Upper SanPedro Partnership

Achieving Sustainable Yield

Partnership goal

Water is an essential resource. Whether there is enough of it to sustain the communities of the Sierra Vista sub-watershed and the **San Pedro Riparian National Conservation Area (SPRNCA)** is a complex question. The members of the Upper San Pedro Partnership are dedicated to working together to find ways to meet the water needs of both area residents and the river.

San Pedro River

As part of this effort, the Partnership has made a commitment to eliminate deficit groundwater pumping and reach sustainable yield of the aquifer by 2011. Sustainable yield means that groundwater is managed so that it will last for an indefinite period of time — meeting the needs of the community and the SPRNCA — without causing unacceptable environmental, economic or social consequences. Some of the needs to be considered in this delicate balancing act include the following:

Social and economic needs	Environmental needs
Sufficient water quantity for human needs	Groundwater levels in aquifer within the SPRNCA are maintained
Fort Huachuca remains operational unless for reasons unrelated to water	Stream base flow and flood flows in the river are maintained
Local participation in water management	Increased aquifer storage
Water quality maintained	Riparian habitat and ecologic diversity maintained
	Water quality sustained in river
	Overall riparian condition maintained
	Springs in the SPRNCA continue to flow

Sustainable yield

We know that currently more water is being removed from the aquifer than is being replaced through natural recharge (rainfall) and artificial recharge. The most recent estimate by the Arizona Department of Water Resources is that there were 9,900 acre-feet more water taken out of the aquifer than were naturally recharged in 2002. Even after factoring in efforts by Partnership members to help recharge water back into the aquifer, the deficit in 2002 was still 3,500 acre-feet. (*An acre-foot = 325,851 gallons or enough water to cover a football field one foot deep in water*)

Taking more water out of the aquifer than is being replaced each year creates a deficit. The effects are cumulative. For example, a 3,500 acre-foot deficit each year for 10 years would result in 35,000 less acre-feet of water being available in storage for people and the river. This is not sustainable.

Sustainable yield, however, is more than just recharging the amount of water we use every year. Consideration must also be given to how the groundwater system works and how the SPRNCA is fed by underground water moving down from the mountains. Research studies are revealing that "where and when" water is pumped can be just as important as "how much" water is pumped when it comes to achieving sustainable yield.

Using science to help find the answers

Some important new planning tools have been developed to evaluate member agency projects and their potential for helping achieve sustainable yield. These tools will improve

SAHRA www.sahra.arizona.edu

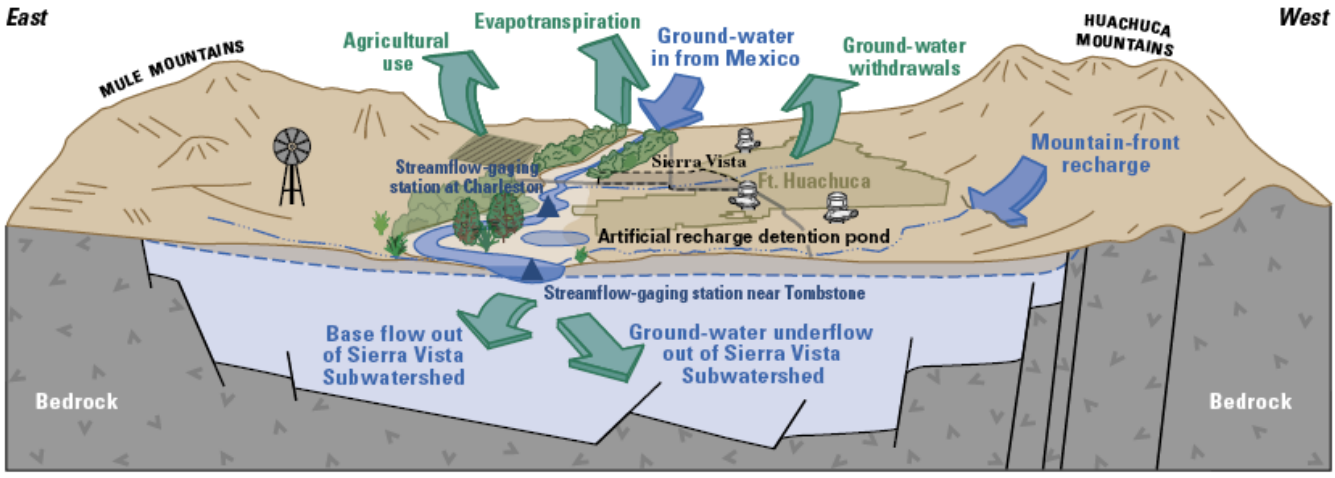
This fact sheet was produced in collaboration with SAHRA, the NSF Center for Sustainability of semi-Arid Region Hydrology and Riparian Areas, at the University of Arizona (www.sahra.arizona.edu). It is part of a series connecting science findings with decision-making in the Upper San Pedro Basin.

accuracy in determining where water can be pumped and recharged in a way that will help achieve sustainable yield while meeting area water needs.

- ***A new groundwater model*** has been developed by the U.S. Geological Survey based on data collected over 5 years from over 200 monitoring wells located throughout the sub-watershed. This model describes how the groundwater system is related to the river and what the effects of water uses are on the entire system.
- ***The decision-support system*** is a computer program developed by SAHRA to integrate many different types of available information, ultimately allowing decision makers to compare the potential impacts of various water management scenarios.

Obligations & opportunities

The communities of the Sierra Vista sub-watershed have an important role to play in the protection of two of the nation's important resources: Fort Huachuca and the San Pedro Riparian National Conservation Area. The future of both will depend on having enough water to meet area water needs. Congress addressed the importance of preserving both these resources in the National Defense Authorization Act for 2004 — Section 321. The bill recognizes the importance of "collaborative water use management" and gives congressional recognition to the Partnership and its continuing efforts to eliminate deficit groundwater pumping by 2011. The Partnership will prepare annual reports to Congress on local mitigation efforts. This report will summarize the best existing information and will update that information as conditions change and as additional information becomes available for future reports.



Simulated annual water budget for a ground-water-flow model — Values are in acre-feet per year

GROUND-WATER INFLOW

	Estimated range	2002 Estimates	2011 Projections
—Natural recharge	11,200–16,000	15,000	15,000
—Underflow from Mexico	3,000–3,400	3,000	3,000
—Total		18,000	18,000

ANNUAL STORAGE CHANGE (no management measures)

—2002 Estimated	–9,900
—2011 Projected	–12,000

GROUND-WATER OUTFLOW

	Estimated range	2002 Estimates	2011 Projections
—San Pedro base flow	3,250–6,290	3,250	3,250
—Net ground-water withdrawals		16,500	18,600
—Riparian and wetland evapotranspiration	6,230–7,700	7,700	7,700
—Ground-water underflow at Tombstone streamflow-gaging station	300–440	440	440
—Total		27,900	30,000

Groundwater budget for the Sierra Vista Subwatershed. From Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona-2004 Report to Congress

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