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New Verde study hopes to quantify riparian needs

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PRESCOTT VALLEY - A new study is trying to quantify how much baseflow the Verde River riparian system needs to survive.

Nature Conservancy hydrologist Jeanmarie Haney talked about the study Wednesday during a Verde Watershed Association meeting in Prescott Valley.

The Arizona Water Institute already has paid for phase one of the multi-agency study, and now it's agreed to pay for phase two, Haney said.

After intense collection of field data this summer, she hopes phase two can quantify the cubic feet per second (cfs) necessary in the river to keep the adjacent riparian habitat alive.

It would be even more complex to quantify the cfs necessary to keep various fish and other aquatic life alive, she said.

Human population growth, a state regulatory system that doesn't recognize the connection between groundwater and surface water, and a severely water-limited landscape are among the threats to the river, Haney said.

The river basically depends on ground-water for its baseflow, she noted.

Scientists generally agree that about 80 percent of the Upper Verde's baseflow comes from the Big Chino aquifer north of Prescott, where Prescott-area municipalities want to pump groundwater to supplement their dwindling Little Chino aquifer supplies.

"The best way to predict the future is to invent it," Haney said, quoting from Alan Kay, a well-known computer scientist. And scientists know better ways to sustain rivers these days, she said.

[Arizona State University](#), [Northern Arizona University](#), [University of Arizona](#), the Museum of Northern Arizona and the Arizona Geological Survey all have been involved in the project.

In phase one, scientists worked on a summary of existing information and examined complex relations between the river and the things dependent upon it before coming up with hypotheses.

Haney offered several examples of these complex relations.

For example, spring high-river flows signal the threatened spinedace fish to start spawning and spur cottonwoods to release their seeds so the seeds will settle in moist soils.

Spinedace and speckled dace also depend upon "riffle" type water flows, where shallow waters move quickly over rocky streambeds. Leopard frogs depend on the riffles to escape narrow-headed garter snakes.

That makes these species more susceptible to slight changes in baseflow than chubs and some suckers that hang out in pools. But scientists haven't quantified minimum baseflow needs.

Nearby are streamside marshes that dragonflies and ducks depend upon. And the endangered yellow-billed cuckoo needs large canopy trees.

Endangered Southwestern willow flycatchers need standing water that contains bugs they feed to their fledgling young.

"There is a lot of interesting complexity in the habitat along the [Verde River](#)," Haney concluded.

Haney said she was surprised to recently learn that fall and winter floods dominate the Verde system, not monsoon floods. In the San Pedro in southern Arizona, the monsoon produces the dominant flood cycles.

That information doesn't bode well for the Verde, since the climate is trending toward warmer temperatures and therefore less spring runoff from snowpack. Measuring sites in the Verde River Basin were devoid of snow this past spring.

Scientists don't have enough information about Verde Valley irrigation uses of the river to incorporate those impacts into this phase of work, Haney said in response to an audience question.

They do know that the flow can get down to 0.5 cfs when irrigation companies draw river water. And the U.S. Geological Survey did some intensive data collection all along the Verde on June 1, she said.

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