

# Linking Ground and Surface Water Levels to the Health of Riparian Bird Communities in the Southwest

## A UNIVERSITY OF ARIZONA RESEARCH PROJECT

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### WHAT ARE RIPARIAN WOODLANDS?

Riparian woodlands are found adjacent to streams in the transitional zone between the steam and the upland environment. In the desert southwest, low-elevation (<1,500 m) riparian woodlands are typically comprised of a mix of the following tree species: Fremont cottonwood, velvet ash, Goodding's willow, Arizona sycamore, velvet mesquite, and Arizona walnut.

### WHY ARE RIPARIAN WOODLANDS IMPORTANT TO SOUTHWESTERN BIRDS?

Although riparian woodlands cover less than 1% of the land surface in the Southwest, these woodlands provide habitat for greater than 50% of the breeding bird species in the region, including rare birds like the Southwestern Willow Flycatcher and Yellow-billed Cuckoo.

Besides providing habitat for breeding birds, riparian woodlands also provide shelter and critical food resources for dozens of species of Neotropical migratory birds that alight in these woodlands during their spring and fall migrations across the desert southwest.



### WHAT ARE THE THREATS TO RIPARIAN WOODLANDS IN THE SOUTHWEST?

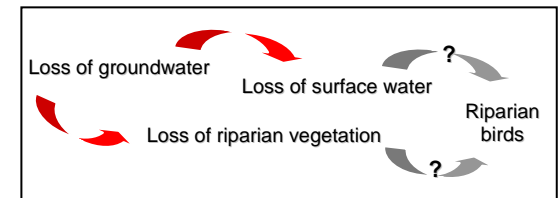
Southwestern riparian woodlands face many threats, including overgrazing by cattle and invasion by non-native plant species (e.g., tamarisk). However, the single greatest threat

to the health and persistence of these riparian woodlands is the growing human demand for limited groundwater resources in the region.

For example, rapid population growth in the City of Sierra Vista (near Fort Huachuca Military Reservation) in southern Arizona has the potential to lower groundwater levels and negatively affect riparian woodlands along the San Pedro River, the last undammed river in the Southwest and a magnet for breeding and migratory birds.

### WHAT IS THE LINK BETWEEN GROUNDWATER AND RIPARAIN BIRDS?

We know that groundwater loss can harm riparian vegetation and reduce or eliminate regular flows of surface water in riparian areas. However, it's unclear how these changes influence the abundance, diversity and reproductive success of riparian birds.



Although some provisions exist to protect riparian birds in the Southwest, legal protection of the water resources that support riparian woodlands (and riparian bird habitat) requires proof of a direct link between groundwater, surface water, and wildlife. Finding proof of a direct link is challenging for terrestrial wildlife like birds, despite the strong association of birds with riparian woodlands in the region.

## WHAT ARE THE OBJECTIVES OF THE RESEARCH PROJECT?

- 1) To gain a better understanding of the connections between groundwater, surface water, and the health of riparian bird communities in the Southwest.
- 2) To examine the underlying ecological processes (e.g., food availability) that may influence these connections.
- 3) To develop a model that will allow resource managers to predict how abundance, diversity, and breeding success of riparian birds will be affected by future reductions in ground and surface water levels in the Southwest.

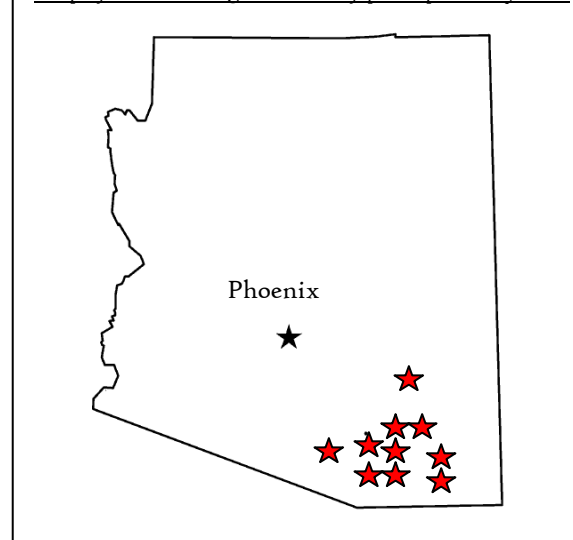


Nest of a Yellow-breasted Chat

## WHERE IS THE PROJECT TAKING PLACE?

This research project is taking place at 17 study sites located in riparian woodlands in southeastern Arizona (e.g., Aravaipa Creek, Cienega Creek, the San Pedro River, and the Santa Cruz River). These sites vary in terms of the amount of surface water present and the extent and health of riparian vegetation.

Map of AZ showing locations of principal study sites



## WHAT IS BEING MEASURED AND HOW?

- 1) Estimates of bird abundance and diversity collected during surveys of breeding birds.
- 2) Estimates of reproductive success and nestling growth rates collected while monitoring nests.
- 3) Estimates of available food resources collected through the sampling of insects.

## WHAT IS THE TIMEFRAME FOR THE PROJECT?

The project began in the spring of 2006 and will continue through the fall of 2009.

## WHO'S INVOLVED WITH THE PROJECT?

The University of Arizona is working in close association with several project partners, including state and federal agencies, non-governmental organizations, and private landowners.

Funding for this research is being provided by the Department of Defense Legacy Resource Management Program, the Arizona Game and Fish Heritage Fund, the National Park Service, and the U.S. Geological Survey. Logistical support is being provided by The Nature Conservancy, the U.S. Bureau of Land Management, The U.S. Forest Service, and the U.S. Fish and Wildlife Service.



## QUESTIONS?

Contact Chris Kirkpatrick or Dr. Courtney J. Conway at the School of Natural Resources, 104 Biological Sciences East, University of Arizona, Tucson, Arizona 85721. See front of brochure for email addresses and phone numbers.