Lower Nueces River

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-6-R-12

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 5-B

Job No. B-23 Basic Survey and Inventory of Fish Species Present in the Lower Nueces River

Project Leader: Charles T. Menn

J. Weldon Watson
Executive Director
Parks and Wildlife Department
Austin, Texas

Marion Toole
D-J Coordinator

Eugene A. Walker
Assistant Director for Wildlife

January 21, 1965

ABSTRACT

The basic survey of the Lower Nueces River from Wesley Seale Dam to Nueces Bay revealed that channel and blue catfish, largemouth bass and white and black crappie are the principal game fish species.

Rough fish species including alligator, spotted and longnose gars, gizzard shad, smallmouth buffalo, striped mullet, bluegill, freshwater drum, Rio Grande perch and lined sole dominated the netting collections both in numbers and in weight with 88.43 per cent of the total number and 97.04 per cent of the weight.

No developmental or management work is presently proposed or recommended.

JOB COMPLETION REPORT

State of Texas

Project No. F-6-R-12 Name: Fisheries Investigations and Surveys of the Waters of Region 5-B

Job No. B-23 Title: Basic Survey and Inventory of Fish Present in the Lower Nueces River

Period Covered: January 1, 1964 through December 31, 1964

Objectives:

To determine the physical, chemical and ecological conditions and the relative numbers of fish species present in the lower portions of the Nueces River lying within San Patricio, Jim Wells and Nueces Counties.

Procedures:

Field trips were made during the months of February, May, August and November. On each trip, nine netting collections and 10 seining collections were made. Standard, 125-foot long, gill nets were set overnight at established netting stations. Each fish was weighed in grams and measured in millimeters. Internal examinations were made to determine sex, stage of sexual development and incidence of parasitism.

Specimens taken in seining collections were preserved in 10 per cent formaldehyde in the field and taken to the Mathis field office for identification and tabulation.

Water analyses were made on each field trip. Notes were made on pollution, aquatic vegetation and topographical data.

Maps prepared by the Texas Highway Department were used to pinpoint netting, seining and water analyses stations.

A list of the fish species taken in nets and seines is included in Table 1. The scientific and common names used in this table were taken from Hubbs' A Checklist of Texas Fresh-Water Fishes, Texas Game and Fish Commission, IF Series No. 3, June, 1961, and from Special Publication No. 2, 1960, American Fisheries Society, entitled A List of Common & Scientific Names of Fishes From the United States & Canada, Second Edition.

Table 1. A list of fish species recorded from Lower Nueces River

Common Name	Scientific Name
Alligator gar	Lepisosteus spatula Lacépède
Spotted gar	L. oculatus (Winchell)
Longnose gar	L. osseus (Linnaeus)
Ladyfish	Elops saurus Linnaeus
Finescale menhaden	Brevoortia gunteri Hildebrand
Gizzard shad	Dorosoma cepedianum (LeSueur)
Striped anchovy	Anchoa hepsetus (Linnaeus)
Mexican tetra	Astyanax mexicanus (Filippi)
Smallmouth buffalo	Ictiobus bubalus (Rafinesque)
Pugnose minnow	Opsopoeodus emiliae Hay
Red shiner	Notropis lutrensis (Baird and Girard)
Bullhead minnow	Pimephales vigilax (Baird and Girard)
Channel catfish	Ictalurus punctatus (Rafinesque)
Blue catfish	I. furcatus (LeSueur)
Tadpole madtom	Satan gyrinus (Mitchill)
Gulf killifish	Fundulus grandis Baird and Girard
Sheepshead minnow	Cyprinodon variegatus Lacépède
Mosquitofish	Gambusia affinis (Baird and Girard)
Sailfin molly	Mollienesia latipinna LeSueur
Amazon molly	M. formosa (Girard)
Striped mullet	Mugil cephalus Linnaeus
Tidewater silverside	Menidia beryllina (Cope)
White bass	Roccus chrysops (Rafinesque)
Largemouth bass	Micropterus salmoides (Lacépède)
Warmouth	Chaenobryttus gulosus (Cuvier)
Bluegill	Lepomis machrochirus Rafinesque
White crappie	Pomoxis annularis Rafinesque
Black crappie	P. nigromaculatus (LeSueur)
Fountain darter	Etheostoma fonticola (Jordan and Gilbert)
Leatherjacket	Oligoplites saurus (Bloch and Schneider)
Freshwater drum	Aplodinotus grunniens Rafinesque
Pinfish	Lagodon rhomboides (Linnaeus)
Rio Grande perch	Cichlasoma cyanoguttatum (Baird and Girard)
Naked goby	Gobiosoma bosci Lacépède
Lined sole	Achirus lineatus (Linnaeus)

Findings:

Physical Description

That portion of the Nueces River from Wesley Seale Dam, at Lake Corpus Christi, to Nueces Bay on the Texas coast was intensively surveyed during this segment (see map). This section of the river, which is approximately 38 miles in length, flows in a southeasterly direction to Nueces Bay. The average depth varies from approximately 4 to 10 feet, while the average width ranges from about 40 feet below the dam to about 200 feet in the lower reaches of the river. The river banks are sharply cut, indicating flooding in the past. Willows, ash, hackberry, live oak, mesquite, retama, and huisache trees are numerous along the river.

Netting Collections

Nine netting stations were set up during this survey. They represented the different types of habitat present. An overnight set was made at each station during February, May, August and November. The nets were run the following morning, and data for each fish were recorded.

A total of 511 fish of 17 species weighing 963 pounds was taken in the netting collections. Game fish species included channel and blue catfish, white bass, largemouth bass, white and black crappie. Collectively, the game fish comprised 11.57 per cent of the netted specimens and 2.96 per cent of their weight. Tables 2 and 3 show the results of netting by station.

A single specimen of white bass was taken below the dam. It apparently came from the lake where they are found in limited numbers. White and black crappie were found in the river, mostly in the lower reaches.

Rough fish species including alligator, spotted and longnose gars, gizzard shad, smallmouth buffalo, striped mullet, bluegill, freshwater drum, Rio Grande perch and lined sole dominated the netting collections both in numbers and in weights with 88.43 per cent of the total number and 97.04 per cent of the total weight.

Gars of one species or another were taken at all stations and were evenly distributed in the river. Collectively, the three species of gars made up 36.79 per cent of the netting collections by number. Upon examination of their stomachs, shad, silversides, unidentifiable fish remains, grasshoppers, crayfish, and unidentifiable insect remains were found. Visceral round worms were found in several gars.

Though gizzard shad were taken at each station, they were more numerous at the lower stations. In the case of smallmouth buffalo, the reverse was true.

Table 4 shows the length-weight statistics for fish taken in netting collections. The "K" factors of all fish were considered normal for fish of this area.

Table 2. Number of fish taken, by stations, Lower Nueces River Basic Survey, 1964

Species	Stations									Total	Per Cent of Total Number
	1	2	3	4	5	6	7	8	9		
Alligator gar		1		1	2		1	2		7	1.37
Spotted gar	4	2	3	2	4		1	3	3	22	4.31
Longnose gar	23	40	18	14	12	12	16	11	12	158	30.98
Ladyfish									1	1	0.20
Gizzard shad	2	4	1	1	9	5	8	25	84	139	27.25
Smallmouth buffalo	12	6	12	16	12	10	5	5	3	81	15.88
Channel catfish*	1	1			2	1		3	5	13	2.55
Blue catfish*			2		1			2	9	14	2.75
Striped mullet		7				2	3	1	1	14	2.75
White bass*		1								1	0.20
Largemouth bass*	1	3			1			2	2	9	1.76
Bluegill	2	1						1	1	5	0.98
White crappie*		1			4	5	5	1	1	17	3.33
Black crappie*		1				1	1		2	5	0.98
Freshwater drum	1		2		14	1	1			19	3.73
Rio Grande perch						1		1		2	0.39
Lined sole			1		1	1				3	0.59
Total	46	68	40	34	62	39	41	57	124	510	100.00
Per Cent Game Fish											11.57
Per Cent Rough Fish											88.43

* Indicates game fish

Table 3. Pounds of fish taken, by stations, Lower Nueces River Basic Survey, 1964

Species	Stations									Total	Per Cent of Total Weight
	1	2	3	4	5	6	7	8	9		
Alligator gar		22.0		21.0	119.3		12.0	57.2		231.5	19.48
Spotted gar	6.3	1.5	5.0	1.1	6.8		2.0	8.6	2.4	33.7	2.89
Longnose gar	42.1	93.9	51.9	29.1	26.4	30.9	57.3	41.8	45.6	419.0	35.92
Ladyfish									0.4	0.4	0.03
Gizzard shad	0.8	1.2	0.1	0.8	8.2	3.6	3.5	16.1	47.9	82.2	7.05
Smallmouth buffalo	44.7	22.6	65.6	58.5	40.2	33.5	13.4	20.9	10.3	309.7	26.55
Channel catfish*	0.8	1.5			0.2	1.1		1.3	1.4	6.3	0.54
Blue catfish*			1.7		1.5			1.3	6.1	10.6	0.91
Striped mullet		24.7				5.7	10.6	0.3	0.8	42.1	3.61
White bass*		0.6								0.6	0.05
Largemouth bass*	0.4	1.8			1.6			0.9	0.5	5.2	0.44
Bluegill	0.2	0.1						0.2	0.1	0.6	0.05
White crappie*		1.3			1.9	1.2	2.8	1.0	0.7	8.9	0.76
Black crappie*		0.7				0.1	0.8		1.4	3.0	0.26
Freshwater drum	0.4		1.2		9.5	0.4	0.5			12.0	1.03
Rio Grande perch						0.3		0.3		0.6	0.05
Lined sole			(**)		0.1	0.1				0.2	0.02
Total	95.7	149.9	125.5	89.5	112.7	76.9	102.9	92.7	117.6	1166.6	100.00
Per Cent Game Fish											2.96
Per Cent Rough Fish											97.04

* Indicates game fish
** Indicates no weight measurement recorded

Table 4. Length-weight statistics for fish from the Lower Nueces River Basic Survey, 1964

Species	Standard Length (millimeters)		Weight (grams)		"K" Factors	
	Range	Average	Range	Average	Range	Average
Alligator gar	875-1670	1073	5443-46721	15070	0.81-1.11	1.01
Spotted gar	328-603	452	188-1644	694	0.53-0.82	0.67
Longnose gar	380-1035	632	139-5925	1215	0.25-0.58	0.41
Ladyfish	270-270	270	189-189	189	0.96-0.96	0.96
Gizzard shad	134-314	234	46-794	276	1.48-2.94	2.00
Smallmouth buffalo	248-572	344	652-6095	1755	3.25-4.77	4.01
Channel catfish	90-318	215	11-680	218	1.39-2.17	1.68
Blue catfish	228-337	275	166-680	336	1.29-1.91	1.55
Striped mullet	181-451	378	131-1956	1365	2.04-2.88	2.33
White bass	208-208	208	267-267	267	2.97-2.97	2.97
Largemouth bass	173-282	218	121-709	283	2.07-3.16	2.40
Bluegill	89-106	96	34-47	39	3.71-5.82	4.57
White crappie	120-250	192	48-567	251	1.51-3.95	3.10
Black crappie	127-216	193	49-358	279	2.39-3.87	3.41
Freshwater drum	178-250	215	168-482	286	2.44-3.25	2.77
Rio Grande perch	110-145	127	58-146	102	4.35-4.78	4.56
Lined sole	82-82	82	24-24	24	4.34-4.34	4.34

Seining Collections

Ten seining stations were set up during the course of this study. A seining collection was made at each station on each field trip with the exception of the last trip when no collections were made at stations 4, 5, 6 and 8 due to high water. Insofar as possible, the stations represented various types of habitats.

All told, 8,604 specimens of 26 species were taken in the 36 seining collections. Table 5 shows the number of each species recorded at each station.

Mosquitofish, tidewater silversides, and red shiners, in that order, were the most frequently encountered species. All together, they comprised 72.63 per cent of the total number taken. Mosquitofish and red shiners were taken at every station and tidewater silversides were taken at 9 of the 10 stations. Sheepshead minnows, sailfin mollys, bluegills, etc., were found in lesser numbers in the river. From all indications there is an ample supply of forage fish in the river.

Chemical Analysis

Two water sampling stations were set up during this survey; one at Bazemore Park and one below State Highway 9 bridge. Each station was visited four times during this study.

Surface water samples were tested for dissolved oxygen, dissolved carbon dioxide, total alkalinity, salinity and pH.

Dissolved oxygen values ranged from 3.0 to 8.6 p.p.m. and dissolved carbon dioxide ranged from 0.0 to 2.0 p.p.m. Methyl orange alkalinity ranged from 105 to 138 p.p.m. Chlorides varied from 160 to 230 p.p.m. and pH ranged from 7.8 to 8.4. All these values are considered normal for this area.

No fish kills were observed or reported in this section of the river during the study period. However, the area game warden reported that a meat processing firm was dumping blood into the river, but fish were not affected. Pollution was not a problem in this section of the river during the study period.

Ecological Conditions

Rainfall in the lower Nueces River drainage ranges from 25 to 30 inches annually. During mid-October, the river rose some 8 feet above its banks due to overflow from Lake Corpus Christi, which is immediately upstream. The rise did not alter the fish population.

Aquatic vegetation consists mostly of arrowhead, cattails, Chara, star-grass and algae. Also, in the vicinity of Bazemore Park, a few water hyacinths

Table 5. Seining results, Lower Nueces River Basic Survey, 1964

Species	Stations										Total	Per Cent of Total Number
	1	2	3	4	5	6	7	8	9	10		
Spotted gar		1		1							2	0.02
Ladyfish								1		1	2	0.02
Finescale menhaden										22	22	0.26
Gizzard shad	178						26		2	9	215	2.50
Striped anchovy									19	193	212	2.46
Mexican tetra							1			1	2	0.02
Pugnose minnow	9	44	26	23	49	40	24				215	2.50
Red shiner	134	188	385	33	55	15	264	135	28	43	1280	14.88
Bullhead minnow	70	4	32	33		15	12				166	1.93
Tadpole madtom		1									1	0.01
Gulf killifish								1	15	3	19	0.22
Sheepshead minnow	8				6		3	148	363	29	557	6.48
Mosquitofish	713	857	495	165	291	109	570	1	257	13	3471	40.34
Sailfin molly	19	16	52	63	29		58		17	9	263	3.06
Amazon molly	38	71	23	29	14	16	7	1			199	2.31
Striped mullet								7	24	26	57	0.66
Tidewater silverside	399	79	34	1		10	47	388	236	304	1498	17.41
Largemouth bass	9	1		10	1	13		20	6	1	61	0.71
Warmouth						1	1				2	0.02
Bluegill	14	111	17	5	5	21	14		6		193	2.25
Fountain darter									2	2	4	0.05
Leatherjacket										1	1	0.01
Pinfish									1	1	2	0.02
Rio Grande perch	2	31	7	51	15	35	4		6		151	1.76
Naked goby									2	1	3	0.03
Lined sole								6			6	0.07
Total	1593	1404	1071	414	465	275	1031	708	984	659	8604	100.00

were found, but they are not a problem at this time. Since there is sufficient flow in the river, aquatic vegetation is not considered a problem and is not likely to become one.

Good soil conservation practices have been used in this area, but more are needed to prevent soil pollution. Many landowners have planted coastal bermuda along the river. This practice has been very successful in stabilizing soil.

No nutria were seen along the river nor was there any indication of their presence.

Discussion:

At the present time there is a limited population of largemouth bass and white and black crappie. Many anglers limit their fishing to catfish, however. No flatheads were found, but there is a good channel and blue catfish population.

No actual count of fishermen was made, but nearly all of them observed were at one of three places; the Highway 359 crossing, Bazemore Park or the Highway 9 crossing.

Presently, there are no commercial fishing camps located along the river, but there are a number of bait stands nearby.

Recommendations:

A commercial netter is recommended to harvest unlimited numbers of gars and smallmouth buffalo from this portion of the river. Any catfish taken in their nets, however, should be returned to the water immediately. The area game warden has reported that he has taken a number of fish traps out of the river. This work should be continued.

For the purpose of keeping a check on the populations, a limited survey and creel census should be made in the future for making management proposals.

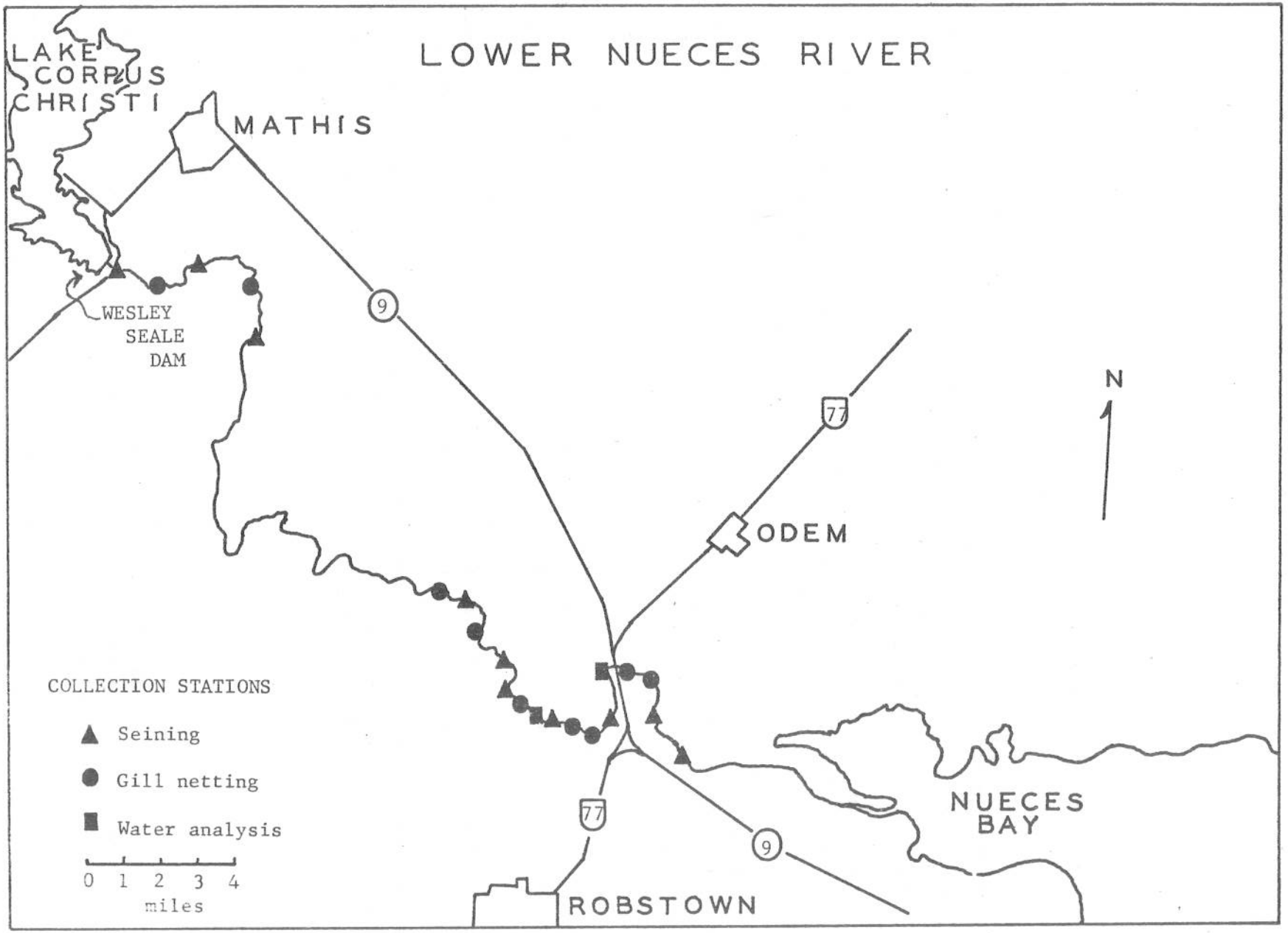
No developmental or management work is presently proposed or recommended.

Prepared by Charles T. Menn
Project Leader

Approved by Marion Toole
Coordinator

Date January 21, 1965

Kenneth C. Jurgens
Regional Supervisor


LOWER NUECES RIVER
LAKE CORPUS CHRISTI
MATHIS
WESLEY SEALE DAM
9
77
ODEM
N
COLLECTION STATIONS
Seining
Gill netting
Water analysis
0 1 2 3 4
miles
NUECES BAY
ROBSTOWN