

YOUR LIVING RIVER

CHANGES ALONG THE LOWER SANTA CRUZ RIVER - 2013 TO 2015



The Lower Santa Cruz River in northwest Tucson and Marana flows year-round and provides the principal wetland habitat in Pima County. River flows are sustained by the release of effluent, highly-treated wastewater, from two regional facilities.

In December 2013, Pima County completed the largest public works project in Southern Arizona by investing over \$600 million to upgrade the treatment process. Improved treatment affords the opportunity to enhance the aquatic environment along the river, reduce odors, and increase re-use of reclaimed water.

The Living River reports were developed to annually gauge conditions of this valuable ecosystem and track the impacts of our community investment. This fact sheet summarizes changes and observations from the 2013, 2014, and 2015 water years.

All Living River reports can be found on the Sonoran Institute website at www.sonoraninstitute.org

CHANGES IN WATER QUALITY AND WETLAND CONDITIONS

- **Ammonia no longer limiting life:** Ammonia, which can be toxic to aquatic organisms, was appreciably reduced to low levels.
- **Oxygen availability not a stressor:** Dissolved oxygen, essential for aquatic life, remained at steady levels or increased. Biochemical oxygen demand (an indirect measure of pollutants that use up oxygen in the water) declined to nearly non-detectable levels, indicating that there is more oxygen available for organisms to thrive.
- **Water clarity much improved:** Sediments and other particles carried in the water decreased, resulting in clear river water on normal non-flooding days. Elevated levels of materials in the water can increase water temperature, thereby decreasing available dissolved oxygen.
- **More diverse life:** Several species of fish and increased diversity of aquatic invertebrates (which include insects, crustaceans, and worms) are being seen in the river.
- **Wetland plants reduced in drying sections:** Overall the release of effluent supports wetland plants and trees. In the sections that are drying, there is a decrease in willows and a shift towards upland plants.
- **Reduced flow extent:** The length of the flowing river has decreased, likely the result of a combination of factors including increased water infiltration from reduced nutrient levels and scouring floods.
- **Very little odor escaped the reclamation facility boundary:** Odor levels far below levels required by facility permits and anecdotal observations of odor as hardly noticeable near the facility boundaries.



Cloudy water, before upgrade



Clear water, after upgrade



American Coot, *Fulica americana*

OTHER OBSERVATIONS

- **Increased infiltration & groundwater recharge:** The amount of water that recharged local aquifers more than doubled between 2013 and 2015. This is likely from increased rates of infiltration resulting in part from improved water quality and scouring floods in September 2014 and January 2015 which helped reduce the “clogging layer” in the riverbed.
- **Many kids are seeing a flowing river for the first time:** The Living River of Words youth art and science program provided the first contact with a flowing stream for numerous Tucson schoolkids. The Lower Santa Cruz River provided meaningful inspiration for youth art and poetry projects.

ACKNOWLEDGEMENTS

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