

The Great Mesquite Forest: A Permanent Loss in Avifauna Along the Santa Cruz River in the Tucson Basin

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The history of riparian vegetation along the Santa Cruz River is one of extreme change that is related to the types of vegetation and their relation to groundwater.

Riparian areas along Southwestern rivers have among the highest densities of birds for the United States, and although cottonwood-willow gallery forests are of special interest to ecologists, mesquite bosques have been a neglected critical habitat for birds. Our forthcoming book (Webb *et al.* 2014) documents the loss of the San Xavier bosque, the best known and one of the largest mesquite bosques in the United States. Also known as the Great Mesquite Forest, this was one of two mesquite bosques along the Santa Cruz River that are named in the scientific literature. The other, Komatke, or New York, Thicket was near the confluence of the Santa Cruz and Gila Rivers on what is now the Gila River Indian Reservation.

Above: View looking south across Santa Cruz River from Martinez Hill. *Left (June 1942)*: A gallery of cottonwoods flanks the river channel and dense mesquite occupied the bottomlands, then a haven for nesting and roosting White-wing Doves. As late as 1942, one could dig by hand and find water in the streambed. (Photographer unknown, courtesy of the Arizona Game and Fish Commission). *Right (25 November 2002)*: The 1977, 1983, and 1993 floods widened the channel significantly, removing floodplains. By 2002, the active channel was reduced in width and floodplains were deposited, particularly in the area behind the palo verde tree at left. (R.M. Turner, Stake 937).

Historical observations of southern Arizona, beginning with Spanish explorations and extending into the mid-19th century, document the presence of regionally important riparian ecosystems. In 1804, Manuel de León described a *ciénega* near San Xavier. In 1854, John Bartlett called the valley “the most picturesque and beautiful we had seen.” Wildlife was abundant, including Black-bellied Whistling-Ducks and Wild Turkeys, heard calling in the mid-1850s. In 1872, Captain Charles Bendire, the first ornithologist to spend significant time in the Tucson Basin, found a nesting Spotted Owl in the Basin, and those that followed observed Gray Hawk, Anhinga, Purple Gallinule, Crested Caracara, Common Black-Hawk, Northern Beardless-Tyrannulet, Rose-throated Becard, Green Heron, Pied-billed Grebe, and Scarlet Ibis. White-wing Doves were



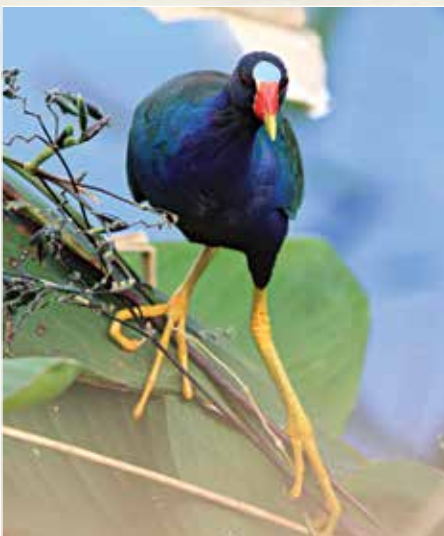
Anhinga

the most abundant bird in the bosque, and approximately 85 species of summer birds were recorded historically from the Great Mesquite Forest, with more than 75 species nesting there before its demise. By the early 20th century, such avian diversity made Tucson the “ornithological capitol” of Arizona, if not the entire Southwest.

By the 1890s, the Great Mesquite Forest had a *ciénega* dominated by perennial grasses at its core. Arroyo downcutting over the next 30 years



The remains of the Great Mesquite Forest, 2012



KENNETH COLE SCHNEIDER

Purple Gallinule

drained groundwater to the channel bed, but this only encouraged more mesquite growth in the drained marsh. Using 1936 aerial photographs, we estimated that the area of the bosque was 7 square miles, and that likely was reduced from its zenith owing to agricultural clearing and woodcutting. Between 1900 and 1940, numerous observers commented on massive trees that were present, some reportedly 60 or more feet tall and exceeding 4 feet in diameter. Woodcutting took a toll, but still secondary growth trees were reportedly 20–25 feet tall in

the early 1940s; by the 1950s, second-growth trees generally were only 15–20 feet tall. Woodcutters kept cutting, but trees regrew; the channel downcut and widened, but the bosque thrived; groundwater overdraft finally killed the Great Mesquite Forest.

By the 1940s, water development caused perennial flow to cease in the Santa Cruz River, and through the mid-20th century, groundwater literally dropped away from tree roots. Bird populations remained only as long as there was habitat and food offered by the bosque. Approximately 10 species of birds were extirpated by the 1970s, disappearing when perennial flow ended. Six species of native fishes were extirpated from the middle reaches of the Santa Cruz River, as well as the California floater, a large unionid clam. Riparian herpetofauna losses consisted of an amphibian, three lizards, and four snakes, including the lowland leopard frog, Sonora mud turtle, and northern Mexican gartersnake.

By the 1960s, the Great Mesquite Forest had been reduced to a fraction of its original size by agricultural fields. The tipping point past which recovery became impossible was in the early 1970s, when



CRESTED CARACARA, MANJITH KANNIKKARA

Crested Caracara

Interstate 19 bisected the western part of the bosque and groundwater levels declined below the limit for riparian tree roots. In the mid-1980s, all that remained were stumps, and trees were replaced by mesquite shrubs, desert plants, and *Athel tamarisk*. Some birds have recolonized the Tucson basin, such as Song Sparrow, using the newly created habitat from wastewater effluent in places such as Sweetwater Wetlands and the reach downstream from the Roger and Ina Road treatment plants. What no longer is present, and cannot be easily replaced, are the open water, ciénegas, and mesquite bosques once natural along the Santa Cruz River. ■

References Cited

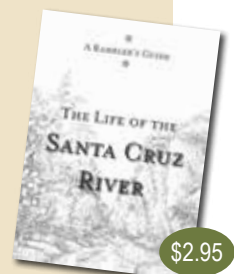
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