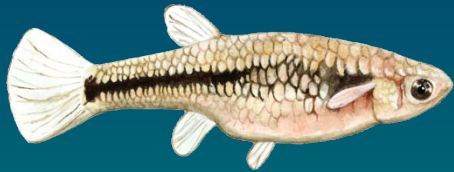


History and Prospects for Fish Santa Cruz River, Pima County



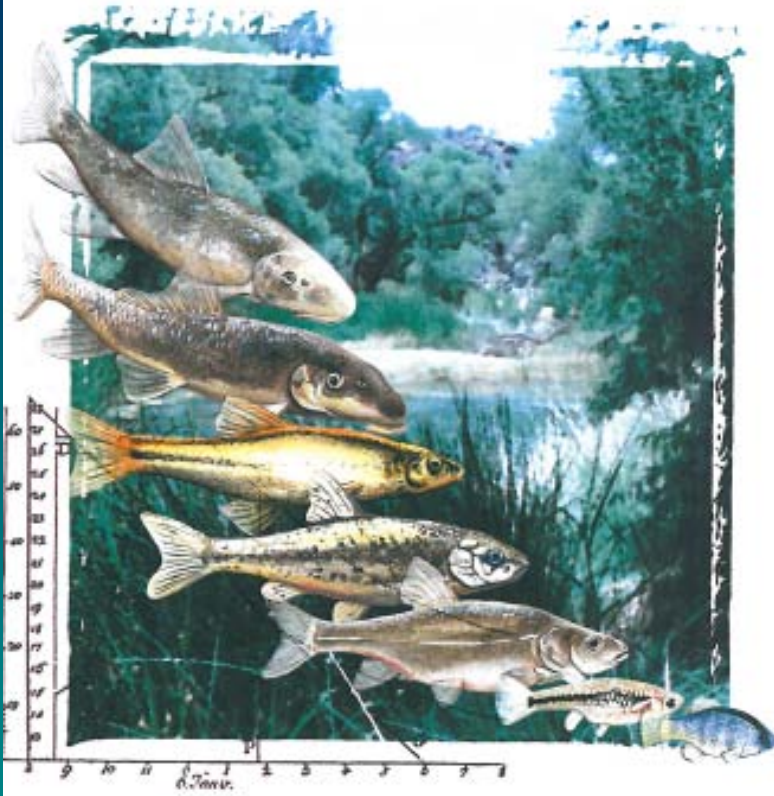
*By Julia Fonseca,
Pima County Office of Conservation Science*

March 29, 2011

Historical Occurrence of Native Fish in Pima County

Sonoran Desert Conservation Plan

December 2000



Sonora sucker

Desert sucker

Gila chub

Long-fin dace

Gila topminnow
(1943)

Santa Cruz pupfish
(1893)

Lower Santa Cruz River





OCT 7 20

Effluent Flow Rates

Typical “baseflows” 40-60 cfs

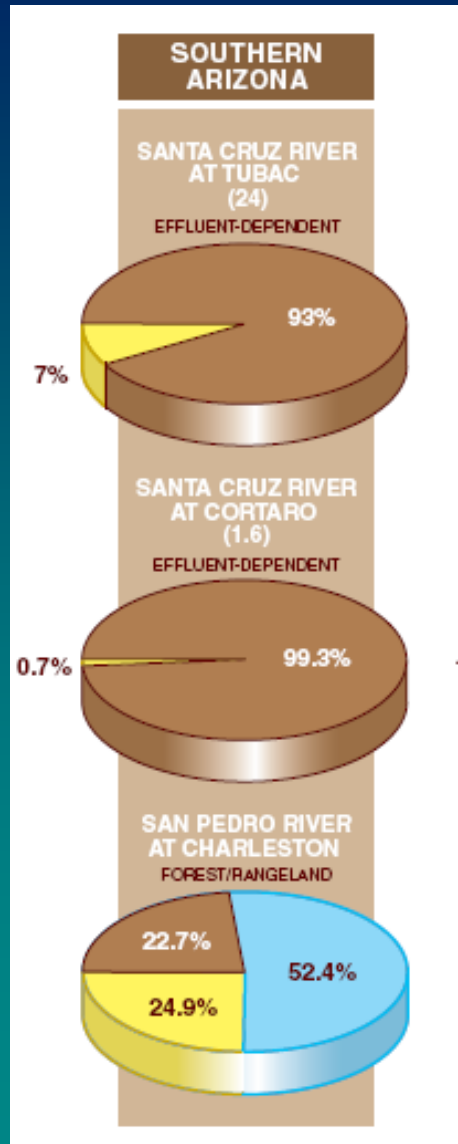
- 25.5 mgd discharged at Ina
- 21 mgd discharged at Roger
- 52,000 acre-feet per year (2009)
- No groundwater intermixing



Physical Substrate



Invertebrate Life



EXPLANATION

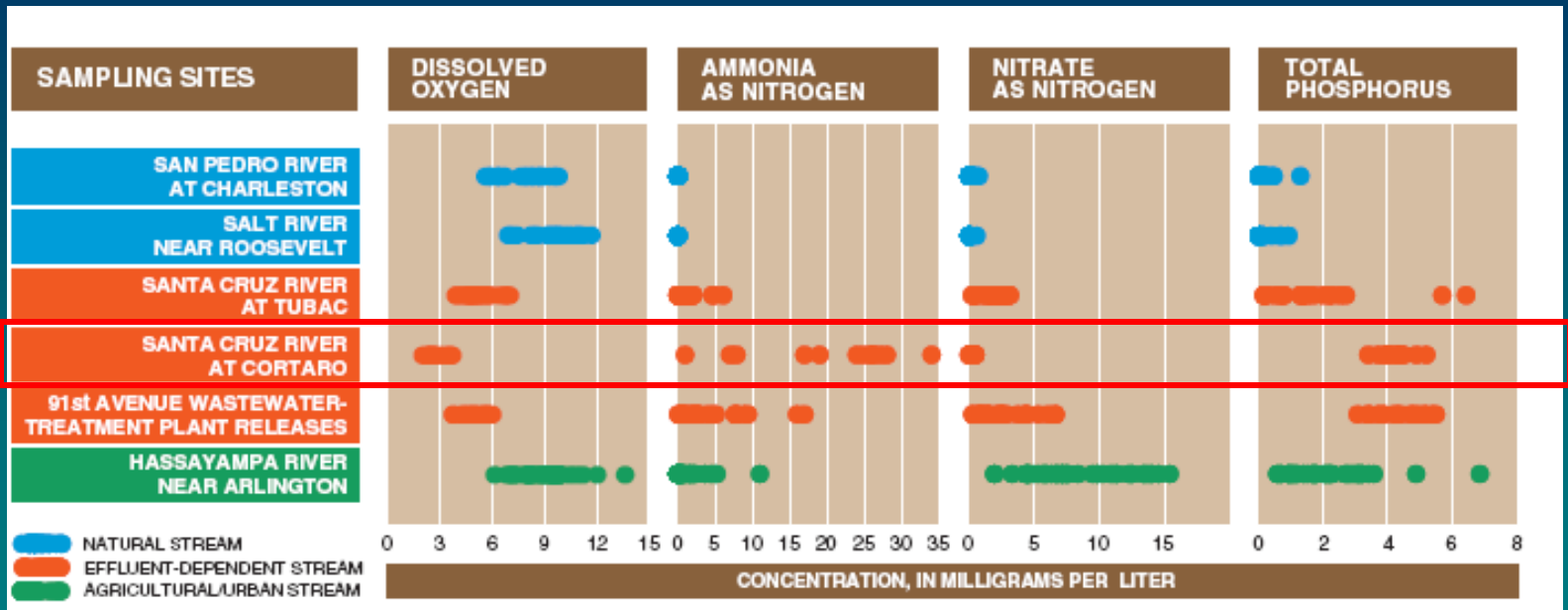
-  AQUATIC WORMS AND MIDGES
-  MAYFLIES, STONEFLIES, AND CADDISFLIES
-  OTHER AQUATIC INVERTEBRATES

(24) NUMBER IN PARENTHESES IS DISTANCE OF SAMPLING SITE, IN KILOMETERS, DOWNSTREAM FROM TREATMENT PLANT

USGS Circular 1213

Figure 14. Pollution-tolerant aquatic invertebrates are most abundant in effluent-dependent streams.

Comparative Water Quality: late 1990s

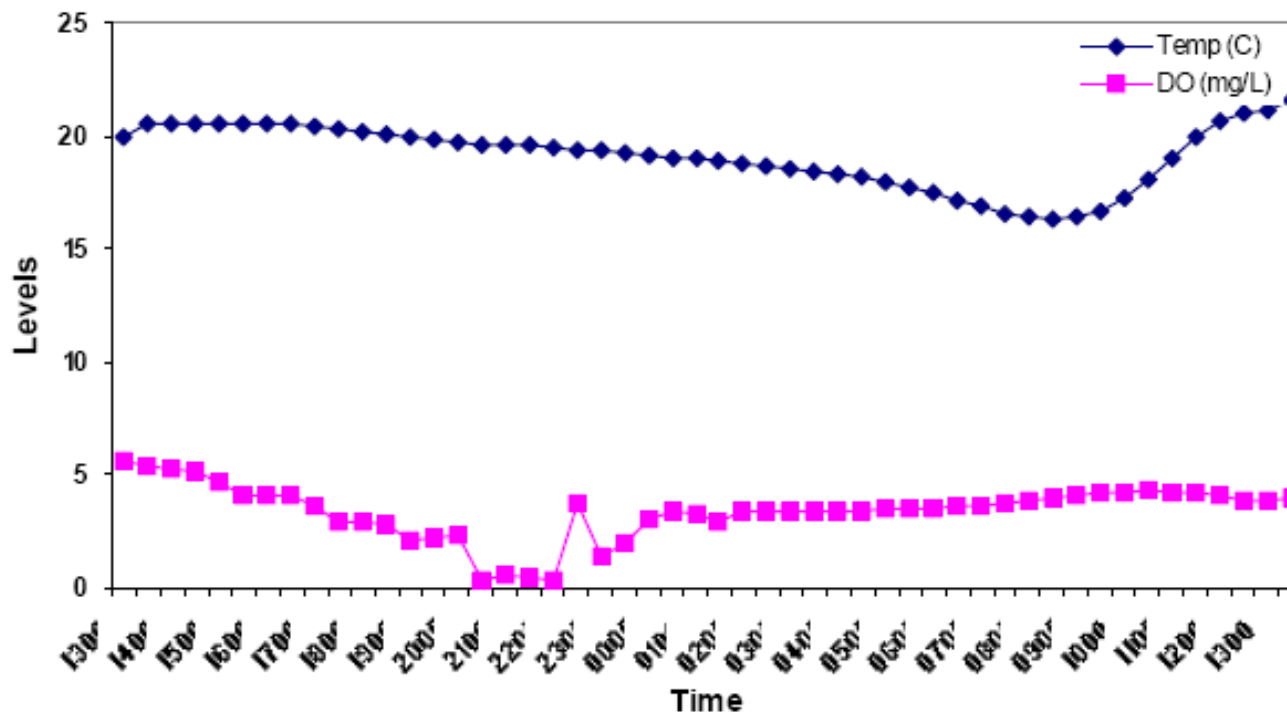


SOURCE: USGS CIRCULAR 1213: WATER QUALITY IN THE CENTRAL ARIZONA BASINS 1995-1998

Oxygen Levels in Effluent Flow

(Walker, et al., 2004)

Figure 11d. *Diel pattern at PCSC2 on 02/28/04*



Water quality improvement



*Cause: overloaded
sewage treatment*

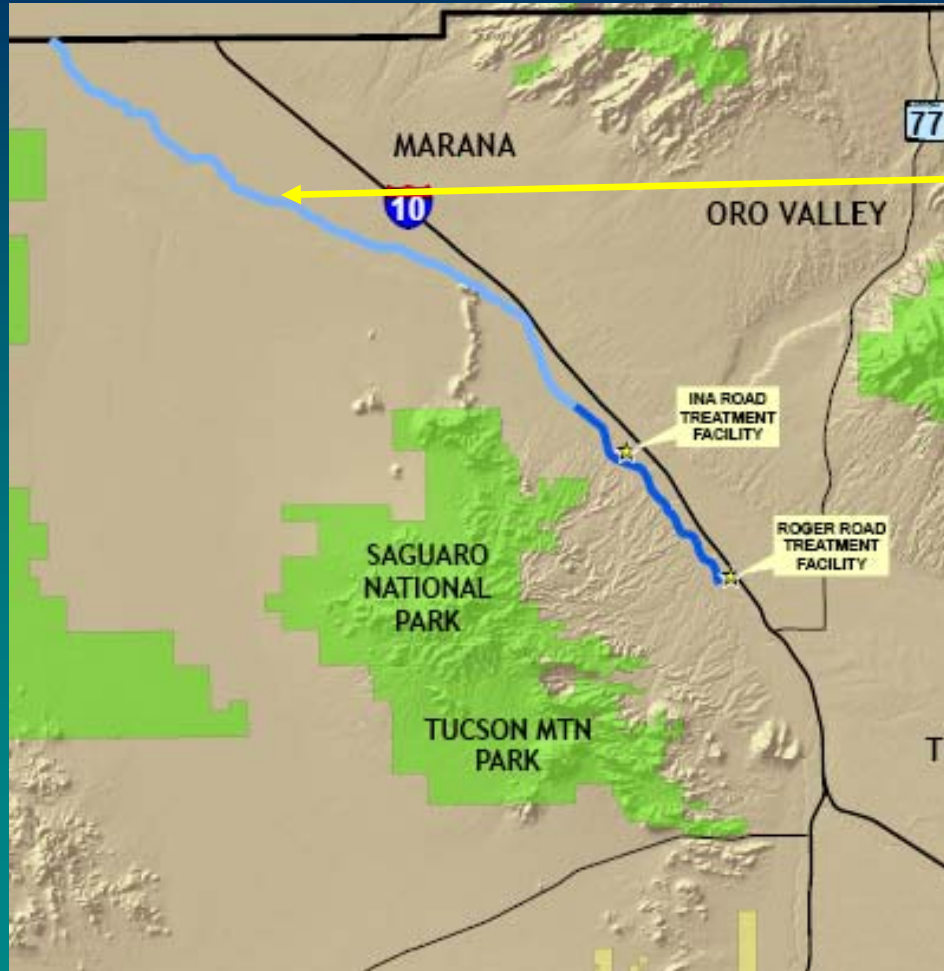
*Solution: Remove
nutrients, more solids*

*12.5 mgd improved
quality, now flowing
into river at Ina*

*Roger Road overhaul
planned*

Roger Road WWTF, looking NW

2011 Dip-netting





Treatment Upgrades

- ADEQ mandates reduction in total nitrogen and ammonia at Roger Road
- County will replace Roger Road facility and expand Ina Road treatment
- \$173 million contract
- Deadline: Jan. 30, 2015



Prospects



- Greater diversity of aquatic life
 - Macroinvertebrates
 - Native and non-native vertebrates
 - Colonization rates
- Benefits to terrestrial wildlife
- Decreased extent of “base” flows

Thanks!

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- Ross Timmons, AZGFD
- Brian Powell, Pima County
- Bill Singleton, Pima County Graphics
- Mark Probstfeld, Pima County GIS