

Status Assessment and Watershed Planning for Plateau Shiner,
Nueces River Shiner, and Nueces Roundnose Minnow
in the Upper Nueces River Basin

Robert J. Edwards, Gary P. Garrett, Kerry Reeves, and Ryan Smith





0 90 km

Frio River

Barksdale

San Antonio

Sabinal River

Uvalde

Nueces River

Crystal City

Carrizo Springs

Mathis



Nueces River Basin



Plateau shiner - Nueces River form (*Cyprinella lepida*)



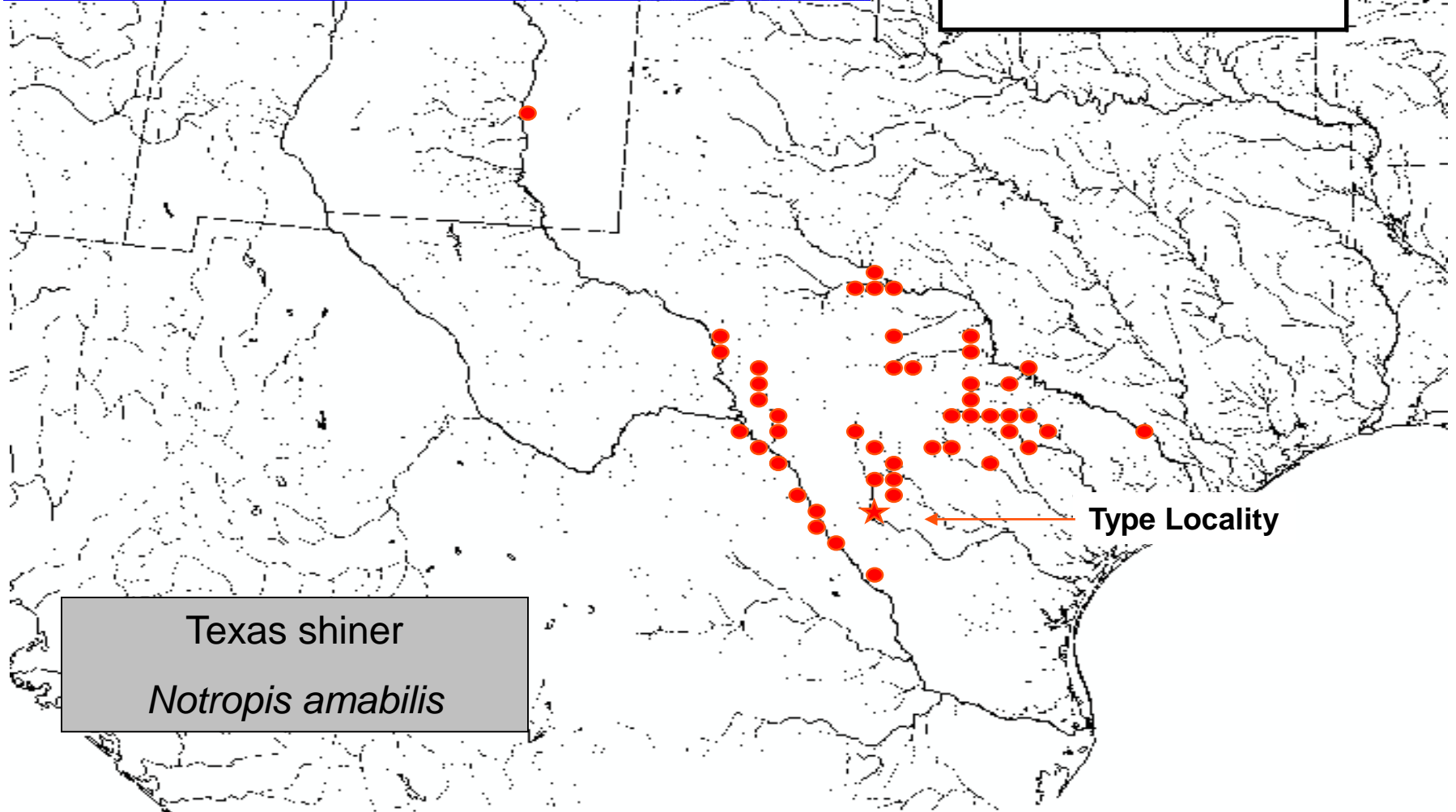
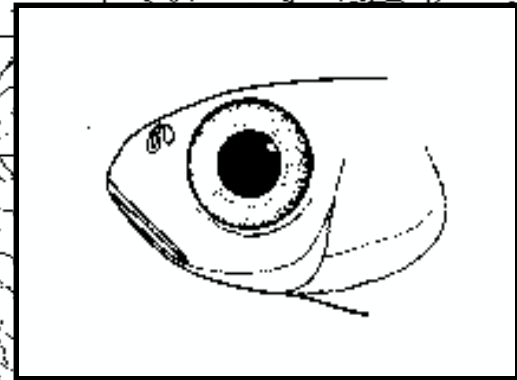
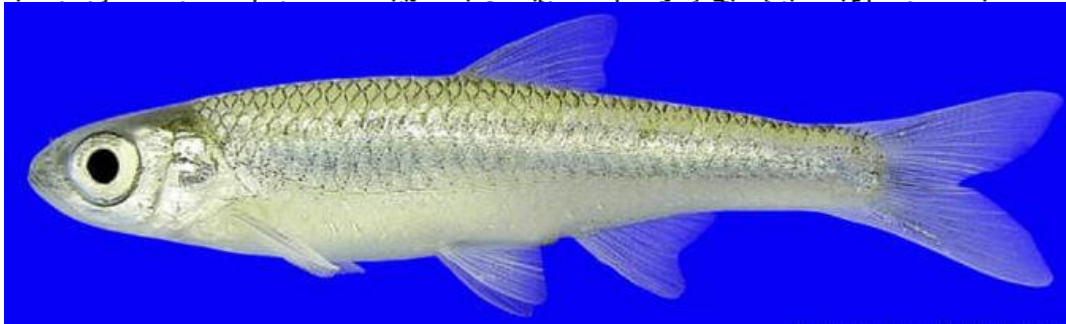
Plateau shiner - Frio River form (*Cyprinella lepida*)

Plateau shiner - Sabinal River form (*Cyprinella lepida*)



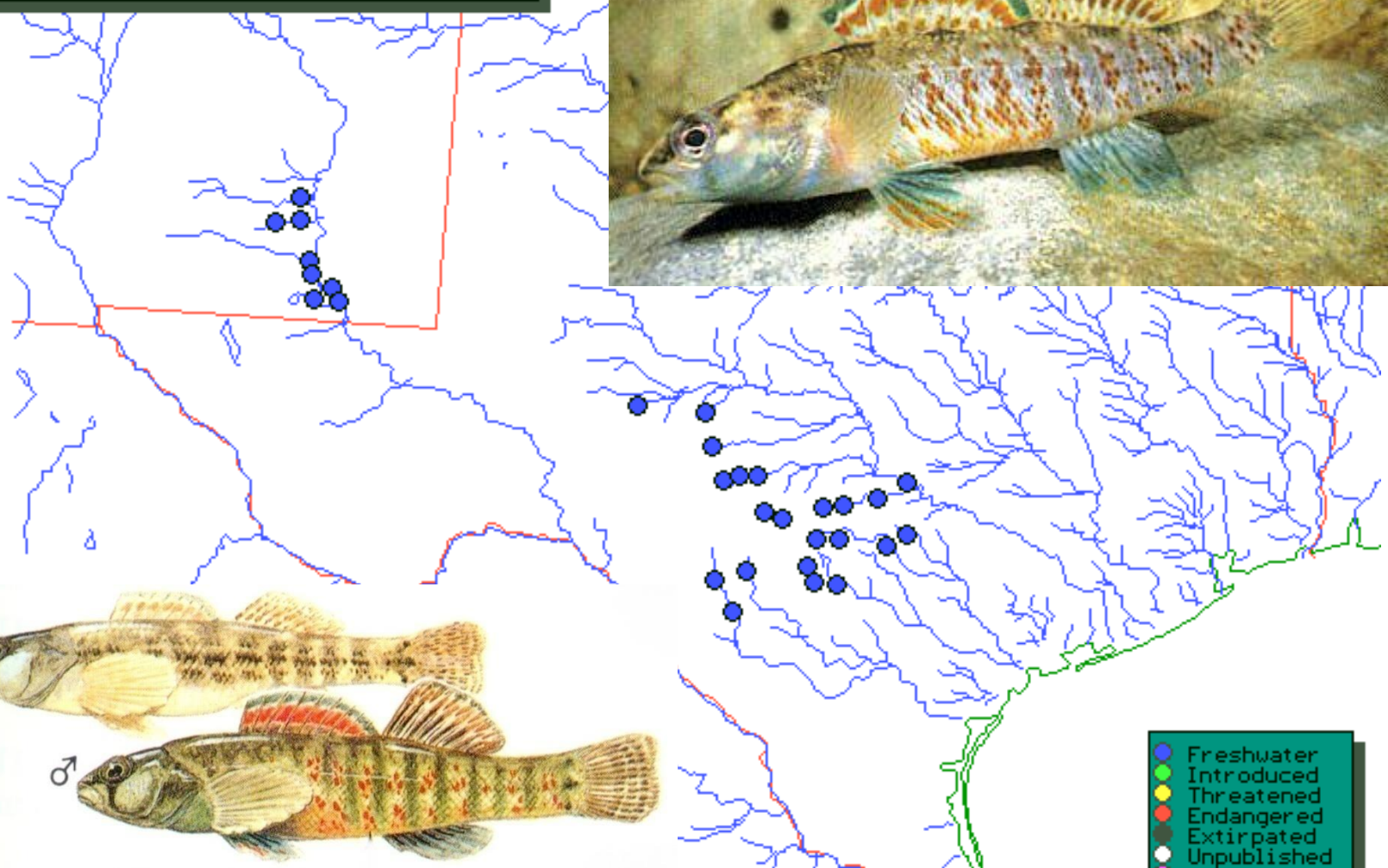


Nueces roundnose minnow (*Dionda serena*)



Texas shiner
Notropis amabilis

Etheostoma lepidum (Baird and Girard 1853)
Greenthroat Darter (#611)
Perciformes Percidae



Greenthroat darter, *Etheostoma lepidum*

- Freshwater
- Introduced
- Threatened
- Endangered
- Extirpated
- Unpublished
- Anadromous
- Catadromous
- Marine
- Estuarine

Mainstem Sites

- Site 12 River Road Xing W of Camp Wood
- Hwy 355 Xing at Flying Bull Ranch
- Xing NE of barksdale
- CR 416
- CR 410
- Site 11 Hwy 55 "Monkey Site"
- Site 6 Old Rocksprings Road
- 187 near Vanderpool
- Site 5
- Site 4 West Sabinal Road Xing
- Site 7 Hwy 1120 "Tuber Heaven"
- Site 2
- Site 8
- Site 9 Hwy 101 Xing
- Uvalde, TX
- Site 10 Hwy 481 Xing



Image © 2009 DigitalGlobe
© 2009 Tele Atlas
Image USDA Farm Service Agency
© 2009 Cnes/Spot Image



29°35'53.16" N 99°52'54.04" W elev 1702 ft

Eye alt 99.74 mi

Creek Sites

- East Prong Nueces R.
- Bullhead Cr. #1
- Bullhead Cr. #2
- Camp Wood Cr. #2
- Camp Wood Cr. #1
- Montell Cr.
- Shut-in Cr.
- Indian Cr.
- Dry Frio Cr.
- Sycamore Cr.
- Brushy Cr.
- Dry Frio R.
- Indian Cr.
- Wedge worth Cr.
- Indian Cr.
- Mill Cr.
- Jernigan Cr.
- W. Sabinal R.
- Nolton Cr.

Uvalde, TX

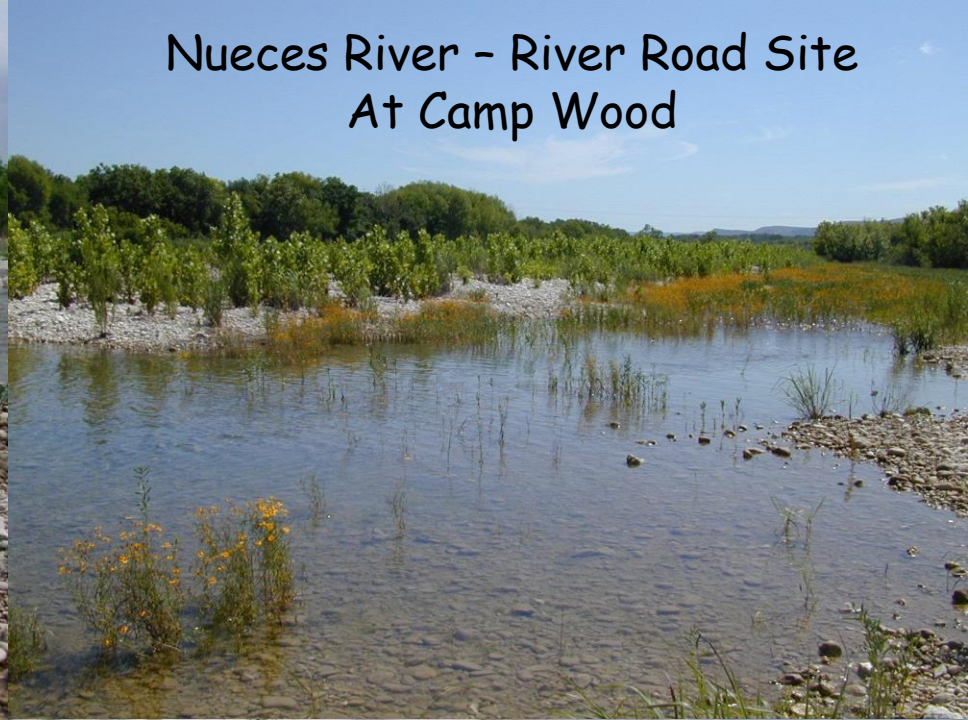
**Nueces River - Hwy 335 Site
22 Km N of Barksdale**



Nueces River - River Road Site At Camp Wood



Discarded aquarium gravel



Nueces River - Hwy 55 Site
26 Km N of Uvalde



Nueces River - Hwy 55 Site



Nueces River - Hwy 481 Site
16 Km SW of Uvalde



Frio River - Hwy 336 Site
14 Km N of Leakey



Frio River - Hwy 1120 Site



Introduced rainbow trout



July 3rd

Frio River - Hwy 2690 Site
8 Km SE of Concan
High Water



Frio River - Hwy 2690 Site
Low Water



Frio River - Hwy 2690 Site
Dry



Frio River - Hwy 2690 Site



Frio River - Hwy 101 Site
High Water



Frio River - Hwy 101 Site
Low Water



Frio River - Hwy 101 Site
Dry





Sabinal River - Hwy 337 Site



Sabinal River - Hwy 187 Site



Sabinal River - Hwy 1050 Site



Sabinal River - Dunlap Road Site



Sabinal River - Dunlap Road Site





Various Creeks in the Nueces Basin

Mostly dry except following rain events
or if dams are present.





West Sabinal R at W Sabinal Rd

Table 1. IBI formulation modified from Linam et al. (2002).

		Scoring Criteria	
Metric	5	3	1
N species	>9	>6	≤6
N native cyprinids	>4	3-4	<3
N benthic invertivore	>1	>0	0
N sunfish species	>3	2-3	<2
N intolerant species	>1	1	0
% individuals as Tolerant species (excluding <i>Gambusia affinis</i>)	<26%	26-50%	>50%
% individuals as Omnivore species	<9%	9-16%	>16%
% individuals as Invertivore species	>65%	33-65%	<33%
% individuals as Piscivores species	>8.4	3.9-8.4%	<3.9%
% individuals as non-native species	<1.4%	1.4-2.7%	>2.7%
% individuals with disease or anomaly	<0.6%	0.6-1.0%	>1.0%
N individuals/seine haul (estimated)	>40	40	<40

Aquatic Life Use: > 52 Exceptional; 42-51 High; 30-41 Intermediate; <30 Limited

Table 2. Fish collection data summary.



















	Nueces	Frio	Sabinal	Nueces	Frio	Sabinal	
Species	N	N	N	%	%	%	
 <i>Astyanax mexicanus</i> *?	104	119	82	2.17	3.22	2.44	
<i>Campostoma anomalum</i>	38	82	85	0.79	2.22	2.53	
<i>Cyprinella lepida</i>	354	1034	172	7.38	27.95	5.13	
<i>Cyprinella lutrensis</i>		14	25		0.38	0.75	
<i>Cyprinella venusta</i>	510	1637	1331	10.63	44.26	39.68	
<i>Cyprinella lepida x venusta</i>		1	2		0.03	0.06	
<i>Dionda serena</i>	557	195	5	11.61	5.27	0.15	
<i>Notropis amabilis</i>	1862	184	758	38.81	4.97	22.60	
<i>Notropis stramineus</i>	12	187	491	0.25	5.06	14.64	
<i>Pimephales vigilax</i>		6			0.16		
<i>Moxostoma congestum</i>		1			0.03		
<i>Ameiurus natalis</i>	1	1		0.02	0.03		
<i>Ictalurus punctatus</i>	5	16	6	0.10	0.43	0.18	
<i>Oncorhynchus mykiss</i> *		1			0.03		
<i>Gambusia affinis</i>	996	105	141	20.76	2.84	4.20	
<i>Lepomis auritus</i> *		4	6		0.11	0.18	
<i>Lepomis cyanellus</i>			11			0.33	
<i>Lepomis macrochirus</i>	2	2	15	0.04	0.05	0.45	
<i>Lepomis megalotis</i>	195	84	44	4.06	2.27	1.31	
<i>Lepomis microlophus</i>			1			0.03	
<i>Micropterus salmoides</i>	11	18	53	0.23	0.49	1.58	
<i>Micropterus treculii</i> *	36		70	0.75		2.09	
<i>Etheostoma lepidum</i>	73	3	3	1.52	0.08	0.09	
<i>Cichlasoma cyanoguttatum</i> *	36	5	53	0.75	0.14	1.58	
<i>Oreochromis aureus</i> *	6			0.13			
(* Introduced)							
Number of Species	17	21	20	17	21	20	
Number	4798	3699	3354				
H'	1.81	1.67	1.85				

Fig. 1. Nueces River discharge for the decade 1998-2008 (A) and for the study period 2007-2008 (B). Data are from the USGS Nueces River monitoring station 08192000 below Uvalde.

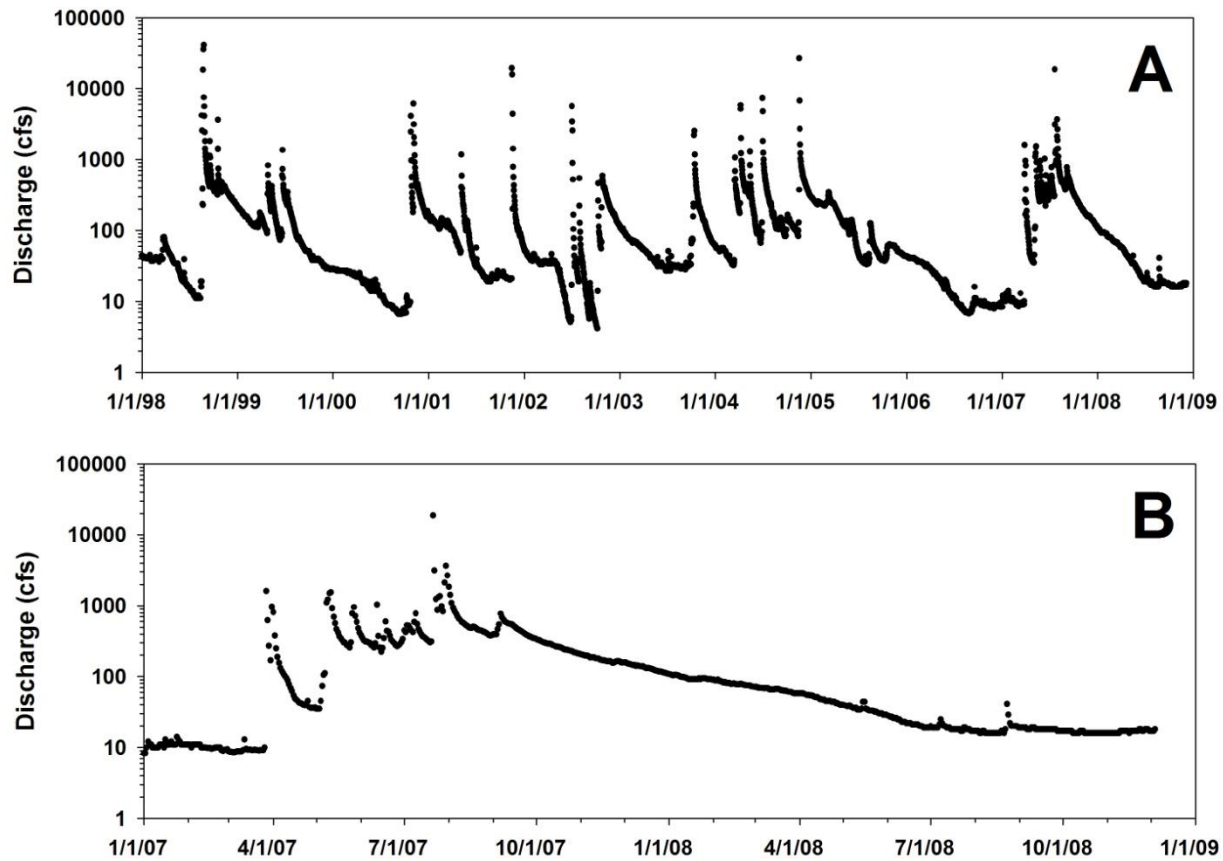


Fig. 2. Frio River discharge for the decade 1998-2008 (A) and for the study period 2007-2008 (B). Data are from the USGS Frio River monitoring station 08195000 at Concan.

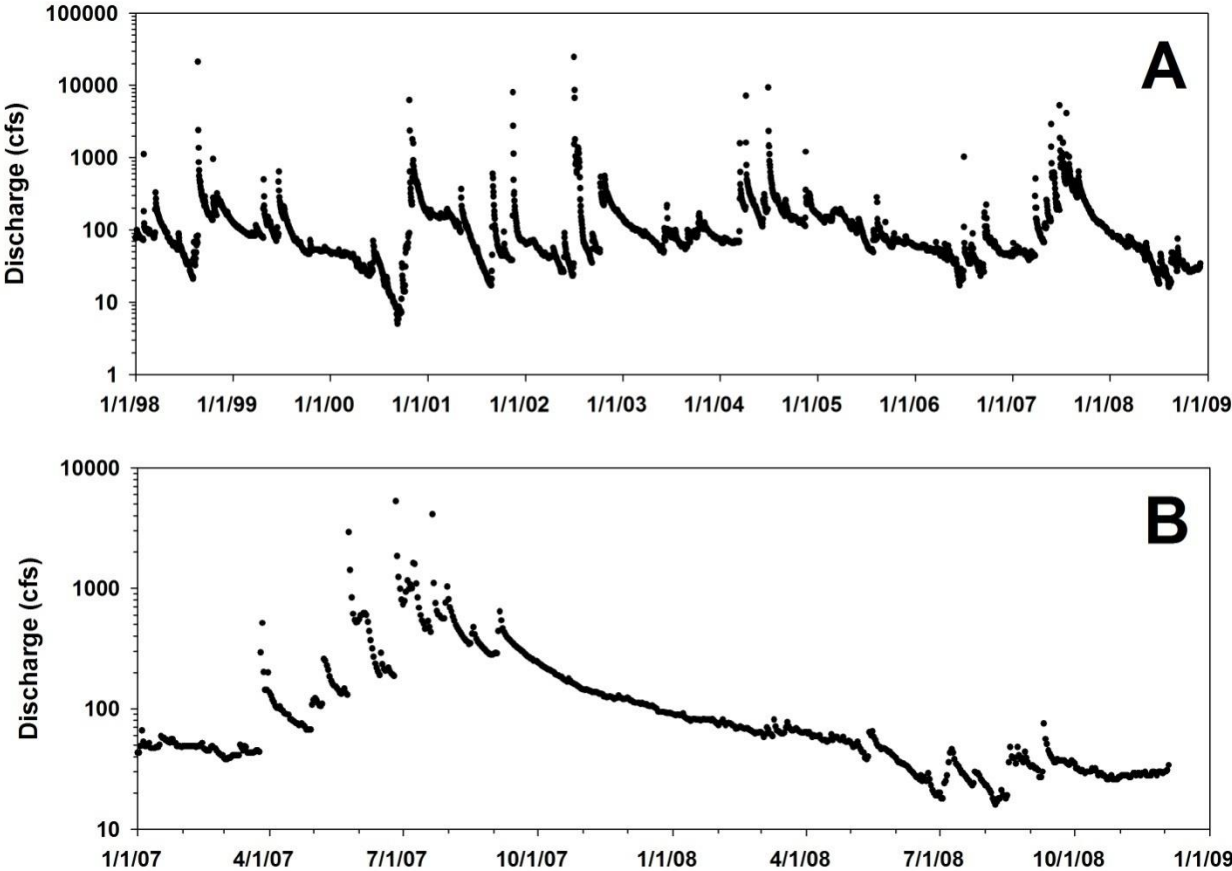


Fig. 3. Sabinal River discharge for the decade 1998-2008 (A) and for the study period 2007-2008 (B). Data are from the USGS Sabinal River monitoring station 081985000 near Sabinal.

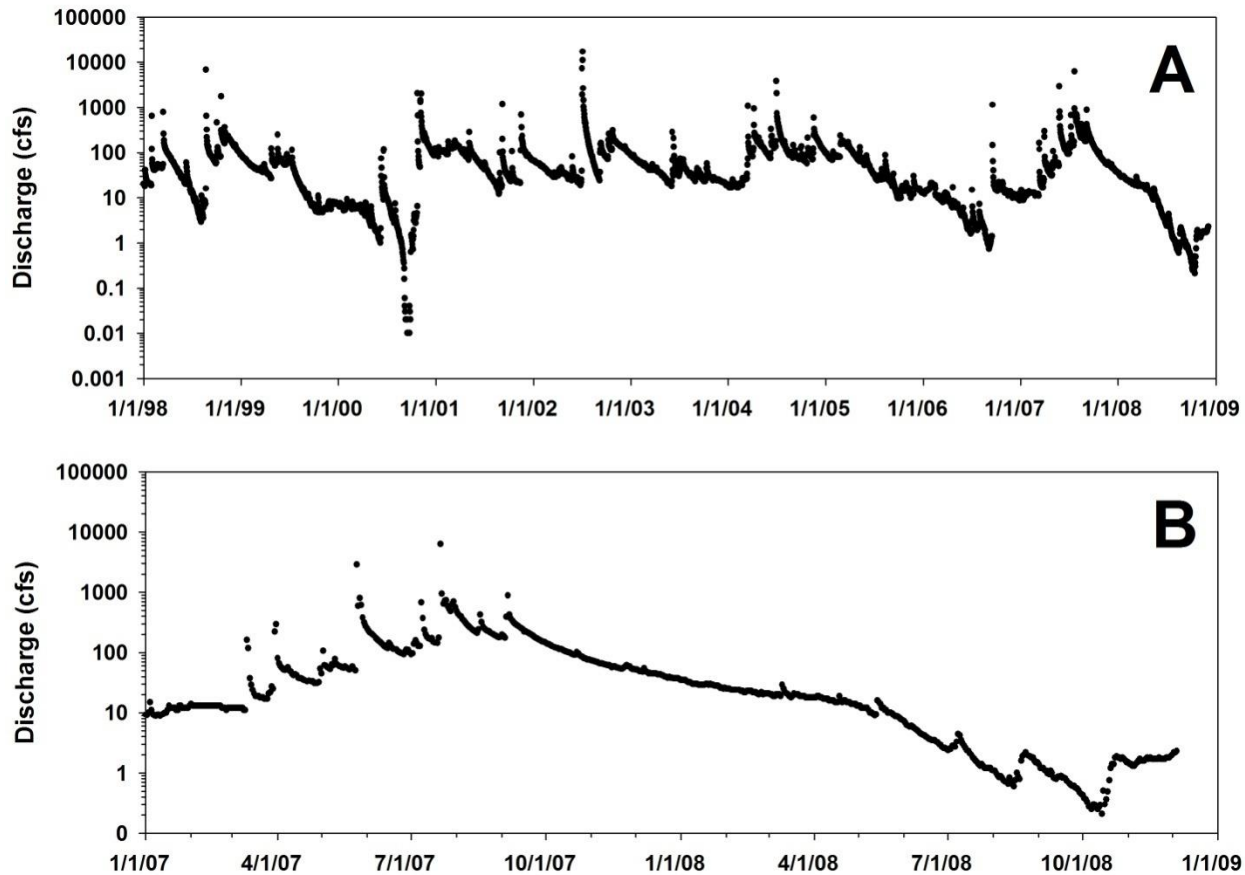


Fig. 4. IBI Scores for samples taken from the Nueces, Frio and Sabinal rivers during the 2007-2008 sampling period. Shown is the most conservative rankings.

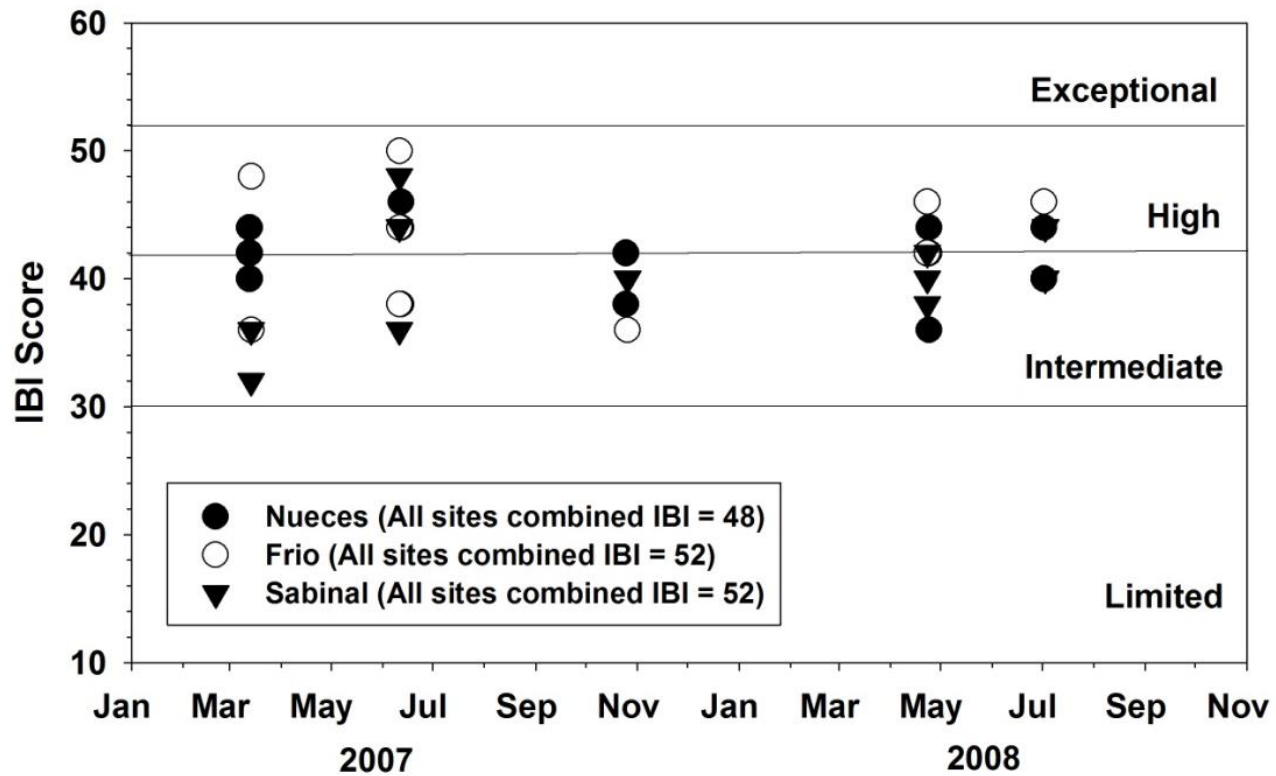


Fig. 5. IBI Scores for samples taken from the Nueces, Frio and Sabinal rivers during the 2007-2008 sampling period. Shown are rankings adjusted for methodology differences.

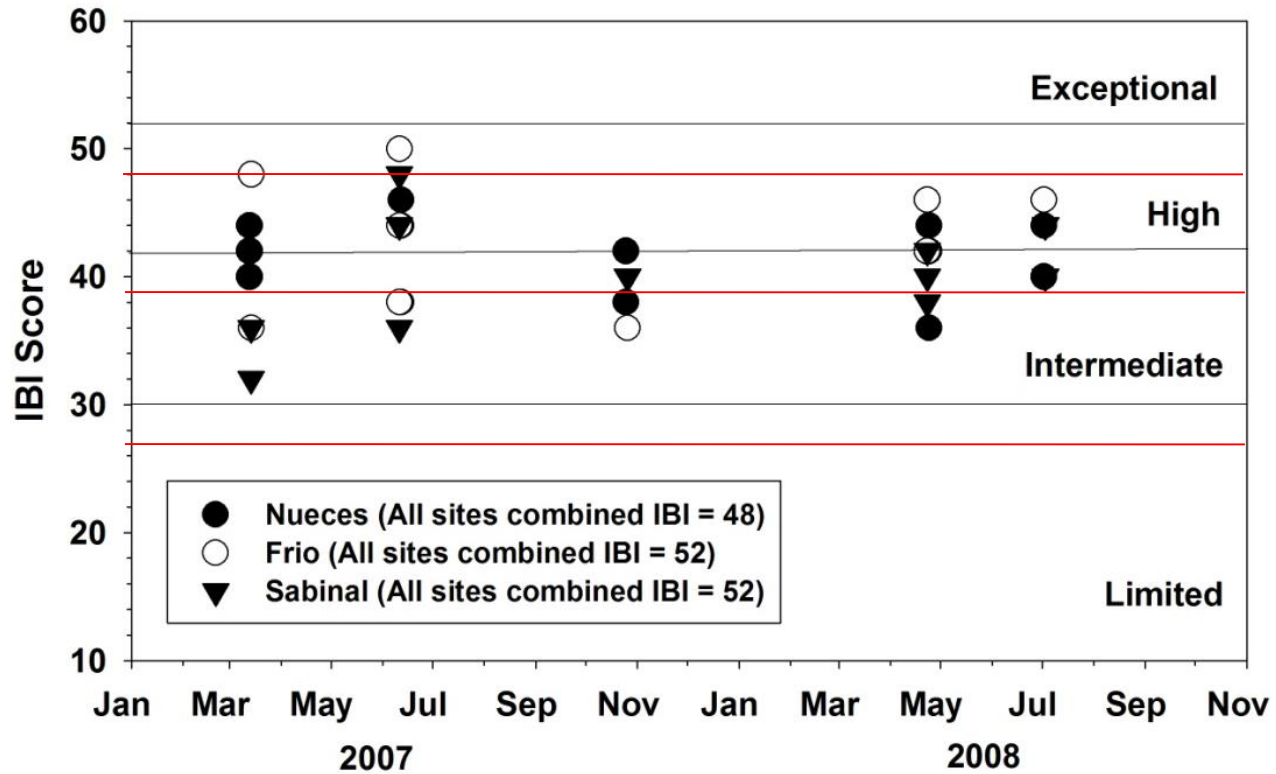
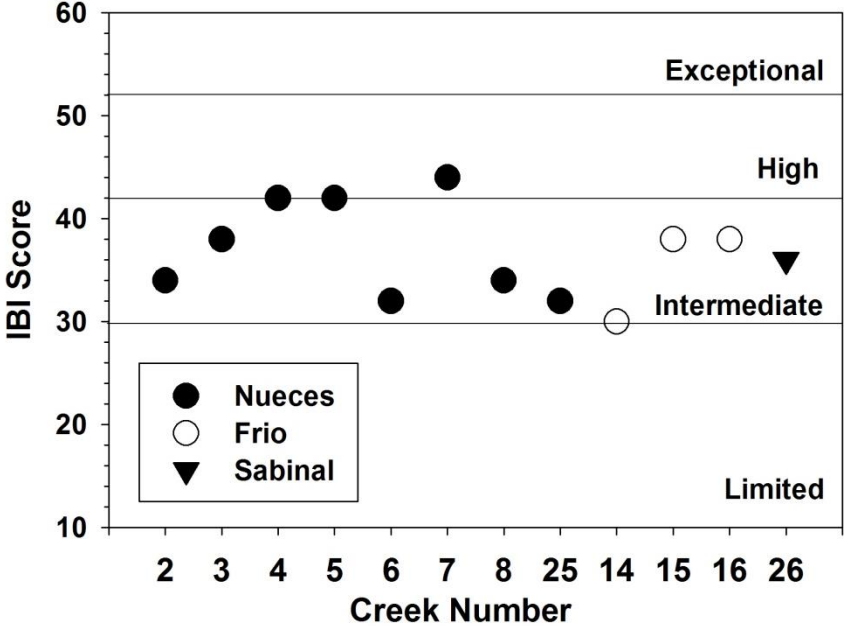


Fig. 6. IBI Scores for samples taken from the flowing creeks in the upper Nueces basin during the 2007-2008 sampling period. Creek numbers correspond to the creek ID codes listed in Table 15



Conclusions:

- The upper Nueces river basin is a significant stream with many unique elements.
- The water quality is generally high and the fish fauna is typical of high quality spring-fed streams within the southern Edwards Plateau.
- A number of significant impacts and threats were discovered during the course of the study, some of which include increased development along the watercourse, stream alterations, especially low-head dams along the Sabinal River, and, at times, intense recreational pressure, especially in the Frio River during the summer months.
- Even with these pressures, the headwater streams of the Nueces river basin maintain much of their integrity as evidenced by the numerous indicator fishes such as *Cyprinella lepida*, *Dionda serena* and *Etheostoma lepidum*.
- Care should be given to maintain these ecosystems as refuges for the unique suite of species found within.

Potential Problems Other Than Flow




Frio River

Frio River



Sabinal River



Acknowledgements

The Nature Conservancy
Rebecca Flack
Deborah Edwards
Paul Fleming

**LIQUOR
GUNS**

Texas

It's like a whole other country.

