CCRN Cochise Conservation & Recharge Network

ANNUAL REPORT 2022

INSIDE

CCRN MEMBERS

Following each member agency is the year they joined CCRN.

City of Sierra Vista, Founding Member, 2015
- Charles Potucek, *City Manager, CCRN Chair*
- Victoria Yarbrough, *Assistant City Manager, Alternate CCRN Representative*
- Sharon Flissar, *Public Works Director, CCRN Technical Representative*

County of Cochise, Founding Member, 2015
- Sharon Gilman, *CCRN Representative*
- Jackie Watkins, *CCRN Technical Representative*
- Mark Apel, *CCRN Technical Representative*

Hereford Natural Resource Conservation District, Founding Member, 2015
- John Ladd, *NRCD Chair, CCRN Representative*
- Pat Call, *NRCD Vice Chair, CCRN Representative*

The Nature Conservancy, Founding Member, 2015
- Kim Schonek, Arizona *Water Program Director, CCRN Representative*
- Bailey Winston, *Southern Arizona Water Projects Manager, CCRN Technical Representative*

City of Bisbee, 2016
- Steve Pauken, *City Manager, CCRN Vice Chair*
- Matthew Gurney, *Public Works Director, CCRN Technical Representative*

Fort Huachuca, 2021
- Col. John M. Ives, *Garrison Commander, CCRN Representative*
- TBD, *Deputy to the Garrison Commander, CCRN Representative*
- Ryan Fitzpatrick, *Compliance Branch Chief, CCRN Technical Representative*
- Holly Ballantyne, *Hydrologist, CCRN Technical Representative*

U.S. Bureau of Land Management, 2022
- Scott Feldhausen, *Gila District Manager, CCRN Representative*

Consultants
- Juliet McKenna, *Montgomery & Associates, CCRN Facilitator*
- Mekha Pereira, *Montgomery & Associates, Hydrologist*
- Holly Richter, *Resilient Rivers, SPRNCA MOU Coordinator*

HOW WE WORK

The San Pedro River, one of the last large undammed rivers in the Southwest, supports a rare desert riparian ecosystem. In 1988, Congress designated the San Pedro Riparian National Conservation Area—the first of its kind—to protect its unique natural resources. Spanning 43 miles along the river in Cochise County, SPRNCA is managed by the federal Bureau of Land Management. The groundwater used for business, agricultural, and residential purposes by U.S. Army Fort Huachuca, the City of Sierra Vista, and neighboring communities is the same water source that sustains the riparian area and keeps the San Pedro River flowing.

The Cochise Conservation and Recharge Network (CCRN) was formed in 2015 to implement projects designed to increase groundwater recharge and protect groundwater resources in the most strategic places, thereby helping to ensure the health of the riparian corridor and securing water for communities. CCRN also supports a long-term monitoring network, hydrologic modeling, and engineering studies. This scientific and innovative approach to water resource management is designed to help sustain the aquifer and the river long into the future.

CCRN Mission

To implement a regional network of land and water management projects that result in a healthy watershed, flowing San Pedro River, conservation of water resources, and a vibrant local economy

Goals guided by 2020-2024 Road Map

1. Groundwater Recharge

Design/construct the Coyote Wash Stormwater Management, Riverstone Effluent, and Bisbee Effluent Recharge Projects

Continue the operation, maintenance, and hydrologic monitoring of all existing network sites

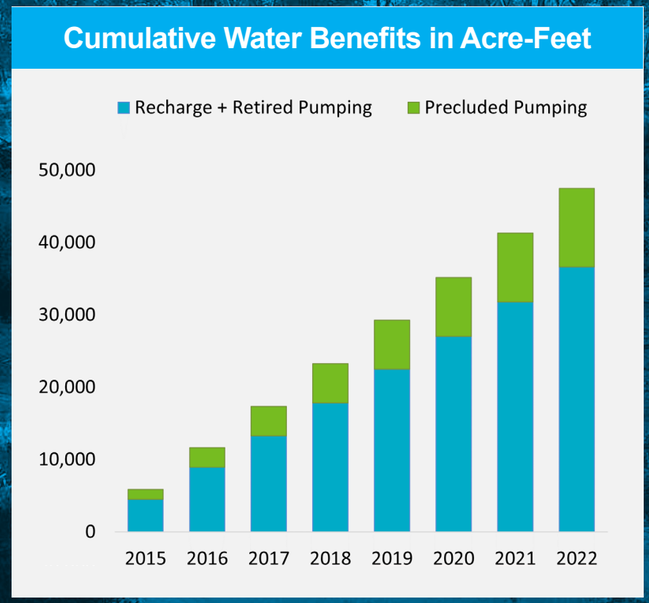
2. Water Conservation

Implement conservation and watershed health projects

Continue to use groundwater modeling and other tools to evaluate the overall effectiveness of all projects

CCRN IMPACT

Since 2015, CCRN project benefits total 46,700 acre-feet (AF) with 36,600 AF of recharge and retired pumping and 10,100 AF of precluded pumping through conservation easements.

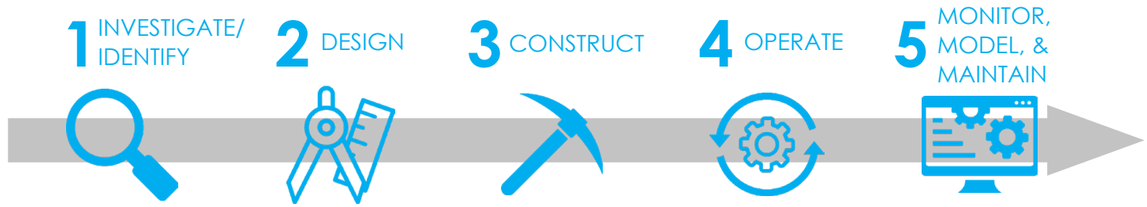


Total Benefits 46,700 AF

Precluded Pumping 10,100 AF

Recharge & Retired Pumping 36,600 AF

Implementing Land and Water Management Projects for the San Pedro



CCRN PROJECT SITES

The map at right shows the extent of the SPRNCA shaded in gray. Numbers 1-14 on the map correspond with riparian health assessment reaches. The green numbers and shapes alongside the map represent the current CCRN project sites, and the blue numbers and shapes show future projects.

1 Babocomari Floodplain Protection Site

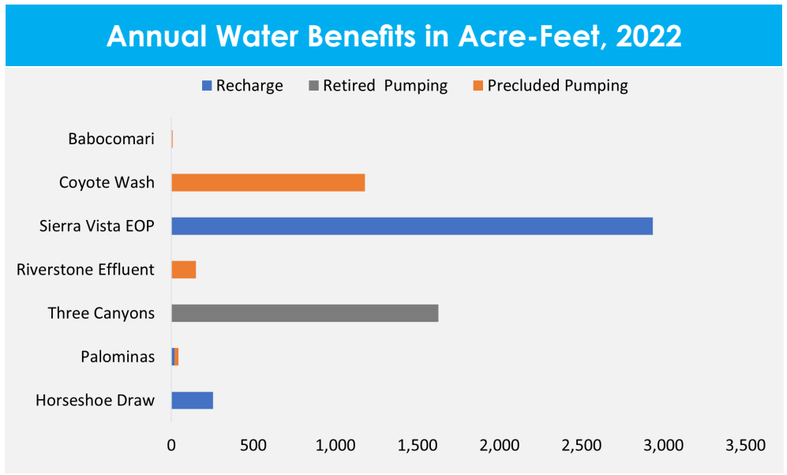
This 105-acre site precludes future pumping through conservation easements. Located along the Babocomari River, the largest tributary to the Upper San Pedro, the project protects the natural floodplain. Flood flows during summer monsoons increase groundwater levels that support riparian vegetation and stream flows.

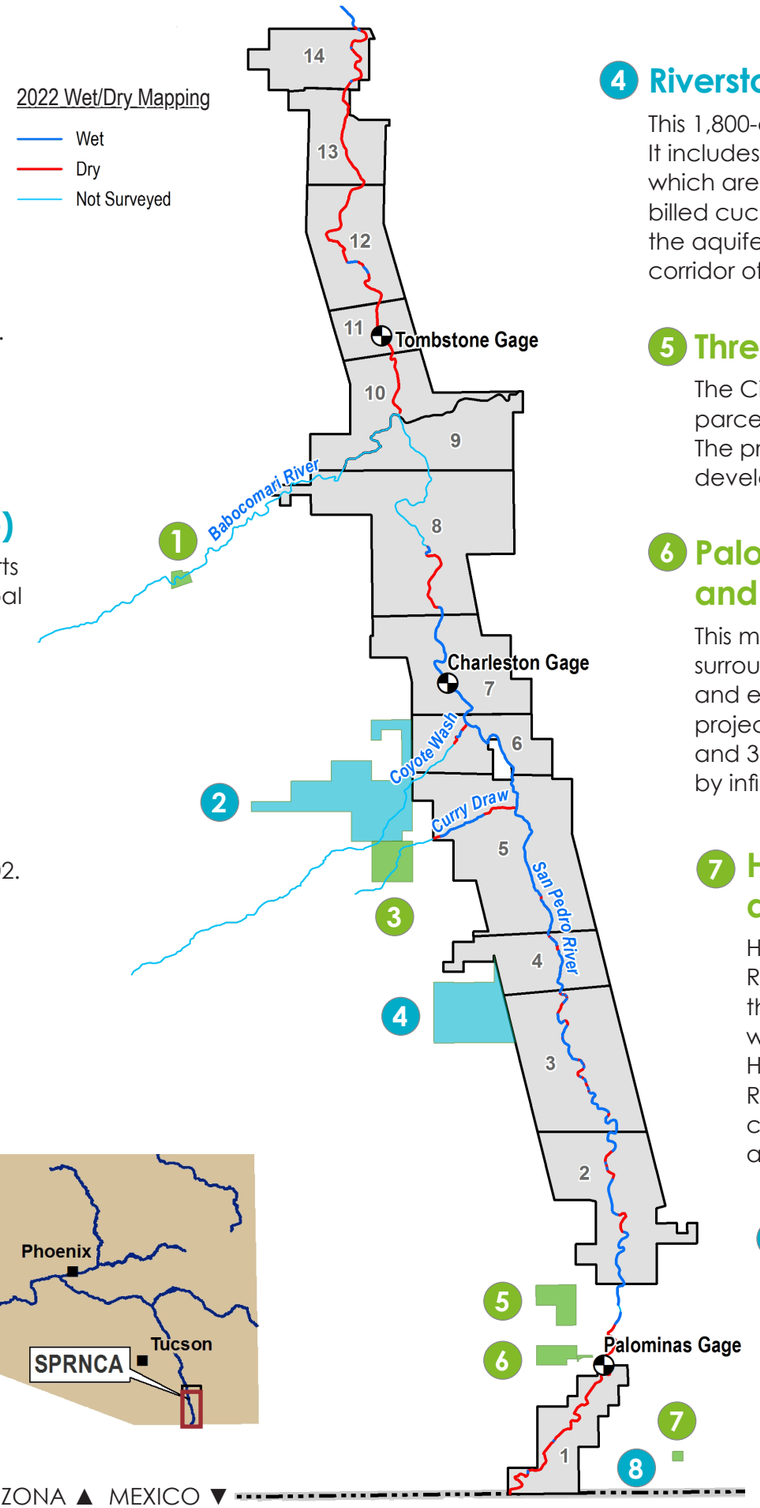
2 Coyote Wash Stormwater Management Project (future)

This 3,000-acre parcel precludes future pumping in a critical area that supports river baseflows and creates a buffer zone that protects the river from municipal groundwater pumping centers. The project will direct urbanized runoff from Sierra Vista in an ephemeral stream channel to raise groundwater levels, reduce runoff and erosion, and protect water quality in the San Pedro River.

3 City of Sierra Vista Effluent Recharge at the Environmental Operations Park

This project recharges the city's Class A-quality treated effluent and is raising groundwater levels in a critical area. Operation and monitoring began in 2002. Approximately 2,700 AF/yr is recharged between the recharge basins and constructed wetlands.





4 Riverstone Effluent Project (future)

This 1,800-acre parcel precludes future pumping adjacent to the SPRNCA. It includes the ephemeral channels of Ramsey and Carr washes, portions of which are designated as critical habitat for the threatened western yellow-billed cuckoo. Effluent from the City of Sierra Vista will be used to replenish the aquifer and restore degraded critical habitat connected to the riparian corridor of the San Pedro River.

5 Three Canyons Conservation Site

The City of Sierra Vista holds a conservation easement on this 480-acre parcel, which has been retired from high-volume irrigation pumping. The project permanently limited future groundwater pumping and development.

6 Palominas Stormwater Recharge and Flood Control Project

This multi-benefit project conveys natural sheetflow runoff from surrounding areas into a large detention basin, mitigating flooding and enhancing recharge in a constructed downstream channel. The project's 13 recharge cells and enhancement structures (6 dry wells and 3 infiltration trenches) reduce the evaporative losses of stormwater by infiltrating more runoff back into the ground.

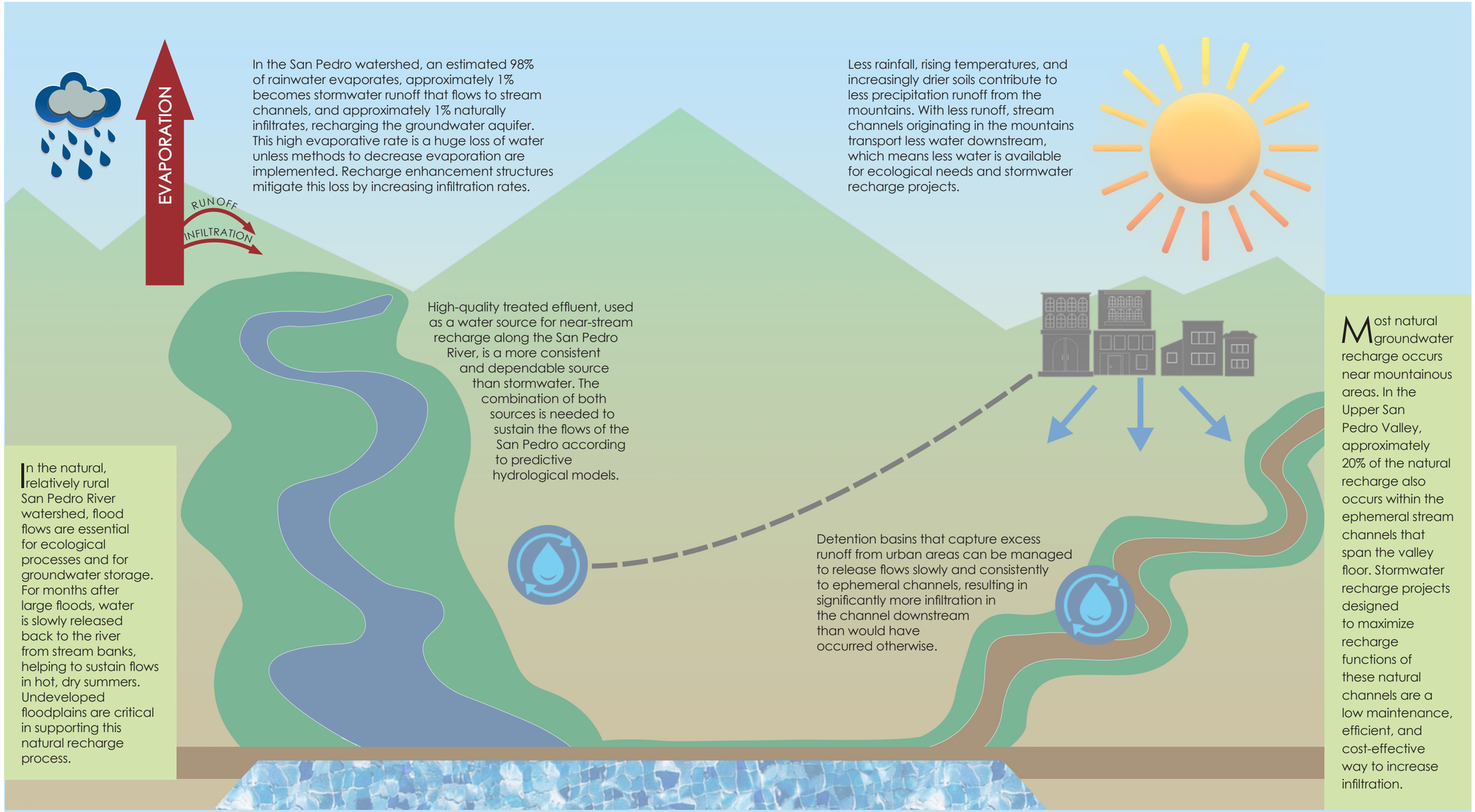
7 Horseshoe Draw Sediment Control and Stormwater Recharge Project

Horseshoe Draw is an ephemeral tributary to the Upper San Pedro River. This project receives accelerated runoff that originates in the San Jose Mountains in Mexico. Before the recharge project was constructed, a large head-cut had been steadily eroding Horseshoe Draw upstream of its confluence with the San Pedro River. The project consists of an 8-acre detention basin that collects and slows the runoff, enhances infiltration to the aquifer, and improves downstream water quality.

8 Bisbee Effluent Recharge Project (future)

This project will be located between the international border and Highway 92 in Palominas at a location to be determined. Over 20 years of monitoring data show longer reaches of the river are becoming dry in this area during the summer months. The project will recharge a minimum of 200 AF/year of effluent transported via a 13-mile pipeline from the City of Bisbee's San Jose Wastewater Treatment Plant.

WHAT WE ARE LEARNING



In the San Pedro watershed, an estimated 98% of rainwater evaporates, approximately 1% becomes stormwater runoff that flows to stream channels, and approximately 1% naturally infiltrates, recharging the groundwater aquifer. This high evaporative rate is a huge loss of water unless methods to decrease evaporation are implemented. Recharge enhancement structures mitigate this loss by increasing infiltration rates.

High-quality treated effluent, used as a water source for near-stream recharge along the San Pedro River, is a more consistent and dependable source than stormwater. The combination of both sources is needed to sustain the flows of the San Pedro according to predictive hydrological models.

In the natural, relatively rural San Pedro River watershed, flood flows are essential for ecological processes and for groundwater storage. For months after large floods, water is slowly released back to the river from stream banks, helping to sustain flows in hot, dry summers. Undeveloped floodplains are critical in supporting this natural recharge process.

CCRN Annual Report 2022

WHAT WE ARE LEARNING

Less rainfall, rising temperatures, and increasingly drier soils contribute to less precipitation runoff from the mountains. With less runoff, stream channels originating in the mountains transport less water downstream, which means less water is available for ecological needs and stormwater recharge projects.

Detention basins that capture excess runoff from urban areas can be managed to release flows slowly and consistently to ephemeral channels, resulting in significantly more infiltration in the channel downstream than would have occurred otherwise.

Most natural groundwater recharge occurs near mountainous areas. In the Upper San Pedro Valley, approximately 20% of the natural recharge also occurs within the ephemeral stream channels that span the valley floor. Stormwater recharge projects designed to maximize recharge functions of these natural channels are a low maintenance, efficient, and cost-effective way to increase infiltration.

Collaborative Partnerships

Over the past 25 years the following partnerships have engaged dozens of local, state, and federal agencies and other organizations, along with hundreds of volunteers, to develop collaborative science and projects to conserve land and water near the Upper San Pedro River.

- **The Upper San Pedro Partnership**, established in 1998, laid the foundation for water management by building strong hydrologic science to inform decision making.
- **The Cochise Conservation and Recharge Network** was formed in 2015 to manage thousands of acres of lands adjacent to the river and implement projects that reduce pumping and increase aquifer recharge.
- **The Fort Huachuca Sentinel Landscape,** designated in 2015, encompasses approximately 2.9 million acres of southeastern Arizona and is a place where conservation, working lands, and national defense interests converge. Collaborative efforts aim to strengthen military readiness, conserve natural resources and habitat, bolster agricultural economies, increase public access to outdoor recreation, and enhance resilience to climate change across the larger landscape.
- **The SPRNCA MOU for Cooperative Monitoring and Management**, signed in 2021, establishes a robust monitoring and adaptive management framework to ensure land and water management projects are sufficient to meet local water needs and the purpose of the SPRNCA.

Prepared by Montgomery & Associates, The Nature Conservancy, and Resilient Rivers in cooperation with the Cochise Conservation and Recharge Network

CCRNSanPedro.org June 2023