



# **CONSERVATION ACROSS BORDERS**

Saving Quitobaquito and Rio Sonoyta  
requires international cooperation

By Cristina Jones



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A half-acre pond (above) fed by a pair of natural springs is the heart of Quitobaquito, a significant area of understated grandeur. In 2008, when water levels dropped to an all-time low, wildlife agency biologists captured the pond's resident mud turtles and pupfish for safekeeping (lower right).

Driving through the port of entry at Lukeville, Ariz., on your way to Puerto Penasco for a much-deserved vacation, you pass through the heart of the Sonoran Desert. Looking around at the cactus, you may think of this as one of the driest places you have ever seen. With water being such a scarcity, this is in fact one of the most arid parts of the Sonoran Desert, and an area of incredible significance and understated grandeur. Even though this area appears parched, you'll be surprised to know that nearby Organ Pipe Cactus National Monument in Arizona and Pinacate Biosphere Reserve in Mexico hold threatened and endangered species, including fishes, a mud turtle and

a springsnail. The permanent water sources of Quitobaquito and the Rio Sonoyta, two fragile ecosystems that straddle the international border, allow these extraordinary aquatic species to persist in the desert.

**WATER IN THE DESERT**

Just half a mile north of the international border, in the far southwest corner of Organ Pipe Cactus National Monument, lies Quitobaquito, a veritable oasis in the desert. This half-acre pond is fed by a pair of natural springs that flow from a wall of dense rock in the Quitobaquito Hills. For centuries, these springs have served as a crucial water source for travel and trade, settlement and habitation, exploration and

migration, irrigation and agriculture. Native Americans in the region used Quitobaquito frequently: Ceremonial use by the Tohono O'odham and the Hia-Ced O'odham (neighbors of the Tohono O'odham in southwestern Arizona and northern Sonora) continues today.

As a cultural landscape, Quitobaquito reflects the occupation and interaction of several ethnic groups from prehistoric times to the present. Evidence of this history remains in relics such as the fig and pomegranate orchard, believed by many to descend from trees planted in the late 1600s by Father Eusebio Francisco Kino, an

energetic, mission-building Jesuit. Kino pioneered the route passing south of Quitobaquito along the Rio Sonoyta, then striking boldly across the desert to the Gila River. This route, later called "Camino del Diablo," the Devil's Highway, was used for more than two centuries. The pond at Quitobaquito was once the last source of reliable water for settlers daring to travel the dreaded Camino del Diablo. To survive the soaring temperatures, which often exceed 106 degrees, travelers had to stock up at Quitobaquito before continuing on their shadeless journey toward a better life.

To the east, the Rio Sonoyta begins in the Tohono O'odham Nation in Arizona, crossing into the state of Sonora, Mexico, about 30 miles east of Lukeville. It runs west parallel to the international border for 22 miles, then turns south and disappears into the sands of the Gran Desierto, flowing underground to reappear at the Sea of Cortez east of Puerto Penasco.

A small portion of the Rio Sonoyta is the only reliable perennial water source within the Pinacate Biosphere Reserve, Organ Pipe Cactus National Monument's sister park in Sonora. Like Quitobaquito, these few permanent water sources along the Rio Sonoyta historically have determined the pattern of human settlement. They remain vital for the small commu-

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nities in or near the reserve, for which ranching and agriculture continue to be the principal sources of human livelihood.



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**FOUR REASONS TO CARE**

Balancing the needs of people with the demands of protecting sacred and historical sites, unique species, and fragile ecosystems across the international border requires time and cooperation. This need led biologists from the United States and Mexico to form a binational, multi-agency group that works together toward the conservation of the Quitobaquito and Rio Sonoyta ecosystems, and the species that rely upon them.

The origins of the Quitobaquito/Rio Sonoyta Working Group stemmed from a growing concern for the Sonoyta mud turtle, a candidate species for listing as threatened under the Endangered Species Act. The Sonoyta mud turtle is highly aquatic and only known to live in Quitobaquito springs and pond in the United States, and seven small pools along the Rio Sonoyta in Sonora. Sonoyta mud turtles are very slow to mature and may live up to 40 years. To put their longevity into perspective compared to other wildlife, white-tailed deer may go through a couple of generations before a baby mud turtle reaches adulthood. Ongoing surveys at Quitobaquito have identified several turtles that were originally captured nearly



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30 years ago. Given the longevity of this species, it is not surprising that the same turtles are captured over such a long time — this is the only permanent body of water for miles.

As the group investigated possible causes for the mud turtle's decline, it quickly recognized that a broader resource, the Rio Sonoyta and its associated springs, was at risk. The group now includes biologists from Mexico (Pinacate Biosphere Reserve and the "Comision de Ecologia y Desarrollo Sustentable del Estado de Sonora," Commission of Ecology and Sustainable Development of the State of Sonora) and Arizona (Organ Pipe Cactus National Monument, Arizona Game and Fish Department, U.S. Fish and Wildlife Service and University of Arizona).

In 2003, the group expanded its focus to include three additional species: the Quitobaquito pupfish, longfin dace and Quitobaquito springsnail. All are unique to this watershed and rely on the perennial aquatic sites it contains.

The endangered Quitobaquito pupfish, measuring about 1½ inches, lives in extreme environments in which water temperatures can reach 113 degrees and salinity levels can be twice as salty as sea water. Normally silver in color, males turn an iridescent blue during the spring breeding season, resembling tiny patches of sky flashing brilliantly in the crystal-clear waters.

The only natural population of Quitobaquito pupfish in the United States is in Quitobaquito pond, which is designated as critical habitat for the species. The only



other area where these fish are still known to exist is along a 1-mile perennial stretch of the Rio Sonoyta on the Pinacate Biosphere Reserve.

The longfin dace, a fish once widespread throughout segments of the Rio Sonoyta, and still locally common in portions of the United States and Mexico, is rarely seen in the Rio Sonoyta today. The Rio Sonoyta population is isolated, and these dace look different than those found elsewhere. Experts think it is likely a separate species altogether. Although not federally listed as threatened or endangered, this population is of concern because it has declined noticeably during recent years. Unlike the pupfish, these fish cannot tolerate extremely high salinity, so they are more deeply affected by the recent drought (which lowers water levels and increases salt concentration).



The Quitobaquito springsnail is a tiny snail, less than ¼-inch long, endemic to (only occurring in) Quitobaquito springs. Very little is known about the snail, although it appears to require slowly flowing water over hard surfaces. Both conditions are met at Quitobaquito springs.

### CREATIVE SOLUTIONS FOR CONSERVATION

The goals of the working group are to preserve the aquatic and riparian communities associated with the Rio Sonoyta in Sonora and Quitobaquito in Arizona, and to conserve and manage the four unique species there for generations to come. To achieve its goals, the working group first

identified the threats each of these communities faces. Currently, they are developing a habitat-based strategy that will reduce or eliminate those threats.

The major threats facing the Rio Sonoyta, like so many other aquatic habitats in the Southwest, are groundwater pumping and habitat degradation. Most of the water supply for the town of Sonoyta, Mexico, as well as the nearby border town of Lukeville, comes from groundwater. To initiate water conservation practices, working group members have met with the local community in Sonoyta and provided suggestions that will reduce groundwater withdrawal. This outreach effort seems to be working: Groundwater pumping for agricultural purposes appears to have decreased in recent years. But there are other, less obvious but no less serious, threats to the persistence of this community.



In the United States, Quitobaquito pupfish (left) are known only from Quitobaquito pond. In Sonora, Mexico, this fish, as well as the longfin dace (right), is found in the Rio Sonoyta.

economic benefits to the community. La Ruta Sonora, an ecotourism venture in the area, has expressed interest in providing birders and other tourists the opportunity to see the wetlands and the wildlife species inhabiting them.

Drought and drying of the pond are the major threats facing Quitobaquito. The springs' flow has diminished by nearly half over the past 20 years. And in 2008, the water level of Quitobaquito pond dropped to an all-time low. The surface area of the pond shrank down to one-third of its original size. Experts suspected water was being lost either through a hole in the bottom or

2,000 pupfish also are being held in five refuge ponds, two in the United States and three in Sonora. The immediate future of Quitobaquito pond is still uncertain, so until the water level has returned to normal, the turtles and pupfish will remain in captivity for safekeeping.

Conservation of the Sonoyta mud turtle, Quitobaquito pupfish, Quitobaquito springsnail and longfin dace, all species dependent upon perennial surface water, will not succeed without public support, active measures and creative approaches. It would be tragic if Quitobaquito were to become the only natural wetland in the region,



A baby Sonoyta mud turtle is weighed (left). Adult turtles are captured using hoopnets (above). A refuge pond in Sonora, Mexico, shelters pupfish (right).

A new wastewater treatment facility is proposed to be established in Sonoyta to meet the town's currently unmet infrastructure needs. Once completed, that facility would cut off the water supply that feeds one of the pools along the Rio Sonoyta where mud turtles occur. In response, members of the working group are meeting with the Town of Sonoyta to discuss opportunities that would meet the health and infrastructure needs of Sonoyta while creating suitable wetlands for native species. Along with providing habitat for many sensitive aquatic and riparian species, these wetlands also could provide

in the earthen dam surrounding the pond. The unexpected and precipitous water loss resulted in emergency salvage of Quitobaquito pupfish and Sonoyta mud turtles, to secure those populations against the real possibility that Quitobaquito pond might dry completely.

After reviewing several options, the working group supported a decision to reinforce the pond's retaining wall in hopes of stopping the water loss. Since then, the water level, although still quite low, has stabilized. The 31 mud turtles and 1,000 pupfish are now guests at the Arizona-Sonora Desert Museum. An additional

and all the aquatic species were restricted to it and listed, or considered for listing, as threatened or endangered. By pursuing creative solutions, including developing curricula for the local schools in both Mexico and the United States, the working group hopes to increase public awareness of the uniqueness of — and threats to — the Rio Sonoyta and Quitobaquito ecosystems. 🐢

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