

# **Lower San Antonio River Biological Indicators**

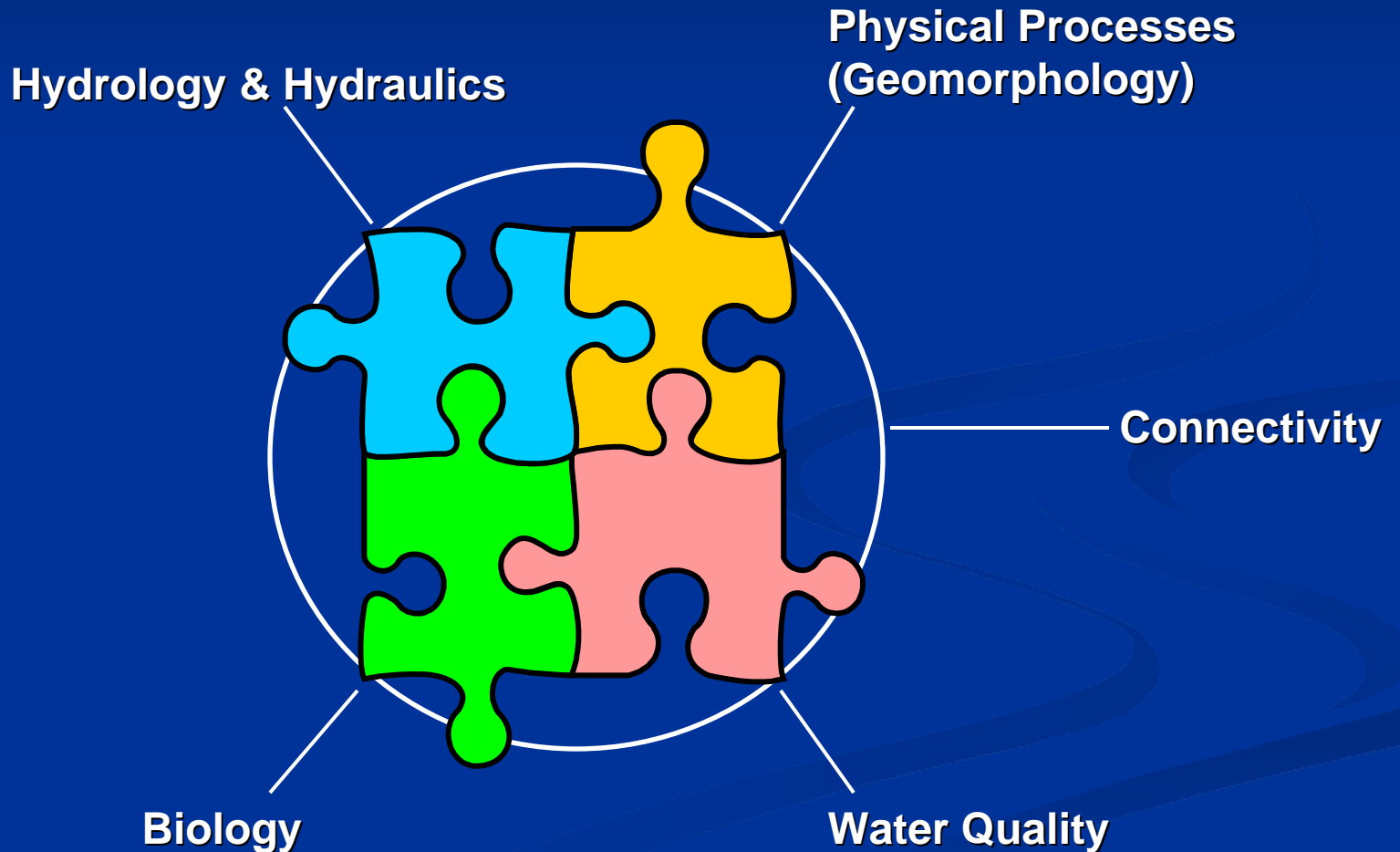
**Texas Instream Flow Program**

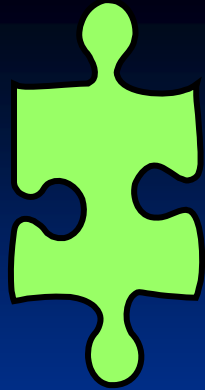
**Third Stakeholder Workshop**

**December 9, 2008**

**Floresville, Texas**

# Primary Disciplines



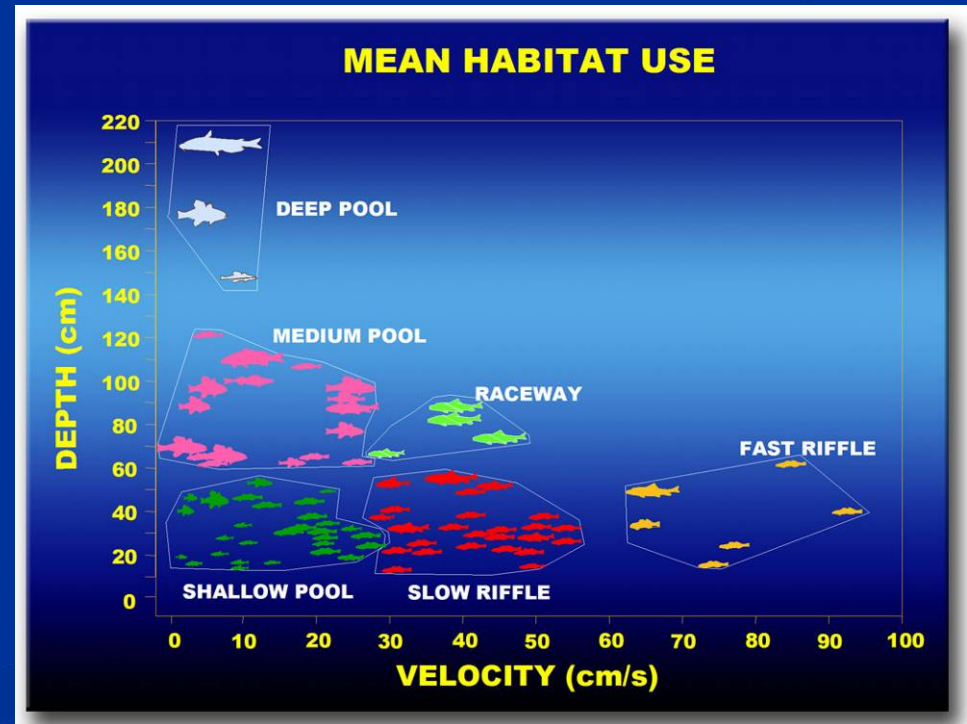


# Biology

## Biodiversity

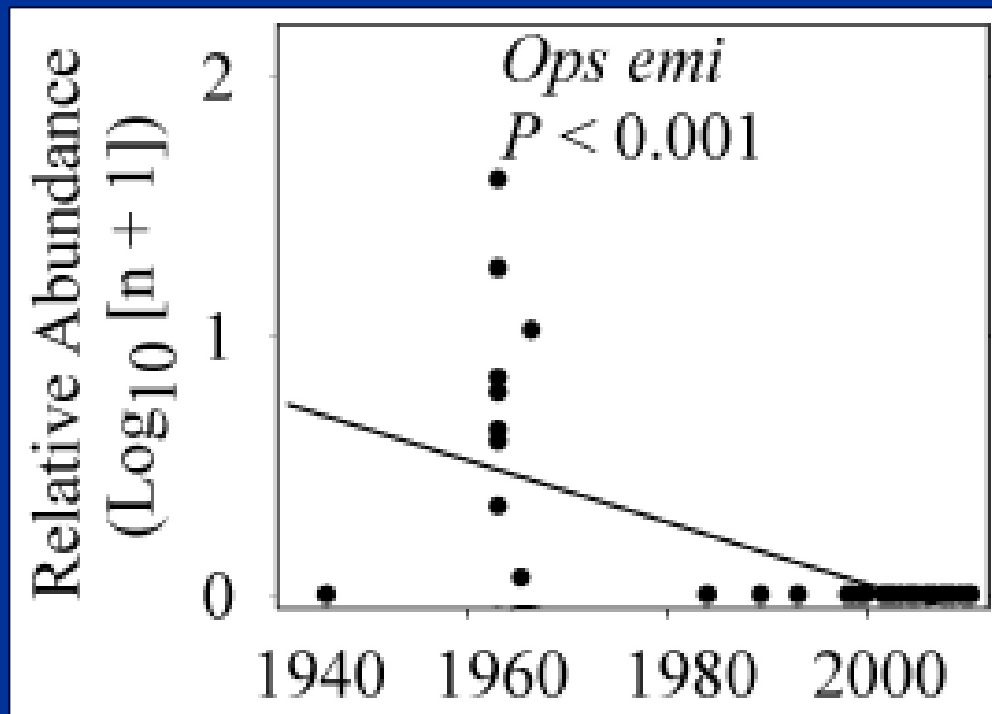


## Habitat Diversity

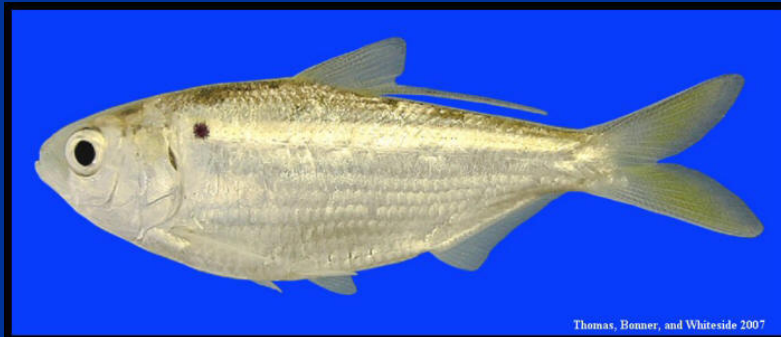


# Analysis of Existing Biological Data

Bonner, TSU  
2007



# Winners



# Losers



Thomas, Bonner, and Whiteside 2007



# Introduced Species



# Lower San Antonio River Instream Flow – Fish Collection Summary Report 2006





# Fish Sampling



# Summary

- **San Antonio River – 41 fish species  
(9 introduced)**
- **Cibolo Creek – 27 fish species  
(5 introduced)**
- **Species of interest**

# Mussel Survey

Karatayev & Burlakova, SFASU  
2007





# Mussels



# **Lower San Antonio River Biological Objectives**

**Determine and maintain flows necessary  
to support:**

- **native species and biological communities known to occur in the river and riparian zones**
- **key aquatic habitats**



# Potential Indicators

**Native Species Richness - the number of species or taxa**

**Relative Abundance – the number of organisms of a particular species as a percentage of the total community**

# Taxa

## Fishes

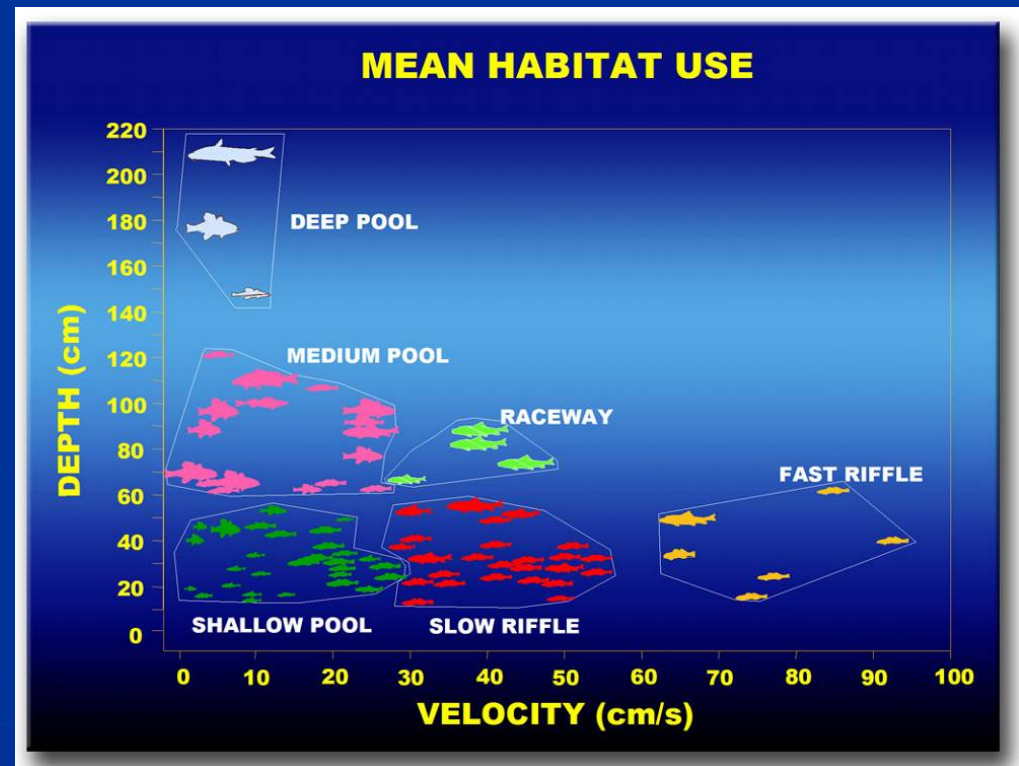
- Flow sensitive species
- Sport fishes
- Prey species
- Imperiled species
- Intolerant species

# Other Taxa

- **Benthic invertebrates**
- **River prawn**
- **Mussels**
- **River and riparian plants**
- **Other vertebrates**

# Instream Habitat

- Habitat Quality and Quantity for Key Species
- Mesohabitat Area and Diversity



# Riparian Habitat

## Vegetation

- Age class distribution of riparian plant species
- Riparian species richness and diversity
- Density
- % Canopy cover



# Riparian Habitat

## Soils

- Riparian soil types

## Hydrology

- Gradient of inundation
- Base flow levels