Trends in native fishes populations in the Santa Ana River, California, 2015-2019

Larry Brown, Jason May, Marissa Wulff (USGS)
Heather Dyer, Chris Jones, Kai Palenscar (SBVMWD)
Kerwin Russell, Brett Mills (RCRCD)
• Santa Ana Sucker (*Catostomus santaanae*)
  - Benthic feeder
  - Scrapes diatoms, algae, invertebrates
  - < 200 mm in length
  - Lifespan 3-4 years

• Arroyo Chub (*Gila orcutti*)
  - Epibenthic and drift feeder
  - Algae, invertebrates
  - < 120 mm in length
  - Lifespan 3-4 years
Collaborators on Santa Ana River fish sampling

- US Geological Survey
  - Larry Brown
  - Marissa Wulff
  - Brock Huntsman
  - Dennis Steinke
- San Bernardino Valley Municipal Water District
  - Heather Dyer
  - Chris Jones
  - Kai Palenscar
- Riverside-Corona Resource Conservation District
  - Kerwin Russell
  - Brett Mills
  - Tawney Hoemke
  - Shani Pynn
- Other local/regional/federal agencies
  - Too many to name!
Motivation

• Santa Ana Sucker is a Federal threatened species and Arroyo Chub and Santa Ana Sucker are State species of special concern

• A Habitat Conservation Plan is currently being developed for the upper Santa Ana River Basin and more data are needed
Objective

Develop information on population size and distribution for Santa Ana Sucker and Arroyo Chub for the Santa Ana River

- Set HCP targets
- Understand possible effects of flow changes
- Inform habitat restoration efforts
This Talk

• How many and where are they?
• Why?
Santa Ana River study area 2015 (≈8 km)

- Rialto Drain to River
- Rialto Drain to RIX outflow
- RIX outflow to south bank
- South bank to Riverside Drive
- Riverside Drive to Mission Inn Avenue

9 cfs
40 cfs
Above RIX

Below RIX

Below Riverside Drive
Santa Ana River study area 2018 (≈8 km)

- Rialto Drain to Confluence: 9 cfs
- Confluence to RIX outflow: 40 cfs
- RIX outflow to Main Channel
- Main channel
- Riverside Drive to Mission Inn Ave.
Santa Ana River study area 2018/2019 (≈8 km)

- Rialto Drain to Confluence
- Confluence to RIX outflow
- RIX outflow to Main Channel
- Main channel
- Riverside Drive to Mission Inn Ave.

9 cfs

40 cfs

2017

2015-2016
Santa Ana River study area 2018 (≈8 km)

- Rialto Drain to Confluence: 9 cfs
- Confluence to RIX outflow: 40 cfs
- RIX outflow to Main Channel
- Main channel
- Riverside Drive to Mission Inn Ave.
Population estimates

• Set up blocknets
  • Closed population

• Snorkel twice and count fish
  • Easy, little equipment
  • Takes experience, requires good visibility and some depth

• Three-pass electrofishing (depletion estimate)
  • Expensive equipment
  • Potential to harm fish
  • Requires large team

• Snorkel only reaches
  • No block nets
Sampling
Best Estimate Population Size Suckers

![Graph showing population size of Santa Ana Suckers and Largemouth Bass from 2015 to 2019.](image)

*Photo courtesy of William Ota*
Best Estimate Population Size Chubs

- Arroyo Chub
- Largemouth Bass

Graph showing the population size from 2015 to 2019.
Hypotheses for Changes in Abundance

- **Largemouth Bass**
  - Stabilization of RIX flows may have reduced dewatering of nests and stabilized habitat for larger fish
  - No other piscivorous fishes present

- **Native fishes**
  - Predation by Largemouth Bass
  - High flows in 2019 during spawning season transported larvae out of the study area
  - Channel configuration in 2018 and 2019 has reduced habitat for young-of-year
Sucker Population by Section

2015 Santa Ana Sucker (6,802)
- Fish
- Stream length

2016 Santa Ana Sucker (7,208)
- Fish
- Stream length

2017 Santa Ana Sucker (6,424)
- Fish
- Stream length

2018 Santa Ana Sucker (935)
- Fish
- Stream length

2019 Santa Ana Sucker (4,149)
- Fish
- Stream length
Chub Population by Section

2015 Arroyo Chub (11,798)

2016 Arroyo Chub (4,862)

2017 Arroyo Chub (21,491)

2018 Arroyo Chub (977)

2019 Arroyo Chub (2,111)
Largemouth Bass Population by Section

2018
Largemouth Bass (68)

2019
Largemouth Bass (1,080)

Above RIX  Below RIX  Below Riverside Drive

Proportion

Fish
Stream length
Current Management Priorities

• Eradicate/control the Largemouth Bass population in the study area
  • Large-scale effort planned for November

• Develop strategies for reducing water temperatures above RIX

• Continue with plans to translocate Santa Ana Sucker into natural and restored tributary streams
There is still good habitat downstream of RIX

- Temperatures are better
- RIX to Riverside has the most hard substrate, gravel and cobble (sucker feeding)
- Large areas of new channel with open canopy
  - Food production (diatoms)
- Most dynamic and heterogeneous
We have a good understanding of habitat suitability in the absence of LMB

- Reach 4, in Main Channel
- Velocities acceptable
- All depths < 30 cm
- Population estimate
  - 40 suckers
  - 186 chubs
- Snorkel count
  - 15 suckers
  - 75 chubs
• Reach 6, in Main Channel (best!)
• Velocities acceptable
• Depths > 30 cm common
• Population estimate
  • 604 suckers
  • 231 chubs
• Snorkel count
  • 160 suckers
  • 100 chubs