## STREAMS IN THE DESERT

### Summary of Theme

Some 90 miles of streams and rivers flow year-round in the Santa Cruz watershed. These support riparian habitats that are both beautiful and the keys to life in the desert. The word "riparian" describes the banks of streams and rivers, and the distinct plants and animals found there. At lower elevations, riparian habitats are dominated by big, billowing willow and cottonwood trees. At higher elevations, these are joined by hackberry, sycamore, ash, walnut, alder, and other trees. In dry regions such as southern Arizona, certain plants are found only in the moist conditions along streams and rivers. Some animals that roam mountains and deserts depend on visits to riparian areas, where they can rest, drink, and sometimes hunt. Other animals spend their entire lives in riparian areas and cannot survive without them. These include many fish, frogs, and bird species. Some 60-75 percent of all wildlife species in this region depend on riparian areas at some point in their lives, and 90 percent of all bird species are found in these desert oases. Riparian areas also function as movement or migration corridors for wildlife. North-south trending rivers such as the Santa Cruz are important migratory routes for birds.

### Description of Theme

*Riparian Areas*

Riparian communities are those ribbons of life along banks of rivers, shoreline communities along slow or non-flowing waters such as marshes and lakes, and along the banks of dry washes in deserts. Riparian communities have three components: water availability, vegetation, and wildlife. These communities occupy less than 5 percent of the proposed National Heritage Area surface, but support 90 percent of its bird life. The majority of the 55 priority vulnerable species identified by the Sonoran Desert Conservation Plan in Pima County are associated with riparian-based ecosystems. Approximately 60-75 percent of all animal species in the area rely on riparian environments at some point during their lifecycle.

The Santa Cruz River provides a riparian corridor of a habitat similar to that in northern Mexico. Because the river has a north-south orientation, it is important as a flyway for migratory birds and bats. Its lush forests of cottonwood, willow, and velvet mesquite contrast with the adjacent dry desert and grassland. At higher elevations, riparian communities include hackberry, sycamore, ash, walnut, alder, and other trees. These riparian communities enable some subtropical species to extend their ranges north into Arizona; for some species, the watershed is the United States stronghold, or place where a species is most readily found. About 30 species of birds of subtropical origin have their northern limits within the region, and of the 36 species of raptors (birds of prey) that nest in Arizona, 31 do so in this watershed. The Santa Cruz watershed is also the northern most range of the jaguar, coatimundi, Mexican long-tongued bat, and banded rock rattlesnake.

For many organisms, the habitat structure of a forest or woodland is as important as the species of tree. This is true of the 4,500 acres of pecan groves (FICO Farms) south of Tucson.

This is an artificial riparian environment maintained for agriculture that provides many of the best ecological functions and values of the native riparian woodland. Many native riparian obligate bird species now live in or frequent this habitat, including the yellow-billed cuckoo, Swainson's hawk, and white-tailed kite, as do many amphibians, reptiles, and mammals.

*Perennial Surface Water Flows*

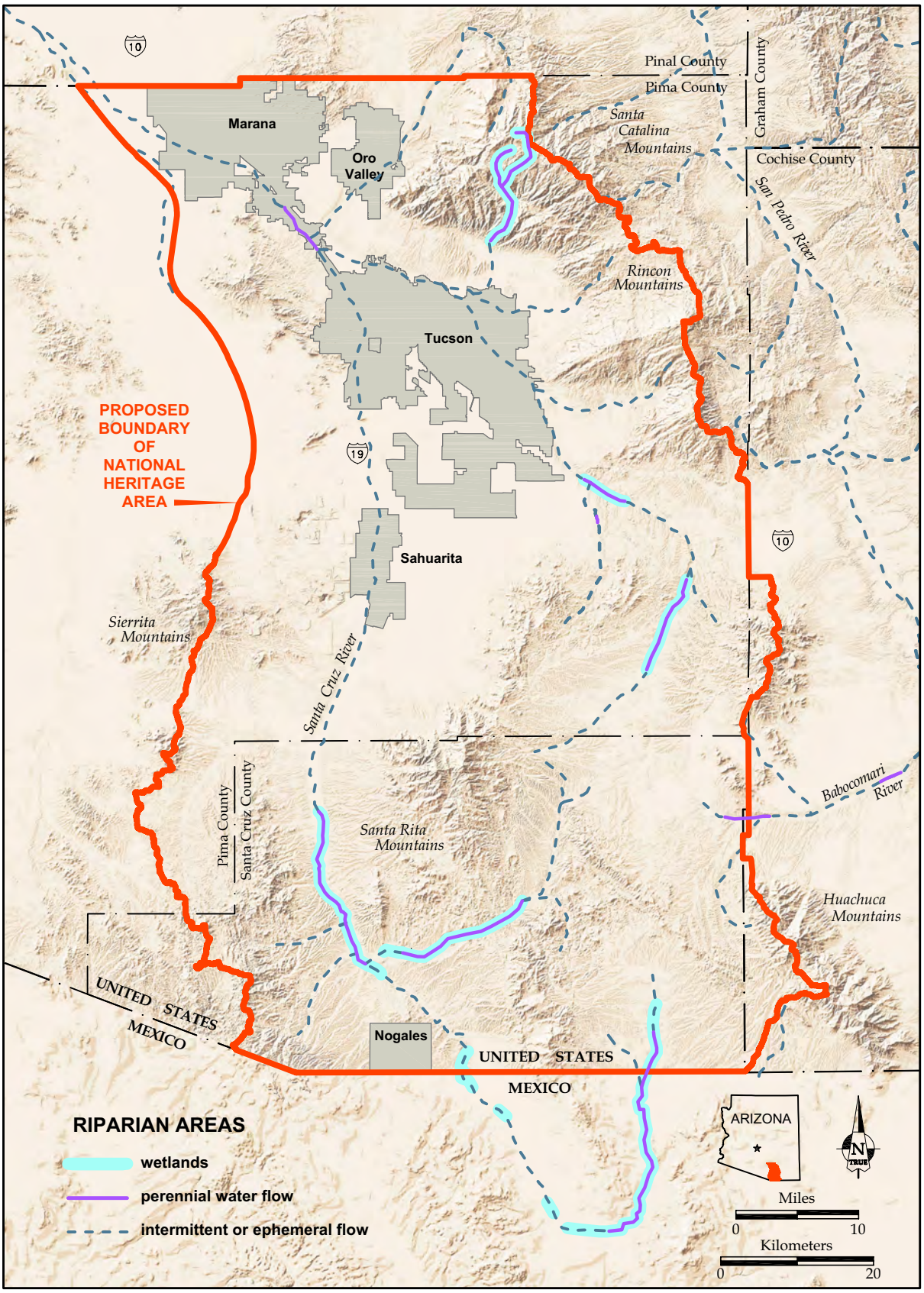
There are roughly 90 miles of year-round flowing water in the upper and middle watershed of the Santa Cruz River. Natural perennial surface flow of the river—varying with month, year, season, and rainfall—occurs only in the San Rafael Valley over a stretch of about 15 miles. Tributaries with year-round flow include Sonoita Creek (about 12 miles), Sabino Creek (about 10 miles), Cienega Creek (approximately 10 miles), and Davidson Canyon (roughly 6 miles). Peck Canyon, Potrero Wash, and Arivaca Creek each have a mile or less of intermittent surface flow, as well as numerous drainages and springs primarily in the surrounding mountains. Other parts of the proposed National Heritage Area have ephemeral (sporadic) surface flow only during heavy rains. Effluent (treated sewage) water maintains lush riparian vegetation and provides recharge for the aquifers along two stretches of the Santa Cruz River. One in Santa Cruz County begins at Calabazas and continues sometimes as far north as Canoa (25 miles). The other, in Pima County, begins at Roger Road and continues sometimes as far north as Red Rock (30 miles).

*Cienegas (Wetlands)*

Riparian marshes, called cienegas in Spanish, were once common along the Santa Cruz River and its tributaries. However, most dried up as the water table dropped from pumping, diverting flows, or draining to prevent malaria epidemics. The remaining cienegas are havens for vegetation and wildlife. The largest three are Potrero Wetlands (Las Lagunas or Meadow Hills) in the City of Nogales, Cienega Creek (Cienega Creek Natural Preserve, Las Cienegas National Conservation Area), and Sonoita Creek (Sonoita Creek State Natural Area, Patagonia-Sonoita Creek Preserve). Several small cienegas are located in the San Rafael Valley. A man-made cienega has been created at Sweetwater Wetlands in Tucson using effluent (sewer-treated) water.

*Riparian Restoration and Rehabilitation*

Riparian restoration is the effort to restore ecosystem structures and functions as they were at some point in the past. Riparian rehabilitation is when there is no attempt to create an ecosystem similar to what was present prior to the activities that degraded the resources. Riparian resources and aquatic systems are the most vulnerable and least protected habitats in the Santa Cruz watershed. Plans are in place to ensure that natural riparian systems be preserved, restored where possible, and managed to compensate for decades of largely unintentional destruction of these systems. Numerous projects are ongoing or planned that will increase riparian habitat in the proposed National Heritage Area. These restoration/rehabilitation projects include: (1) ongoing—one on the San Xavier District of the Tohono O'odham Nation, one south of the Town of Marana, and one in Santa Cruz County (Nogales); and (2) planned—more than 10 in Pima County which involve collaborative efforts of the county with the Town of Marana, City of Tucson, and the Army Corps of Engineers.




Map showing areas of perennial flow and wetlands in the proposed National Heritage Area (Nature Conservancy has map).

**Riparian Restoration/Rehabilitation Projects in the Proposed National Heritage Area**

*Ongoing*

- Wa:k Hikdañ restoration site (San Xavier District of the Tohono O'odham Nation)
- Tucson Audubon's Santa Cruz River Habitat Project (south of the Town of Marana)
- North River Road (Santa Cruz County, City of Nogales)

*Planned*

- Town of Marana
- Tucson Origins Heritage Park (City of Tucson)
- Paseo de las Iglesias (City of Tucson, Pima County, and the Army Corps of Engineers) Christopher Columbus Park (City of Tucson and Pima County)
- Cortaro Mesquite Bosque (Pima County)
- Tres Ríos del Norte (Town of Marana, Pima County, and the City of Tucson)
- Río Antiquo (Pima County and the Army Corps of Engineers)
- Rillito Watershed Projects (various)
- Canoa Ranch (Pima County)

**Distinctiveness of Theme**

The Santa Cruz River is a natural treasure for three nations: United States, Tohono O'odham, and Mexico. The Santa Cruz River is nationally unique in that it originates in the United States, crosses into Mexico, and returns to the United States. Rising in the San Rafael Valley of southern Arizona, it crosses south into Sonora, Mexico, then turns north to reenter the United States east of Nogales. It continues north to cross a 10-mile stretch of the San Xavier District of the Tohono O'odham Nation, through Tucson, and then north-northwest to the Gila River west of Phoenix. Riparian areas along the banks of the Santa Cruz and its perennial tributaries are home to special plants and animals, and are corridors for wildlife movements and migrations. These oases are habitats and migration stopovers for many bird species. This theme is distinctive among existing National Heritage Areas.

**Related Resources**

Several stretches of the Santa Cruz River and its tributaries have year-round surface flows and are accessible to the public. The Santa Cruz River emerges in the San Rafael Valley, and flows with treated wastewater from Rio Rico to Tubac, and from Tucson to Marana. Two developed segments of the Juan Bautista de Anza National Historical Trail follow the riverbank between Rio Rico and Tubac. Portions of Cienega Creek are protected in Las Cienegas National Conservation Area and the Cienega Creek Natural Preserve. The Sabino Creek recreational area in Coronado National Forest has hiking trails, a paved road, and tram rides. The Patagonia-Sonoita Creek Preserve has trails and an interpretive center.

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