & Ecology Center's WATER Institute. These groups are water resource practitioners and scientists who are motivated to protect salmonid species and improve water security for their local communities in the Russian River watershed. The Partnership has worked with a variety of other local, state, and federal entities and stakeholders as part of their Technical Advisory Committee (TAC) (Figure 2).

- | | |
|--|---|
| » California Department of Conservation | » Friends of the Mark West Watershed |
| » California Department of Fish and Wildlife | » Jackson Family Wines |
| » California Department of Water Resources | » NOAA Fisheries |
| » California Environmental Water Network | » Natural Resource Conservation Service |
| » California State Coastal Conservancy | » O'Connor Environmental, Inc |
| » California Water Boards | » Salmonid Restoration Federation |
| » California Wildlife Conservation Board | » The Nature Conservancy |
| » CalTrout | » University of California, Berkeley |
| » Coast Range Watershed Institute | » US Army Corps of Engineers |
| » ESRI | » US Fish and Wildlife Service |

Figure 2. List of entities that have worked with the partnership. Source: Coho Partnership Glossary Final Report.

Partnership Dynamic Each of the core partners brings their own expertise to the Partnership. The RCDs are an indispensable local part of the partnership with a national conservation organization like TU. They provide connections to landowners and stakeholders on the ground that are essential for identifying and developing projects. There is often a mistrust of larger, national entities among local landowners in the watershed. The local relationships that are established through the RCDs are essential for achieving the Partnership's goals. TU brings its capacity and in-house hydrology and water right expertise to the Partnership and provides broader access to state and federal agencies than RCDs may have on their own.

In the first few years of the Partnership, it was critical to focus efforts on establishing and developing cohesiveness between the core partners. It took a few years to build relationships and develop a programmatic structure among partners who had never worked collaboratively together on this scale. Tension existed early among these groups who had previously been in competition with each other on grant proposals or other project funding opportunities. For this reason, a lot of the focus of the Partnership's early work was to coalesce around how best to collaborate to achieve their shared goals. These discussions resulted in signed documents outlining the ways in which the core partners would collaborate on projects as part of the Partnership. Through this collaboration, the Partnership has been more effective at securing funds and more efficient at utilizing the time and capacities of each core partner. For example, the California Wildlife Conservation Board has a certain grant proposal model that requires implementation and monitoring to be included in each project. The Partnership can bring together partners with expertise in each of these elements to secure funding for a well-rounded collaborative project.

Initial relationship-building and development of an agreed-upon programmatic framework is an essential preliminary stage for establishing an effective coalition of partners. However, it can be challenging to take these critical steps without the support of an initial source of core funding. The challenge is that these entities usually rely on funding that is primarily for the design and implementation of specific projects rather than for activities such as partnership building. The Russian River Coho Water Resources Partnership had a major advantage in this regard due to having secured long-term funding from the National Fish and Wildlife Foundation (NFWF) in 2009 to both launch and sustain the collaboration for over a decade. NFWF made the long-term funding commitment through

its now defunct keystone initiatives, which were developed and nurtured by four NFWF scientific experts. This funding was indispensable for providing the opportunity and will to continue having the conversations needed for the Partnership to work and succeed together. NFWF funding concluded in 2020, but the relationships and structure that were established during the initial stages of the Partnership remain.

Partnerships with Private Landowners Given that about 90% of the watershed is privately-owned, it is critical to have landowner participation to be able to identify and implement conservation projects. Relationships with landowners have been developed largely by the RCDs and TU, but the Partnership has continued to maintain and foster new relationships through public outreach and education efforts. By the start of 2022, the Partnership had communicated with 10,000 community members either through direct outreach or public meetings (Gold Ridge Resource Conservation District et al. 2022a). Through public outreach and education, they have been able to identify specific landowners to collaborate with on certain projects that benefit both the landowner and the river. Collaborations are typically with agricultural and rural residential landowners and tend to be smaller in scale. For example, the Partnership worked with a vineyard in the Grape Creek subwatershed to replace irrigation-based vineyard frost protection systems with a fan system. The Partnership has also collaborated on projects with other types of private landowners in the watershed. In the Dutch Bill Creek subwatershed, they worked on a water storage and conservation project with the Westminster Woods Camp and Conference Center, a year-round camp, outdoor school, and retreat center. The project involved irrigation efficiency improvements and turf replacement, installation of storage tanks, and permanent removal of the camp's existing diversion pump from the Dutch Bill Creek (Russian River Coho Water Resources Partnership, n.d.). Projects like these meet the landowner's irrigation needs while leaving more water available for instream flow.

Priority Conservation Issues and Efforts

Conservation Issues The Russian River watershed is home to 3 listed species of salmon that have experienced a significant decline in abundance due primarily to insufficient water quantity. As such, the most important conservation issue in the watershed is the restoration and protection of instream flows. Sufficient streamflow is required for multiple parts of the salmonid life cycle, including spawning during the winter months, rearing in pools during summer dry season, and migrating to the ocean in the spring as smolts (Gold Ridge Resource Conservation District et al. 2022b). In particular, juvenile salmonid stranding during the dry summer months is a major limiting factor for overall population viability.

Hydrologic restoration for flow enhancement is the overarching focus of many smaller, more specific conservation issues in the watershed. These primarily include sediment reduction, forest management, and wildfire resilience and prevention. Sediment is a major issue in most of the Russian River's subwatersheds, as a result of past land use and wildfires. There are multiple subwatersheds that experience problems with stream channel incision in their headwaters transporting sediment downstream and contributing to sedimentation and flooding issues. This ties into the watershed's ability to produce flow, as streams tend to dry up faster with degraded and disconnected alluvial aquifers. Issues with forest management also tie into overall watershed health and hydrology. Forests are currently overstocked with trees in the same age range, leading to greater water consumption than in the past. Overstocked forests lead to increased fire hazard as well and creating conservation issues resulting from wildfire. In addition, wildfires pose a serious risk to communities, infrastructure, habitat, and watershed health.

Strategic Approach Each conservation issue in the watershed has multiple resource connections that relate to overall watershed health and hydrologic function and thus restoration requires an integrated approach. The approach taken to addressing instream flow and other related conservation issues in the Russian River watershed is to harness collective expertise and action through partnerships and coalition-

building. In 2009, the RCDs, TU, and other groups formed the Russian River Coho Water Resources Partnership with the goal of improving instream flow for coho salmon while addressing water supply reliability for water users (Gold Ridge Resource Conservation District et al. 2022b). They focused specifically on the 5 subwatersheds listed previously – Mark West, Mill, Grape, Green Valley, and Dutch Bill.

Project Types and Scale The Partnership focused first on improving streamflow through water storage, water conservation, and flow release projects in the subwatersheds of focus. Some examples of these project types include nonirrigated frost protection, custom-designed rainwater tanks to increase catchment capacity, irrigation efficiency improvements, installation of off-stream storage tanks to shift timing of diversions from summer to winter, and more (Gold Ridge Resource Conservation District et al. 2022a). These projects were implemented at many locations within each subwatershed (see Figure 1). However, the groups recognized that even if all human water demands were addressed, in some years it would still not generate enough flow to achieve ecological goals for salmonids. Watershed impairment would also need to be addressed to achieve the greatest potential from each subwatershed. It has generally been more difficult for the Partnership to find funding for watershed health than for direct flow restoration, as there is no simple metric to evaluate effectiveness of investment dollars, and fisheries funders increasingly prioritize projects with direct and immediate results. However, in recent years, the Partnership has been increasingly approaching watershed health from the angle of fire resilience while concurrently achieving hydrologic restoration. Through the lens of fire, the RCDs have been able to access state funding available for wildfire resilience and utilize it to start addressing issues related to sediment and forest management. For example, TU has worked with the RCDs on addressing flow and water diversion in the context of community fire preparedness while also having conversations about storage tanks that are good for both wildfire and fish (MaryAnn King, personal communication).

The RCDs in the Russian have recognized in recent years that funding for fire resilience will represent an increasing share of the overall funding available for future work in the watershed. Mark West, Mill, and Grape Creek subwatersheds have each been significantly impacted by catastrophic wildfires in the past 5 years. Post-fire recovery and fire resilience projects in these subwatershed can also be used to address the issues of forest management and sedimentation that impact streamflow. RCDs have started to look toward federal and state funding opportunities for fire resilience projects as a way to also address watershed health at the subwatershed scale. For example, FEMA's Building Resilient Infrastructure and Communities (BRIC) program has been utilized by Sonoma County to perform forest health and natural infrastructure projects to reduce wildfire risk for three small communities in the watershed.

Projects related to sediment reduction, wildfire resilience, and forest management have typically been implemented at the subwatershed-scale in Mark West, Mill, Grape, Green Valley, and Dutch Bill subwatersheds. The idea is to restore and protect watershed condition at the subwatershed-scale such that each system can contribute as much flow as possible, particularly during the low-flow dry season, in hopes of achieving ecological goals for salmonid species. In watersheds that haven't experienced large fires, like Green Valley and Dutch Bill, the goal is to implement large-scale fire resilience and forest management projects so that catastrophic wildfires like those that have happened in other areas of the watershed can be avoided.

Funding

Funding for projects in the Russian River have been secured from a variety of federal, state, local, and private sources. The sources used to fund different project types are summarized in Table 1.

Category	Project Types	Funding Sources & Opportunities
Coalition Building	Coalition Building	NFWF Keystone
Flow Restoration and Protection	Water Storage	NFWF Keystone + grantee match, FRGP, WCB
	Water Conservation	NFWF Keystone + grantee match, FRGP, WCB
	Flow Release	NFWF Keystone + grantee match, FRGP, WCB
Soil Reduction	Road Remediation	FRGP
	Bank Stabilization	FRGP
Wildfires	Wildfire Prevention and Resilience	FEMA BRIC, USFS Wildfire Crisis Strategy
Salmon Recovery	Salmon Recovery	NOAA
Coastal Resilience	Coastal Resilience and Infrastructure	Federal Infrastructure Bill (through NOAA)

Table 1. Summary of project types and funding sources in Russian River Watershed.

Initial and Core Partnership Funding The Russian River Coho Water Resources Partnership received its initial keystone investment from NFWF in 2009. NFWF used US Fish and Wildlife Service money as a base for the annual grant, with periodic additions from private donors. It initially provided about \$800,000 per year to the Partnership, but the amount eventually fell to \$600,000 per year and finally to \$400,000 per year by the end of the funding window. It was expected to last 12 years but ended up concluding in 2020 after 11 years. In total, more than \$6 million was invested into the Russian River Coho program, with an additional \$10.6 million leveraged in grantee match (National Fish and Wildlife Foundation n.d.). Significant funding support was also provided by Sonoma Water.

In the first few years, the NFWF funding was used primarily for relationship-building, programmatic design of the Partnership, outreach and project development, and setting up the Partnership fisheries and streamflow monitoring. This was a critical first step for the Partnership, especially in the first 6 months. It was important for relationship-building among the core partners, but also for outreach to foster connections with landowners and stakeholders in the watershed. Outreach was noted as being the most difficult part of the program to find funding for, but NFWF and other related funding matches helped fill that gap. Comprehensive watershed planning was also funded by NFWF. This was helpful in the early phases for establishing a scientific basis for conservation efforts in the watershed. Having a scientific basis early on has helped the Partnership strengthen their proposals when they reached the project implementation phase of their collaboration. Since the conclusion of the NFWF annual funding, the Partnership has been continued to maintain its cohesiveness and has focused on securing funding from various sources on a project-specific, piecemeal basis.

Federal Funding Sources The Partnership has received various sources of federal funding (either through state agencies or directly) for projects on the ground. A major source of their federal funding is through the Fisheries Restoration Grant Program (FRGP). This is a state program with the California Department of Fish and Wildlife (CDFW) that channels federal (primarily from the Pacific Coastal Salmon Recovery Fund (PCSRF) administered by NOAA-Fisheries) and other funding sources towards the recovery and conservation of salmon and steelhead populations in coastal California watersheds. The Partnership was able to match FRGP funding with NFWF funding to implement conservation projects in the watershed. In addition to the flow enhancement project types described above (Section 2.4.3), FRGP funding has been used in the past for road remediation work to reduce sediment loads in streams and implement numerous instream habitat enhancement projects. CDFW has moved away from erosion prevention work over the past 10 years and the Partnership has mostly moved away from seeking FRGP funding. Gold Ridge RCD still applies for and received FRGP funds on a somewhat regular basis, although there have been grant cycles in recent years where they have not applied for it.

The Partnership has also directly utilized NOAA money for salmon recovery through their Habitat Blueprint program. This was focused primarily on improving streamflow in Grape Creek and Dutch Bill Creek (Alliance Redwoods project) for the conservation of salmon species. Since then, Sonoma RCD has

attempted to apply directly to NOAA for certain grant programs but without much success. Sonoma RCD has received the bulk of their federal funding from the Environmental Protection Agency through the California State Water Resources Control Board under the Clean Water Act. Sonoma RCD has also received Bureau of Reclamation WaterSMART grants for projects in other adjacent watersheds, but not for work in the Russian River watershed. Certain WaterSMART programs were not an important source of funding for entities in the Partnership because they focus on planning and strategy development, and the Partnership already had NFWF funding for that purpose. It was noted that the NFWF funding was easier and more effective for this purpose than seeking WaterSMART would have been. In the future, the Partnership could seek project implementation funding through other WaterSMART programs such as the new Environmental Water Resources Projects program.

Natural Resources Conservation Service (NRCS) funding has been secured in bits and pieces for conservation work in Sonoma County through a partner's Regional Conservation Partnership Program (RCPP) award. In 2020, Sonoma County Agricultural Preservation and Open Space District and partners received \$3.5 million for an RCPP Alternative Funding Arrangement (AFA) project. The project, called "Innovative Conservation: Vital Streams and Forests", is a multi-objective project focused the development of innovative riparian corridor conservation easements and source water protection forestland easements (NRCS California n.d.). RCPP funding has been used in the county for conservation planning and has been noted to be flexible enough to be utilized by both RCDs for forest management, carbon sequestration and erosion prevention planning. However, the RCD has noted that, in their experience, RCPP processes have become more difficult to navigate, with intricate requirements that are difficult to match up with programmatic needs.

In addition, Sonoma County has received federal funding for fire risk reduction from the first round of FEMA's Building Resilient Infrastructure and Communities (BRIC) grant program. The BRIC program has allocated \$1 billion to "support states, local communities, tribes, and territories as they undertake mitigation projects, reducing the risks they face from disasters and natural hazards" (FEMA n.d.). Sonoma County received \$37 million from the program for wildfire prevention. The BRIC grant requires a 25% match from its recipients, to which Sonoma has committed \$13 million it had set aside from Pacific Gas & Electric (PG&E) legal settlements. The BRIC program emphasizes wildfire prevention through a human objective of protecting communities and infrastructure but has been utilized by Sonoma for broader-scale forest management that also has benefits for overall watershed health.

State Funding Sources The bulk of the Partnership's funding for work on the ground is through a combination of state funding sources (and FRGP). This comes from Proposition 1 and California Wildlife Conservation Board (WCB) grant programs. Proposition 1 is an assembly bill in the state of California that provides large amounts of money (\$7.545 billion) for a variety of water projects including watershed protection and restoration. This funding provided \$200 million to WCB for flow enhancement projects. WCB also provides opportunities for additional restoration grant funding that the Partnership has utilized in the Russian River watershed. In addition, Gold Ridge RCD also utilized North Coast Integrated Regional Water Planning funds for project implementation. These funds were from Prop. 84 and were administered by the CA Department of Water Resources.

Private Funding Sources Private contributions to the Russian River Coho Water Resources Partnership were leveraged as matches to the keystone NFWF funding. Over 11 years of NFWF funding, a total of \$10.6 million was leveraged in grantee match. However, it was not discussed in detail how much of that was sourced from private donors. Interviewees did not describe which types of private donors were contributing funds or how they were utilized in the watershed.

Future Funding Sources With the conclusion of the NFWF keystone funding, the core partners of the Russian River Coho Water Resources Partnership have shifted their efforts towards project-specific funding for conservation projects in the watershed while maintaining core support for staff capacity. Sonoma and Gold Ridge RCDs plan to take slightly different approaches to securing future funding. Gold

Ridge is considering moving back towards FRGP, as the program has been moving in a new direction in Sonoma County. The 2021 FRGP project announcement re-emphasized the use of bank stabilization and road decommissioning as strategies for restoring salmonid habitat in coastal watersheds (California Dept. of Fish & Wildlife 2021). They will also be looking towards funding from the federal infrastructure bill administered through NOAA for coastal resilience.

Both RCDs acknowledged the transition to FEMA funding for fire prevention as an avenue for securing funding for watershed health. However, both noted that the FEMA grant process is difficult to work with due to long delays to get the grant in place and a sizable 25% match requirement. They recognized that it is a tough task for smaller RCDs like theirs to be able to find a match of that size. Sonoma RCD will attempt to partner with the California Association of Resource Conservation Districts in an effort to work with FEMA. The Association has more experience with acquiring large federal grants funding that Sonoma does not have on its own. Application for FEMA grants requires a partnership with at least one larger partner that is capable of shouldering a grant of that size. In general, the RCDs have noted that there is a considerable lack of capacity for smaller entities to be able to keep up with the amount of money available. Finally, the U.S. Forest Service's recently launched 10-year Wildfire Crisis Strategy will expand federal funding for fire prevention and remediation beyond just the agency's lands. Under this new initiative, the Forest Service intends to work with partners to treat up to an additional 30 million acres of other Federal, State, Tribal, and private lands.

Challenges, Opportunities, and Lessons Learned

In the Russian River, the key challenges to collective conservation efforts are associated with program and project development and the process for seeking project funding, particularly through the state FRGP. Very few of the existing funding sources allow the award of unrestricted funds, or even moderately restricted funds, which are critical for developing conservation programs and individual projects. Activities such as outreach, development and maintenance of landowner relationships, project site evaluation and initial project planning are critical precursors to getting work done on the ground, but it is nearly impossible to secure funds explicitly intended for these activities. The programmatic nature of the NFWF funding was critical in this respect – the Partnership was able to use it to get this preliminary work done, then go to other sources to fund design and implementation. One interviewee stated that the biggest impediment to getting collective work done was the idea that the grant application process needs to be competitive. This is likely the cause for the initial tension when the core partners got together to form the Russian River Coho Water Resources Partnership. It took years of conversations to build trust and form a coalition that was capable of working collaboratively on conservation issues in the watershed. In addition, a competitive grant process requires a large expenditure of resources, time, and money – the cost of which is taken on by the applicant. As mentioned before, RCDs have limited to no tax base or other unrestricted funds, so they must figure out a way to pay for the writing of a grant proposal and for administering grants that do not always cover the full costs of a project. That can require another partner with more resources to invest in the grant application work that comes before the actual project work can be funded, and/or to act as lead administering the grant once funded. Relationships between the entity applying for the grant and the funding agency can be difficult to manage in this situation. Funding agencies have their own priorities as well that may not perfectly align with local needs on the ground. This poses a difficult situation for RCDs to receive funding for their conservation projects.

The upside of these challenges is that there are considerable amounts of resources available for this type of work. The opportunity exists to improve and streamline grant application processes and grant program terms such that local entities like RCDs can afford to secure that funding. To do that, one interviewee recommends that early-stage grants not come with large match requirements, and the process should be streamlined so as not to require 10 grants just to get one project done. However, given that this is often the case for smaller entities, the opportunity exists for them to have larger

comprehensive conversations on what it actually takes to complete a project and how to get there with multiple funding partners.

A key takeaway from the Russian River case is that fostering collaborations within the watershed and with larger entities can help to secure large-scale federal funding sources that are available for conservation work. Collaborative effort allows the collective expertise of the partners to be utilized most effectively to bring in funding and design and implement projects. Each individual entity brings its own connections and expertise that contribute to the greater success of the partnership as a whole. As seen in the Russian River Coho Water Resources Partnership, the RCDs contribute the essential relationships with local landowners needed for project design and implementation and TU contributes their capacity and expertise in hydrology and water right permitting and policy. with state and federal programs to bring in funding. All members of the Partnership contribute to grant writing, with the RCDs leading the charge on securing implementation funding. One key aspect of this, however, is that flexible funding is essential for the success of a collaborative effort. Money secured by TU must be able to be utilized on the ground by the RCDs or other partners.

With the collaborative approach, the challenge remains on how to fund the conversations and relationship-building required to foster these collaborations in the first place. The Russian River Coho Water Resources Partnership had a major advantage in this regard due to the NFWF funding that they received. Other entities do not have this luxury but can look to the example set by the Partnership. While NFWF's keystone initiative is now defunct, other funders may be cultivated to provide the type of support provided to the Russian River Partnership.

It is also beneficial for local entities like an RCD to secure federal funding that is disbursed through local and state programs. Both Sonoma and Gold Ridge RCDs have often done this through FRGP, the State Water Board, and Sonoma County. Participation in the larger, statewide associations, like the California Association of RCDs can further improve the ability to secure federal funding, whether directly or through a local or state agency. Finally, as mentioned above, the partnership with a national organization like TU can provide additional capacity and a broader perspective on how to fund conservation strategies.

References

MaryAnn King, Trout Unlimited. Personal communication, March 28, 2022.

Valerie Minton, Sonoma Resource Conservation District. Personal communication, March 28, 2022.

John Green, Gold Ridge Resource Conservation District. Personal communication, March 28, 2022.

California Dept. of Fish & Wildlife. 2021. "Mitigated Negative Declaration for FRGP, Steelhead and Forest Land Restoration Projects." 2021. <https://wildlife.ca.gov/Grants/FRGP/MND>.

California Forward. 2019. "Toward Russian River Sustainability." Prepared for Russian River Watershed Interests and California Department of Water Resources.

Center for Western Weather and Water Extremes. n.d. "Russian River Watershed Characteristics." Accessed April 7, 2022. <https://cw3e.ucsd.edu/firo-watershed-characteristics-and-challenges/>.

FEMA. n.d. "Building Resilient Infrastructure and Communities." Accessed April 14, 2022. <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>.

Gold Ridge Resource Conservation District. n.d. "Mission." Accessed April 8, 2022. <http://www.goldridgercd.org/htm/mission.htm>.

Gold Ridge Resource Conservation District, SeaGrant California, Trout Unlimited, Occidental Arts & Ecology Center, and Sonoma Resource Conservation District. 2022a. “The Russian River Coho Water Resources Partnership - Dedicated to Improving Water Reliability for Fish and People.”

———. 2022b. “The Russian River Coho Water Resources Partnership - Lessons Learned for Streamflow Enhancement in California.” Russian River Coho Water Resources Partnership.

National Fish and Wildlife Foundation. n.d. “Russian River Coho.” NFWF. Accessed April 11, 2022. <https://www.nfwf.org/programs/russian-river-coho>.

NRCS California. n.d. “NRCS Invests \$3.5 Million in Innovative, Partner-Driven Conservation Project in California.” Accessed April 14, 2022. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/newsroom/releases/?cid=NRCSEPRD1656215>.

Russian River Coho Water Resources Partnership. n.d. “Dutch Bill Creek Water Conservation & Storage Project Westminster Woods.”

Sonoma Resource Conservation District. n.d. “About Us.” Accessed April 8, 2022. <https://sonomarc.org/about/>.

*Technical Memorandum
prepared for River Network
by AMP Insights,
June 3, 2022.*

AMP Insights





TETON RIVER BASIN

BUILDING FORMAL COLLABORATIVES TO LEVERAGE FEDERAL FUNDING

Watershed Context

The Teton River watershed is located in eastern Idaho and western Wyoming, just west of the iconic Teton mountain range. The mainstem Teton River collects snowmelt runoff from tributary streams originating in the surrounding Teton, Big Hole and Snake River mountains and discharges into Henry's Fork of the Snake River. Land use development and changes have impacted the health and function of the watershed's aquatic systems, which historically supported a thriving population of Yellowstone Cutthroat Trout. Friends of the Teton River (FTR) is a nonprofit organization whose mission is to restore and conserve populations of native trout species, surface and groundwater quality and healthy, functioning natural hydrology. Through their principles of sound science, community education and effective collaboration, FTR has partnered with local landowners and agricultural producers, public agencies, The Nature Conservancy (TNC) and other NGOs to implement strategic and effective conservation projects in the Teton River watershed.

Characterization of the Watershed

The Teton River watershed drains 806 square miles of eastern Idaho and 327 square miles of western Wyoming. The Upper Teton River flows through the Teton Valley, a wide, flat portion of the upper watershed with lots of vegetation and wetlands and the cities of Driggs, Teton and Victor. The river flows northward and exits the valley by dropping into the Teton River Canyon. As a snowmelt-fed river, the Teton's peak flows occur in the early summer and its hydrograph decreases significantly throughout the summer and fall. Its important tributaries – Fox Creek, Teton Creek, Bitch Creek, Canyon Creek – are wild and remote and begin in the national forest (Amy Verbeten and Anna Lindstedt, personal communication).

The Teton Valley is surrounded by public land in its neighboring mountain ranges. About 25% of the watershed area is federally- or state-owned, with the majority of its land being managed by the USFS as part of Caribou-Targhee National Forest. The Teton Valley itself is primarily private land, with about 50% of it being used for agriculture and the other 50% developed or at least planned for development.

The Teton Valley's main agricultural products are malt barley, hay, ranching of beef cattle and some potatoes. In recent years, the valley has been undergoing a transition from an agriculture-dominated economy to one also based on recreational tourism due to its proximity to Grand Teton and Yellowstone national parks. The lack of available private land and cost inflation of Jackson Hole is causing residential growth to expand into the Teton Valley. As a result, the population of Teton County, Idaho grew by 39% between 2000 and 2007, making it the fourth fastest growing county in the United States during that time (Friends of the Teton River, n.d.). Water use in the basin has been and remains primarily for agricultural, but urban water demands have been increasing in recent years.

In 1975, Teton Dam was constructed at the lower end of Teton Canyon to create a reservoir for irrigation water. However, in 1976 the earthen dam catastrophically failed, releasing 250,000 acre-feet of water and 4 million cubic yards of embankment material downstream. The portion of the river downstream of the dam site was significantly altered and has since undergone mitigation and restoration work.

The focal species of conservation efforts in the Teton River is the Yellowstone cutthroat trout (YCT). The watershed historically supported productive trout populations but now only occupy 23% of their historic range (Friends of the Teton River 2021b). While not listed as endangered, YCT are considered to be an indicator of ecosystem health and are a species of conservation concern by multi-state and federal agencies.

Agencies / Entities Interviewed

Friends of the Teton River (FTR) is a non-profit organization based in Driggs, Idaho, in the center of the Teton Valley. Their mission is to “restore and conserve the Teton River Watershed, ensuring a lasting legacy of clean water, healthy streams and a vibrant wild fishery” (Friends of the Teton River n.d.). While one of their primary objectives is to restore and conserve YCT, FTR is not exclusively a fish-based organization. Their other objectives are to restore and conserve surface and groundwater quality, restore and conserve healthy, functioning stream channels, floodplains, riparian areas and natural wetlands, provide watershed education and promote a strong and sustainable organization. They are founded on the principles of sound science, community education and effective collaboration with a diverse group of local stakeholders, community members, regional representatives and state and federal agencies (Friends of the Teton River n.d.).

FTR has worked along the mainstem Teton River and its tributaries throughout the watershed. Most of these efforts have been focused on the upper Teton River and Teton Valley since the lower section of the river is very remote and difficult to access due to steep canyon walls. They initially prioritized projects in tributaries to the upper Teton River, like Trail Creek, Fox Creek, Darby Creek, Teton Creek, South Leigh Creek and Badger Creek. Projects in these tributaries were seen as “low-hanging fruit”, as in they were smaller, less costly and were supported by landowners and science. FTR has since expanded their efforts to other tributaries that feed into the lower Teton River, like Bitch Creek, Canyon Creek and Moody Creek.

Coalition of Partners

Local Agricultural Partners Collaboration is an important principle of the work that FTR does in the Teton watershed. They work with broad categories of partners – from private landowners in the Teton Valley to public agencies in the surrounding mountains. They acknowledge that their most critical partners are private landowners, primarily local farming and ranching communities. They have developed key agricultural partnerships not only with individual landowners, but with larger entities that represent landowners and agricultural partners. For example, they have partnered with the local (Teton County) chapters of the Farm Bureau and Soil Conservation District, as well as individual canal companies like Canyon Creek Canal Company, Trail Creek Sprinkler Irrigation Company and others.

FTR have worked to develop and maintain key partnerships with local landowners and agricultural entities through community engagement and education efforts. Starting in 2018, they began hosting the Annual Teton Farm & Agricultural Tour, where they lead community members on a 5-hour bus tour highlighting the work local farmers, ranchers and conservation groups are doing to benefit the health of the Teton Valley. The tour is sponsored by FTR, Teton County Farm Bureau, Teton County Soil Conservation District, Teton Regional Land Trust and local agricultural partners. The 2019 tour saw a turnout of about 100 community members (Sean Ellis 2019). FTR also hosts other types of education events for the agricultural community. In 2019, they partnered with Teton County Soil Conservation District to host a soil health workshop with a regenerative agriculture specialist for 30 producers and community members (Friends of the Teton River 2021a). Through its dedicated effort to engage with the

local agricultural community, FTR has been able to foster positive working relationships on the ground. These relationships have been critical in accomplishing FTR's conservation goals, as a majority of their work has been on private land in the Teton Valley.

Public Agency Partners FTR has also partnered with state and federal agencies that manage the public lands in the surrounding mountain ranges. Most of the headwaters to the Teton River's tributaries originate in the Caribou-Targhee National Forest, managed by the US Forest Service. As such, they have worked with the Forest Service on its projects located in those tributaries. To a lesser extent, FTR has partnered with the Bureau of Land Management which manages portions of the canyon section of the Teton River. They have also worked with state agencies in Idaho and Wyoming, including the Idaho Department of Lands, Idaho Department of Fish and Game and Wyoming Game and Fish Department. FTR has also collaborated with the Natural Resources Conservation Service and even shares an employee with them.

Discrete Collaborations on Specific Projects In addition to working broadly with private landowners and public agencies, FTR collaborates with other NGOs on discrete projects. Their biggest partners are Henry's Fork Foundation (HFF), Teton Regional Land Trust and TNC. FTR has worked particularly closely with HFF through a new form of collaboration in which the two entities share staff. TNC has increasingly been a partner in the Teton watershed, whereas Trout Unlimited is less present there than it is in other Idaho geographies. In its collaboration with TNC, FTR identifies key projects in the basin that require significant land acquisitions and water transactions components and then goes to TNC to utilize their financial and structural capacity to implement those components. With these roles, FTR and TNC have collaborated on a discrete project with 1,000 acres of water rights. For her work on this project, TNC has been funding Sarah Lien, FTR's Water Resources Director (Amy Verbeten and Anna Lindstedt, personal communication).

Other NGO partners include American Rivers, the Greater Yellowstone Coalition and LegacyWorks, a conservation catalyst group. FTR has increasingly worked with issue-specific groups as well on discrete projects. This includes Teton Valley Trails & Pathways, Valley Advocates for Responsible Development and others.

The benefit of collaborating with such a wide range of entities is that FTR can organize different entities on specific projects. Any number of these entities could be organized around what FTR is trying to accomplish on any given project. This helps FTR utilize entities with specific interests, expertise and capacities that are best suited for a specific project. An example of this is FTR's Farms & Fish Initiative, in which Teton Soil Conservation District, Teton County Farm Bureau, Teton Regional Land Trust, HFF and local stakeholders have been organized to form the Teton Water Users Association (Friends of the Teton River n.d.). Other examples include the Teton Creek Collaborative and Teton Creek Stakeholders Groups (Amy Verbeten and Anna Lindstedt, personal communication).

Priority Conservation Issues and Efforts

Conservation Issues The primary conservation issue that drives much of the work in the Teton River watershed is the population decline of Yellowstone cutthroat trout. The watershed had historically supported flourishing populations of YCT, which would make spawning runs into the mountain tributaries in the watershed. However, between 1999 and 2003 populations of YCT declined by 95% due to a variety of natural and human causes. These include overfishing, habitat destruction from grazing, logging and mining, drought causing spawning reaches to run dry, predation from larger, more aggressive lake trout, interbreeding with introduced rainbow trout and outbreaks of disease in spawning grounds (Teton Regional Land Trust 2020).

Due to the wide range of causes for YCT decline, priority conservation issues for FTR are not limited to restoring and conserving their populations. Their mission is to work for clean water and healthy streams in addition to a vibrant wild fishery. The three major surface water quality threats to the Teton River, as

identified by the Idaho Department of Environmental Quality (IDEQ) are sediment, temperature and nutrients. Groundwater quality issues are due to increased residential development and dependence on private wells. Streamflow and habitat alterations have also been recognized as important factors impacting both surface water quality and hydrologic function of the watershed's stream channels, floodplains, riparian areas and natural wetlands. FTR focuses its work on addressing these issues as well as improving its YCT fishery.

Strategic Approach At a high level, FTR's strategy is to implement programs and projects based on community education and cooperation with landowners, citizens and agency partners. Their conservation efforts have been prioritized based on strong science, as FTR has established their own original research and monitoring programs. The first five years of the organization was spent establishing baseline data by monitoring water quality and quantity, performing habitat health assessments and studying YCT populations, spawning location, movement patterns and mortality. With this baseline of information, FTR then began prioritizing conservation and restoration projects that were seen as "low-hanging fruit". These efforts were smaller, primarily focused on upper Teton River tributaries and were supported by science and landowners (Amy Verbeten and Anna Lindstedt, personal communication). Examples of "low-hanging fruit" projects include irrigation diversion improvements, fish passage, streambank erosion and sediment reduction projects. FTR worked at a quick pace at first to knock off many of these projects so that they can in effect prevent hydrologic and ecologic conditions from declining further. This allowed them to shift their focus to more complicated, larger-scale projects that require more planning and funding. With a focus on bigger projects in recent years, FTR has been able to be more selective about the projects they do implement. They have also continued their research and monitoring efforts over time to assess current conditions and evaluate how effective their work has been.

The other side of FTR's approach is an education program intended to teach the current and future generation of community members in the watershed. Their goal is to integrate education within the community through a two-way transfer of knowledge. Through this education program, they offer tours and events for local community members, as mentioned previously (Section 4.1). Engaging the community through these events helps FTR to grow and monitor the community's capacity for working towards its conservation goals. It also builds and maintains key partnerships with private landowners and stakeholders. In addition, FTR has been intentionally building stakeholder groups at the subwatershed level to increase capacity for planning and implementing specific projects within those subwatersheds. For example, they have done this in the Teton Creek subwatershed by organizing various partner entities into the Teton Creek Collaborative and Teton Creek Stakeholders Groups (Amy Verbeten and Anna Lindstedt, personal communication).

Project Types and Scale The projects implemented by FTR are categorized into four main project types – water quality, water quantity, fish passage and migration and stream habitat and function. Water quality projects are focused on protecting and improving surface and groundwater quality for the health of the watershed's communities and aquatic ecosystems. Examples of specific projects implemented by FTR towards this goal include:

- Community education and incentives programs to test well water, properly dispose of hazardous waste and maintain septic tanks;
- Stream stabilization and habitat restoration projects to reduce sediment inputs to streams; and
- On-farm best management practices to improve soil health and reduce runoff and nutrient input through partnerships with local agricultural producers.

FTR’s water quantity projects seek to improve stream flows and the availability and predictability of water supplies for human and environmental needs. They implemented a streamflow restoration program in 2006 which utilizes cooperative, voluntary actions to improve streamflow in the tributaries to the Teton River. They have partnered with agricultural producers and other landowners on projects to improve irrigation infrastructure and on-farm conservation. An example of this is FTR’s Farms and Fish Initiative, in which they have utilized its coalition of partners to provide financial incentives and support for local agricultural producers to implement conservation farming and best management practices. This includes water conservation, soil health and aquifer recharge efforts. Since 2016, \$750,000 in funding has been secured for this initiative (Friends of the Teton River n.d.).

Fish passage and migration projects seek to protect and restore connected migration routes of native YCT to improve their reproductive success and increase populations. Towards this goal, FTR conducted a comprehensive assessment of potential barriers to fish passage in 2005. Many of the barriers identified in this assessment were either irrigation diversion structures that acted as small dams that were impassable at low flows or canals with high entrapment potential for fish. Since 2006, FTR has worked with willing landowners and canal companies on projects to improve outdated infrastructure with more fish-friendly headgates. They have also installed fish ladders or step pools in certain locations where there were significant blockages to upstream migration.

Stream habitat and function projects focus on improving hydrologic function of the mainstem Teton and its tributaries. They focus on improving geomorphology by implementing bio-engineering techniques to stabilize stream banks and create instream habitat for fish and wildlife. The best example of this work is in Teton Creek, where they have performed a geomorphology project near the city of Driggs. They continue to expand on that project both upstream and downstream of the original project site.

In the first few years, FTR’s efforts were focused on the mainstem and tributaries of the upper Teton River but have since been expanded to the lower reaches of the watershed as well. The scale of FTR project implementation for each of the primary project types has been specific to reaches or segments of the mainstem Teton River and its tributary subwatersheds. Projects along the mainstem Teton River are broken down into several reaches – Headwaters to South Bates Bridge, South Bates to Packsaddle Road crossing, Packsaddle to Harrops Bridge, Harrops to Felt Dam and Felt Dam to Wilford Dam. For the tributaries like Teton Creek and Trail Creek, for example, project reaches are broken into Upper and Lower segments. The exceptions to this are Bitch Creek and Canyon Creek, the important tributaries lower in the watershed which are considered as one reach for project implementation. Based on FTR’s extensive monitoring and research programs, priority rankings are determined for each reach based on risk scores that include YCT population significance, climate change risk, habitat degradation, water quality, land use change and non-native competition, among other factors.

Project Cost Estimates Project implementation in the Teton watershed comes with both social and on-the-ground costs. FTR has provided examples of specific projects prioritized for future implementation and their estimated costs. The costs of different project types are summarized below (Table 1).

Project Type	Cost Estimate Range - Social	Cost Estimate Range - On the Ground
Barrier Removal	\$15,000 - \$60,000	\$90,000 - \$1,000,000
Fish Screens	\$15,000 - \$60,000	\$85,000 - \$2,000,000
Flow Restoration	\$15,000 - \$300,000	\$400,000 - \$2,500,000
Habitat Restoration	\$15,000 - \$750,000	\$150,000 - \$25,000,000
Non-native Trout Management	\$20,000 - \$180,000	\$15,000 - \$500,000

Table 1. Cost estimates for various FTR project types. Source: FTR

Funding

Program	Federal Source(s)	State Source(s)	Other Source(s) - Private, Foundation, Local	Example Project(s)	Funding Received
Stream Habitat & River Restoration	NFWF - Bring Back the Natives, USFWS - Partners Program	Idaho Fish and Wildlife Foundation	Cushman Family Foundation, Donald C. Brace Foundation, Jackson Hole One Fly Foundation	Teton Creek Corridor Project	\$500,000
Stream Flow Restoration and Monitoring	BOR WaterSMART, Columbia Basin Water Transactions Program (Bonneville Power Administration)	Idaho Water Resource Board	N/A	Canyon Creek	\$74,000
Farms & Fish Initiative	NFWF - Conoco Phillips Spirit Award, NRCS - CIG, NRCS - RCPP	Idaho Department of Environmental Quality	TNC, Putnam Family Foundation	Soil & Water Health, Aquifer Recharge, others	\$4,000,000 (total for initiative)
Fisheries Research & Monitoring	NFWF - Freshwater Restoration Accounting Fund	N/A	John and Mary Wilkes Short Foundation	Tributary Trout Assessment (4th annual)	\$75,000
Fish Passage Restoration	USFWS	N/A	Teton Conservation District (WY), Jackson Hole One Fly Foundation, Patagonia	Automated Fish Screen System on Hog Canal	\$24,000
Water Quality and Well Water Testing	N/A	N/A	Community Foundation of Teton Valley, Silver Star Communications, Teton Conservation District (WY)	Cost-share Well Water Testing Program	\$17,000

Table 2. FTR funding source summary by program with example projects. Source: FTR.

Federal Funding Sources FTR has secured funding from Bureau of Reclamation, USFWS, NRCS, NFWF and EPA grant programs. Reclamation money has primarily come through its WaterSMART program. They have used this in the past for projects in Canyon Creek and projects related to the failed Teton Dam. Initial BOR grants for the latter came out of recommendations from the Basin Plan for the Henry’s Fork Snake River, which included some specific efforts being targeted towards replacing the Teton Dam. In recent years, however the focus of Teton Dam work has been on aquifer recharge rather than dam rebuild. WaterSMART grand funding has been used to research and implement that. In addition to WaterSMART, FTR has received funding for project planning through BOR’s Collaborative Watershed Management Program (CWMP). Looking forward, FTR also recently applied for WaterSMART funding for a fish screen as well as submitted a proposal for another grant through Reclamation’s new Environmental Water Resources Projects program.

USFWS funding has come through the Partners for Fish and Wildlife Program (Partners Program). The Partners Program offers technical and financial assistance to landowners, managers, tribes, corporations, schools and nonprofits interested in improving wildlife habitat on their land. As such, this funding has been used for stream habitat, fish passage and river restoration projects in the Teton watershed. Through NRCS, FTR has secured funding through its Regional Conservation Partnership Program (RCPP) and Conservation Innovation Grants (CIG) programs. These are both for its Farms & Fish Initiative, with the RCPP funding going towards the Soil Health Initiative and CIG going towards the Aquifer Recharge Initiative. NFWF has provided funding for FTR’s ongoing research and monitoring programs to track YCT populations and habitat in the watershed. This funding has been secured through its Freshwater Flow Restoration Accounting Fund program. In addition, NFWF’s Bring Back the Natives program has funded stream habitat and river restoration activities in the watershed. EPA’s Environmental Education grant has been used for FTR’s community education and outreach programs.

State Funding Sources State funding makes up a small proportion of the money that FTR brings in for its projects. Idaho’s state natural resource agencies lack the capacity, personnel, or funding to support FTR projects akin to federal or other funding sources. For this reason, FTR typically refrains from requesting direct state funding but instead uses agencies as a conduit for seeking federal and other sources of funding. For example, funding from the Idaho Water Resource Board for streamflow restoration and monitoring comes from a subcontract through the Columbia Basin Water Transactions Program sponsored by the Bonneville Power Administration (within the U.S. Department of Energy). FTR

has also received EPA 319 Grant Program funds administered by the Idaho Department of Environmental Quality and landscape-scale restoration grants from USFS through the Idaho Department of Lands.

Other Funding Sources – Private, Local, Foundation Being in a tight-knit community has allowed FTR to tap into funding from local entities and private donors and foundations. Part of their approach to securing funding is to educate funders on their work. FTR wants to help form funder’s connection and interest in conservation by bringing them out into the field to experience firsthand the work that they are doing on the ground. They regularly receive funding from Patagonia and some other private foundations of stakeholders in the watershed (listed in Table 2). There are some private donors from Jackson, Wyoming, including the Jackson Hole One Fly Foundation and Teton Conservation District, but typically FTR targets donors with direct connection to the Teton River watershed. They have also received funding from the Western Native Trout Initiative, which is a public-private fish habitat partnership that works across the 12 western states to conserve native trout species.

Challenges, Opportunities, and Lessons Learned

FTR’s approach to implementing conservation projects was to start out by establishing scientific baselines and prioritizing small-scale projects based on those baseline conditions, before expanding to larger-scale projects that require more planning and funding. One key aspect of that approach was that it involved FTR being in “do it yourself” mode for the early years of its organization. In its initial years, this meant that FTR would attempt to use only their own capacity to plan and implement its conservation projects. This early phase was integral into its ability to learn about its strengths and weaknesses as an organization. This helped them understand the key pieces that they were capable of doing themselves but even more so helped them understand where to cultivate relationships to activate other partnerships. An example of this is its relationship with TNC. FTR has identified key projects in the basin that require significant land acquisitions and water transactions components but understand that they don’t have the financial or structural capacity to be able to do that themselves, so they partnered with TNC. They recognized TNC as the expert in land and water acquisition, let them handle that piece of their project and take credit for it. This was a win-win partnership for both entities.

In terms of funding, FTR’s approach created some challenges in the early run but paid off significantly in the long-term. In the early years of the organization, FTR worked with limited budgets from one-off grants for specific projects. It was important for them to work in a timely fashion on these projects so that they were not strapped for money during the last phases of implementation. Often, they were cut short on projects because they were limited by how many unrestricted (non-federal) dollars they could bring in. They found it challenging to secure capacity support funding. In recent years, their approach has shifted such that they seek multi-year grants and can plan several years ahead financially. This involves applying for planning grants to establish the data and close scientific gaps before project implementation. In turn, the time spent in the planning phases makes them more successful at getting funding for the implementation phases. Funders have a better idea of FTR’s objectives and have more confidence the project will be a good investment. This approach has allowed FTR to successfully bring in significant amounts of funding for project implementation.

A unique advantage that has allowed FTR to be successful in securing funding is that they have in-house expertise dedicated to fundraising (Anna Lindstedt). Typically, an entity of their size would rely on staff from larger NGOs like TNC or TU to raise money. This can create problems for the smaller entity, as their project objectives may not align with the larger entity that they turn to help secure funding. FTR is in a position to avoid that potential conflict by being capable of fundraising using their own in-house capacity. Another important advantage they have is excellent staff longevity and little turnover. This is because of the small, close-knit community of the Teton Valley – its people feel invested in both the watershed and the community itself. The longevity of its staff allows FTR staff to establish long-term relationships with funders and therefore become more successful at securing funding.

FTR's dedication to community education have been another critical component of its ability to develop partnerships with local landowners, agricultural producers and project sponsors. Through tours and events that it sponsors, FTR engages local community members, youth, potential project funders and partners alike. These groups learn firsthand about the conservation issues facing the Teton River and the type of work that FTR does in the watershed – an important experience that inspires community action. It is these principles that have contributed to the success of FTR in fostering effective collaborations and implementing win-win conservation projects in the Teton watershed.

References

Anna Lindstedt, Friends of the Teton River. Personal communication, April 6, 2022.

Amy Verbeten, Friends of the Teton River. Personal communication, April 6, 2022.

Friends of the Teton River. 2021a. "FY 2021 Annual Report."

———. 2021b. "Teton River Watershed Hydrology Management Plan for Yellowstone Cutthroat Trout Conservation."

———. n.d. "Farms and Fish." Friends of the Teton River (blog). Accessed May 4, 2022a. <https://www.tetonwater.org/featured-work/farms-and-fish/>.

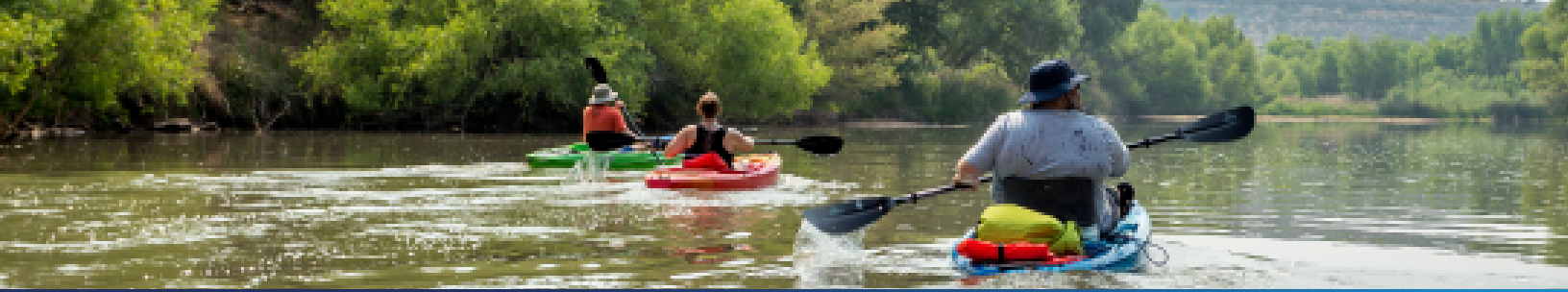
———. n.d. "Improving Ecological Resilience through Water Management Activities in the Teton River Watershed."

———. n.d. "Our Story." Friends of the Teton River (blog). Accessed May 4, 2022b. <https://www.tetonwater.org/about-us/our-story/>.

Sean Ellis. 2019. "Farmers, Conservation Groups Work Together in Teton County." Idaho Farm Bureau. August 13, 2019. <https://www.idahofb.org/news-room/posts/farmers-conservation-groups-work-together-in-tetoncounty/>.

Teton Regional Land Trust. 2020. "A Symbol of Our Region - Yellowstone Cutthroat Trout." Teton Regional Land Trust. July 1, 2020. <https://tetonlandtrust.org/a-symbol-of-our-region-yellowstone-cutthroat-trout/>.





VERDE RIVER BASIN

BUILDING FORMAL COLLABORATIVES TO LEVERAGE FEDERAL FUNDING

Watershed Context

The Verde River is located in Central Arizona, just below the southern rim of the Colorado Plateau. As a perennial stream in an arid landscape, the Verde River is of great ecologic, economic, recreational and cultural importance to its surrounding communities and those who rely on its water. However, over the past few decades, its flows have been reduced through surface water diversions, groundwater pumping and climatic factors. The watershed has been experiencing rapid commercial and residential growth, increasing demands for surface and groundwater and threatening future flows in the river. Friends of the Verde River (FVR) and The Nature Conservancy (TNC) have collaborated on restoration projects to sustain and restore instream flows, improve habitat and build supportive communities in the Verde Valley. The two organizations plus the Environmental Defense Fund (EDF) have developed an effective partnership by meeting regularly, establishing an efficient division of labor and roles and working together to build relationships with local landowners and agricultural producers. Their work has been effective along the Middle Verde River, and they now face the challenge of expanding to the rest of the watershed while maintaining the relationships and progress already developed in the Valley.

Characterization of the Watershed

The Verde River travels about 189 miles southward from Paulden, Arizona to discharge into the Salt River just south of Fort McDowell, Arizona. Downstream of its confluence with the Salt River is the Phoenix metropolitan area. The watershed is characterized by a semiarid climate with seasonal rainfall patterns – it receives low-intensity, long-duration precipitation in the winter and shorter, high-intensity storms during the summer monsoon season (Paretti et al. 2018). The Verde watershed contains over 500 miles of perennial streams. Its headwaters begin as ephemeral washes in the Prescott and Chino Valleys and the Big Chino Wash. Just below Sullivan Lake, perennial flow begins in the upper Verde River, supported by groundwater discharge from the Big Chino and Little Chino aquifers. Lower-middle Verde River streamflow is supported by surface runoff, groundwater discharge and contributions from its perennial tributaries, including Sycamore Creek, Oak Creek, Beaver Creek and West Clear Creek. Flows in the middle Verde River are largely unregulated and the watershed is the only in Arizona to contain reaches designated as “wild and scenic” in the Wild and Scenic Rivers Act (Paretti et al. 2018). Large parts of the watershed are maintained by the US Forest Service – in Coconino, Prescott, Kaibab and Tonto National Forests.

The Verde River watershed covers 4.2 million acres and contains the communities of Jerome, Camp Verde, Clarkdale, Cottonwood, Sedona, and Chino Valley, as well as areas of Williams, Flagstaff, Prescott, Prescott Valley, Payson, Scottsdale, Fountain Hills, and other unincorporated communities. Groundwater that feeds the river is the primary source of domestic fresh water for communities and rural households

within the watershed. The Salt and Verde Rivers supplies about 40% of surface water delivered to the Phoenix Metropolitan Area through the Salt River Project. Within the Verde Valley, surface flows support an agricultural lifestyle. A study found that recreation associated with rivers in Yavapai County, including the Verde River, brings in \$1 billion and 9,400 jobs to the region annually (Audubon Arizona 2019). The region is also the ancestral home of the Hualapai, Yavapai Prescott, Yavapai-Apache Nation, Tonto Apache, Ft McDowell Yavapai, and the Salt River Pima Maricopa Indian Community and other tribes (Paretti et al. 2018). The Verde Valley has experienced considerable commercial and residential development in recent decades, increasing demands on the watershed's water resources. In 2006, American Rivers recognized the Verde on its list of America's Most Endangered Rivers due to the threat that increased groundwater pumping poses on the river's base flows.

The Verde River's riparian corridor is an important ecological oasis that supports a diverse array of wildlife. This includes 270 bird species, 94 mammals and 76 species of amphibians and reptiles (Verde River Basin Partnership 2015). It has historically been home to at least 13 native fish species, including seven that are now threatened or endangered. The watershed provides one-third of the breeding areas for an endangered population of desert-nesting bald eagles and supports populations of endangered southwestern willow flycatcher and threatened yellow-billed cuckoo (Paretti et al. 2018). Ecological flows in the Verde River are of critical importance to sustain the rich riparian habitat upon which its wildlife relies. Efforts in the watershed focus on maintaining ecological flows despite increasing pressure from development and its associated water demands.

Agencies / Entities Interviewed

Friends of the Verde River (FVR) is a nonprofit organization located within the middle Verde River watershed in Cottonwood, Arizona. Their mission is to work collaboratively for a healthy, flowing Verde River and tributaries that support our natural environment, vibrant communities, and quality of life for future generations (Friends of the Verde River n.d.). Their work focuses on restoring habitat, sustaining and restoring instream flows and building supportive communities. FVR proactively addresses these issues through a combination of on-the-ground projects and policy solutions supported by sound conservation principles.

The Nature Conservancy (TNC) has worked towards a shared vision with partner organizations in the Verde Valley, including FVR. Their work in the area is also focused on protecting a healthy Verde River system, with perennially flowing water, healthy riverside habitat and vibrant local economies. Since the late 1980's, TNC has been involved in various efforts to address these issues, starting with the acquisition of the Verde River Greenway. They have continued to work with local agricultural producers and communities to increase river flows in the Verde (The Nature Conservancy n.d.).

Geographies of Focus In the past decade, the primary focus of conservation efforts in the Verde watershed has been in the Verde Valley, along the middle Verde River. The middle reach of the Verde River begins just downstream of Paulden, where perennial flow begins and extends to just south of the town of Camp Verde. The Verde Valley is generally considered to be from Perkinsville to Camp Verde. It contains the tributaries of Sycamore Creek, Oak Creek, Beaver Creek and West Clear Creek (Figure 1). While the main focus is on the middle Verde, some restoration work has been done in the upper and lower reaches. TNC has done some projects on Horseshoe Reservoir, however, the TNC representative interviewed acknowledged that this is the furthest downstream they would go in their past work. One of FVR's current focuses is on trying to expand their efforts into the lower Verde through its connections with partners (Tracy Stephens, personal communication). TNC is working towards implementing strategies from the Verde in other watersheds in Arizona (John Ford, personal communication).

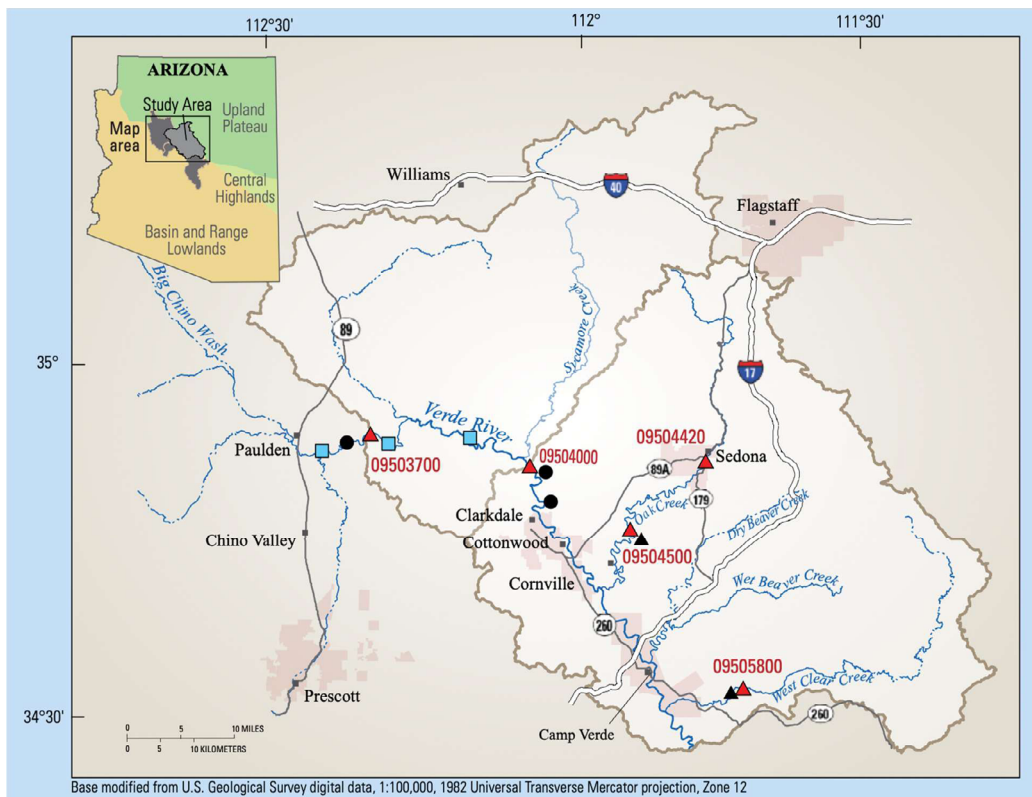


Figure 1. Map of the Middle Verde River watershed. Source: USGS.

Coalition of Partners

The three main partners in the Verde River coalition are FVR, TNC and Environmental Defense Fund (EDF). The relationship between FVR and TNC is particularly close in this coalition. They share a common mission and vision for the watershed and find ways to collaborate effectively. Typically, FVR's role is more focused on working with landowners on riparian restoration projects while TNC has established agricultural relationships for irrigation efficiency projects.

Tribes, including the Yavapai-Apache Nation, are one of the biggest and most important partners in the Verde watershed, with whom both TNC and FVR have been working on maintaining and building relationships. TNC has been trying to make their relationship with tribes more collaborative. In recent years they have had some breakthroughs with their agriculture department. As a result, TNC is currently working extensively with tribes on crop switching and groundwater modeling projects.

The main coalition of FVR, TNC and EDF also work with many other partners on the Verde River.

Verde Watershed Restoration Coalition The Verde Watershed Restoration Coalition (VWRC) is a key collaboration in the watershed, led by FVR. VWRC is a coalition of private landowners, non-profit organizations, local communities and businesses and federal and state agencies with a common interest in the health of the Verde River watershed. Tracy Stephens of FVR noted that 25-30 agencies and 240 private landowners participate in VWRC (personal communication). The group was established in 2012, with the initial goal of removing invasive plant species from the watershed's riparian corridors. They have since expanded their scope to include other projects that support a properly functioning Verde River system and local economy (Friends of the Verde River n.d.).

Through VWRC, FVR has worked with the USFS on restoring native plants in the parts of the watershed that fall within the Coconino and Prescott National forests. FVR have also partnered with the Arizona Department of Environmental Quality on a monitoring program in the Verde. Communities and municipalities also play an important role in VWRC. They are especially important in the coalition's

efforts to restore flows, as they have partnered on municipal stormwater programs and river friendly developments. In addition, a lot of riparian invasive plant management work occurs on city or town lands. VWRC’s efforts also help improve recreational value of the river corridor as it passes through cities or towns, so these relationships are beneficial to community partners as well. VWRC is guided by a multi-stakeholder steering committee that meets quarterly to coordinate, share information and plan restoration projects. The full list of stakeholders that have partnered to form VWRC is in Figure 2.

- | | |
|---|--|
| Arizona Department of Environmental Quality | The Nature Conservancy |
| Arizona Department of Water Resources | The Wildlife Habitat Council |
| Arizona Game & Fish Department | Tonto National Forest |
| AZ Conservation Corps | Town of Camp Verde |
| City of Cottonwood | Town of Clarkdale |
| Coconino National Forest | U.S. Bureau of Reclamation |
| Friends of the Verde River | U.S. Fish & Wildlife Service |
| Kaibab National Forest | Verde Natural Resource Conservation District |
| National Audubon Society | Verde Valley Land Preservation |
| National Forest Foundation | Walton Family Foundation |
| National Park Service | Yavapai-Apache Nation |
| Natural Resources Conservation Service | |
| Oak Creek Watershed Council | |
| Prescott National Forest | |
| Salt River Project | |
| Southwest Conservation Corps | |

Figure 2. The list of stakeholders and partners in the Verde Watershed Restoration Coalition. Source: FVR.

Priority Conservation Issues and Efforts

Conservation Issues The major conservation issue being addressed in the middle Verde River is stream flow protection and restoration. Flows issues are the result of increased surface water diversions, groundwater pumping and other climatic factors, including reductions to natural recharge. A study in 2013 found that base flow at the Clarkdale gaging station (just north of Cottonwood, AZ) had declined by about 4,900 acre-feet per year as a result of human impacts to the river system (Garner et al. 2013). The Verde River Report Card, published in 2020, found the decline in flows to be 34% at the Clarkdale gaging station since 1990, and 41% at the Camp Verde station (University of Maryland Center for Environmental Studies 2020). By 2013, certain stretches of the Verde had already begun to go nearly dry at certain times of year, negatively impacting stream connectivity. As an important riparian corridor in an arid landscape, maintaining a perennially flowing and connected Verde River is of critical importance to the ecological diversity and recreation that it supports. Future development in the watershed is expected to continue to increase stress on surface and groundwater demand. Conservation efforts focus on trying to address these human impacts to protect habitat for wildlife, create accessible and healthy recreation opportunities and maintain function throughout the watershed.

Strategic Approach The approach taken by FVR and TNC in addressing flow issues in the Verde is very driven by strategic planning efforts and documents, including the “Roadmap” for a Flowing Verde River. The purpose of the Roadmap is to help describe, shape and document the efforts of a core group of actors with a shared goal of preventing surface and groundwater diversions from depleting flows below target thresholds (Freshwater Policy Consulting, LLC 2015). After defining this goal, the Roadmap

proposes a general “theory of change” that is used as the overall strategy for achieving it. This is broken down into three strategic “paths” that could be pursued concurrently to achieve perennial flow in the Verde River. The three paths are:

- **Surface water path** - to prevent current and future surface water diversions from depleting flows below target levels;
- **Groundwater path** - to prevent past, ongoing and future groundwater withdrawals from depleting flows below target levels; and
- **Political will/stakeholder path** – to build decision-maker and stakeholder support for the overall goal and for individual tactics or outcomes.

The projects implemented by both FVR and TNC both follow the Roadmap and its strategic paths. However, they have taken an approach in which projects are implemented by different partners based on the strengths and capacity. For example, TNC is best at working with private landowners while FVR is best at working with agencies managing the public lands within the watershed. TNC’s strategic focus is to work on the ground with private landowners and water stakeholders, specifically those with legal access to water. This includes landowners, water managers, agricultural producers and local governments. This works seeks to build trust and complete projects on private lands. They also typically focus on projects that inform broader statewide policy. FVR has strong relationships with the US Forest Service, which is important as a majority of the Verde watershed is public land. Their focus has been to work on a variety of projects in partnership with the forest service. While FVR and TNC have utilized different partnerships and worked in different areas of focus, they still maintain collaboration through discussions to ensure that they’re working together to accomplish the conservation objectives that they’ve developed jointly. They hold regular meetings monthly and communicate on specific projects as needed (Tracy Stephens/John Ford, personal communication).

Project Types and Scale

Friends of the Verde River

FVR implements a variety of conservation projects that align with the goals and strategies laid out in the Roadmap for a Flowing Verde River. FVR focuses on the following project types in the Verde Valley:

- Riparian invasive plant removal
- Wildlife corridors and connectivity
- Sediment reduction and erosion control
- Water quality monitoring
- Community science program
- Verde Valley Birding & Nature Festival

Over the first 10 years, they have performed riparian invasive plant management on 10,500 acres throughout the watershed and have a monitoring crew to learn from work and assess if any areas are in need of retreatment. Their work on habitat connectivity and wildlife corridors started more recently and is still at a small, local scale. FVR has worked with private landowners and the forest service to identify bottlenecks to wildlife connectivity. Sediment reduction projects focus on management of gullies and structures to build soil back up. FVR has developed a community science program called Gully Busters to train community scientists to identify, monitoring and map gully systems so they can address management.

Water quality monitoring is another fairly new project type for FVR; they focus on monitoring E. coli in areas that ADEQ have identified as data gaps. FVR also does some work with stormwater management.

They have completed two stormwater management projects, both with private landowners. They have done the engineering and are waiting on permits to do a large scale stormwater project with a city and school district.

FVR's focuses on community-based education and certification programs to create watershed stewards. Their community science program includes annual events, like the BioBlitz, in which participants are invited to explore the Verde River and its tributary systems and collect photos and data on plant, animal, bird and insect species. This serves as a way for community members of current and future generations to better understand the ecology of their river and to help FVR document native and invasive species. This program is centered specifically on the Verde Valley. More community involvement comes from FVR's River Friendly Living program, in which homes, businesses and developments throughout communities can get certified as river-friendly. So far, 15 homes and businesses in the Verde Valley has signed on to this program, but FVR hopes to expand across the watershed and statewide. FVR also hosts a bi-annual conference called the "State of the Verde Watershed Conference." This conference was held in 2017, 2019 and 2022 (scheduled for 2024).

The Nature Conservancy

TNC has mostly focused their work at a Verde Valley scale but have been expanding into the Upper Verde on certain projects. The types of projects TNC has implemented in the Verde are:

- Irrigation and conveyance infrastructure improvements,
- Market interventions to increase value of low-value crops,
- Water trading platform to manage ditch supply,
- Municipal and stormwater management,
- Irrigation water measurement, and
- Design for fish passage.

TNC has worked extensively with local agricultural partners on irrigation system upgrades and conveyance improvements for large-scale farms and piping projects. They have utilized other market mechanisms to improve the value of low-value crops and encourage farmers to grow low water-use crops rather than traditional cropping. This includes paying farmers for crop switching and investing in graincleaning machines with the Yavapai-Apache Nation to increase their value to make grains competitive with alfalfa. They have done several projects focused on specific ditches within the Verde Valley – including developing a water trading platform on a ditch to match align current and historic water use. They have also worked on projects establishing telemetry on ditches and designing ditches to improve fish passage.

TNC has received completed a feasibility analysis for the Upper Verde River and convened a stakeholders group to better understand project implementation roles and responsibilities. Projects are related to the management of previously unmanaged groundwater pumping, groundwater recharge and utilization of stormwater effluent. They also have small implementation projects on rainwater capture and stormwater recharge that are in the strategy and development phase in the Upper Verde.

In Partnership - Verde River Exchange

In 2016, after two years of extensive analysis, stakeholder input and program design, EDF, FVR and TNC launched the Verde River Exchange program (Exchange). The Exchange is a groundwater mitigation program that allows users to offset the impact of their groundwater use by purchasing credits. These credits can be developed and sold by water users who voluntarily reduce their water use. This is a community-based program with the support of local businesses, decision makers, community members and conservation organizations.

In Partnership - VWRC

Since 2012, VWRC has focused their efforts on removing invasive plant species from riparian corridors in the Verde River watershed. In 2015, VWRC added nine additional priorities to achieving their collective vision of a healthy watershed and formed working groups for each priority. These include:

- Cooperative invasive plant management
- Sustaining flows
- Research, monitoring, and adaptive plant management
- Verde native seed and plant cooperative
- Verde outdoor volunteer network
- Streambank stabilization/erosion hazards
- Youth pathways
- Sustainable funding

Funding

TNC has been a significant funding partner to FVR. They have collaborated on joint funding proposals, allowing FVR to take advantage of the in-house capacity of TNC to find funding. Together, they have applied for and secured funding from various federal, state and private sources for restoration work in the Verde watershed (Table 1).

Program	Federal Source(s)	State Source(s)	Other Source(s) - Private, Foundation, Local	Example Project	Funding Received
Riparian Invasive Plant Removal	USFS, USFWS - Partners for Fish & Wildlife Grant	AZ Forestry - Invasive Plant Grant; Arizona Game and Fish Department - Heritage Grant	Forever Our Rivers - Southwest River Stewardship Fund, Walton Family Foundation; Yavapai County - RAC Grant	Arundo Free Oak Creek	\$200,000
Sustaining Flows	NRCS - RCPP	n/a	Charitable trusts, corporate offsets	Verde River Flow and Habitat Restoration Program	\$2,800,000
Wildlife Corridors & Connectivity	n/a	n/a	Charitable trusts, corporate offsets	Dry Creek Restoration	\$2,750
Water Quality Monitoring	BOR WaterSMART: Cooperative Watershed Management Program	ADEQ	Charitable trusts, corporate offsets	Verde Water Quality Monitoring	\$97,000
Irrigation & Conveyance Infrastructure Improvements	NRCS - EQIP	n/a	Nina Mason Pulliam Charitable Trust, Bonneville Environmental Foundation	Diamond S Ditch automated diversion system	\$85,676
Verde River Exchange	n/a	n/a	Nina Mason Pulliam Charitable Trust, corporate offsets	Four flow protection projects	\$600,000

Table 1. FVR and TNC funding source summary by program with example projects.

Federal Funding Sources - Federal, State, and Private Grant funding, primarily from federal sources, makes up a majority of the revenue brought in for restoration work in the Verde. For example, FVR's annual revenue in fiscal year 2020 was comprised of 81.6% grant funding, with an additional 10.1% coming from events and 7.6% from private contributions.

TNC and FVR have sought funding from large federal sources offered by NRCS, USFS, Bureau of Reclamation (BOR). TNC has used money from NRCS's Environmental Quality Incentives Program (EQIP)

for its agricultural infrastructure projects like irrigation system upgrades and conveyance improvements for large-scale farms. Quite a bit of FVR's funding comes through the forest service – this is primarily focused on riparian restoration and sediment reduction projects which are located on forest service lands that surround the Verde Valley. Both FVR and TNC have utilized BOR WaterSMART funding for various projects. FVR received a BOR WaterSMART Cooperative Watershed Management Program (CWMP) Phase I grant for its water quality monitoring plan (Tracy Stephens, personal communication). TNC has a WaterSMART Small-Scale Efficiency Grant right now with 50% cost share and a WaterSMART Drought Resiliency Projects grant in partnership with the Apache Tribe with 100% cost share. In addition, they are currently consolidating money in BOR's WaterSMART Environmental Water Resources Projects (EWRP) program (John Ford, personal communication). However, both FVR and TNC are making a big push to apply for future opportunities, as there is currently a lot of funding available through its programs. The application process has proven to be very daunting for BOR's WaterSMART grants, though – FVR has acknowledged a need to streamline that process.

While most of FVR's funding comes from federal sources, they have also secured state funding for certain projects. Their water quality monitoring efforts have mostly been through an Arizona Department of Environmental Quality (ADEQ) program. VWRC efforts have received funding support from Arizona Department of Forestry and Fire Management's Invasive Plant Grant and Arizona Game and Fish Department's Heritage Grant.

Private funding comes from two main sectors – charitable trusts and corporate water stewardship. Charitable trusts are more interested in funding projects and putting their dollars towards supporting the community of the Verde Valley. Corporate water stewardship investments are looking to fund projects that save certain amounts of water to offset their own usage. The Walton Family Foundation has been a major private donor to FVR and its projects throughout the watershed. John Ford of TNC acknowledged a preference for securing more private funding in the future over applying for BOR grants due to the cumbersome and clunky application process (John Ford, personal communication).

VWRC - Sustainable Funding Working Group One of the working groups of VWRC is focused on assuring that developing a sustainable revenue stream for its work in the Verde. Sustainable funding is defined by VWRC as “sufficient in magnitude to accomplish our program's goals and reliable enough to confidently ensure long-term watershed health” (Friends of the Verde River n.d.). They seek to do this by expanding new funding sources, being proactive in grant writing, collaborating with cities, counties and tribes on funding assistance and maintaining and enhancing current relationships with state and federal agencies. The Sustainable Funding working group meets monthly and includes representatives from FVR, Prescott National Forest, Arizona Game and Fish, Vetraplex (a veteran's organization) and RiversEdge West. These meetings are for identifying potential grants that would be a good fit for their mission, to keep track of proposal submission deadlines and explore new fundraising approaches. Through the working group, VWRC is better positioned to request agency funding for its projects at the beginning of the fiscal year and to facilitate transfers of unspent funds at the end of the fiscal year. VWRC funding comes from Walton Family Foundation, Arizona Forestry's Invasive Plant Grant, USFWS's Partners for Fish & Wildlife Grant, Yavapai County's RAC Grant and Arizona Game & Fish's Heritage Grant (Friends of the Verde River n.d.).

Challenges, Opportunities, and Lessons Learned

A key takeaway from the work done in the Verde watershed is the importance of effective collaboration and relationship building. For FVR, its relationships with local landowners, agencies and TNC have been essential to getting any conservation work completed in the Verde Valley. These relationships have been developed through participation in the VWRC, on-the-ground collaboration and educational events put on by FVR for the community of the Verde Valley. Both FVR and TNC recognize that much of the necessary relationship-building occurs from going out into the field, meeting with community members

and engaging with local stakeholders on the ground. As such, the local aspect has been a point of emphasis for TNC as a large organization. TNC staff working on Verde River restoration have extensive local knowledge from working and living within the watershed. In that way, TNC can work with various groups at a small level on specific projects and move up from there to build lasting relationships in the watershed. This type of collaboration is typical of a local nonprofit organization like FVR, which is comprised of local community members, but is rarer for a larger organization like TNC. However, it is this local emphasis that makes both FVR and TNC successful in developing and maintaining relationships in the Verde Valley.

TNC and FVR have taken a “bottom-up” approach to developing new relationships with local landowners and agencies. In this approach, they start small by meeting with various groups or landowners in person to discuss a plan for implementing certain projects that work towards their goals while being beneficial to the group or landowner. Once a plan has been discussed on the ground, the next step is to apply that plan at a higher level. This means taking the strategy discussed with the landowner or group and bringing it to a larger coalition to find ways to implement the strategy more widely. This has notably been the approach taken to strengthen the partnership with tribes in the watershed. TNC and FVR start by developing projects with individual farmers and landowners then move it up the chain and eventually propose those projects to the tribal council. As an important partner in the watershed, they will continue to employ this strategy and build relationships from the bottom-up.

Another key aspect of successful project implementation in the Verde is the effective collaboration between FVR and TNC. They have done this by defining their collaborative partnership and respective roles in accomplishing their shared goals. This means recognizing what each organization is best at and allocating tasks that play to their respective strengths. For example, TNC has developed strong relationships with agricultural producers, so they focus on irrigation efficiency projects with those partners while FVR has strong relationships with local landowners and community members and works with them on riparian restoration. They have established this division of roles and labor as being the most efficient for implementing projects with its various partners. In addition, the two organizations also share contacts with each other and help with relationship building wherever possible to continue to strengthen their collective ties in the watershed. The local aspect employed by TNC helps in this regard as well, as their presence and local knowledge helps make their partnership with FVR feel more collaborative on the ground. The dynamic between the two is less of a large nationwide organization coming in from afar to help out a local organization and more of a partnership of two groups of people living and working together in the watershed toward shared goals. As mentioned previously, FVR also utilizes TNC’s inhouse capacity to bring in more funding to the Verde and they frequently collaborate on project proposals.

The next big challenge for the Verde partnership is to maintain its existing relationships while expanding into other areas of the watershed. As mentioned above, most of the work completed in the Verde has been focused in the Verde Valley, the stretch of the Middle Verde River between Perkinsville and Camp Verde. However, efforts have been made to expand their work to the upper and lower reaches of the river as well. This requires new relationships to be developed with different landowners in those reaches, which requires time and effort that takes away from their collective capacity to maintain the current relationships they have already developed in the Verde Valley. As they look to expand on this work, FVR and TNC will need to find a balance between new and existing partnerships so that they can work towards their goals at the Verde watershed scale.

One other challenge noted by both interviewees was the cumbersome and clunky application process for BOR grant funding. Even with the capacity of TNC to help find funding, they are finding it difficult or time-consuming to bring in BOR grants. There is a lot of money available right now through BOR’s various WaterSMART programs, so it represents an important funding opportunity. It was recognized in the Verde and in other case studies that the process of applying for BOR grants needs to be streamlined to make it more accessible and put it to use on project implementation.

References

Audubon Arizona. 2019. “The Economic Contributions of Water-related Outdoor Recreation in Arizona.

Freshwater Policy Consulting, LLC. 2015. “Draft ‘Roadmap’ for a Flowing Verde River.” Prepared for the Walton Family Foundation & Grantees.

Friends of the Verde River. n.d. “About the Verde Watershed Restoration Coalition.” Friends of the Verde River (blog). Accessed May 25, 2022a. <https://verderiver.org/verde-watershed-restoration-coalition/about-theverde-watershed-restoration-coalition/>.

———. n.d. “Our Mission and Vision.” Friends of the Verde River (blog). Accessed May 17, 2022b. <https://verderiver.org/our-mission-and-vision/>.

———. n.d. “Sustainable Funding.” Friends of the Verde River (blog). Accessed May 26, 2022c. <https://verderiver.org/verde-watershed-restoration-coalition/vwrc-in-action/sustainable-funding/>.

Garner, Bradley D., D.R. Pool, Fred D. Tillman, and Brandon T. Forbes. 2013. “Human Effects on the Hydrologic System of the Verde Valley, Central Arizona, 1910-2005 and 2005-2110, Using a Regional Groundwater Flow Model.” U.S. Geological Survey Scientific Investigations Report 2013-5029.

Paretti, N.V., A.M.D. Brasher, S.L. Pearlstein, D.M. Skow, Bruce Gungle, and Bradley D. Garner. 2018. “Preliminary Synthesis and Assessment of Environmental Flows in the Middle Verde River Watershed, Arizona.” 2017–5100. U.S. Geological Survey Scientific Investigations Report.

The Nature Conservancy. n.d. “Why We Protect the Verde River.” Accessed May 17, 2022. <https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/verde-river/>.

University of Maryland Center for Environmental Studies. 2020. “Verde River Watershed Report Card.”

Verde River Basin Partnership. 2015. “Verde River Basin Water Resources Primer.”

**Technical Memorandum
prepared for River Network
by AMP Insights,
June 3, 2022.**

AMP Insights

The logo for River Network features a stylized blue and green wave icon to the left of the text. The word "river" is in a bold, lowercase, blue sans-serif font, and "NETWORK" is in a smaller, uppercase, blue sans-serif font below it. Underneath "NETWORK" is the tagline "connecting people · saving rivers" in a small, lowercase, blue sans-serif font.

**river
NETWORK**
connecting people · saving rivers