

Ichthyology & Aquatic Systems Management

Chris Chapa

USFWS Partners for Fish and Wildlife

Little about me...



- * Texas A&M 07' & 12'
 - * Marine Fisheries
 - * Wildlife and Fisheries Science
- * TPWD Coastal Fisheries
- * Private Consulting Firm
- * USFWS TXFWCO
- * USFWS PFW

Partners for Fish and Wildlife??

- * Mission: To efficiently achieve **voluntary habitat restoration on private lands**, through financial and technical assistance, for the benefit of Federal Trust Species



Partners for Fish and Wildlife??

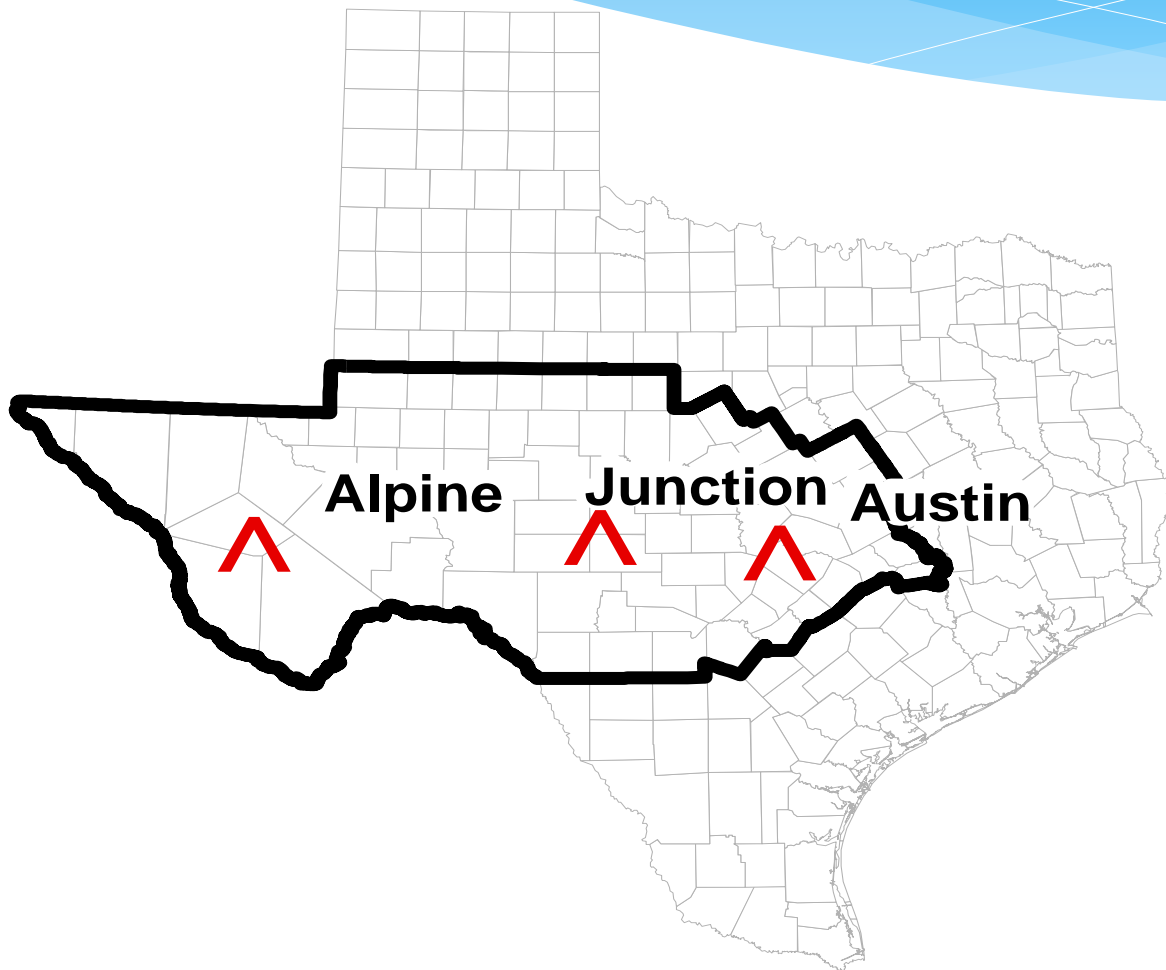
- * What do we do
 - * Offer technical/financial assistance to:
 - * Private landowners
 - * Conservation orgs.
 - * Schools
 - * State gov't, cities, and towns



Partners for Fish and Wildlife??

- * What do we do?
 - * Fund habitat restoration / enhancement projects
 - * Brush management
 - * Grassland restoration
 - * Riparian restoration and management





Alpine

Junction

Austin

Ichthyology

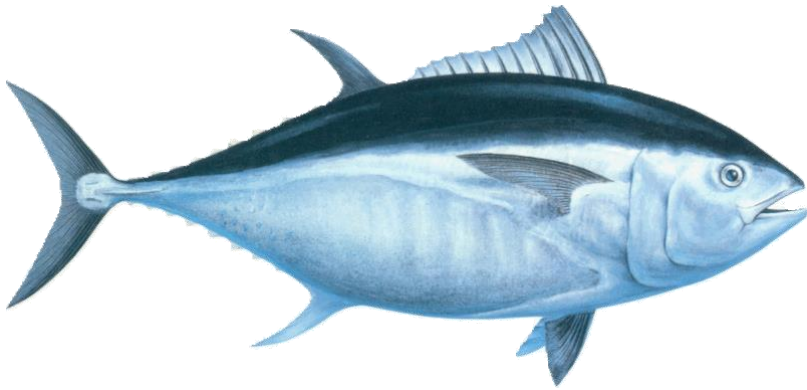
Fish are awesome!

- * 25,000 species have been described
 - * 45-50% of ALL vertebrate spp are fish
- * In Texas
 - * 871 spp!!!!!!!
 - * 268 in FW

What is a fish?

- * Poikilotherm
- * Aquatic chordate
- * With appendages (when present) developed as fins
- * Gills
- * Scales...

Exceptions to the rule



Exceptions to the rule

Australian lungfish
(*Neoceratodus forsteri*)



African lungfish
(*Protopterus annectens*)

South American lungfish
(*Lepidosiren paradoxa*)



Devonian lungfish
(*Dipterus*)



Adaptations and Cool Facts!

Thought to have been extinct
65myo

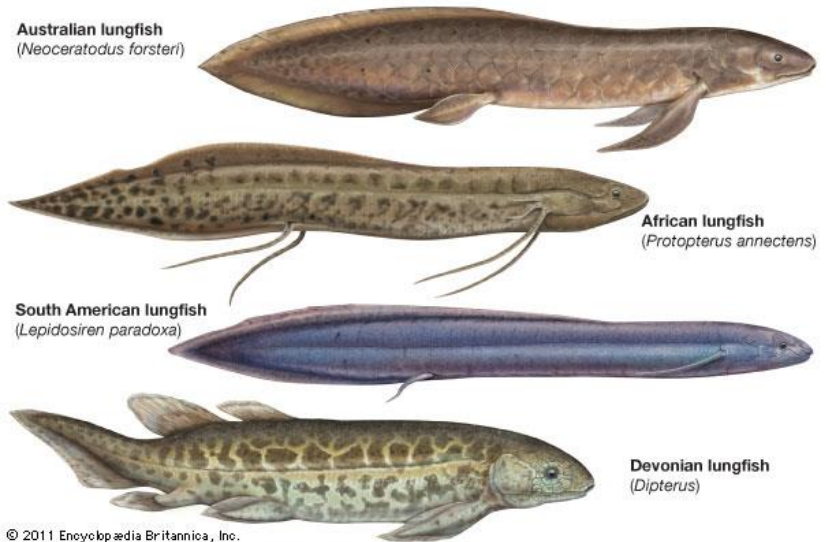
Rediscovered in 1938 in South
Africa



Adaptations and Cool Facts!

Can live in a dry state up to 4 years!

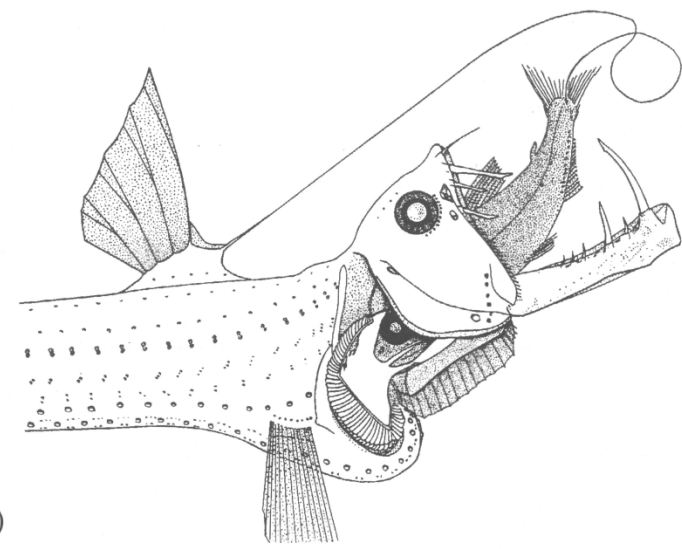
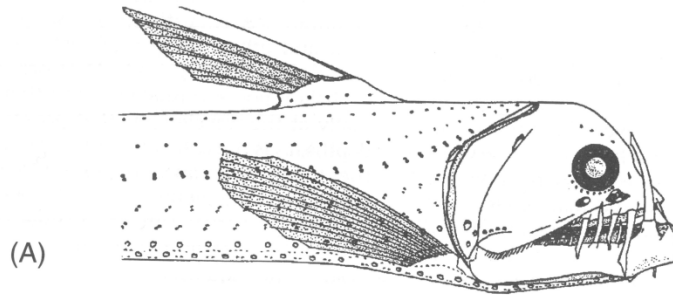
When ponds dry they go into a dormant state



Adaptations and Cool Facts!

Deep sea fishes capable of swallowing prey larger than themselves

Limited food supply



From Tchernavin 1953; used with permission.

Adaptations and Cool Facts!

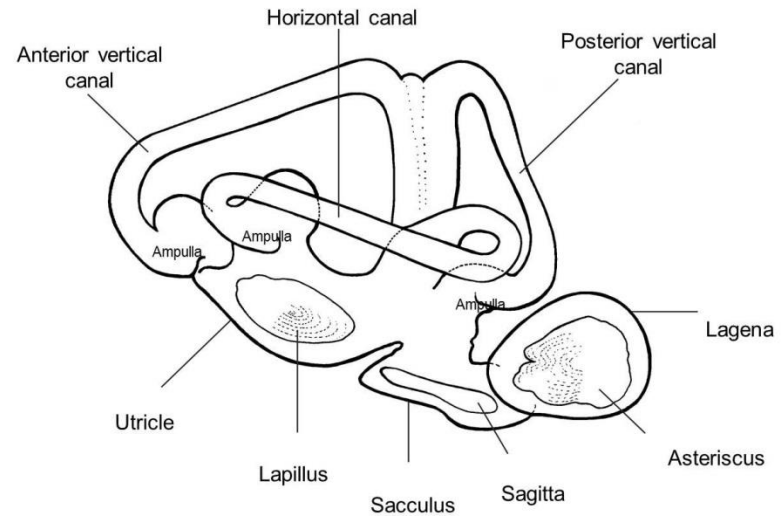
- * Lifespans vary 1 – 150 years
- * Gender change common in some species
- * Parental care varies – nest, mouth brooding, live birth
- * Detect bioelectricity
- * Produce electricity
- * Produce light

Water

- * Water Density
- * 800 x more dense than air
 - * Buoyancy – little to no gravity effect
 - * More force to be exerted
 - * Influences body shape
 - * Large proportion of body is muscle
- * Incompressible
- * Locomotion becomes displacement
 - * Produces turbulence and drag
 - * Detectable
 - * Sense of touch
- * Suction feeding
- * Forceful ventilation

Water

- * Sound moves further and faster – 4x faster
- * All fish can hear!
- * Body is the same density as water sounds waves pass through

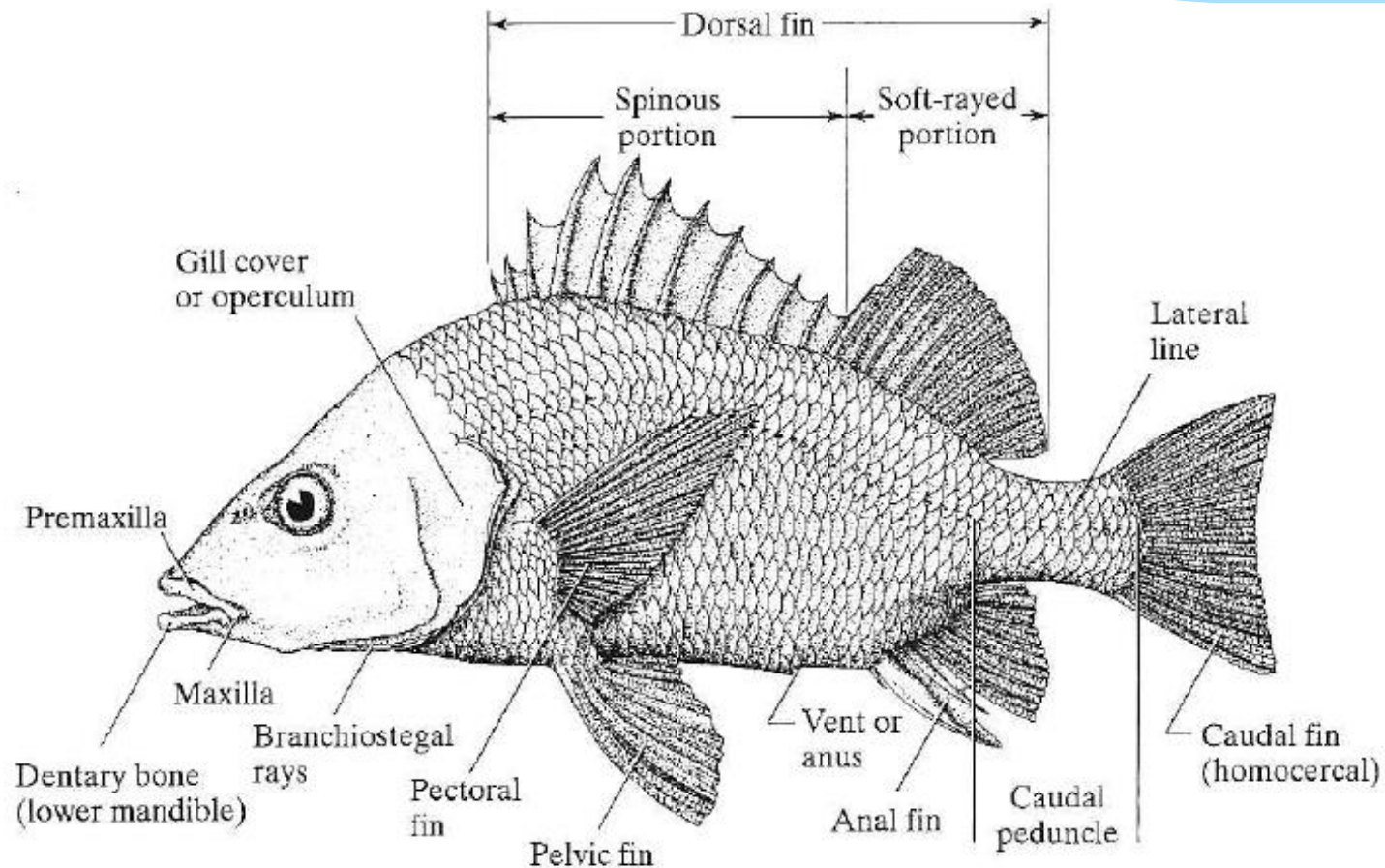


Water

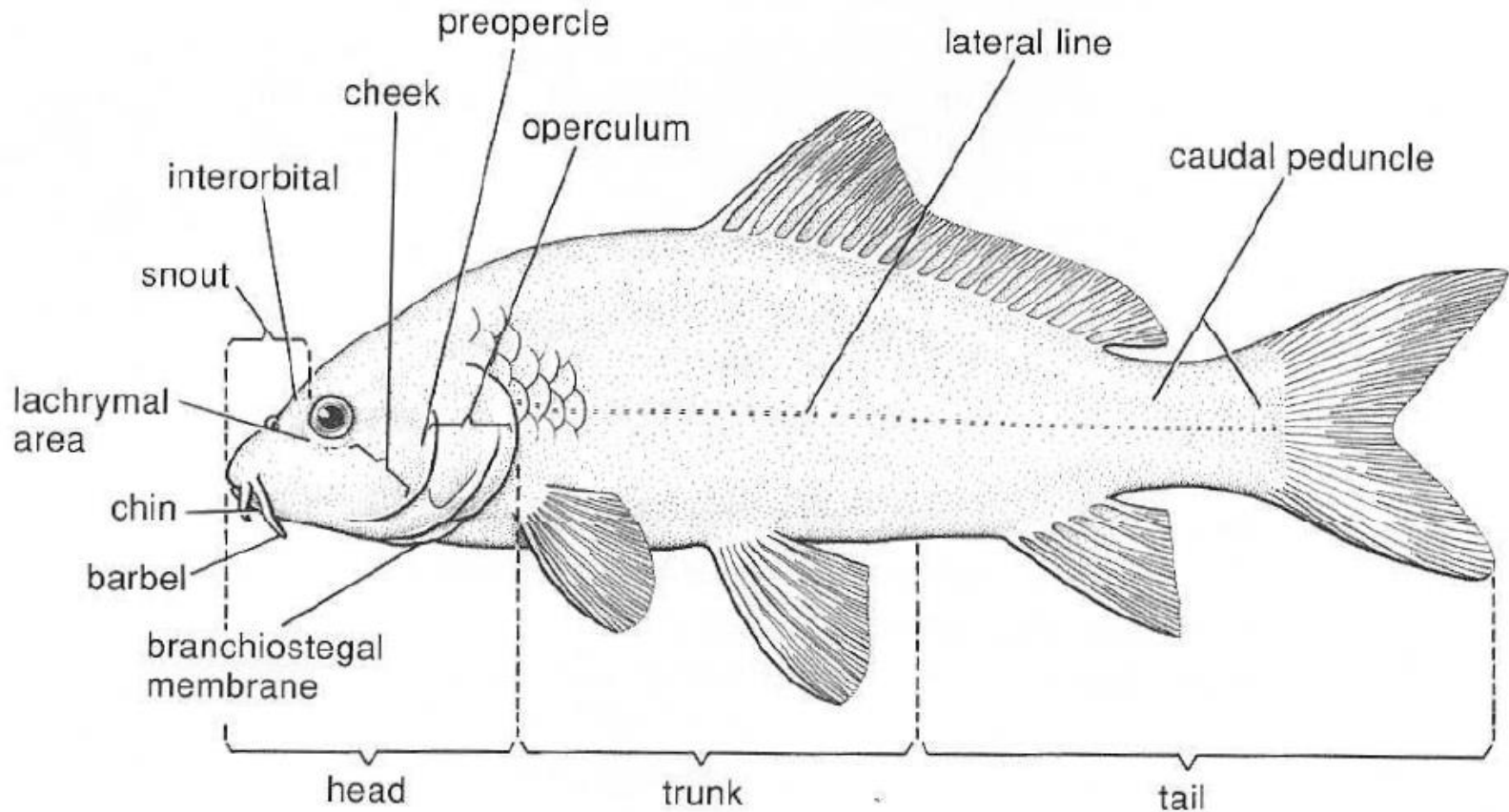
and in this case Freshwater

- * 41% of all the worlds spp of fish live in FW
 - * FW comprise only 0.0093% of all the water on the planet
 - * NEARLY HALF OF ALL THE FISH SPP LIVE IN LESS THAN 1% OF THE WORLDS WATER SUPPLY
 - * WHY?

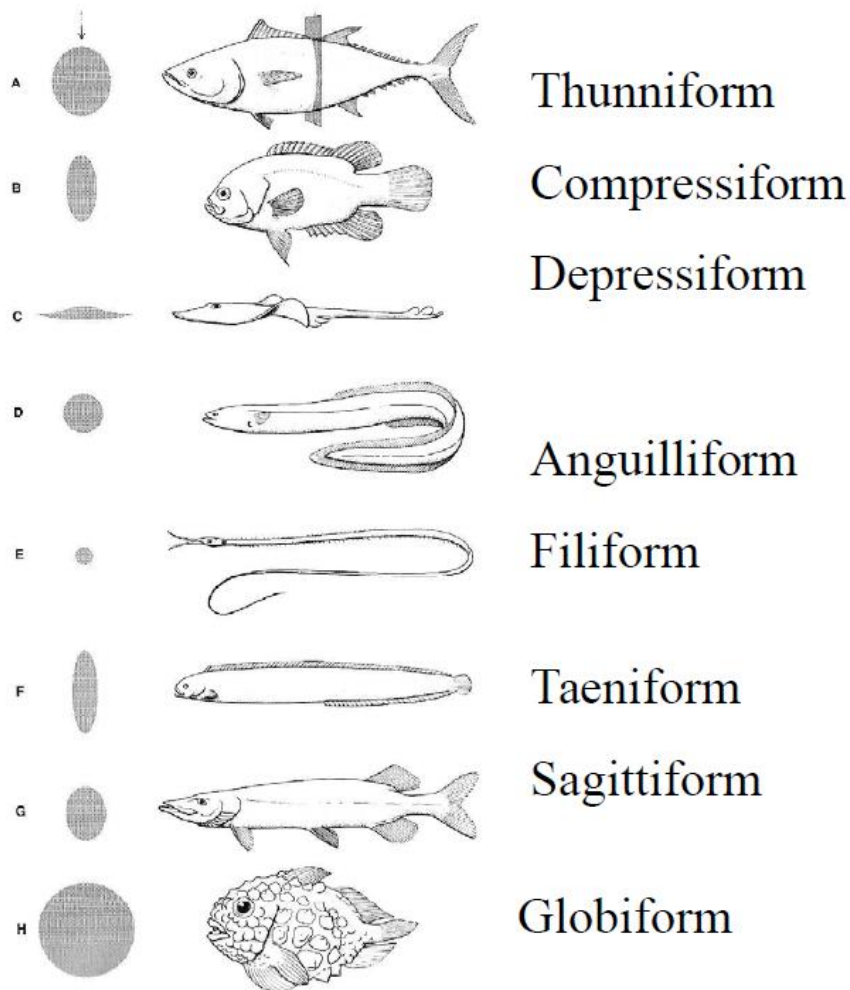
Morphology



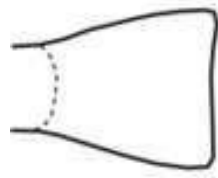
Morphology



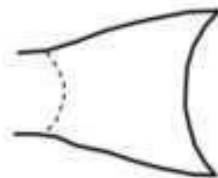
Morphology



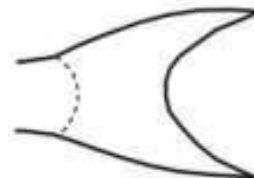
Morphology



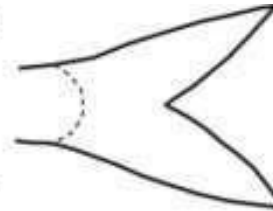
Truncate



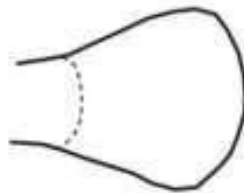
Emarginate



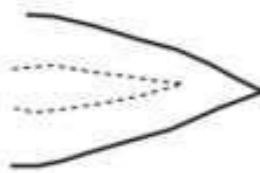
Lunate



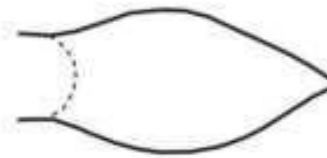
Forked



Rounded

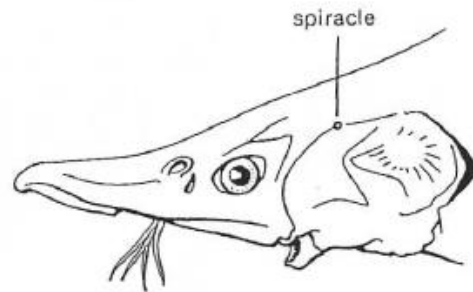


Pointed and continuation
from dorsal and anal fin

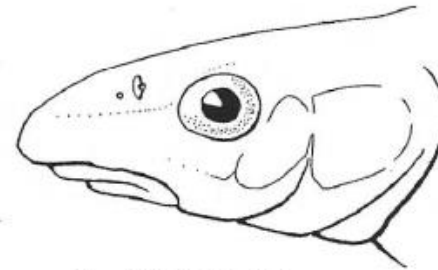


Pointed and apart
from dorsal and anal fin

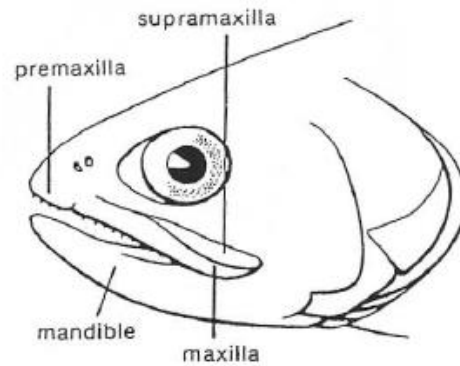
Morphology



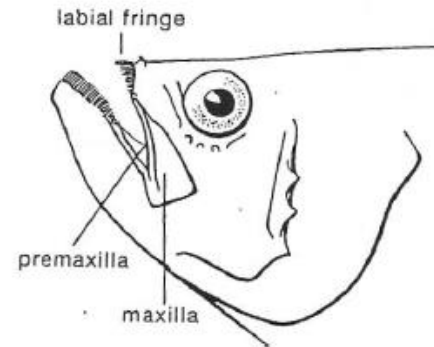
A INFERIOR



B SUBTERMINAL



C TERMINAL

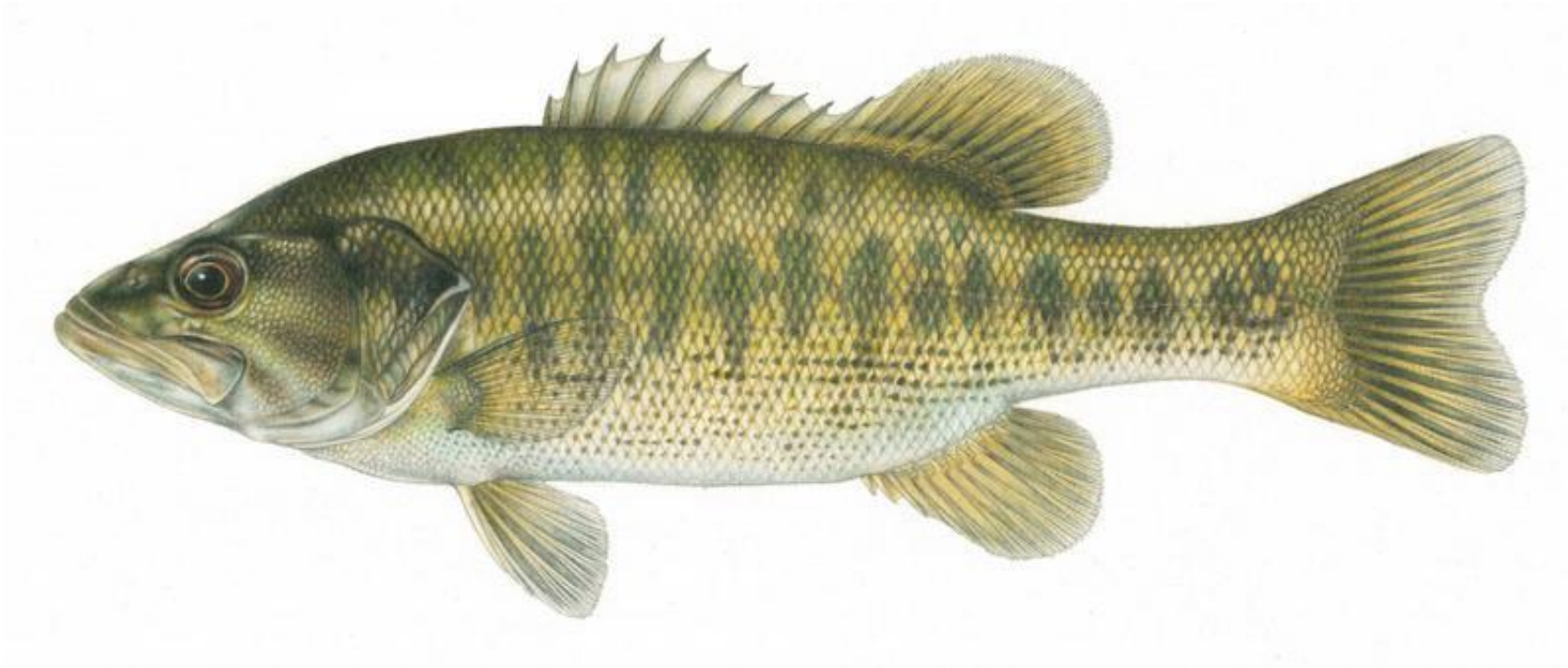


D SUPERIOR

Texas Fishes!

- * 268 species in TX FW
- * Common Families to TX?
- * Familiar with dichotomous keys?
- * How many species can you name?

Centrarchidae



Centrarchidae

Two crappie in TX

Whats the difference between
the two?



What about perch?



Thomas, Bonner, and Whiteside 2007



*



Thomas, Bonner, and Whiteside 2007

Moronidae

- * Temperate Basses
 - * More closely related to:
 - * Snooks
 - * Sea basses
- * Exciting time of year!



Thomas, Bonner, and Whiteside 2007



Thomas, Bonner, and Whiteside 2007

Ictaluridae

- * Unique family
- * Barbels
- * Flat head
- * Scale-less!
- * Easily recognized

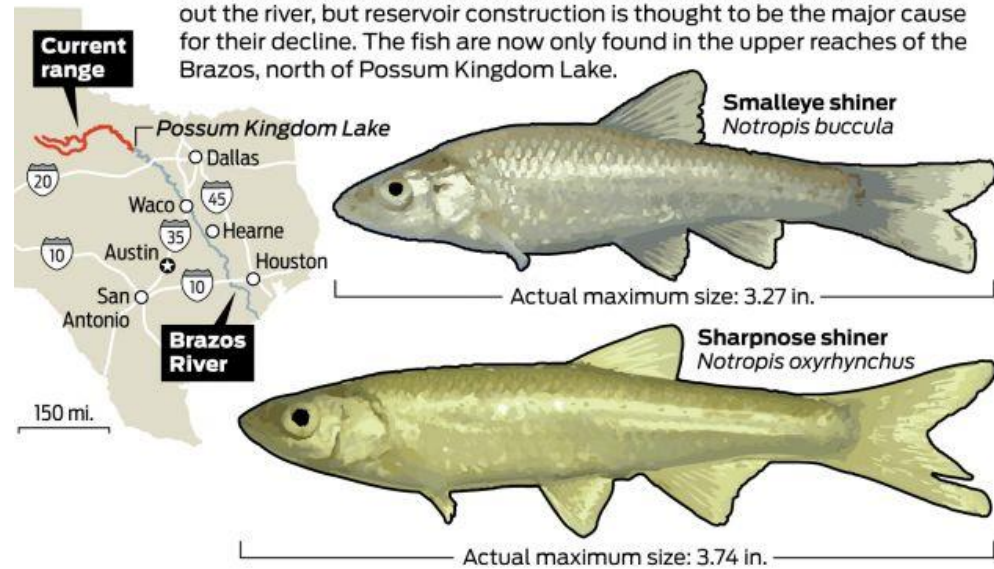


T&E

- * 34 state listed or federally listed spp
- * 11 minnows
- * 6 Gambusia
- * 2 blind catfish

Endangered shiners

The smalleye shiner and sharpnose shiner are two small, silvery minnows native to the Brazos River. Historically, both occurred throughout the river, but reservoir construction is thought to be the major cause for their decline. The fish are now only found in the upper reaches of the Brazos, north of Possum Kingdom Lake.



Sources: U.S. Fish and Wildlife Service; Texas State University

Jay Carr / Houston Chronicle

Pupfish

- * 4 spp in T
- * Endemic
- * Body de
- * Mouth
- * General
- amphip



- * Spring-fed wetland – quiet water near edges
- * Endangered FWS, 1980 – nearly extinct

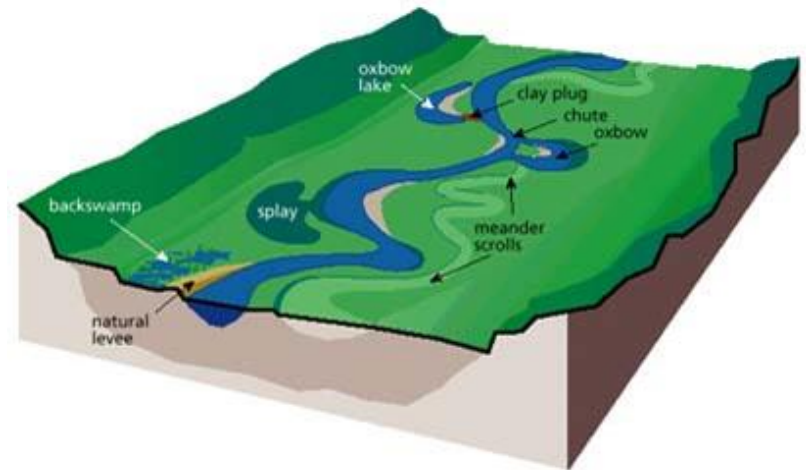
ss
neir SW
tolerance

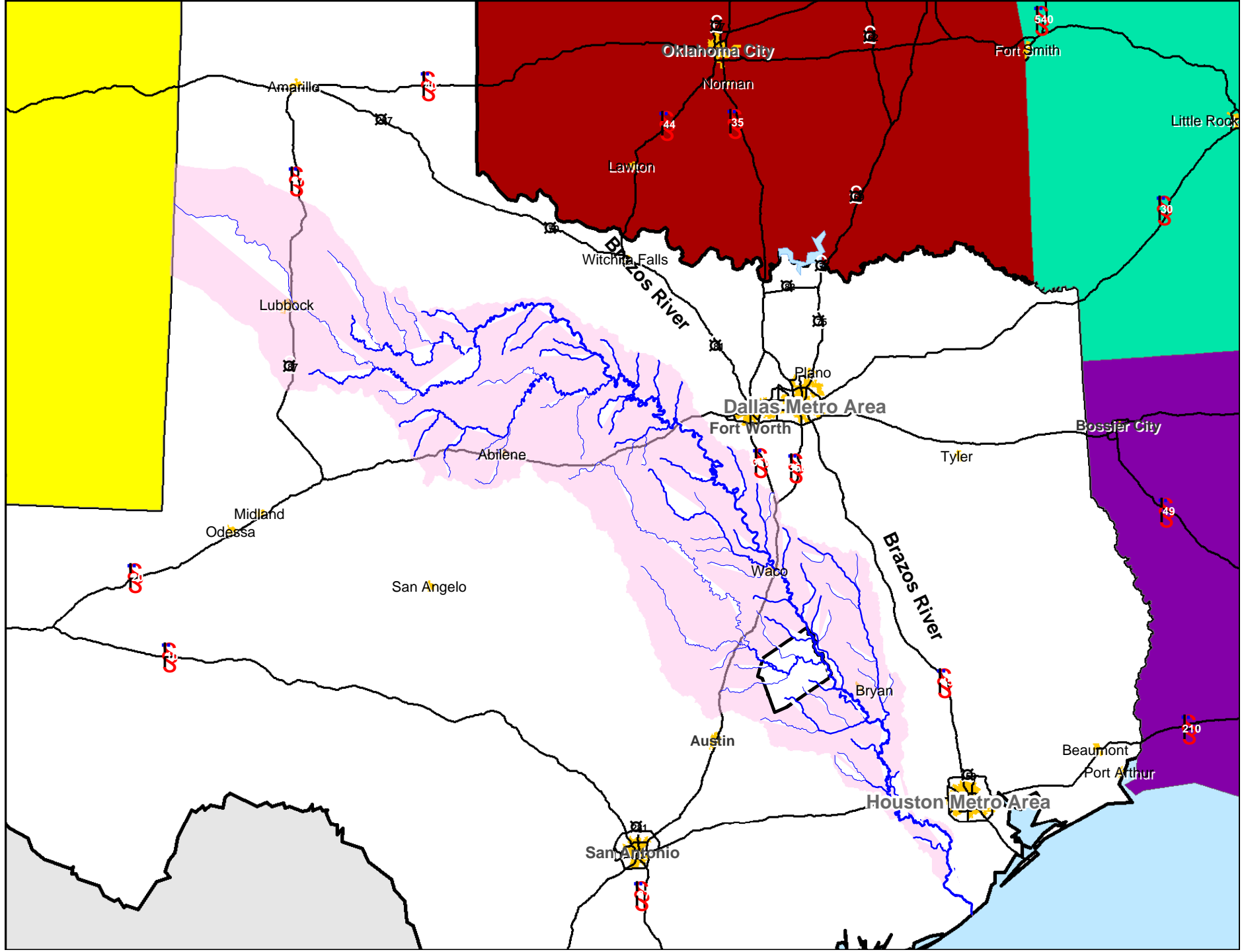
Phantom Cave



Habitat

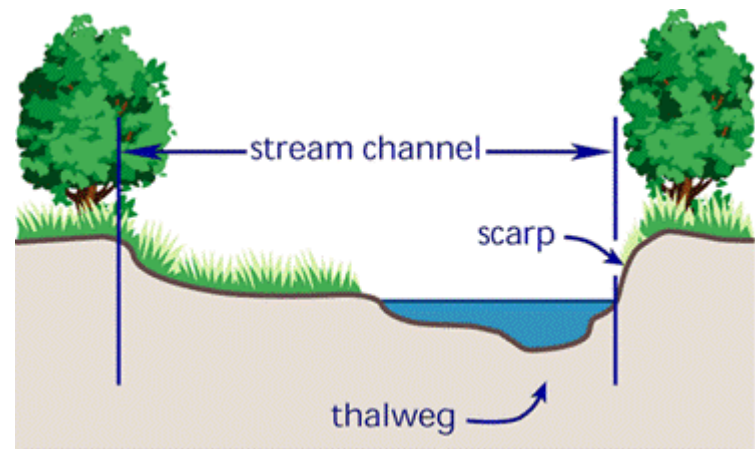
- * 15 River basins
- * 191,000 River miles
- * 196 Major reservoirs
- * 7 estuaries



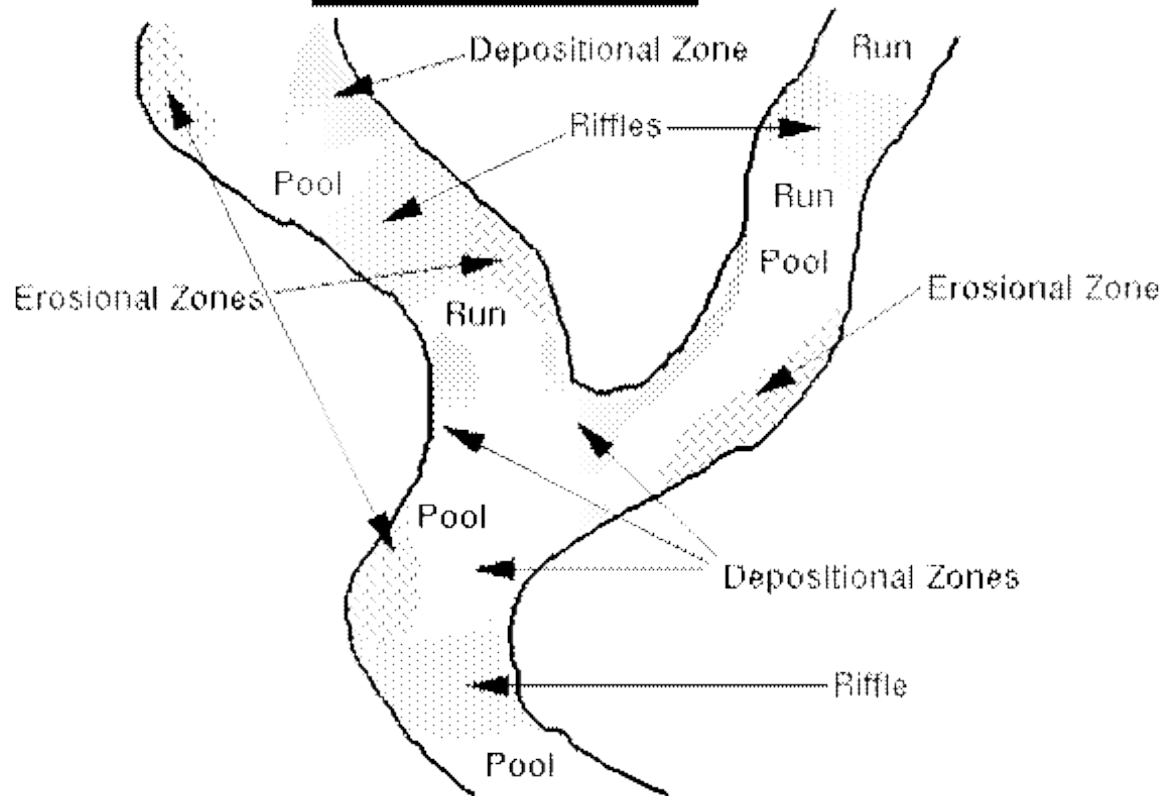


Stream Habitat Types

- * Riffle – water surface broken
- * Run – water surface smooth
 - * has thalweg = valley way
- * Pool/Glide – relatively deep and still
- * Backwater – slow water
- * Slackwater
- * Snag – woody debris, structure/shelter
- * Bank (cutbank = erosion, point bar = deposition)
- * Channel – main/side, wide, narrow



River Habitats



Thanks!

Christopher Chapa
Private Lands Biologist
Partners for Fish and Wildlife
Austin Ecological Services Office

Christopher_chapa@fws.gov

512-490-0057 x 244