

Middle & Lower Brazos River Biological Indicators

Third Stakeholder Workshop

December 11, 2008

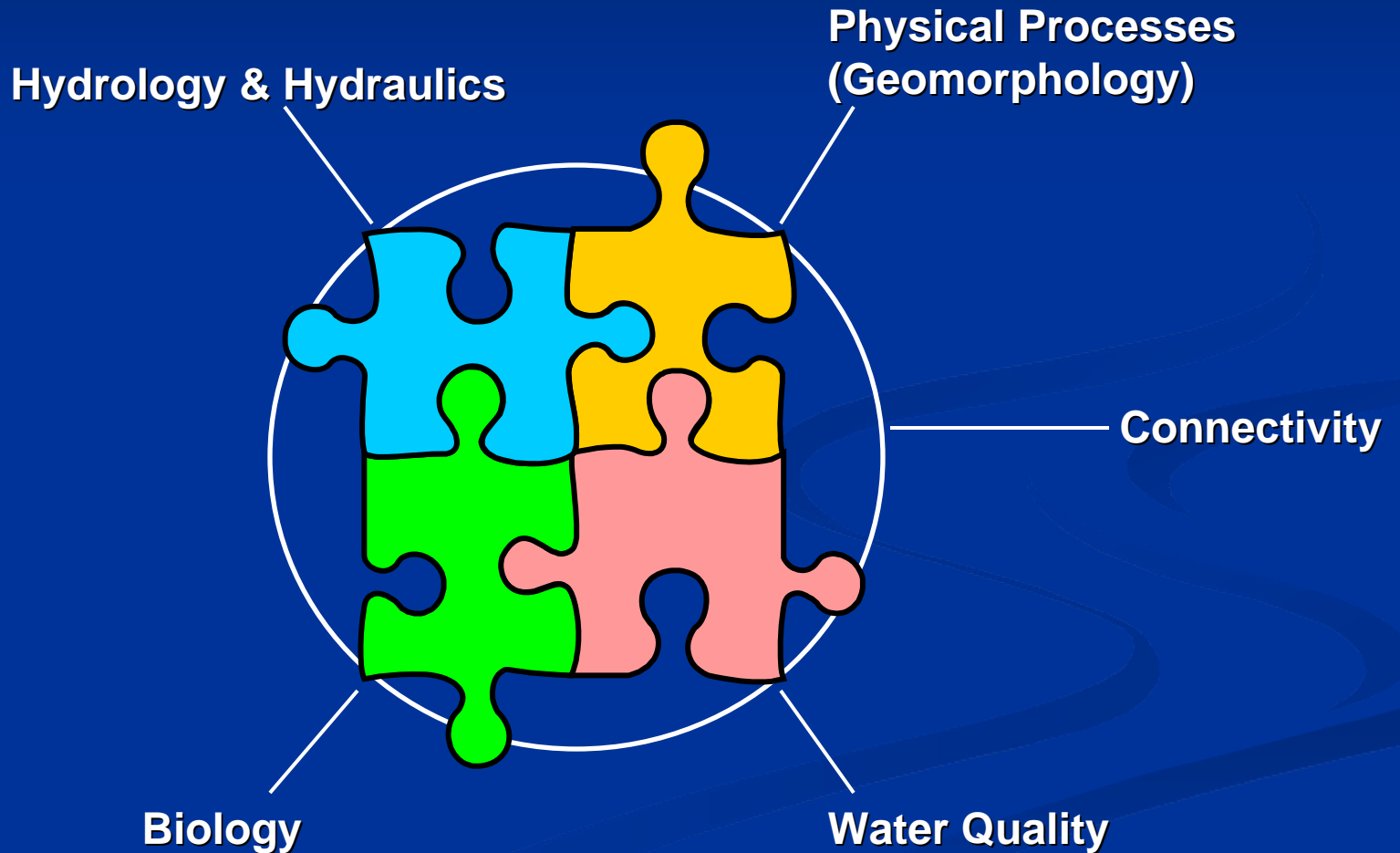
Bryan, Texas

John Botros

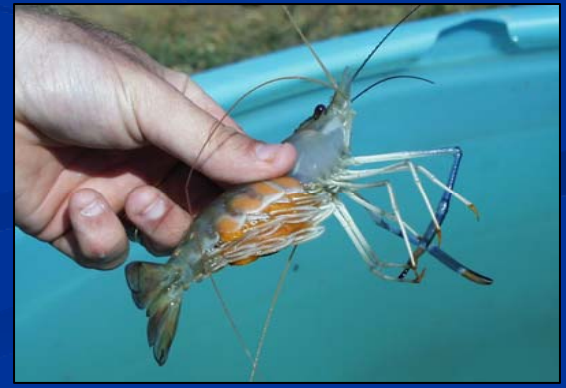
Kevin Mayes



Primary Disciplines

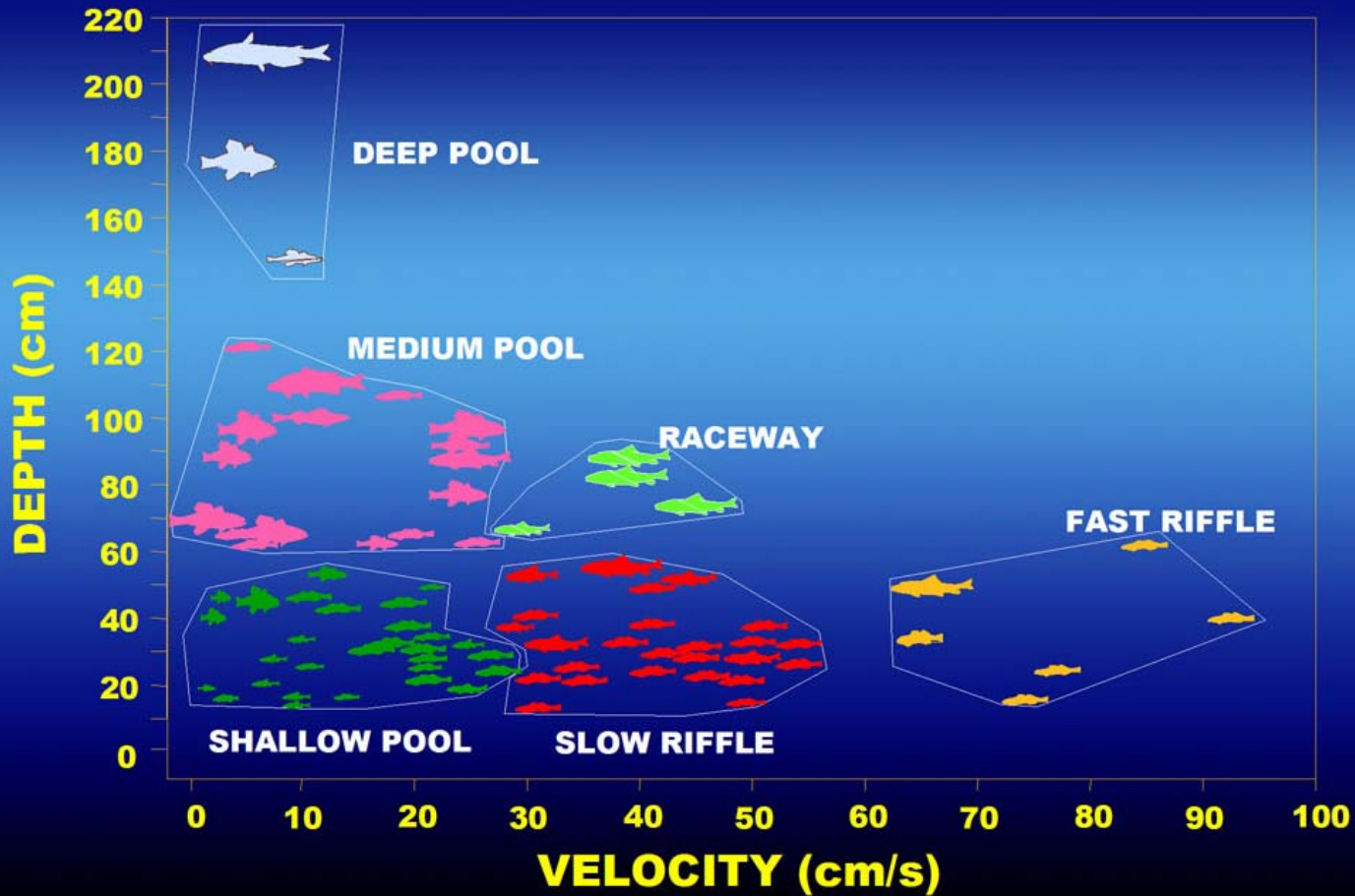


Biodiversity



Habitat Diversity

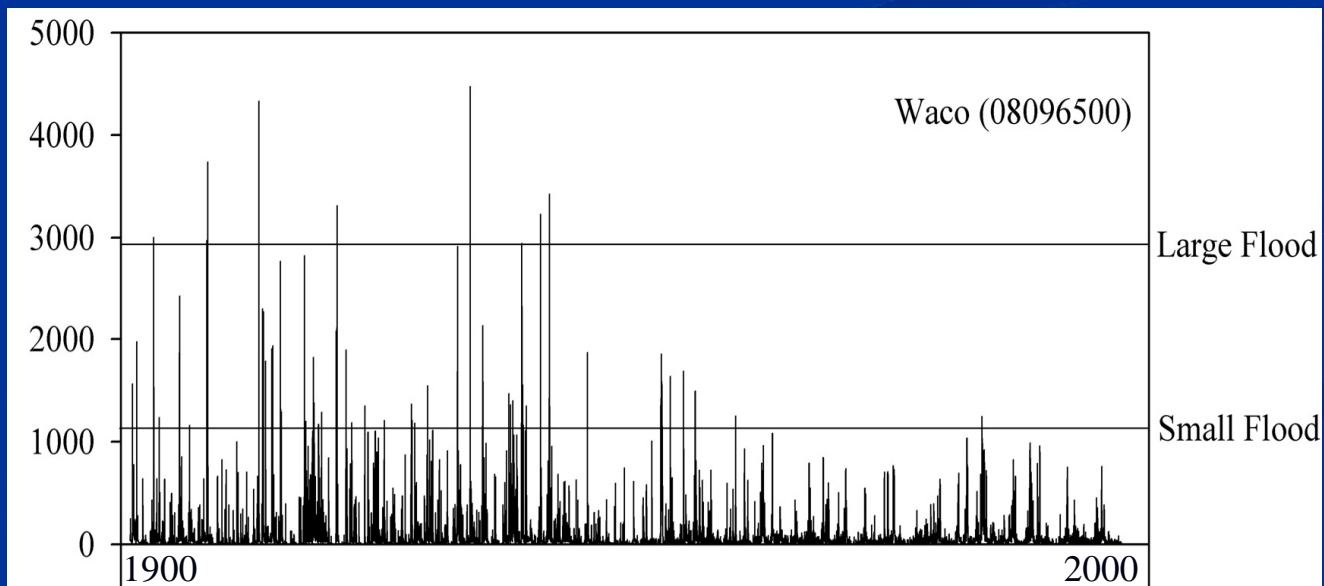
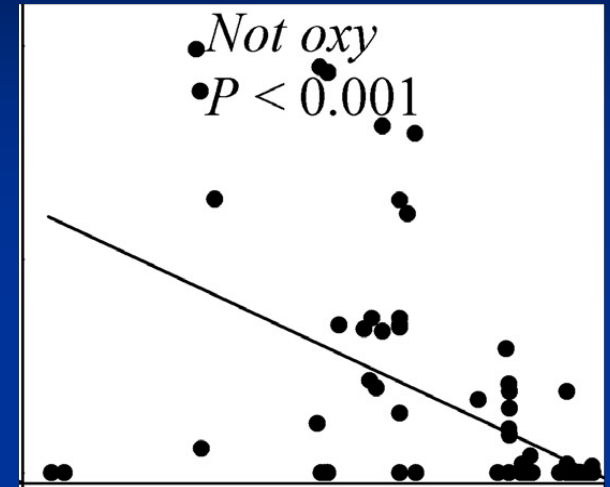
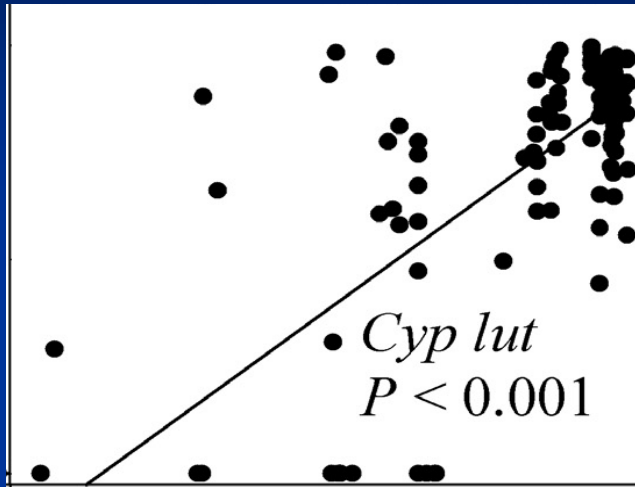
MEAN HABITAT USE



Analysis of Historic Fish Data

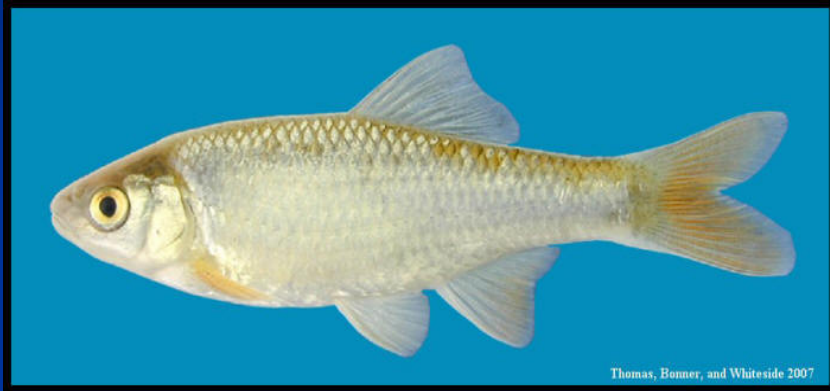
Bonner, TSU

2007

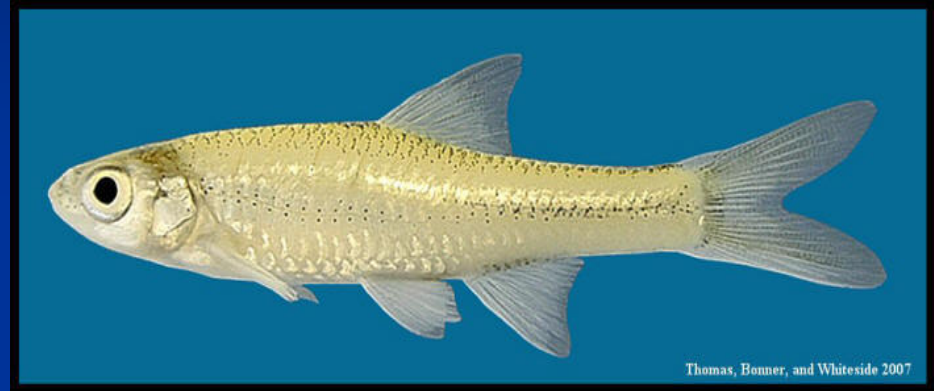


Winners

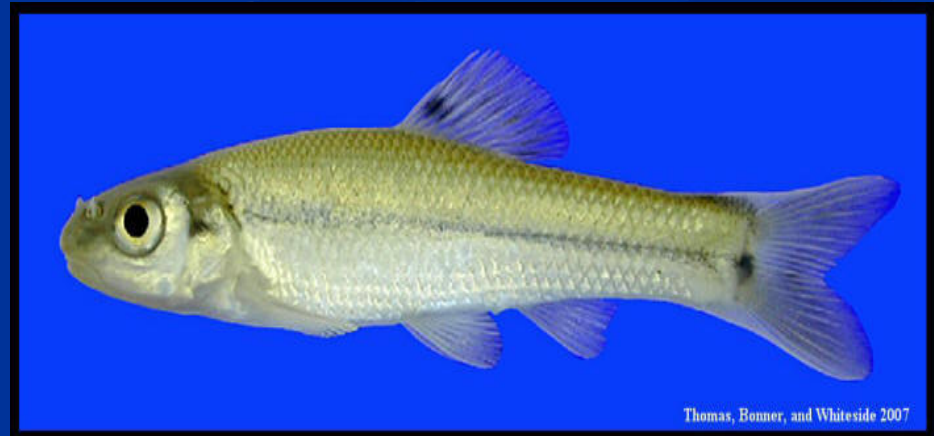
Cyprinella lutrensis – red shiner



Notropis buchanani – ghost shiner

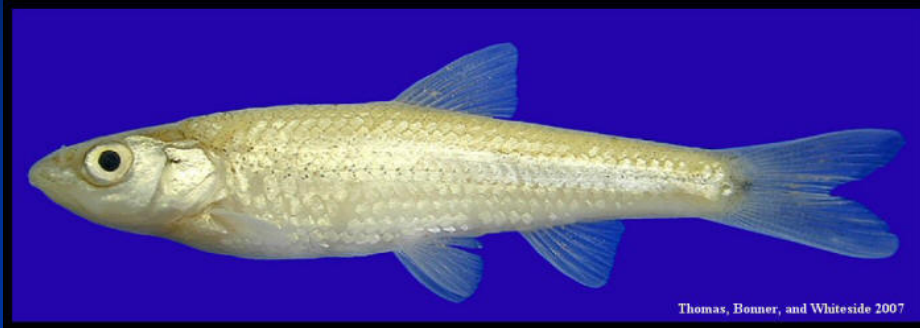


Gambusia affinis – western mosquitofish



Pimephales vigilax – bullhead minnow

Losers: Prairie stream minnows



Thomas, Bonner, and Whiteside 2007

Notropis potteri
chub shiner



Photo By Chad Thomas, Texas State University - San Marcos

Notropis oxyrinchus –
sharpnose shiner

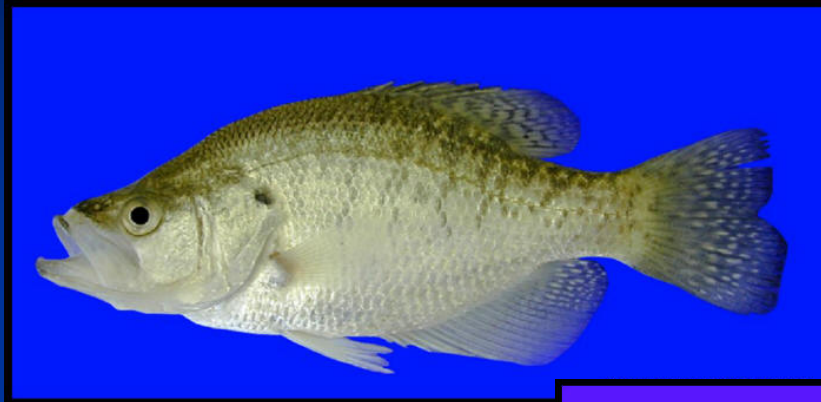


Photo By Chad Thomas, Texas State University - San Marcos

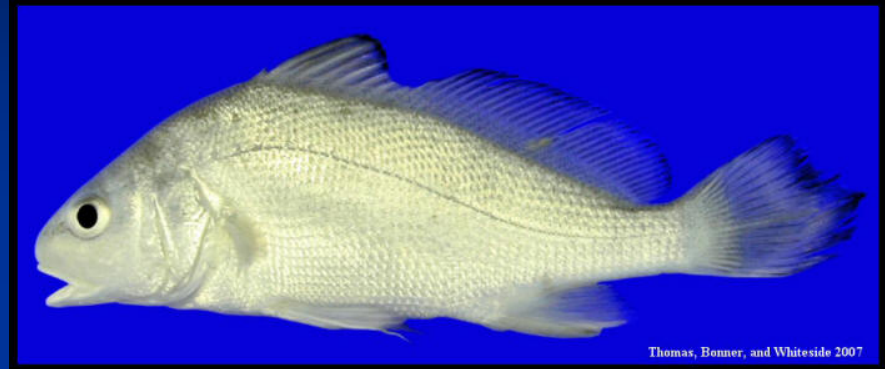
Notropis buccula –
smalleye shiner

More losers...

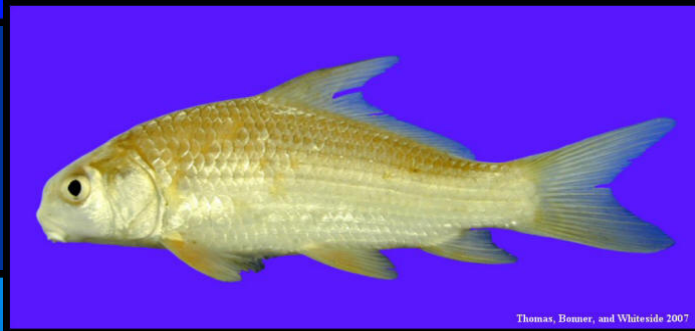
Pomoxis annularis – white crappie



Aplodinotus grunniens – freshwater drum



Thomas, Bonner, and Whiteside 2007



Thomas, Bonner, and Whiteside 2007

Carpionodes carpio – river carpsucker



Thomas, Bonner, and Whiteside 2007

Lepomis gulosus - warmouth



Thomas, Bonner, and Whiteside 2007

Ictalurus punctatus –channel catfish

Introduced Species



Pimephales promelas –
fathead minnow



Tilapia aureus - blue tilapia



Cyprinus carpio –
common carp



Middle and Lower Brazos River Instream Flow Study Fish Collection Summary Report 2006



Fish Sampling

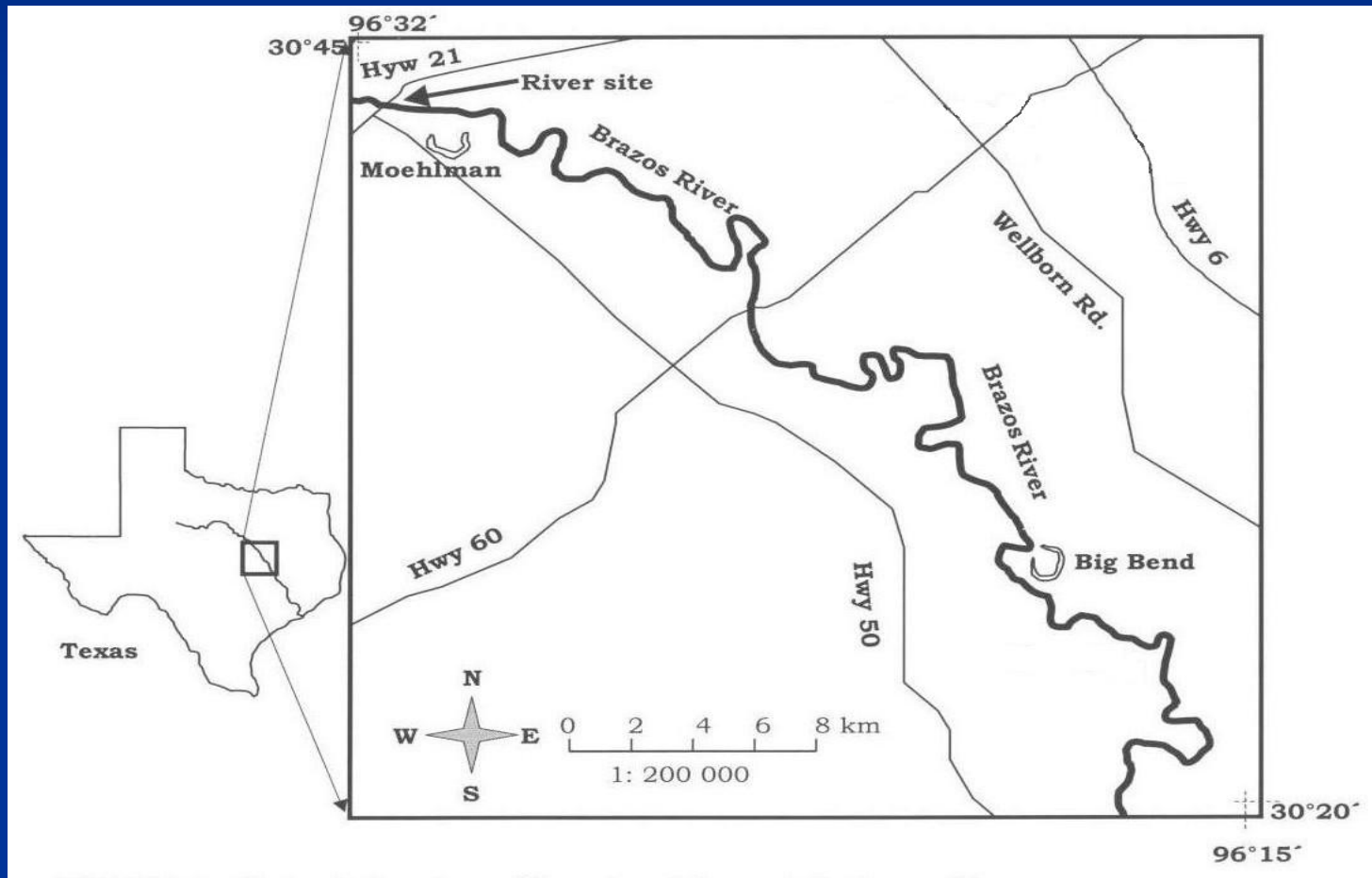


Summary of Recent Fish Collections

- **Brazos River – 44 fish species**
- **Little River – 26 fish species**
- **Navasota River – 30 fish species**

Oxbow Lake Study

Winemiller, Gelwick, & Bonner, 2004



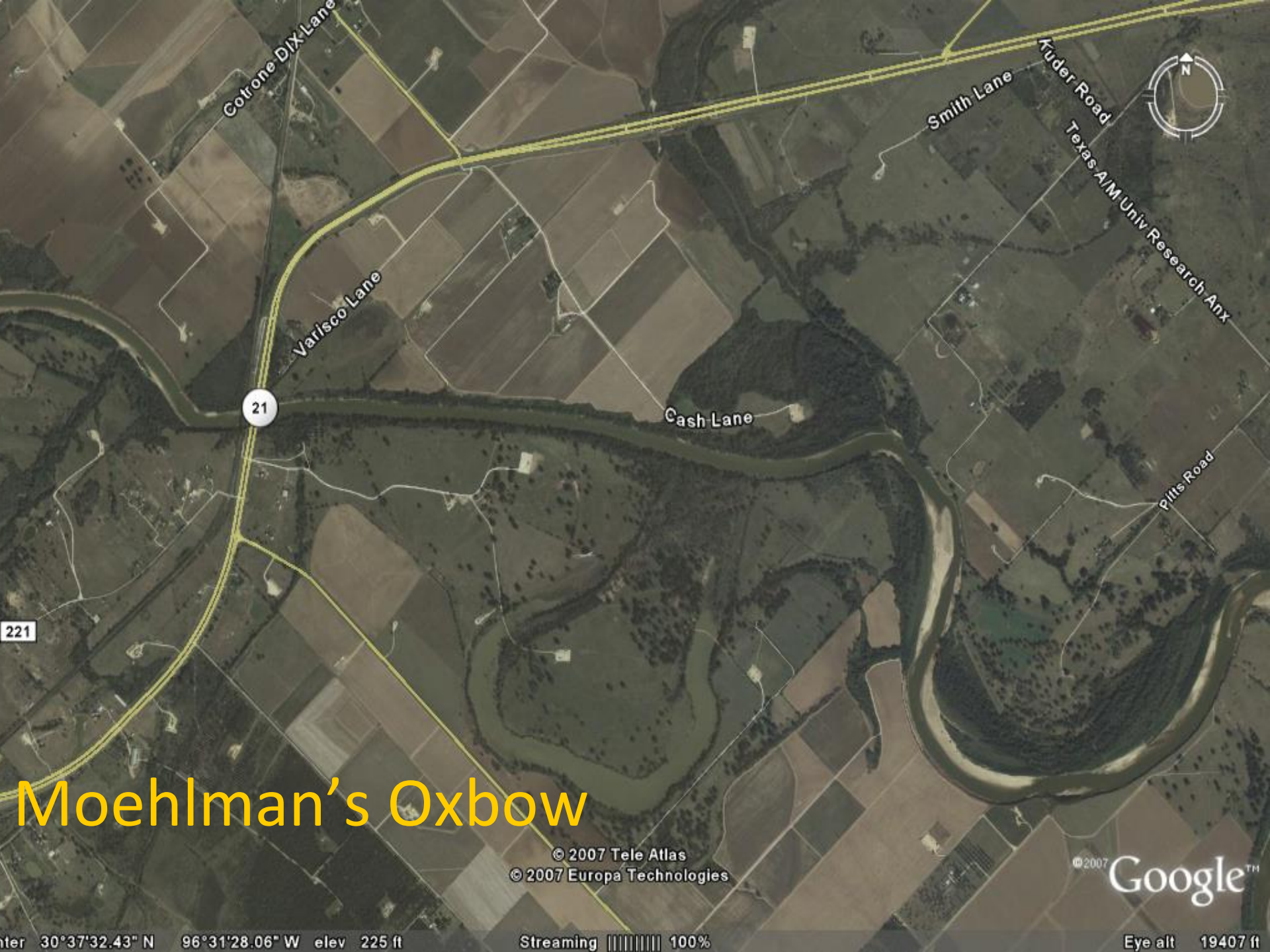
Oxbow Formation



1996



2002



Cotrone Dix Lane

Varisco Lane

Cash Lane

Smith Lane

Kruder Road

Texas A/M Univ Research Anx

Pitts Road

21

221

Moehlman's Oxbow

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ter 30°37'32.43" N 96°31'28.06" W elev 225 ft

Streaming 100%

Eye alt 19407 ft

Big Bend Oxbow

468

Windy Ryan Road

Prumino Road

Stousland Road



© 2007 Tele Atlas
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Image © 2007 DigitalGlobe

© 2007 Google™

Pointer 30°28'25.11" N 96°19'35.15" W elev 205 ft

Streaming ||||| 100%

Eye alt 13278 ft







6 1:56 PM



Mussel Surveys

Karatayev & Burlakova, SFASU 2007
Randlev & Kennedy, UNT 2008



Brazos and
tributary
drainages
contained high
diversity of
freshwater
mussel
populations

Freshwater Mussels



Middle & Lower Brazos River Biological Objectives

- **Identify and manage flow regimes for the benefit of the native ecosystem (i.e. habitat, flora, and fauna)**
- **Maintain a diverse aquatic community and prevent the extinction of native species**
- **Preserve/protect and restore/improve key habitat features for native species in river and riparian zones**

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

Potential Indicators

Fishes

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

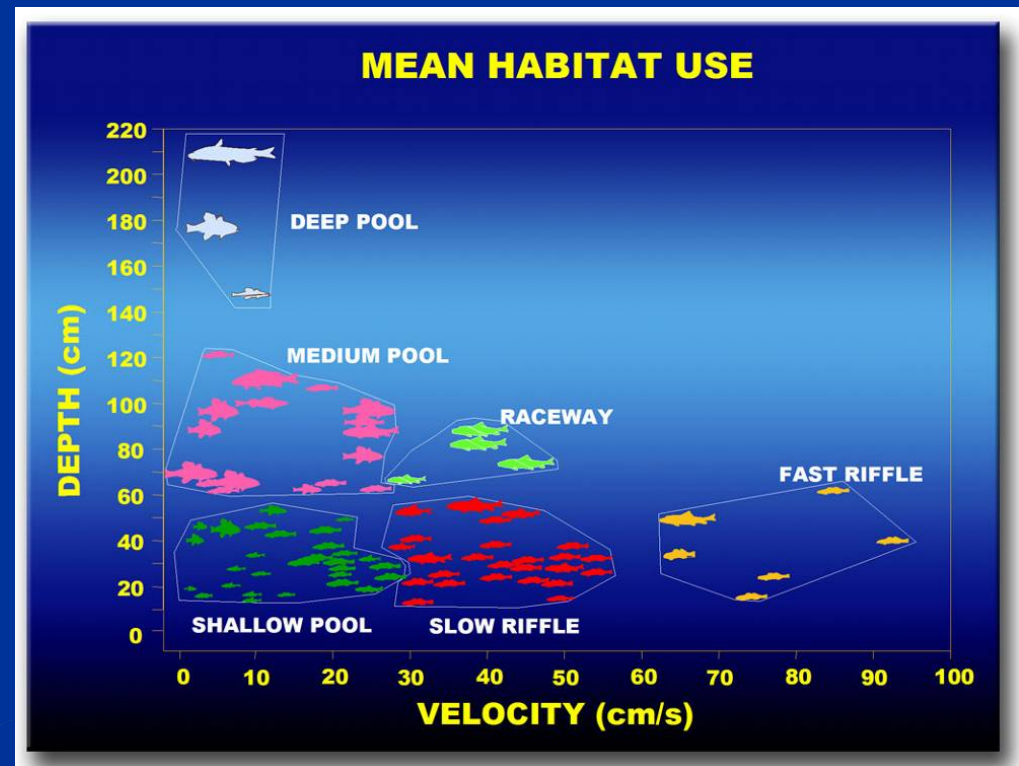


Other Potential Indicators

- 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