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In This Issue:

**THE WAVE
OF THE FUTURE**

CHAMPIONS OF TEXAS WATER

GLOBAL PREDICTIONS

AND MUCH MORE...



Recovering from the Past

Group committed to restoring the Arroyo Colorado



Paul Bergh's love of the Arroyo Colorado in the Lower Rio Grande Valley goes back more than 40 years. His first experience with the Arroyo was in 1961 when the then 15-year-old was a guest of his girlfriend whose family had a place on the channel.

“Drinking water was hauled in by truck and stored in a cistern and the toilet flushed with water scooped out of the Arroyo,” Bergh said. “It was pretty rustic to say the least, but the fishing was fantastic.”

That same trip Bergh remembers the water being “much cleaner and clearer, still green but a very pretty and clear green.”

Time went on. Bergh married his girlfriend. They inherited the family place and spent much of their free time with their kids, fishing and swimming the Arroyo Colorado.

As more time passed, shrimp farms moved to the area, additional municipal water plants were built to serve the growing population, and dredging for barges and flood control continued. The Arroyo Colorado, which begins in Mission and empties into the Lower Laguna Madre, became less clean and less clear.

“Fishing went to hell in a handbag and the water stunk,” Bergh said.

Today, Bergh and a diverse group of individuals from agriculture, wastewater management, urban planning, environmental protection, economic development, academia and other disciplines are united in a common purpose—to restore this ancient channel of the Rio Grande. The Arroyo Colorado Watershed Partnership is developing a voluntary watershed protection plan that outlines ways to clean up the 90-mile polluted stream.

The Arroyo Colorado is the primary source of fresh water to the Lower Laguna Madre, a lagoon off the Gulf of Mexico and home to many fish and shrimp species. Commercial barges travel up and down the stream from the Port of Harlingen to the Laguna Madre and the Gulf Intracoastal Waterway. The stream, which receives natural flow beginning about halfway down the channel, collects treated wastewater from 18 municipal water plants along with excess floodwaters and stormwater runoff from urban and

(clockwise from top left)

Paul Bergh, a member of the Arroyo Colorado Watershed Partnership steering committee, grew up fishing and swimming in the Arroyo Colorado. He became involved in protecting and cleaning up the Arroyo in the early 1990s. Photo by Rod Santa Ana.

Because the Arroyo Colorado is dredged, commercial barges can travel up and down the Arroyo Colorado from the Port of Harlingen to the Laguna Madre and the Gulf Intracoastal Waterway. Photo by Brad Cowan.

The Arroyo Colorado collects irrigation water from 300,000 acres of cotton, citrus, vegetables, grain sorghum, corn and sugarcane as well as floodwaters and storm water runoff from urban and agricultural areas. Photo by Laura De La Garza.

The Arroyo Colorado Watershed Partnership’s mission is to reduce the addition of pollutants to the Arroyo Colorado to meet state water quality standards and to improve natural terrestrial, riparian and aquatic habitats associated with the watershed. Photo by Brad Cowan.

agricultural areas, and excess irrigation water from approximately 300,000 acres of cotton, citrus, vegetables, grain sorghum, corn and sugarcane. With its abundance of birds, plants and fish, the area attracts tourists and naturalists to its birding centers and Laguna Atascosa National Wildlife Refuge along with sports enthusiasts to fish the waters.

Unfortunately, because of the dredging and runoff, the Arroyo Colorado has one of the highest levels of nutrients, such as phosphorus and nitrogen, of all streams in Texas, according to the Texas Commission on Environmental Quality (TCEQ).

Since 1998, Texas has included the lower tidal part of the Arroyo Colorado on the Clean Water Act list of impaired water bodies for low levels of dissolved oxygen. From 1999 to 2004, the stream had 19 documented fish kills, claiming 26 million fish, according to the Texas Parks and Wildlife Department. The upper part of the stream is on the impaired list for bacteria.

In 2002, TCEQ completed the first phase of a total maximum daily load (TMDL) study that showed that extensive physical modifications of the Arroyo Colorado along with excessive nutrients from urban, agricultural and wastewater sources caused the low levels of dissolved oxygen. The TMDL results indicated that achieving healthy dissolved oxygen levels would require a 90 percent reduction of nutrients and biochemical oxygen demand. Faced with this large and virtually unachievable load reduction, TCEQ turned to local stakeholders to develop a watershed protection plan to reduce pollutants, said Roger Miranda, TCEQ strategic assessment division coordinator.

The partnership, originally organized by TCEQ and the Texas State Soil and Water Conservation Board (TSSWCB), is led by a 25-member steering committee. The committee oversees the efforts of seven work groups: wastewater infrastructure, agriculture, habitat restoration, land use and development, education and outreach, TMDL and monitoring. The Arroyo Colorado Watershed Protection Plan should be published by the end of 2006 and will be one of the first completed watershed protection plans for Texas.



Dr. Jude Benavides, steering committee chairman, said this is one of the first times the state has tried to use a voluntary effort to restore a watershed that failed to meet TMDL requirements.

“We need to succeed,” said Benavides, assistant professor of hydrology and water resources at the University of Texas at Brownsville.

“I think it is most important that each member can acknowledge the importance of succeeding so we can serve as a template for other watersheds and other local stakeholders,” Benavides said

Laura De La Garza, the partnership’s watershed coordinator, said the plan’s goal “is to reduce the nutrient levels to the maximum extent feasible and, for this first phase of the planning process, we are aiming for a 20 percent reduction after the plan’s recommendations are implemented.”

One of the plan’s top recommendations, De La Garza said, is to construct wetlands for treatment of point source and nonpoint source pollution. Wetlands can serve as a habitat for fish and other aquatic animals, stabilize streambeds and banks, and filter and process wastewater contaminants in the water, she said.

Bergh agreed that wetlands are a priority. “They will not only provide for cleaning of the water but will create habitat for wildlife that local municipal and special interest groups can take charge of, creating awareness and education and a sense of pride for the populace,” he said.

Thirteen cities and public utilities have agreed to undertake projects or change their permits to reduce wastewater runoff into the stream, De La Garza said. The plan supports upgrades for a few cities, additional reuse and construction of treatment ponds and wetlands.

Miranda said the wastewater infrastructure work group has recommended voluntary permit reductions and enhanced wastewater treatment to further reduce nutrients and suspended solids in the effluent.

“Most of our municipalities have improved or plan to improve their wastewater collection and treatment systems in some way,” De La Garza said. “Our cities should be commended for the numerous colonia hook-ups and for the partial reuse of their wastewater effluent.”

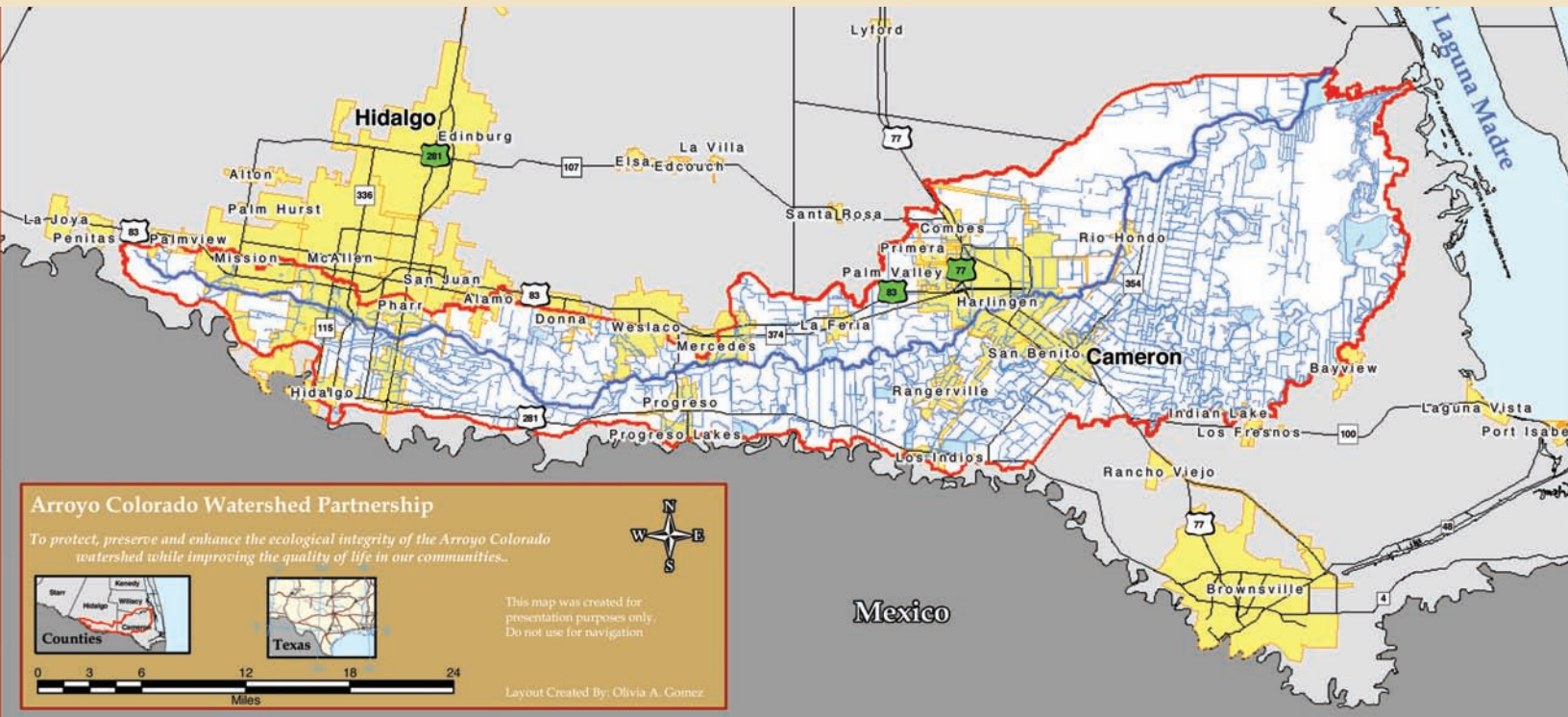
Because most of the land surrounding the Arroyo Colorado is farmland, management of nonpoint pollution from agricultural runoff that includes fertilizer and pesticides is included in the plan.

Kevin Wagner of the Texas Water Resources Institute (TWRI) said the plan’s agricultural section recommends education on proper nutrient and irrigation management practices and how to implement best management practices that work on irrigated cropland. Then, monitoring actual impacts will be crucial to gauge the effectiveness of educational programs and the use of best management practices, he said.

TWRI and Texas Cooperative Extension staff, through a Clean Water Act 319(h) project funded by TSSWCB, are already addressing some of the agricultural issues addressed in the watershed protection plan. Extension agents in Cameron, Willacy and Hidalgo counties are educating farmers on managing their land to reduce the potential for nonpoint source pollution.

Wagner, TWRI’s manager of the project, said Extension has sponsored free soil-testing campaigns to encourage soil testing and to endorse proper fertilizer use. Other programs provide training on crop production, integrated pest management and irrigation management. To help the producers implement these best management practices, the project promotes cost-share programs such as the USDA–Natural Resources Conservation Service’s EQIP program, which provides farmers funds to apply specific conservation practices on their land, Wagner said.

“Our goal is for 50 percent or more of the farmers to implement best management practices by 2015 as a result of the educational efforts and cost-share programs,” he said.



Wagner said the institute is seeking additional 319(h) funding to do the monitoring and assessment of the education and best management practices as recommended in the watershed protection plan.

The habitat restoration group puts a priority on conserving and restoring existing riparian and wetlands habitats, constructing additional wetlands, and reducing channel and stream bank erosion to reduce nonpoint source pollution.

De La Garza said the plan also calls for increasing awareness of water quality issues and their impacts through public education, school-based curriculum and outreach projects.

Benavides believes the education and outreach component, particularly in the Rio Grande Valley, is an important part of this protection plan, because as more people learn about the Arroyo Colorado and its importance, they will learn to take care of it.

When the plan is finished, the group will sponsor a “pachanga,” or party, to present the plan and raise awareness of the Arroyo Colorado water quality issues within the valley.

As the watershed protection plan is implemented, TCEQ is working on Phase II of the TMDL study to determine more specifically how much of the low dissolved oxygen is caused from excessive nutrients and

how much is from the stream’s physical condition, Miranda said. He said the TMDL study will not be completed for a few more years pending evaluation of the implementation of the protection plan.

Once the plan is published, the partnership will continue. A watershed protection plan is an “evolving plan,” De La Garza said. “We know we will need to adjust it as plan elements are implemented with a formal revision every five years.”

Benavides expects the steering committee to continue to monitor activities in the watershed to ensure the partnership is reaching its objectives.

“I hope that we can come up with a good enough plan that is not only strong enough to get into compliance, but also flexible enough in the future to keep everyone behind it,” Benavides said. “I hope the arroyo can serve as a model to other watersheds that fail to meet compliance in whatever regulation.”

For Bergh, the success of the protection plan is more personal.

“My involvement is about protecting land and water that belongs to us all,” Bergh said. “My benefit will come from enjoying the fish and wildlife and knowing that others behind me might get an even greater enjoyment of it if they take care of it.”

