



The Estuary

Soon after the Upper Gulf of California estuary was identified as a key conservation priority in 2005, the Sonoran Institute began ecological monitoring in the area. In 2009, we began developing a strategy for estuarine habitat restoration, partnering with the University of Baja California (UABC), the University of Arizona, the Ecological Association of Users of the Hardy and Colorado Rivers (AEURHYC), and Pronatura Noroeste to study the connectivity between the river and the ocean. Our overall restoration goal is to improve estuarine habitat and reconnect the river with the ocean to allow access of marine species to spawning and nursing grounds.

Research in the last two decades has shown that marine fisheries in the Upper Gulf of California are dependent on freshwater flows from the Delta. Twelve of the 13 species that constitute 98% of the commercial landings in the Upper Gulf require brackish (low salinity) water during their early development (Calderon and Flessa, 2009). These data suggest that increased river water creates a larger nursery ground for these fish, in turn increasing their adult population in subsequent years.

However, reduced river flows and the presence of a sand bar acting as a physical barrier between what remains of the Colorado River and the ocean is limiting estuarine habitat and diminishing fisheries. Sonoran Institute and partners are investigating these issues through on-the-ground monitoring of baseline conditions, water quality and flows, fish surveys, nutrient surveys (ichthyoplankton and macrozooplankton), topographic surveys, and bird abundance and diversity. With this data we are designing a restoration strategy with three main components: 1) develop a model to better understand the relationship between river flows and marine species, particularly shrimp, corvina and totoaba, an endangered marine fish; 2) determine the required magnitude of water flows needed to maintain connectivity between the river and the ocean and create a pilot channel to establish reconnection; and 3) acquire additional water flows for the Delta.



View of the Colorado River from the Gulf of California



Monitoring in the estuary

Successes Up-to-Date

- Collected data on fish abundance and diversity in the estuary and the salinity, water level, and topography upstream and downstream of the sandbar area.
- Developed a general restoration strategy for the estuary based on data analysis.
- Continued ecological monitoring in the estuary.

2011-2013 Objectives

- Establish the relationship between river flows and shrimp and corvina populations through the development of an ecological model.
- Develop a surface hydrological model to determine the required magnitude of river flows needed to maintain connectivity between the river and the ocean.
- Assess the feasibility and impact of the creation of a pilot channel to reconnect the river and the ocean.
- Secure additional environmental flows to the Delta and estuary.

