April 14, 2008
Section: Front
Edition: Final Chaser
Page: A1

How a map may help protect the San Pedro River

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Water flows year-round through 39 percent of the San Pedro River, according to a first-of-its-kind map that researchers hope will aid efforts to protect the ailing waterway from growing demand and overuse.

Based on data provided by hundreds of volunteers, the map shows more water in the river's upper reaches, from the headwaters in Mexico north to Benson, than in the lower river, which dries up for long lengths as it nears Winkelman.
The San Pedro holds special importance for river ecologists because it is one of the last free-flowing rivers in the Southwest, undammed along its entire 174-mile length. It supports a stunning array of birds -- as many as 250 species, many of them migratory -- and other wildlife, from beavers to the rapidly vanishing jaguar.
The map confirms fears that growth in southeastern Arizona has damaged the San Pedro, but it also gives scientists a way to better study the effects on the river's ecosystem of activities such as groundwater pumping.
"It's like going to the doctor for a checkup and getting your vital signs," said Holly Richter, director of the Nature Conservancy's Upper San Pedro Program. "I would consider this the river's vital signs. I think it will help inform regional water-management decisions."
Years of overuse have deprived the river's fragile riparian areas of water diverted to farms and cities. Environmental groups have fought to slow groundwater pumping, but state laws don't recognize a clear link between wells and surface water.
With the data, scientists can study that link, as well as the river's response to changing climate conditions and water-use patterns, said Brian Bellew, Tucson field manager for the Bureau of Land Management, which participated in the map project.
Richter said the map could also help provide new evidence of how water use along the river affects its flow. Smaller surveys dating to 1999 already have produced helpful information, such as how a brief period of heavy runoff can saturate the riverbanks and feed flows for months.

Creating the map

To draw the map, hundreds of volunteers converged on the river last summer with notebooks, cameras and GPS units. On foot and horseback, the volunteers charted lengths of the river and used the GPS units to mark the start and end of areas where water flowed. The timing allowed surveyors to track the river during critical summer base-flow conditions.
Typically, hydrologists measure a river's volume with stream gauges, which can provide real-time data about how much water flows at a particular location. The mapping project was designed as a one-day snapshot of the entire river.
"We're realizing, because ecosystems and habitats like this are so rare, we need the whole picture," Richter said.
But these moment-in-time water maps don't provide a full picture of the river's health, said Robin Silver, a longtime San Pedro activist for the Tucson-based Center for Biological Diversity. Inventories of vegetation along the river's banks provide a better reflection of trends and health of the stream, Silver said.
One such survey, conducted by the Bureau of Land Management, found poor conditions on at least 22 miles of the upper San Pedro, even though water flows through most of the area. Scientists say groundwater pumping in recent years has diverted an increasing amount of water from that stretch of the river, which is a part of the San Pedro Riparian National Conservation Area.
The bureau and the Nature Conservancy worked on the survey with the Benson-based Community Watershed Alliance and volunteers from other organizations in the area.
The groups will fan out again in June to update the map, Richter said.

Map available online

To view the San Pedro River map, go to the Nature Conservancy's site at www.azconservation.org and click on "downloads." The map is also on the Community Watershed Alliance's site at www.cwatershedalliance.com.