



Quantifying impacts of ground water withdrawal on avian communities in desert riparian woodlands of the southwestern U.S.

Project
#07-290

Background: Riparian woodlands in the desert southwest are an extremely important resource because they constitute <1% of the desert landscape, yet typically support >50% of the 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. Ground water withdrawal (and subsequent loss of surface water) to support urban developments in the desert southwest has the potential to degrade or eliminate riparian woodlands throughout the region, including riparian woodlands along the San Pedro River adjacent to Fort Huachuca Military Reservation in Arizona. Military readiness could be jeopardized if limited resources are diverted from the military's mission at Fort Huachuca Military Reservation (and at other military installations in the southwestern U.S.) to deal with the recovery of potentially dozens of declining populations of riparian birds. Funding for this research project was provided by the DOD Legacy Resource Management Program.

Objective: The objective of this research project was to assess the value of riparian woodlands to the health and persistence of avian communities in the desert southwest. Specifically, we sought to quantify the extent to which both surface water and the health of riparian vegetation influence the abundance and diversity of riparian birds. Ultimately, our objective was to develop models to allow resource managers on military lands to better predict the effects of future ground water withdrawal and surface water depletion on riparian bird communities along the San Pedro River and elsewhere in the southwestern U.S.



Surface water flowing in Arivaca Creek, AZ

Summary of Approach: From March to October 2007, we surveyed birds, sampled vegetation, and measured surface water at 16 study sights located in riparian woodlands throughout southeastern Arizona, including 2 study sites situated along the San Pedro River near Fort Huachuca Military Reservation. We also sampled avian food resources (i.e., aerial arthropods) and monitored nests of riparian bird species at a subset of these study sites.

Benefit: Results from this study provide data that will allow resource managers on military lands to better predict how abundance and diversity of riparian birds will be affected by reductions in ground and surface water levels.



Yellow-breasted Chat - a common riparian bird in AZ

Accomplishments: We found that the extent of surface water at our study sites was positively associated with total relative abundance of riparian birds and with relative abundance of several bird species including Black Phoebe and White-winged Dove. In addition, avian food resources (i.e., aerial arthropods) averaged 89% greater at "wet" versus "dry" study sites. Finally, we found that species like Vermillion Flycatcher, House Finch, and Common Yellowthroat were negatively associated with the extent of dead or dormant riparian vegetation at study sites. These results provide some of the first quantitative data demonstrating the importance of water to the health of riparian bird communities in the southwestern U.S.

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