

## **Ayuquila River Restoration**

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The Ayuquila River in Western Central Mexico flows through a remarkably diverse landscape that includes mountain peaks and coastal plains, and more species than France, Canada or the British Isles. It is home to over 100 different mammals, and over 300 species of birds, with vegetation that includes mangrove, tropical jungle, and evergreen pine forests.

Modern times arrived in the Ayuquila River watershed in the 1950s with the construction of dams and irrigation channels to support the expansion of the water-intensive (and profitable) sugarcane crop around the upstream communities of Autlán and El Grullo which, fueled by the sugar industry,



quickly developed as local centers of industry and commerce. Currently about 80% of the population of the watershed lives in this "upstream" region. The remaining 20% lives downstream from this concentration of agriculture and industry. As the upstream communities thrived, those downstream dwindled, threatened by a lower river flow, loss of fish and crustacean species and severe water pollution.

In the early 1980s the region received international attention from the scientific community when a perennial relative of maize was discovered in the region by University of Guadalajara researchers. This discovery prompted the State of Jalisco to purchase over 1,000 hectares in the mountainous area known as the Sierra de Manantlán in 1984, and donate the land to the University for the development of a research laboratory facility. From the beginning, the University's strategy included strong social outreach and environmental education programs to complement the basic science research. It stepped in and implemented a variety of innovative strategies to begin to address watershed issues, including the establishment of an Advisory Council embracing municipal, state and federal authorities,

academia and non-profit organizations, as well as disenfranchised ethnic and social groups.

The University quickly achieved results by working with local communities. For example, a network of River Defense Committees from each community affected by pollution. Though a sugar mill was blamed for most of the pollution, regular water quality monitoring soon revealed sewage and improper solid waste disposal from the cities of Autlán and El Grullo to play a significant role as well. Successful waste separation, recycling and composting programs were implemented. Meanwhile, under pressure from the University and its many partners, the federal government began building regional sewage treatment plants.

However, the sugar mill refused to cooperate. Many species of fish and crustaceans would disappear from long stretches of river during the months when the mill was working, with damage was so severe that the river could not recover during the off-season. After a disastrous molasses spill in 1998 which was exhaustively documented by the University's water-monitoring team, the Sugarcane Workers Union switched sides and joined the conservationist forces in their long-standing dispute with the sugar mill. Soon after the University invited Cuban specialists to evaluate the mill's pollution problem and offer their counsel, which included such basic measures as using some wastewater to irrigate nearby cane fields. Left without allies or excuses, the sugar mill was finally forced to comply and implement a comprehensive pollution control program that immediately improved the health of the river, to everyone's benefit.

The same social participation strategy has been successful in other ways, such as establishment of the Sierra de Manantlán Biosphere Reserve in 1987, which put a halt to illegal logging, addressed conflicts with mining interests, and halved the number of forest fires within the Reserve. Though many problems remain in the region, the restoration of the Ayuquila River has been so successful that it has become a case study for international organizations, including the United Nations, the World Bank, and the International Union for the Conservation of Nature.