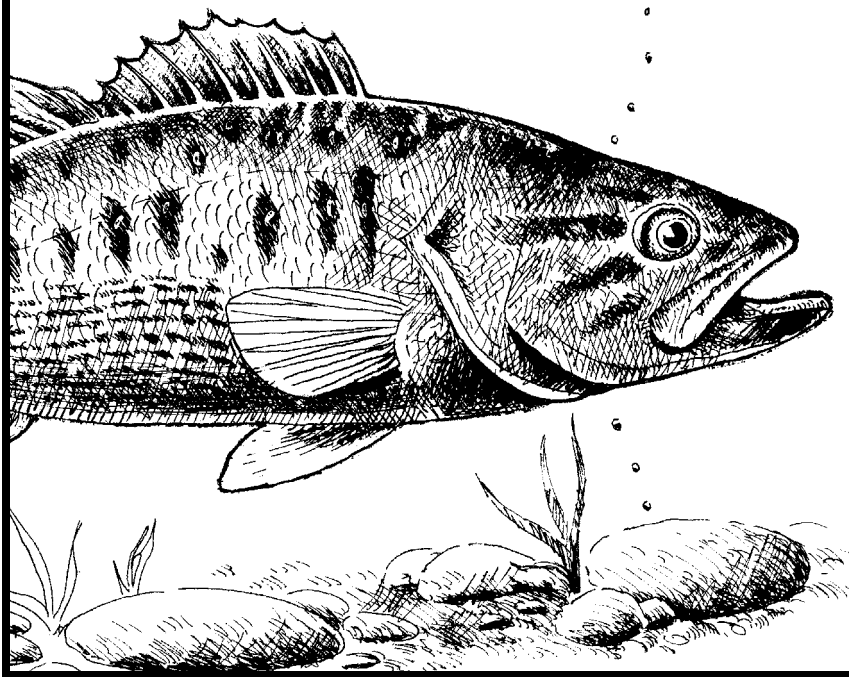


TEXAS PARKS AND WILDLIFE

# TEXAS NON-GAME FRESHWATER FISHES

By Mark Klym & Gary P. Garrett



## **ACKNOWLEDGEMENTS**

The authors acknowledge the contributions of Fred Janssen, Ken Kurzawski, Gordon Linam, Celeste Brancel-Brown and Pat Morton in making this project possible. Without their help in reviewing the document, fact checking and final edits, this booklet would not have become a reality.

# Texas Non-game Freshwater Fishes

## INTRODUCTION

When we think of freshwater fish, the thought that comes to the minds of most Texans is a huge bass taking a top water plug and putting up a great fight on the end of the fishing line. This is true in most states – the species may be different and the equipment may change but for most jurisdictions fish refers to sport fish. In Texas, like in the other states, there are far more fish species that we do not fish, than there are game fish.

Texas has a great wealth of freshwater fish species with 247 different ones being identified in our inland waters. These fish range in size from the tiny, 1 inch, mosquito fish (*Gambusia affinis*) to the giant, 5 foot, paddlefish (*Polyodon spathula*), a protected species in our state. Their appearances, ecology, roles and concerns are as diverse as their sizes reflect – yet their value as individual species within our ecosystem is as significant as that of the largemouth bass our angler dreams of fighting.

## WHAT IS A NON-GAME FISH?

Non-game means different things to different folks, but essentially it includes any fish that is not listed as a sport fish or as a threatened or endangered species. This would include the fishes we use as bait, fish that we have found are not particularly appetizing and do not put up a “sporting” fight, and fish we simply choose not to fish for. By far, the largest group is this latter – a group that includes fishes that we deem too small to bother with. While often small and insignificant, these fishes play vital roles in our environment.

We have chosen to add to this group, for this publication’s purposes, the 26 species of truly freshwater fish that are in need of special protection and so are listed as threatened or endangered species. These animals are competing against changing environmental conditions that make their continued existence quite tenuous, and thus deserve to be considered.

### **WHY ARE THEY IMPORTANT?**

While man often has little use for anything we do not deliberately target, non-game fishes play some very significant ecological roles. Scavengers, like the suckers and catfishes, help to clean up organic debris on the bottom of waterways. Forage fish provide vital food resources for the game fish we pursue as well as for birds and wildlife we enjoy. Several species feed on insects we find unpleasant. The presence or absence of sensitive species, and those with specialized environmental needs can serve as sentinels - informing us about changing environmental conditions.

Many of the species we enjoy in Texas share unique features, color patterns or behaviors that can be entertaining, intriguing and educational. All fish lay eggs, right? No! In Texas we have fish, including the “mosquito fish” that give birth to live young! Minnows are just small fish aren’t they? Not so. The common carp, a member of the minnow family, is regularly reported at several pounds size.

Another reason for interest in these species, is that the more we know about our native Texas fishes and their environmental needs, the less likely we are to deliberately introduce exotic species - a problem that is certainly evident in our Texas waters. Some of the non-native fishes we can find in Texas include: goldfish, common carp, rudd, armadillo del rio, guppy and rock bass. There are probably others, not yet found frequently enough to appear on a species list, but still found occasionally in our waters. Many of these fish were introduced by people releasing pets into local waterways or by fishermen dumping bait. Care in these activities helps to protect some of our vital natural resources.

### **ARE THERE FISHES THAT NEED SPECIAL PROTECTION?**

A biologist discussing “species of special concern” is referring not only to species listed on the federal or state endangered species lists, but also to species that are thought to be declining. It is always better to prevent listing than to have to list the species and develop a recovery plan. Once a species is listed, we are often working in situations that work against the species recovering.

In a September 1999, article Dr. Gary Garrett stated that more than 25% of native Texas freshwater fishes are of conservation concern or already lost. The same article included a list with eight species listed as extirpated or extinct. Fishes are certainly in need of special protective measures, especially as water supplies are diminished and water demands increase.

Often these species of special concern are in situations where their populations have become very precarious - to the point where they could realistically be pushed to near extirpation. In these cases, the state may choose to list them as "threatened" species. These are species not yet in danger of immediate extinction within the state, but with very unstable populations. The threatened status provides additional regulatory protection to the species while allowing habitat rehabilitation to continue. In Texas, 18 species are currently listed in this category.

Some species however are found in a situation where a single natural or man-made disaster could extirpate the species from Texas or cause it to go extinct. This could be due to low population numbers, due to habitat loss, or due to the loss of some vital factor that is becoming scarce in the environment. The venue does not matter, the effect is the same - another species in danger of being eliminated. These are the species that get added to the endangered species list as state, or federally endangered. In these cases significant effort is needed in addition to conserving habitat, to ensure the survival of this species. This may include transplanting individuals from secure populations, captive breeding and introduction, restoring or establishing new suitable habitat or any combination of these efforts. In Texas, 8 fishes are currently listed as endangered species.

## **CONSERVATION AND DEVELOPMENT**

Unlike man, fish are very limited in their options of where to live. When we find one spot unsuitable, we either try to modify our surroundings or we pick up and move, often finding suitable locations elsewhere. While fish can move some, they are limited to where the water will take them. Physical barriers in the waterways, like dams, reduce their options further. Their own physiology may further limit the ability of the fish to adapt to new waterways.

Some of the things we can do to preserve water quality and protect fish habitat include:

- Reduce erosion by planting on bare soil in places where rainwater enters the stream flow.
- Reduce stock grazing along waterways.
- Use pesticides, herbicides and fertilizers only according to label instructions, be especially careful around water.
- Landscape with native plants that require fewer chemicals. Good guidelines are found in the Texas Wildscapes program.
- Never release live fish in waters where they were not caught, especially bait fish and aquarium pets.
- When operating off road vehicles, always cross streams where you will disturb as little silt as possible.
- Never introduce live aquatic plants (aquarium plants) to a waterway they were not originally found in.
- Inspect your boat for live or dried aquatic life before moving between waterways. Always remove any aquatic life before launching your boat.

These simple rules will help conserve our precious aquatic life in Texas.

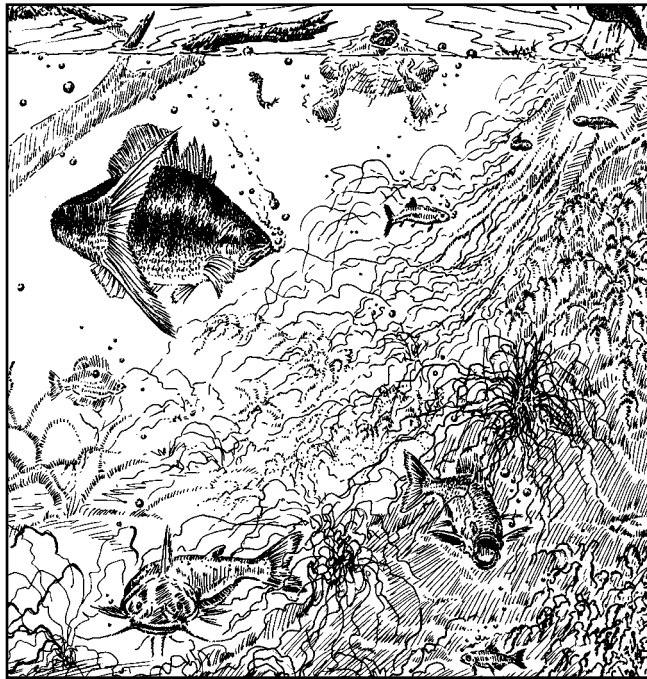
While some fishes are in need of special protection, conservation actions can be compatible with other interests in the watershed. Some projects and programs undertaken to develop or enhance specific habitat needs for certain species include:

- Restoration of a desert wetland (San Solomon Cienega) at Balmorhea State Park. The success of this project was due in large part to the cooperative efforts of local farmers. This project not only protects two endangered fish (Comanche Springs pupfish and Pecos gambusia), but also helps to protect spring flows for irrigation that are essential to the farming economy of the area.
- Creation of desert wetland habitat for Pecos pupfish. A cooperative project with shrimp farmers in West Texas has yielded two wetlands that provide a safe haven for a threatened fish and help to insure its future survival.

- Conservation Agreement with the City of Del Rio and local ranchers. This project provides for the restoration of the Devils River minnow and supports research to determine how to protect the habitat of this minnow and other species in the Devils River and San Felipe Creek.

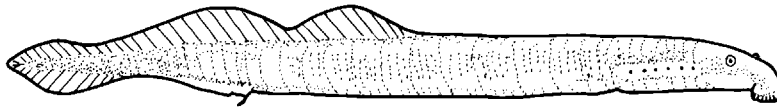
Projects such as these are developed and directed with the assistance of fisheries biologists to ensure greatest effect with minimal impact on non-target species.

Clean and adequate water is essential to fish survival. Many of our threatened and endangered fish are simply running out of water - so much water is removed from the stream flow that there is not enough left for the basic needs of the fish. This is sometimes hard to understand when we look at a river and see water, but often that water is flowing at a rate far too slow for the needs of the fish. Water conservation practices, like reducing the amount of water required for irrigation, irrigating in a way that uses rather than loses the water, and reducing water used for non-essential purposes will help ensure water resources for our non-game fishes.



## The Non-game Fish Families

### Lamprey



These very primitive fish species really do not look much like fish at all – they are long and slender, ropelike organisms with sucker mouths. Both parasitic and non-parasitic species are found in Texas, primarily in streams of the Red, Sabine and Neches River basins. Parasitic species have evolved to feed on fish, spending their adult life attached to a host species. Non-parasitic species are generally filter feeders surviving on aquatic plankton.

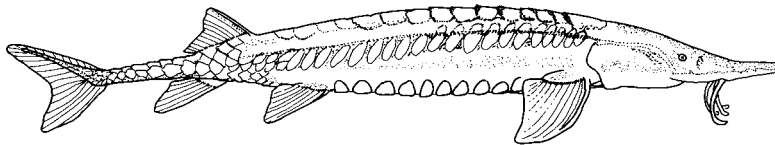
*chestnut lamprey*

parasitic

*southern brook lamprey*

non-parasitic

### Sturgeons



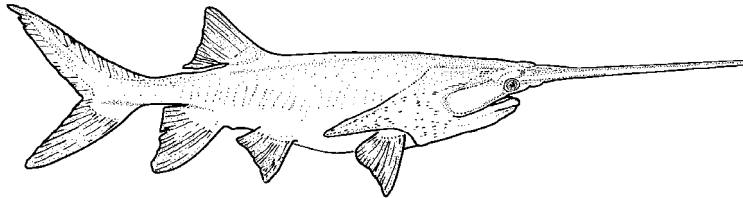
Again, a very primitive family of fishes, the sturgeons are represented in Texas by only one species found only in the Red River below the Lake Texoma reservoir. The shovel-nose sturgeon, like other fishes in this family, has several rows of scaly “spines” on their back and a long, slender profile. These fish seldom reach 5 pounds and are bottom feeders. In Texas this is a threatened species.

***Threatened species***

*shovelnose sturgeon*



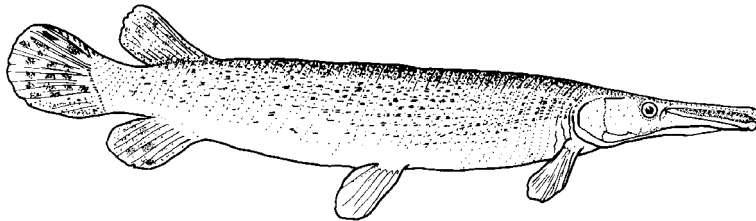
## Paddlefish



This bizarre looking fish with an elongated paddle on the front of its head is one of the threatened fishes in Texas. A paddlefish restoration project is being undertaken for this fish that was once found in every major river from the Trinity Basin eastward. This fish, which can reach a size of 6 feet or more, is generally considered a sport fish in other areas where it is not in need of special protection.

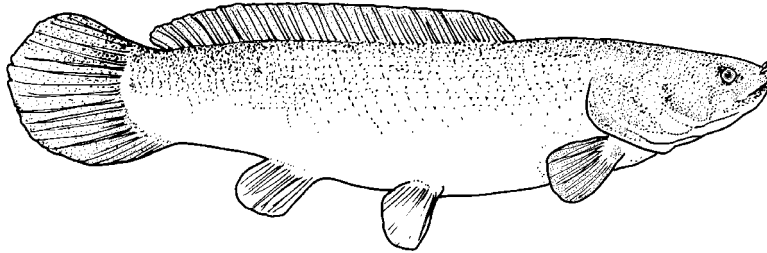
*Threatened species*  
*paddlefish*

## Gar



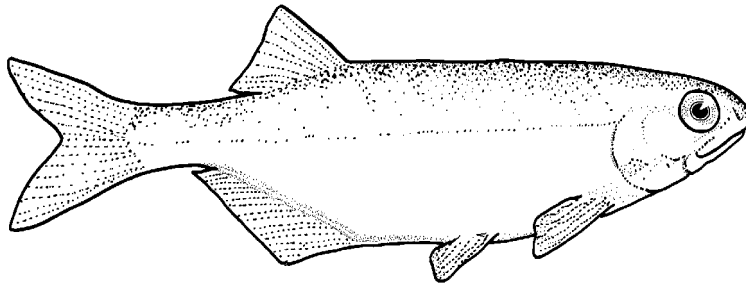
While treated as a non-game fish in Texas, these predators are a sought after sport fish in some jurisdictions. Four species of these torpedo-like fish with long tubular snout are found in Texas freshwaters, some being found through most of the state.

*spotted gar*  
*longnose gar*  
*shortnose gar*  
*alligator gar*

**Bowfin**

These elongated, moderately deep bodied fish with a dorsal fin that extends almost the full length of the fish and notably rounded tail fin are voracious predators. In Texas, they can be found in freshwater drainages of the Red, San Jacinto, Sabine, Brazos and Colorado rivers.

*bowfin*

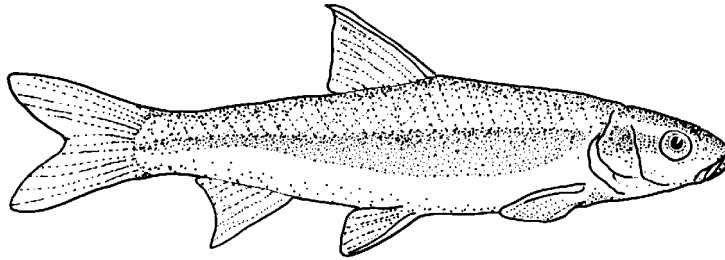
**Mooneyes**

The goldeye is a long, compressed fish with a deep body. The scales are said to have a gold color to the front of the fish with a more orange color to the rear. A predator, this fish eats insects, small fish and even the occasional mouse that may stray nearby. In Texas they are known only from the Red River Basin and Lake Texoma. This is a special concern species.

*Special concern species*

*goldeye*

## Minnows



This is a very diverse family of fishes, but most North American species resemble each other in being elongate, slender with one or two pair of barbels sometimes present. These fish are very dependent on a freshwater environment, and have a very low salt tolerance. Most of the fish anglers use as bait come from this family. In Texas, 52 species of minnow are currently found with 4 of these being introduced species. Twelve species are concern species or threatened and endangered species. Three species of minnow are believed extirpated or extinct from Texas waters.

*central stoneroller*

*plateau shiner*

*red shiner*

*blacktail shiner*

*Manantial roundnose minnow*

*roundnose minnow*

*Nueces roundnose minnow*

*cypress minnow*

*Mississippi silvery minnow*

*plains minnow*

*striped shiner*

*ribbon shiner*

*redfin shiner*

*speckled chub*

*silver chub*

*golden shiner*

*Texas shiner*

*pallid shiner*

*emerald shiner*

*blackspot shiner*

*Red River shiner*

*river shiner*

*Tamaulipas shiner*

*smalleye shiner*

*ghost shiner*

*chub shiner*

*Sabine shiner*

*silverband shiner*

*sand shiner*

*weed shiner*

*mimic shiner*

*pugnose minnow*

*suckermouth minnow*

*fathead minnow*

*bullhead minnow*

*flathead chub*

*longnose dace*

*creek chub*

***Special concern species***

*ironcolor shiner*  
*Rio Grande shiner*  
*taillight shiner*  
*sharpnose shiner*

***Threatened species***

*Mexican stoneroller*  
*Devils River minnow*  
*proserpine shiner*  
*Rio Grande chub*  
*Chihuahua shiner*  
*bluehead shiner*  
*Arkansas River shiner*

***Introduced species***

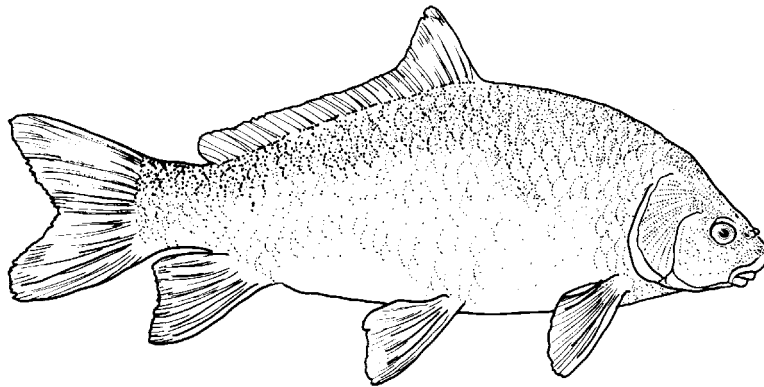
*goldfish*  
*grass carp*  
*common carp*  
*rudd*

***Extirpated species***

*Rio Grande silvery minnow*

***Extinct species***

*phantom shiner*  
*bluntnose shiner*

**Suckers**

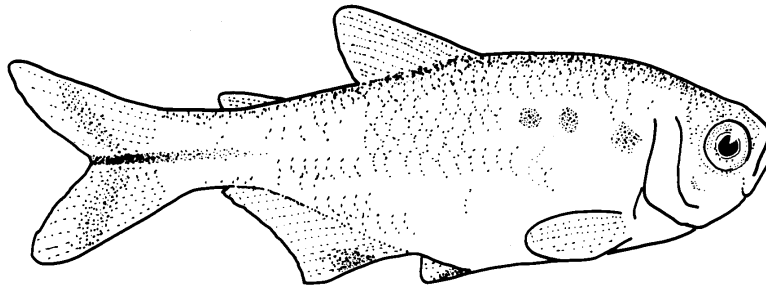
The most notable characteristic of the sucker family is their typical mouth, often referred to as resembling a vacuum cleaner, which they use to forage for food along the bottom. Often maligned as trout egg eaters in the north, this family of fishes are primarily algae eaters and are themselves a food resource for many game fishes. Suckers are taken as food fishes in many regions of North America. Eleven species of sucker are found in Texas waters with two species listed as threatened.

*river carpsucker*  
*lake chubsucker*  
*smallmouth buffalo*  
*bigmouth buffalo*  
*black buffalo*  
*spotted sucker*  
*west Mexican redhorse*

*gray redhorse*  
*golden redhorse*  
*blacktail redhorse*

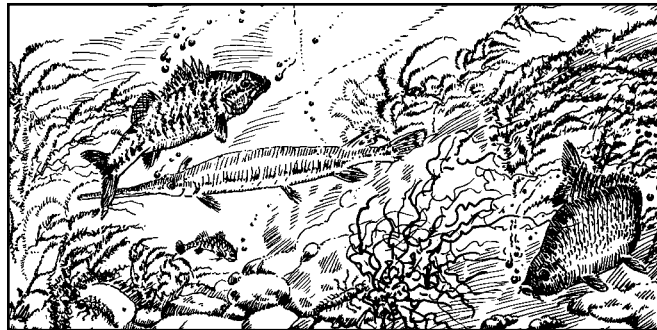
***Threatened species***  
*blue sucker*  
*creek chubsucker*

### Characins

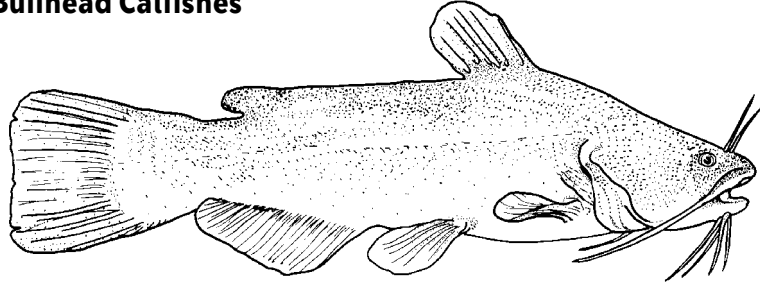


The tetras, highly prized by aquarium enthusiasts, are another variable family of fishes, but the Mexican tetra is the only species found in Texas. Native to the Rio Grande and possibly the Nueces River drainages, this fish has been introduced statewide by “bait bucket” releases. This fish is about 4 inches long, with a deep body toward the front, large eyes and a second fin, called an adipose fin, very close to the tail.

*Mexican tetra*



### Bullhead Catfishes



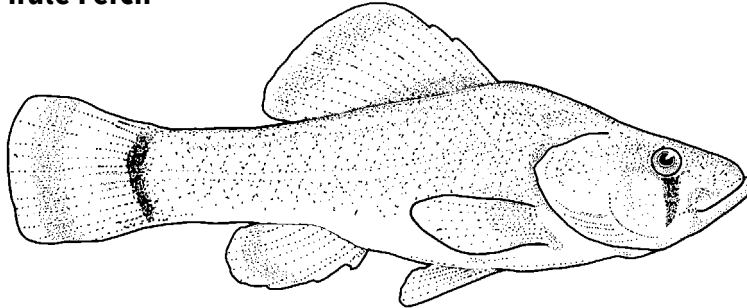
While the blue, channel and flathead catfishes are common game fish in Texas, the Lonestar State is also home to several other species of freshwater catfish. Generally, these are elongated, slender fishes with barbels and no scales. Eight species of non-game catfish are found in Texas freshwaters with two of those being threatened and another two being listed as special concern species.

*black bullhead*  
*yellow bullhead*  
*tadpole madtom*  
*freckled madtom*

***Threatened species***  
*widemouth blindcat*  
*toothless blindcat*

***Special concern species***  
*headwater catfish*  
*Chihuahua catfish*

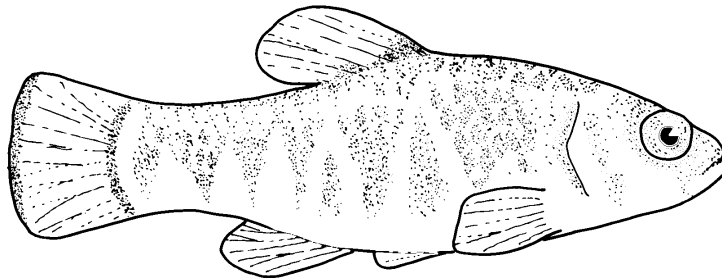
### Pirate Perch



This small, plain looking fish with a deep body and rounded fins is the only surviving representative of this family of fishes. They are found in East Texas from the Red River through the lower Brazos Basin. This forage fish provides nutrition for other fish species.

*pirate perch*

## Killifish



Small elongated, somewhat cylindrical fishes found in shallow water, these fish are primarily insect eaters. While generally classified as freshwater fishes, killifish will tolerate some brackish, and even salt water. Ten freshwater species are recorded from Texas waters, of which two are listed as endangered and two as threatened.

*sheepshead minnow*

*golden topminnow*

*starhead minnow*

*blackstripe topminnow*

*blackspotted topminnow*

*plains killifish*

*rainwater killifish*

*Red River pupfish*

### **Endangered species**

*Leon Springs pupfish*

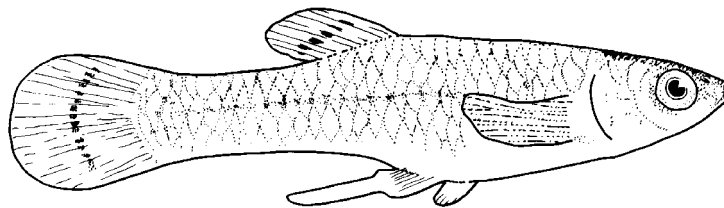
*Comanche Springs pupfish*

### **Threatened species**

*Conchos pupfish*

*Pecos pupfish*

## Livebearers



The unique thing about this group of small fishes is that they all give birth to live offspring! The male specimens of most species have a modified anal fin forming a tube to allow transfer of sperm to the female. These fish seldom exceed 2.5 inches. They are omnivorous, feeding on whatever food happens to be available. Several species were once used for widespread mosquito control. Eleven species, one of which is introduced, are now

found in Texas freshwaters, with three of these being listed as endangered. Another three species are listed as extinct or extirpated from Texas waters.

*largespring gambusia*  
*Mexican mosquitofish*  
*least killifish*  
*Amazon molly*  
*sailfin molly*  
*western mosquitofish*

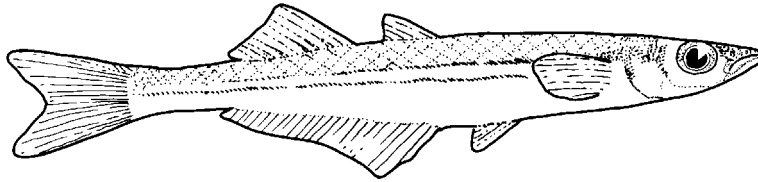
**Introduced species**  
*guppy*

**Extirpated species**  
*blotched gambusia*

**Extinct species**  
*Amistad gambusia*  
*San Marcos gambusia*

**Endangered species**  
*Big Bend gambusia*  
*Clear Creek gambusia*  
*Pecos gambusia*

## Silversides



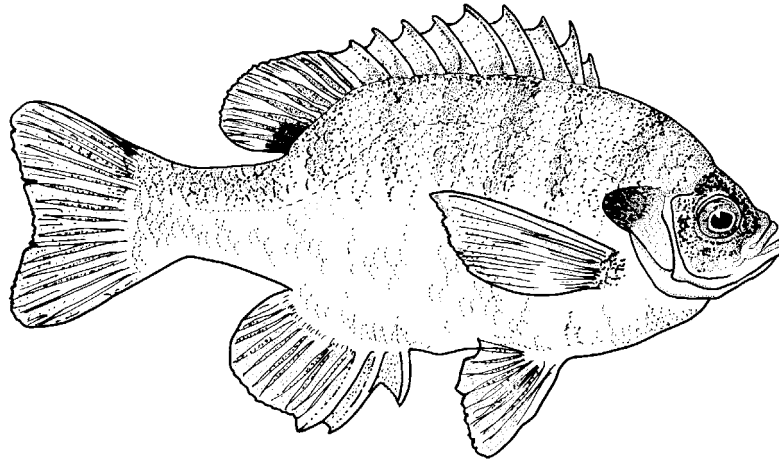
Two species of these nearly transparent, elongated fish with notable lateral line and large eyes are found in our freshwaters. Found in the Sabine River and parts of the Red River drainages, the brook silverside is a prime forage fish for other species. They do not make good bait for anglers since they often can not survive on the hook. One species of marine silverside has been introduced to freshwaters in Texas.

*brook silverside*  
*inland silverside*

**Introduced species**  
*rough silverside*



## Sunfish



While not considered a game fish by state regulation, many Texans enjoy fishing for bluegill and other sunfish within the state. Some species, while still predatory, are too small to make them a target of anglers. These fishes generally serve as forage fishes for other game fish and a common fishery management practice is to stock sunfish with your bass as a forage. Sixteen species of native sunfish are found in Texas. One of the game fish, the Guadalupe Bass, is also the State Fish of Texas and is listed as special concern. Another three species of sunfish have been introduced to the state's fresh waters, all for angling purposes.

### *flier*

*banded pygmy sunfish*

*green sunfish*

*warmouth*

*orangespotted sunfish*

*bluegill*

*dollar sunfish*

*longear sunfish*

*redecor sunfish*

*spotted sunfish*

*bantam sunfish*

### ***Introduced species***

*rock bass*

*redbreast sunfish*

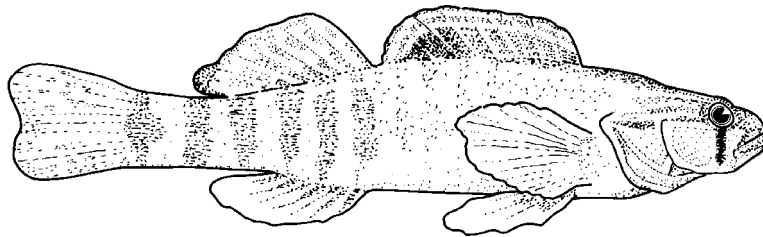
### ***Introduced game species***

*smallmouth bass*

### ***Special concern species***

*Guadalupe bass*

## Darters



Elongated, thin fish sometimes laterally compressed with a dorsal fin that is completely separated into a spiny and a soft portion. These often brightly colored fish are usually bottom dwellers. In the same family as the walleye and sauger of angling circles, these fish are often smaller and serve as insectivores, eating minute insects and crustaceans. Twenty-one non-game species of this family are found in Texas, most are in East Texas. Of these, three are special concern species while two are listed as threatened and one as endangered. Three species from this family have been introduced to Texas waters, the yellow perch, the walleye and the sauger, all for angling purposes.

*scaly sand darter*  
*eastern redbfin darter*  
*mud darter*  
*bluntnose darter*  
*swamp darter*  
*slough darter*  
*harlequin darter*  
*greenthroat darter*  
*goldstripe darter*  
*cypress darter*  
*orangethroat darter*  
*Texas logperch*  
*bigscale logperch*  
*dusky darter*  
*river darter*

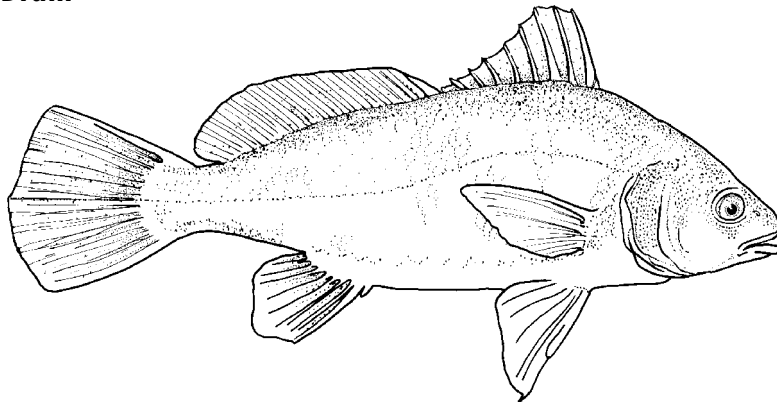
***Introduced species***  
*yellow perch*

***Introduced game species***  
*walleye*  
*sauger*

***Special concern species***  
*western sand darter*  
*orangebelly darter*  
*logperch*

***Threatened species***  
*Rio Grande darter*  
*blackside darter*

***Endangered species***  
*fountain darter*

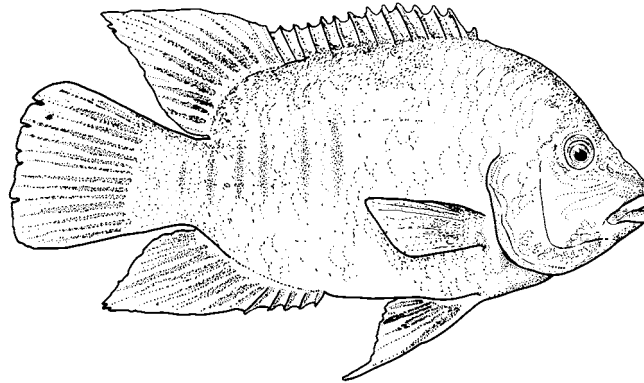
**Drum**

These large, heavy bodied fishes, usually deeper than they are wide, can be found in both fresh and salt water environments around the world. Only one of the eight species of this family found in Texas waters truly qualifies as a freshwater fish. It can be found throughout the state. Mayflies and gammarus are important food items at all sizes while larger fish tend to eat more fish and crayfish. Drum are taken by anglers, usually incidental catches while fishing for sport fishes.

*freshwater drum*



## Cichlids



Common to the aquarium trade, these primarily southern hemisphere fishes have one Texas representative - the Rio Grande cichlid. Originally found only in the Rio Grande and Pecos drainages, the Rio Grande cichlid is now widespread across the state due to introduction. Cichlids are generally deep bodied fishes that are laterally compressed. Their body shape is very similar to that of the sunfishes. Rio Grande cichlids are aggressive predators eating insect larvae and smaller fishes. Three species of Asian cichlids have been successfully introduced in Texas.

*Rio Grande cichlid*

***Introduced species***

*blue tilapia*

*Mozambique tilapia*

*redbelly tilapia*

## Additional Information

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Page, L. M. and B. M. Burr. 1991. A field guide to freshwater fishes. Houghton Mifflin Co., Boston. 432 pp.

Woodling, John. 1985. Colorado's Little Fish. A Guide to the Minnows and Other Lesser Known Fishes in the State of Colorado. Colorado Division of Wildlife. Denver.

### Web Sites

An Annotated Checklist of the Freshwater Fishes of Texas, With Keys to Identification of Species:

[www.utexas.edu/depts/tnhc/.www/fish/credits/hubbcite.html](http://www.utexas.edu/depts/tnhc/.www/fish/credits/hubbcite.html)

Southeastern Fishes Council:

[www.flmnh.ufl.edu/fish/organizations/SFC/SFCDefault.htm](http://www.flmnh.ufl.edu/fish/organizations/SFC/SFCDefault.htm)

Native fish Conservancy:

[www.nativefish.org/index.html](http://www.nativefish.org/index.html)

Desert Fishes Council:

[www.utexas.edu/depts/tnhc/.www/fish/dfc/dfc\\_top.html](http://www.utexas.edu/depts/tnhc/.www/fish/dfc/dfc_top.html)

American Society of Ichthyologists and Herpetologists:

<http://199.245.200.110/>

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