



A REGIONAL WATER AGENCY
SINCE 1954

Enhancing Native Fish Habitat in the Santa Ana River

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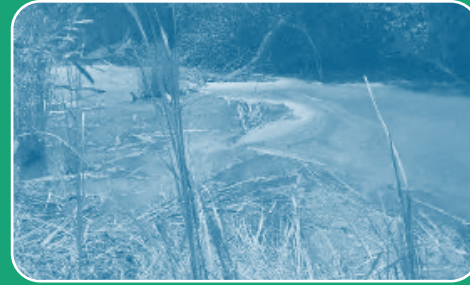
Conditions in the Santa Ana River Watershed



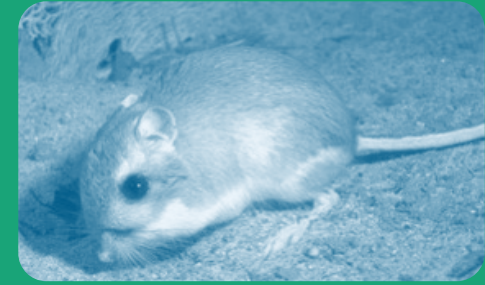
Growing
population and
need for
reliable source
of water



Coordinated
watershed
management



Degraded
ecological
conditions in
the river



Threatened
and
endangered
species

Santa Ana River Watershed Challenge

- How do we maximize the value of local water resources?
- How do we meet water supply needs while protecting the needs of a functional riverine ecosystem?



09.08.2021

**Native fishes of the
mainstem
Santa Ana River**



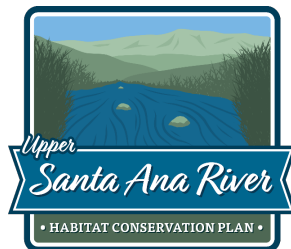
Arroyo chub
(Gila orcutti)



Santa Ana sucker
(Catostomus santaanae)

Road Map

- Upper Santa Ana River HCP
- Nonnative Aquatic Species Control Program
- Golden Mussel Monitoring

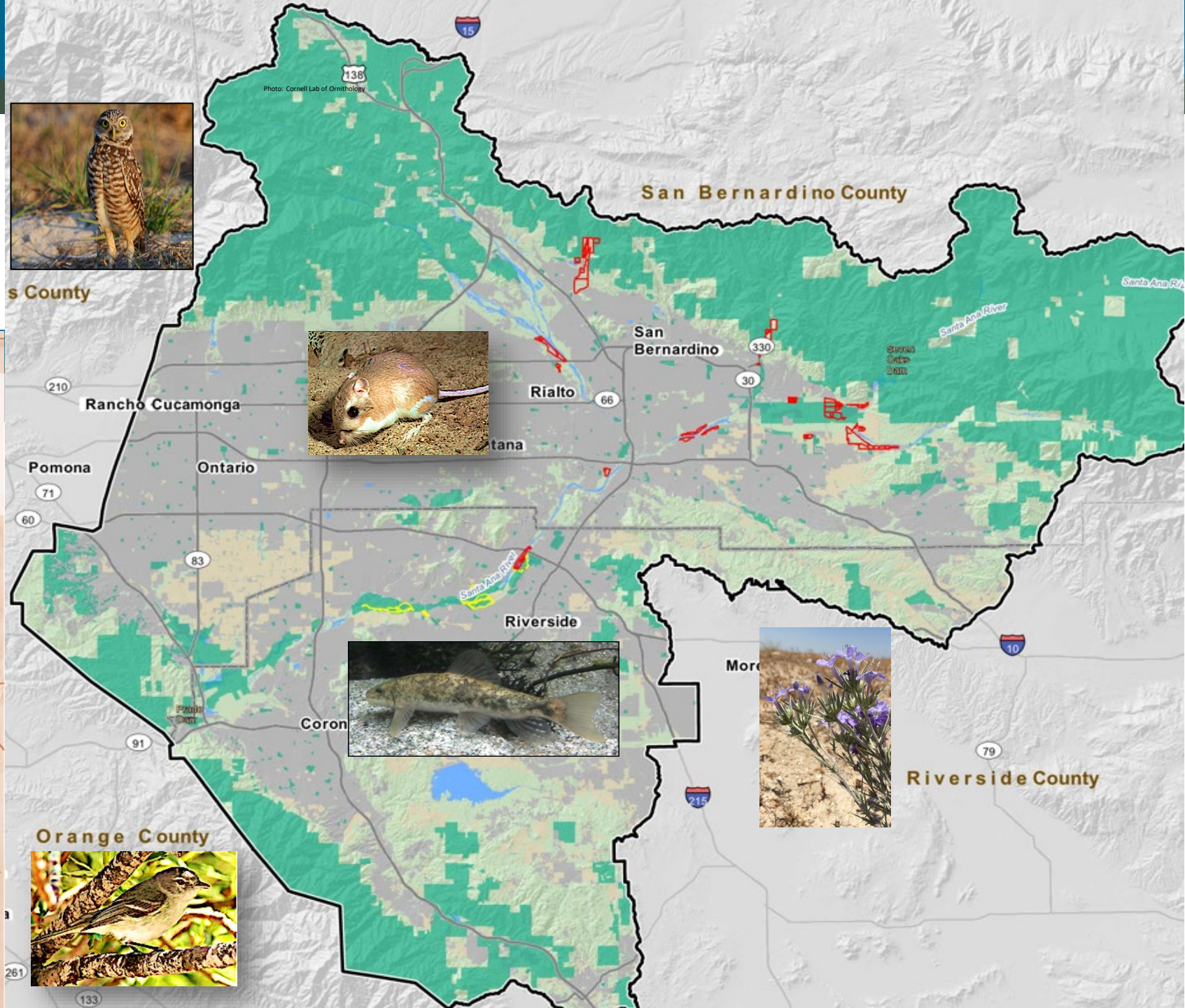


Upper Santa Ana River Habitat Conservation Plan

The bottom half of the slide features several horizontal, wavy lines in a lighter shade of blue, creating a sense of movement and representing water or terrain.



- Over 2,000 square miles
- Over 40 tributaries
- Over 6 million people



ESA Permitting for Covered Species

Plants

Slender-horned spineflower
Santa Ana River woolly-star

Fishes

Santa Ana sucker
Arroyo chub
Santa Ana speckled dace*

Amphibians and Reptiles

Western spadefoot*
Mountain yellow-legged frog
Western pond turtle*
South coast garter snake
California glossy snake

Mammals

San Bernardino kangaroo rat
Los Angeles pocket mouse

Birds

Least Bell's vireo
Southwestern willow flycatcher
Yellow-breasted chat
Western yellow-billed cuckoo
Tricolored blackbird
Burrowing owl*
Coastal California gnatcatcher
Cactus wren

Insect

Delhi Sands flower-loving fly

Fully avoided species

Arroyo toad



Photo: San Diego Zoo



Photo: RCRCD



Photo: Cornell Lab of Ornithology



Photo: SB County Public Works

HCP Benefits

Increase
regional water
supply
reliability

Local water cost
savings: \$945M

Permanent
conservation

Manage
conservation
lands, &
translocations in
perpetuity.
Provide dedicated
stream flow.

Capture &
Recharge of
~80,000 AFY

Creation of ~85
jobs annually

Protect 22
native animals
and plants

Protect 12
endangered
/threatened
species

SANTA ANA SUCKER Conservation



Conservation Actions

- Nonnative aquatic predator control
- Re-establish new populations of Santa Ana sucker
- Create/Enhance in-stream habitat





Native Fish Survey

since 2015





Various Stream Habitats





Native Fishes

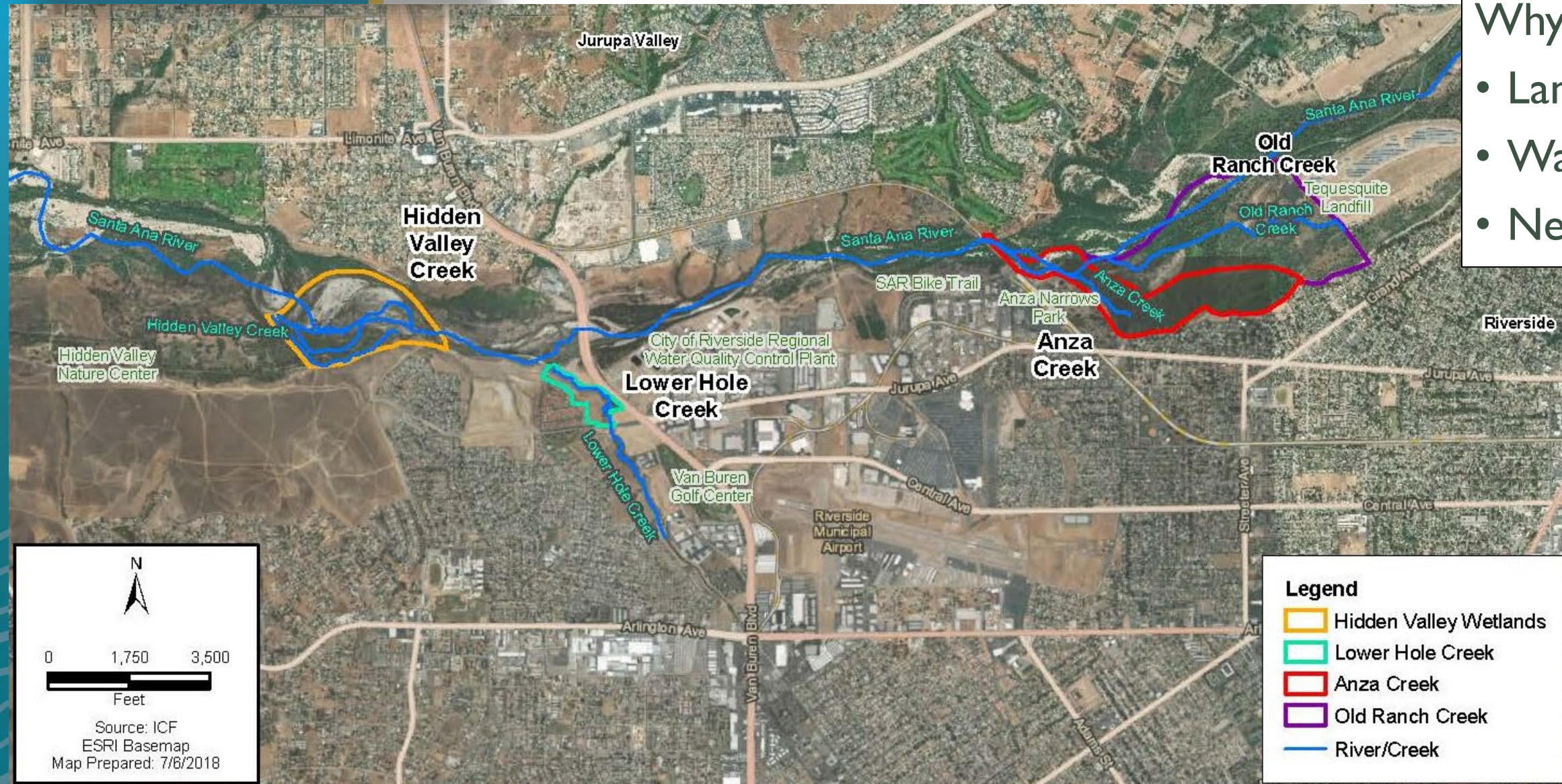




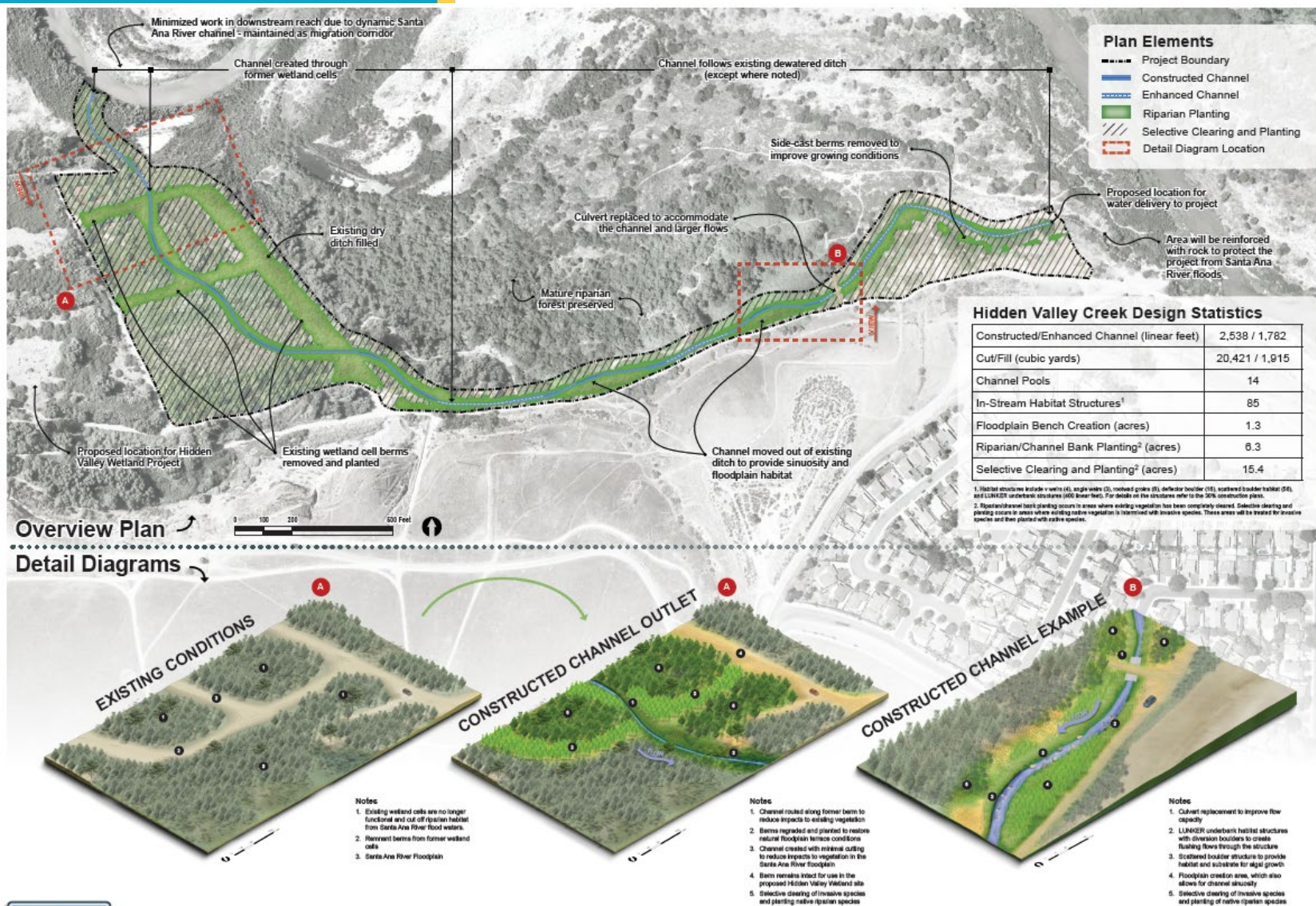
Tributary Restoration Sites

Why Here?

- Land
- Water
- Need



Design Example – Hidden Valley Creek



Nonnative Aquatic Predator Control Program





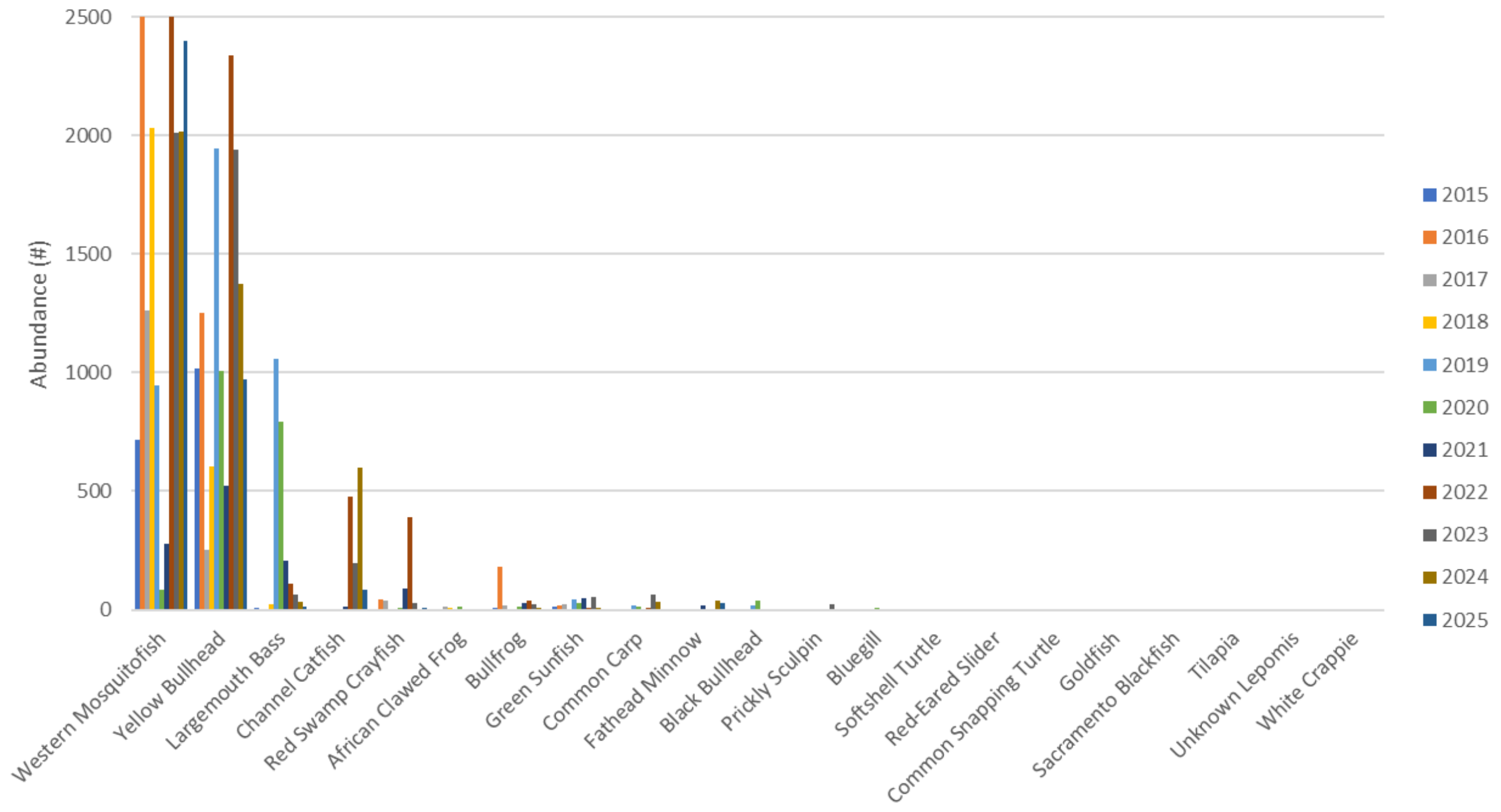
Stream Drying/Flow Modification



Electrofishing/Seining

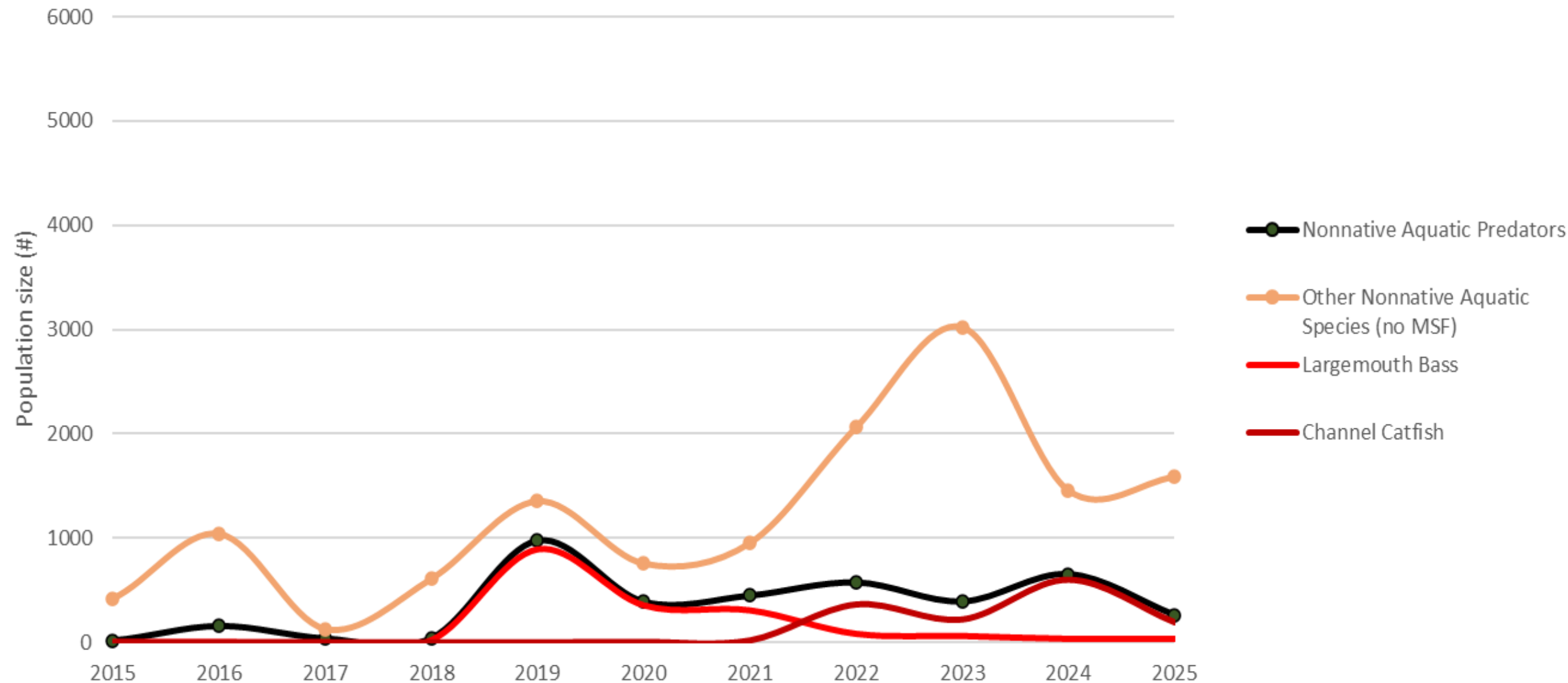


Nonnative Species Controlled in the Upper Santa Ana River



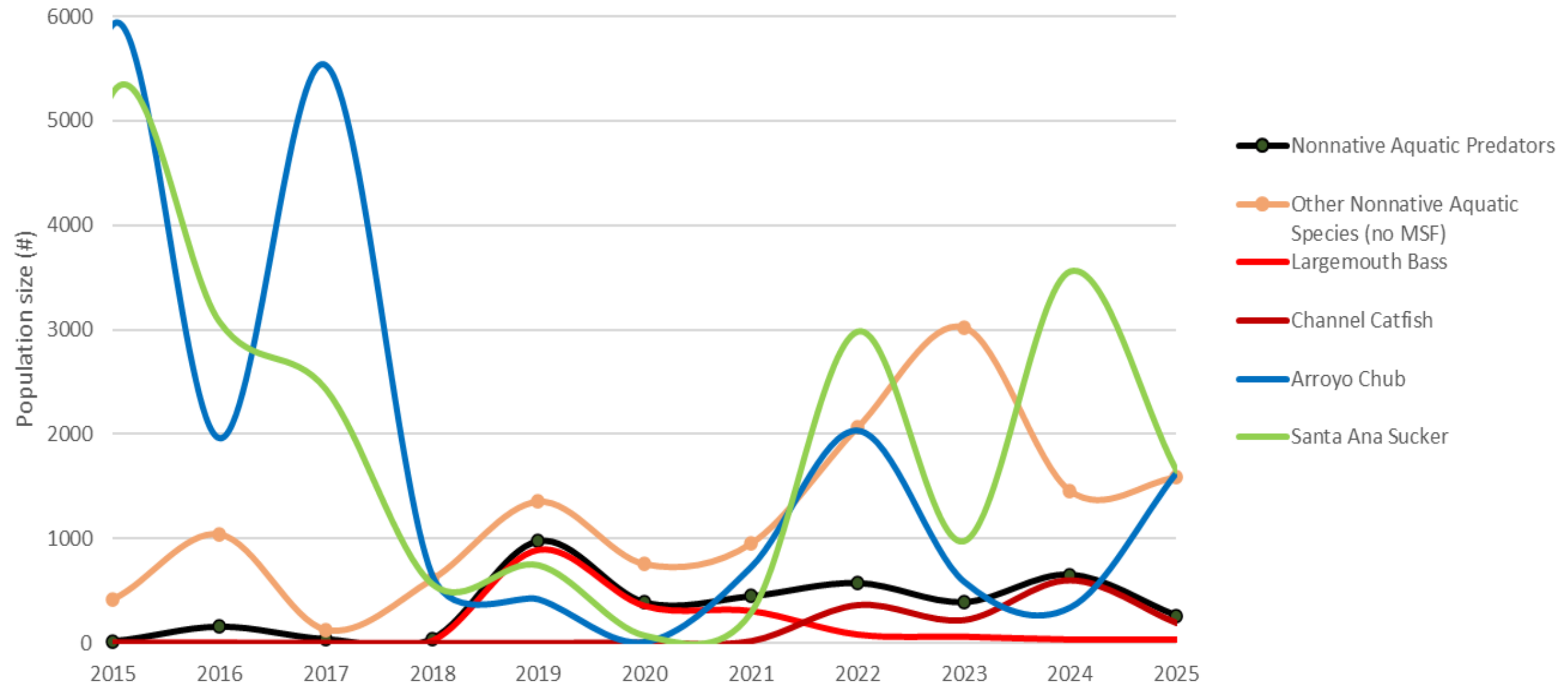
Catch Data Standardized by Effort

Catch Data for Aquatic Species in Upper Santa Ana River

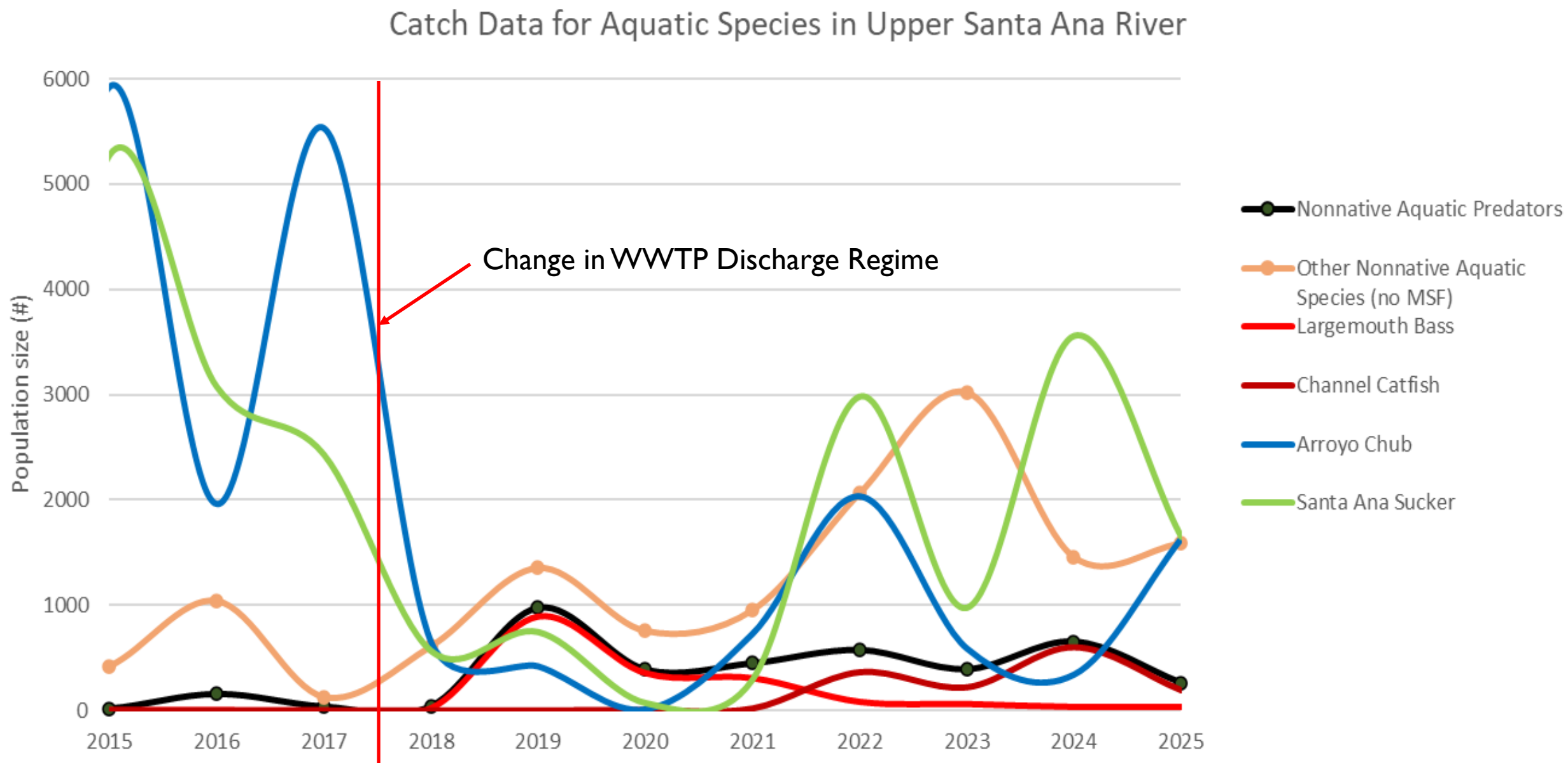


Catch Data Standardized by Effort

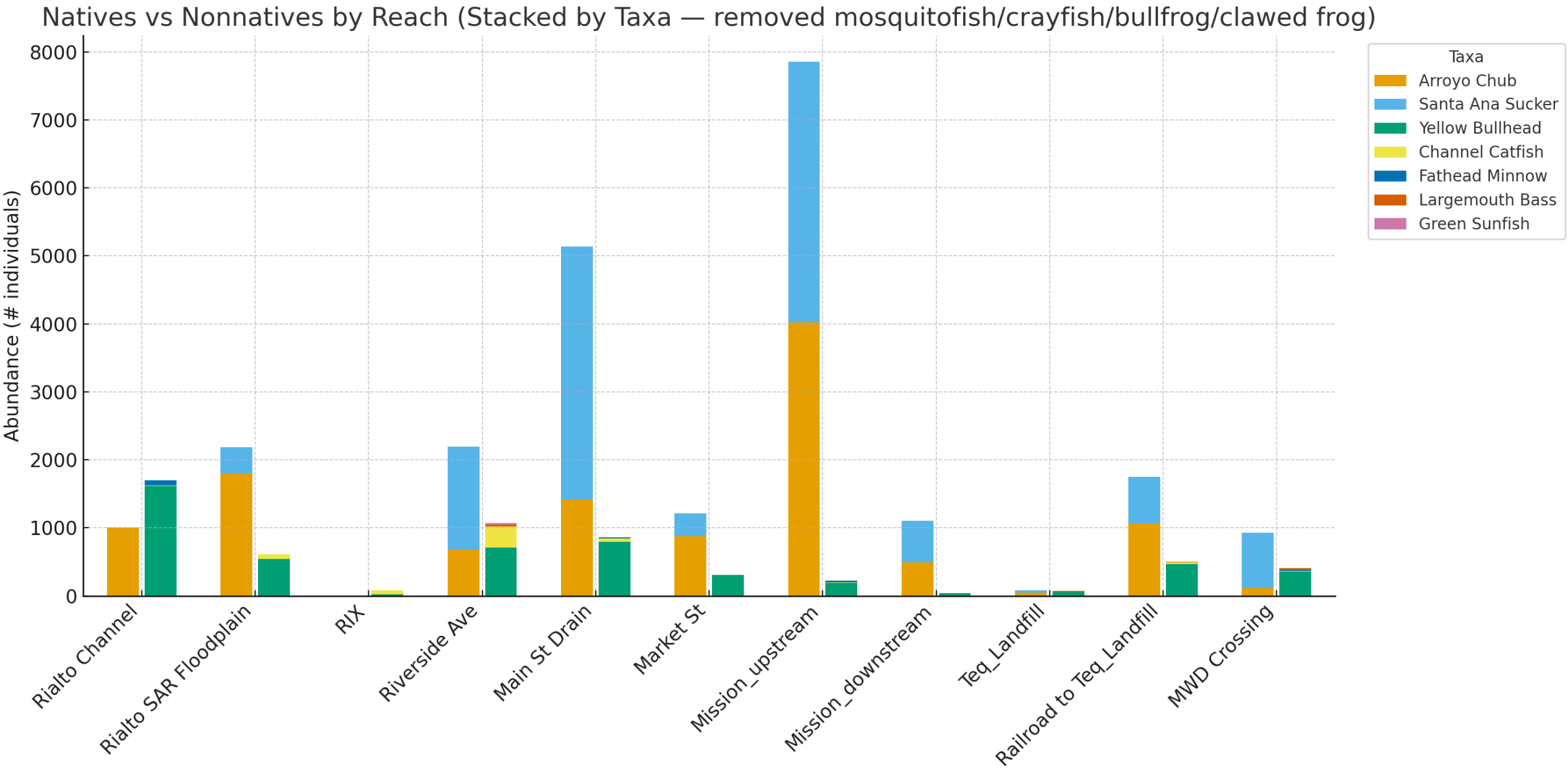
Catch Data for Aquatic Species in Upper Santa Ana River



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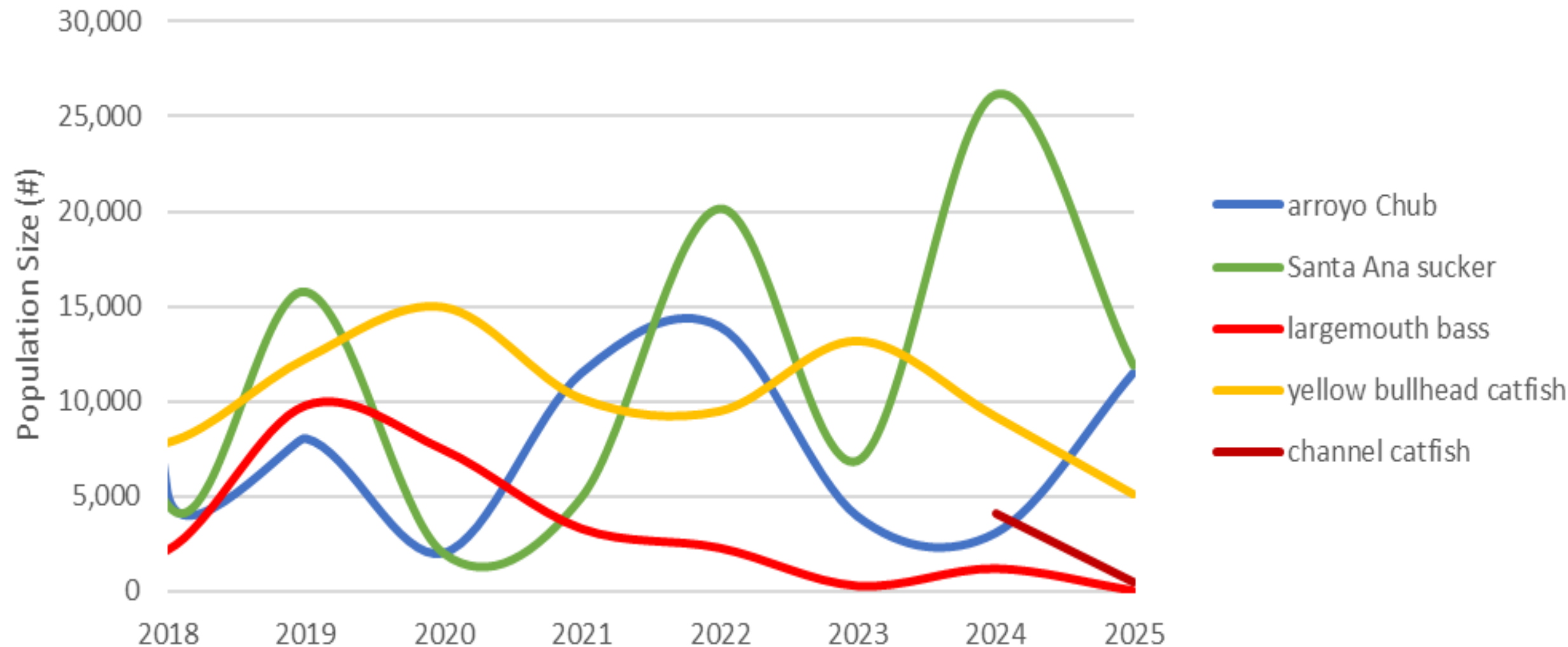


2025 Native Fish Survey Dataset



Catch Data Standardized by Effort

Fish Population Estimates in the Santa Ana River (2018-2025)



Golden Mussel Monitoring Program

- Golden Mussel Monitoring and Management Plan
 - SBVMWD is creating and will be implementing a plan within a portion of the State Water Project (Citrus Reservoir).
 - Settling Plates
 - eDNA
- Prevention of Establishment (golden mussel is upstream)
 - Earthtec (2 ppm, 100 ppb copper) is being used to treat both noxious algae and the veliger stage of golden mussel.



Photo: Great Lakes Echo, Alexander Karatayev



It takes a village!





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SINCE 1954

Questions?