Frio River

JOB PROGRESS REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-6-R-19

FISHERIES INVESTIGATIONS, REGION 5-B

Job No. I, Fish Harvest Regulations and Stocking Recommendations

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SUMMARY

Changes in the Southeast, Oak Prairie, South Central Texas Hunting, Fishing, and Trapping Proclamation were approved in amended form by the Parks and Wildlife Commission on September 31, 1971. Live Oak County, which had been under general law during previous years, was placed under regulatory authority during segment 19. Fishing regulations will be in compliance with the 1971-72 Proclamation. Possession and bag limits on channel, blue, and flathead catfish were removed "in the Nueces River below Wesley Seale Dam to Nueces Bay, in Medio Creek where it forms the boundary between Bee and Goliad Counties, and in the Aransas River where it forms the boundary of San Patricio County with Refugio County...." In all other areas of Region 5-B under regulatory authority, channel, blue, and flathead catfish now have a possession limit of fifty (50) in the aggregate and a minimum size limit of eleven (11) inches. Another change removed the portion of Lake Corpus Christi in San Patricio and Jim Wells Counties from a list of areas with special regulations and brought the whole lake under regulatory law. A new regulation affecting the entire South Central district states that "all freshwater trotlines must be identified by a legible tag, constructed of a material as durable as the trotline, bearing the name and address of the fisherman and the date it was set out."

There were no newly constructed or renovated waters in Region 5-B; therefore, no stocking ratio determinations were necessary. Surveys to determine species composition and abundance of young game fish were conducted at the Frio, Nueces, and San Antonio Rivers, and at Lake Corpus Christi and Alice City Lake.

Management practices have been ineffective in improving the river fisheries in area 5-B and plans to discontinue river surveys at the end of segment 19 have been made and approved.

Alice City Lake received releases of 2,000 advanced young channel catfish during segment 19. Releases of advanced fingerling flathead catfish are recommended for Alice City Lake and Lake Corpus Christi when they become available from Region 5 hatcheries.

JOB PROGRESS REPORT

State Texas

Project No. F-6-R-19 Project Title: Fisheries Investigations - Region 5-B

Job No. I Job Title: Fish Harvest Regulations and Stocking Recommendations

Period Covered: January 1, 1971 to December 31, 1971

OBJECTIVES:

To situate fish harvest regulations and stocking needs for Region 5-B waters.

1. To recommend fish harvest regulations to the Texas Parks and Wildlife Commission.

2. To recommend stocking ratios for newly constructed or renovated waters.

3. To determine the species composition and abundance of young game fishes in specified waters having established fish populations.

4. To recommend stocking of specified waters having established fish populations which exhibit deficits of young game fishes.

PROCEDURES:

On March 26, 1971, a meeting of biologists and game management officers was conducted for the purpose of formulating changes in hunting and fishing regulations in the regulatory counties of Region 5-B. The proposed changes were forwarded through proper channels to Austin headquarters for approval prior to presentation to the public at hearings in each county under regulatory authority. The Proclamation changes, along with records of each hearing, including public testimony, were then submitted to the Parks and Wildlife Commission for final consideration.

PROCEDURES: (Cont.)

Date	Time	Town	County	Number Attending
May 3	8:00 pm	Beeville	Bee	4
May 3	2:00 pm	Sinton	San Patricio	2
May 3	10:00 am	Rockport	Aransas	1
May 5	10:00 am	San Diego	Duval	0
May 5	2:00 pm	Alice	Jim Wells	0
Sept 14	8:00 am	George West	Live Oak	0
Sept 14	10:00 am	Sinton	San Patricio	0
Sept 14	2:00 pm	Alice	Jim Wells	0

There were no newly constructed or renovated waters in Region 5-B; therefore, no stocking ratio determinations were necessary during segment 19.

Fisheries surveys were conducted at sites on the Frio, Nueces, and San Antonio Rivers, Alice City Lake, and Lake Corpus Christi. Information pertaining to the location and description of each area was given in the 1969 job progress report.

Overnight gill netting and marginal seining were the major sampling techniques used during spring and fall surveys of each site. Limited use of a hoop net and trawl provided supplementary data.

Netting equipment consisted of straight mesh gill nets (1, 1½, or 2-inch mesh and 100-feet long), experimental gill nets (1-to 3½-inch mesh and 150-feet long), and graduated mesh gill nets (½-to 3-inch mesh and 100-feet long). Three seines were utilized in making fish collections. They included a 20-foot straight seine with 1/8-inch mesh, a 20-foot bag seine with 1/8-inch mesh, and a 32-foot bag seine with 1/8-inch mesh. Other sampling equipment consisted of a 10-foot otter trawl and a 3-foot diameter hoop net.

All game fishes and a representative sample of rough fishes, taken by net and trawl, were weighed and measured individually. Numbers and bulk weights were recorded for each species and game fish-rough fish ratios were determined. Seine samples were preserved in formalin and later categorized by species and size range.

Surface water samples were taken at each site and tested for temperature, dissolved oxygen, carbon dioxide, turbidity, alkalinity, pH, chlorides, and total hardness.

All fish species encountered during segment 19 are included in Table 1. Common and scientific names are in accord with those found in Special Publication No. 6, A List of Common and Scientific Names of Fishes from the United States and Canada (Third Edition), a publication of the American Fisheries Society.

Table 1

Species Checklist

Spotted gar	*Lepisosteus oculatus*
Longnose gar	*Lepisosteus osseus*
Alligator gar	*Lepisosteus spatula*
Gizzard shad	*Dorosoma cepedianum*
Threadfin shad	*Dorosoma petenense*
Mexican tetra	*Astyanax mexicanus*
Carp	*Cyprinus carpio*
Golden shiner	*Notemigonus crysoleucas*
Blackspot shiner	*Notropis atrocaudalis*
Pugnose minnow	*Notropis emiliae*
Red shiner	*Notropis lutrensis*
Proserpine shiner	*Notropis proserpinus*
Blacktail shiner	*Notropis venustus*
Bullhead minnow	*Pimephales vigilax*
River carpsucker	*Carpiodes carpio*
Smallmouth buffalo	*Ictiobus bubalus*
Blue catfish	*Ictalurus furcatus*
Black bullhead	*Ictalurus melas*
Channel catfish	*Ictalurus punctatus*
Flathead catfish	*Pylodictis olivaris*
Mosquitofish	*Gambusia affinis*
Sailfin molly	*Poecilia latipinna*
Tidewater silversides	*Menidia beryllina*
White bass	*Morone chrysops*
Green sunfish	*Lepomis cyanellus*
Warmouth	*Lepomis gulosus*
Bluegill	*Lepomis macrochirus*
Longear sunfish	*Lepomis megalotis*
Redear sunfish	*Lepomis microlophus*
Largemouth bass	*Micropterus salmoides*
White crappie	*Pomoxis annularis*
Black crappie	*Pomoxis nigromaculatus*
Freshwater drum	*Aplodinotus grunniens*
Rio Grande perch	*Cichlasoma cyanoguttatum*

FINDINGS:

Fish Harvest Regulations

The Southeast, Oak Prairie, South Central Texas Hunting, Fishing, and Trapping Proclamation was approved in amended form by the Texas Parks and Wildlife Commission on September 31, 1971. The following changes were included:

1. A possession limit of fifty (50) in the aggregate and a minimum size limit of eleven (11) inches was imposed on channel, blue, and flathead catfish in all the regulatory counties of Region 5-B.

2. The portion of Lake Corpus Christi in San Patricio and Jim Wells Counties was removed from a list of areas with special possession and bag limits and was placed under regulatory law.

3. Special possession and bag limits were removed on channel, blue, and flathead catfish "in the Nueces River below Wesley Seale Dam to Nueces Bay, in Medio Creek where it forms the boundary between Bee and Karnes Counties, in Blanco Creek and the Sarco River where they form the boundary between Bee and Goliad Counties, and in the Aransas River where it forms the boundary of San Patricio County with Refugio County...."

4. In all regulatory counties of the South Central District "all freshwater trotlines must be identified by a legible tag, constructed of a material as durable as the trotline, bearing the name and address of the fisherman and the date it was set out."

5. Live Oak County, which had been under general law during previous years, was placed under regulatory authority during segment 19. Fishing regulations will be in compliance with the 1971-72 Proclamation.

Fishery Surveys

Frio River
(Live Oak County)

Surveys were conducted over a one mile area of the river adjacent to Tips County Park extending above and below State Highway 72 bridge.

Data obtained from seven experimental gill nets set overnight during the two sampling efforts showed no significant variation from past surveys. Of the 98 individuals taken, 19.4 per cent were game fishes and 80.6 per cent were rough fishes (Table 2). The game fish-rough fish ratio was lower than in 1970 when game fish comprised 33.8 per cent of the total yield, yet higher than the 1969 ratio when game fishes accounted for only 4.5 per cent of the total yield.

Table 2

Frio River Netting Results, April and November 1971

Species	No.	%No.	Wt.	%Wt.	Avg. K	Avg. Wt.
Alligator gar	3	3.06	4.7	4.16		1.6
Spotted gar	13	13.27	20.3	17.98		1.6
Longnose gar	9	9.18	31.1	27.55		3.5
Gizzard shad	32	32.66	9.8	8.68		0.3
Smallmouth buffalo	15	15.31	28.7	25.42		1.9
Carp	2	2.04	1.9	1.68		1.0
Channel catfish*	7	7.14	5.5	4.87	1.64	0.8
Blue catfish*	1	1.02	1.5	1.33	1.76	1.5
Flathead catfish*	1	1.02	1.1	0.97	1.59	1.1
White bass*	3	3.06	1.5	1.33	2.76	0.5
Warmouth*	2	2.04	0.6	0.53	4.58	0.3
White crappie*	4	4.08	1.5	1.33	2.76	0.4
Black crappie*	1	1.02	0.3	0.27	3.66	0.3
Freshwater drum	4	4.08	4.2	3.72		1.1
Rio Grande perch	1	1.02	0.2	0.18		0.2
Total	98	100.00	112.9	100.00		
Game fish	19	19.38	12.0	10.63		
Rough fish	79	80.62	100.9	89.37		

* Denotes game fish

FINDINGS: (Cont.)

During the spring survey marginal seining produced adequate numbers of forage species with an abundance of red shiners and bullhead minnows. Moderate numbers of gizzard shad, threadfin shad, mosquitofish, and proserpine shiner were found. Small numbers of young-of-the-year channel catfish and largemouth bass were seined. Seining was not attempted in the fall due to flood conditions and steep muddy banks. The setting of a hoop net with a 50-foot lead had negative results.

Water analyses results are given in Table 3. High alkalinity and chloride readings were present in the April sample but were normal the following November. These high readings were apparently related to drought conditions and low water levels which had persisted for several months prior to the survey.

Nueces River
(Jim Wells, San Patricio, and Nueces Counties)

An area of the Nueces River below the Wesley Seale Dam extending south into Nueces County was sampled during May and December. The area is subject to wide fluctuations in water levels and frequent flooding. Fishing pressure is high for channel and blue catfish year-round and for white bass during the fall spawning season.

Table 4 gives the results of gill netting efforts. Overnight sets of four experimental gill nets produced a poor rough fish-game fish ratio. Twenty-three game fish were caught and represented only 27.1 per cent of the total yield. Channel and blue catfish accounted for 91.3 per cent of the game fish netted. Longnose gar, spotted gar, smallmouth buffalo, and freshwater drum were the major rough fishes present. Gizzard shad, which had dominated net yields in past years, were not found in the nets and only two were taken by seine. Both netting and seining produced numerous blue crabs (Callinectes sp.).

Marginal seining was not attempted during the spring survey due to the inaccessability of the area. Fall seining revealed large numbers of bluegills, bullhead minnows, and pugnose minnows; 14 immature white bass and 3 young-of-the-year channel catfish were taken. Other fish species, represented in small numbers, included mosquitofish, pugnose minnow, gizzard shad, warmouth, and freshwater goby.

Water analyses results are considered normal for the area (Table 5).

Table 3

Frio River Water Analyses Results, 1971

	April 27	November 24
Location	Tips Park	Tips Park
Depth	Surface	Surface
Water temperature (°F.)	73°	58°
Dissolved oxygen (ppm)	10.0	14.0
Carbon dioxide (ppm)	<4.0	2.5
M. O. alkalinity (ppm)	500.0	230.0
Turbidity (JTU)	10.0	65.0
pH	6.9	7.3
Chlorides (Cl^-) (ppm)	850.0	250.0

Table 4

Nueces River Netting Results, May and December 1971

Species	No.	%No.	Wt.	%Wt.	Avg. K	Avg. Wt.
Alligator gar	1	1.17	9.5	4.94		9.5
Spotted gar	4	4.71	6.1	3.17		1.5
Longnose gar	19	22.35	69.0	35.90		3.6
Smallmouth buffalo	15	17.65	78.5	40.84		5.2
Channel catfish*	14	16.47	7.2[1]	3.75	1.66	0.8
Blue catfish*	7	8.24	12.2[2]	6.35	1.66	2.4
Bluegill*	2	2.35	0.2	0.11	4.51	0.1
Freshwater drum	23	27.06	9.5[3]	4.94		0.6
Total	85	100.00	192.2	100.00		
Game fish	23	27.06	19.6	10.21		
Rough fish	62	72.94	172.6	89.79		

* Denotes game fish
1 Based on 9 fish
2 Based on 5 fish
3 Based on 15 fish

FINDINGS: (Cont.)

Table 5

Nueces River Water Analyses Results, 1971

	December 21
Location	State Hwy. 359 Crossing
Depth	Surface
Water temperature (^{o}F.)	66^{o}
Dissolved oxygen (ppm)	8.0
Carbon dioxide (ppm)	4.0
M. O. alkalinity (ppm)	110.0
Turbidity (JTU)	30.0
pH	7.25
Chlorides (Cl^{-}) (ppm)	30.0
Total hardness (ppm)	160.0

San Antonio River
(Karnes County)

The San Antonio River was sampled at Conquista Park in April and November. The park is located on F. M. 791 east of Falls City, Texas. This area of the river is characterized by steep banks, deep pools, and rapids created by limestone outcroppings.

Four experimental and eight 1-inch mesh gill nets yielded 122 specimens (Table 6). Game fish accounted for 21.3 per cent of the total yield as compared with 34.8 per cent in 1969 and 18.7 per cent in 1970. The per cent of game fish by weight showed little deviation from past surveys.

Red shiners and bullhead minnows were abundant in the spring seining collection. Young-of-the-year channel catfish were well represented in the fall, giving a good indication of a successful spawn. Fall seining also produced many bullhead minnows and Mexican tetras, with fewer numbers of gizzard shad, sailfin mollies, bluegills, and green sunfish.

Results of water analyses are given in Table 7. A higher than normal turbidity reading was found during the October survey as a result of the heavy rains which occurred in the area prior to and during the survey. No other abnormal readings were noted.

Table 6

San Antonio River Netting Results, April and October 1971

Species	No.	%No.	Wt.	%Wt.	Avg. K	Avg. Wt.
Spotted gar	2	1.64	3.2	2.24		1.6
Longnose gar	15	12.30	12.2	8.55		0.8
Gizzard shad	53	43.44	29.1	20.39		0.5
Smallmouth buffalo	21	17.21	63.6	44.57		3.0
River carpsucker	1	0.82	1.8	1.26		1.8
Carp	1	0.82	1.9	1.33		1.9
Channel catfish*	16	13.11	11.3	7.92	1.67	0.7
Flathead catfish*	4	3.28	17.6	12.34	1.90	4.4
Largemouth bass*	2	1.64	0.4	0.28	2.37	0.2
Longear sunfish*	2	1.64	0.2	0.14	4.91	0.1
White crappie*	2	1.64	1.0	0.70	2.92	0.5
Rio Grande perch	3	2.46	0.4	0.28		0.1
Total	122	100.00	142.7	100.00		
Game fish	26	21.31	30.5	21.38		
Rough fish	96	78.69	112.2	78.62		

* Denotes game fish

FINDINGS: (Cont.)

Table 7

San Antonio Water Analyses Results, 1971

	April 8	October 20
Location	Conquista Park*	Conquista Park*
Depth	Surface	Surface
Water temperature (^{o}F.)	64.4^{o}	75^{o}
Dissolved Oxygen (ppm)	9.0	14.0
Carbon dioxide (ppm)	<5	<5
M. O. alkalinity (ppm)	260.0	210.0
Turbidity (JTU)	33.0	120.0
pH	6.8	8.2
Chlorides (Cl^{-}) (ppm)	140.0	40
Total hardness (ppm)	330.0	310.0

* Denotes below rapids

Lake Corpus Christi
(Live Oak, Jim Wells, and San Patricio Counties)

Fisheries surveys were conducted in April and December at Lake Corpus Christi. Additional data were obtained in November when project personnel assisted the Bureau of Sports Fisheries and Wildlife in an annual pesticide monitoring survey.

Nine experimental, three 1-inch, one 1½-inch, and three variable mesh (½- 3-inch) gill nets were set during the year. A total of 199 game fish (152.5 lb.) and 236 rough fish (181.7 lb.) were caught (Table 8). Game fish represented 45.8 per cent of the total number and 45.6 per cent of the total weight. The game fish-rough fish ratio was consistent with past survey results.

The seining collection contained many bluegill and redear sunfishes of all sizes. Forage species were abundant and included bullhead minnow, mosquitofish, pugnose minnow, and blackspot shiner. Ten young-of-the-year largemouth bass were recorded as compared with 3 in 1970 and 9 in 1969.

Water analyses data showed favorable water quality (Table 9). No oxygen reading was taken during the December survey due to the contamination of a reagent used in the process.

Table 8

Lake Corpus Christi Netting Results, April, November, and December 1971

Species	No.	%No.	Wt.	%Wt.	Avg. K	Avg. Wt.
Alligator gar	1	0.23	1.2	0.36		1.2
Spotted gar	28	6.43	67.4	20.17		2.4
Gizzard shad	106	24.37	30.7	9.19		0.3
Smallmouth buffalo	9	2.07	29.0	8.68		3.2
Carp	2	0.46	1.7	0.51		0.9
Channel catfish*	41	9.42	12.9	3.86	1.54	0.3
Blue catfish*	69	15.86	112.0	33.51	1.57	1.6
White bass*	13	2.99	5.5	1.64	2.60	0.4
Largemouth bass*	3	0.69	1.1	0.33	2.41	0.4
Redear sunfish*	12	2.76	1.1	0.33	3.85	0.1
Bluegill*	8	1.84	0.7	0.21	4.29	0.1
White crappie*	21	4.83	10.4	3.11	2.86	0.5
Black crappie*	32	7.36	8.8	2.63	3.45	0.3
Freshwater drum	90	20.69	51.7	15.47		0.6
Total	435	100.00	334.2	100.00		
Game fish	199	45.75	152.5	45.62		
Rough fish	236	54.25	181.7	54.38		

* Denotes game fish

FINDINGS: (Cont.)

Table 9

Lake Corpus Christi Water Analyses Results, 1971

	April 30	December 17
Location	Lake Corpus Christi**	Lake Corpus Christi**
Depth	Surface	Surface
Water temperature (°F.)	77°	65°
*Dissolved oxygen (ppm)	12.0	* X
Carbon dioxide (ppm)	<5	<5
M. O. alkalinity (ppm)	165.0	130.0
Turbidity (JTU)	30	52
pH	6.8	7.6
Chlorides (Cl^-) (ppm)	75.0	35.0
Total hardness (ppm)	180.0	130.0

* PAO reagent contaminated; no reading
** Denotes Weber's Camp

Alice City Lake
(Jim Wells County)

Eight experimental and five 1-inch mesh gill nets were utilized on Alice City Lake. Netting produced 461 fish with a total weight of 196.6 pounds (Table 10). Channel catfish, black crappie, and white crappie were present in fewer numbers than in past samples; gizzard shad and black bullhead numbers increased. The game fish-rough fish ratio was lower than in either 1969 or 1970, with game fish representing only 23.0 per cent of the total number and 48.1 per cent of the total weight. In an attempt to increase game fish numbers, 2,000 advanced young channel catfish were stocked in the lake in December 1971. Seining activities produced only six 0-1 age group largemouth bass and no 0-1 age group channel catfish. Forage fishes were abundant with large numbers of bluegill, gizzard shad, Mexican tetra, tidewater silverside, and bullhead minnow.

The seine collection was supplemented by both daytime and nighttime trawling efforts. Even though the catch was limited, nighttime trawling was most effective, producing small numbers of 0-1 age group channel catfish, threadfin shad, and gizzard shad. Additional data were obtained from the setting of a hoop net in which 30 fishes were caught. The yield, however, was limited to black bullheads and several sunfish species.

FINDINGS: (Cont.)

Surface water samples were taken and analyzed during each survey (Table 11). Results of the analyses were considered normal for the lake and no significant changes in water quality were observed during the year.

Table 10

Alice City Lake Netting Results, May and November 1971

Species	No.	%No.	Wt.	%Wt.	Avg. K	Avg. Wt.
Gizzard shad	201	43.60	59.1	30.06		0.3
Smallmouth buffalo	1	0.22	1.4	0.71		1.4
Carp	2	0.43	5.0	2.54		2.5
Golden shiner	59	12.80	10.8	5.50		0.2
Channel catfish*	32	6.94	49.6	25.23	1.82	1.6
Black bullhead	92	19.96	25.7	13.07		0.3
Largemouth bass*	13	2.82	28.9	14.70	2.63	2.2
Warmouth*	6	1.30	0.6	0.31		0.1
Redear sunfish*	2	0.43	0.3	0.15	2.98	0.2
Bluegill*	20	4.34	1.9	0.97	4.15	0.1
White crappie*	18	3.91	7.4	3.76	2.81	0.4
Black crappie*	15	3.25	5.9	3.00	3.36	0.4
Total	461	100.00	196.6	100.00		
Game fish	106	22.99	94.6	48.12		
Rough fish	355	77.01	102.0	51.88		

* Denotes game fish

FINDINGS: (Cont.)

Table 11

Alice City Lake Water Analyses Results, 1971

	May 20	November 12
Location	Alice City Lake	Alice City Lake
Depth	Surface	Surface
Water temperature (°F.)	76°	68°
Dissolved oxygen (ppm)	10.0	11.0
Carbon dioxide (ppm)	2.5	2.5
M. O. alkalinity (ppm)	250.0	90.0
Turbidity (JTU)	70	10.0
pH	6.5	7.1
Chlorides (Cl-) (ppm)	40.0	5.0
Total hardness (ppm)	125.0	70.0

Stocking Recommendations

Alice City Lake received 2,000 advanced fingerling channel catfish (6-8 inches) during this segment.

As in past years, data, as well as fisherman interviews, indicate a continuing decline in the flathead catfish population in Lake Corpus Christi. It is recommended that hatchery reared advanced fingerlings be released into the lake if and when they become available from Region 5 hatcheries.

Introductions of flathead catfish should be made at Alice City Lake at a rate of 25 per acre. This stocking would provide another popular sports fish for the lake and would provide a predator for the control of the increasing black bullhead population.

RECOMMENDATIONS:

The lower Nueces, San Antonio, and Frio Rivers are subject to great variations in water levels. Although they are as shallow as 1-2 feet in some areas during drought periods, they may rise to overflow 30-foot banks during periods of heavy rainfall. Due to these extreme variations in water levels, fish populations are highly migratory. Management practices, such as the release of hatchery reared fishes into the river, are never realized by the sportsman. Therefore, plans have been made to discontinue fisheries

RECOMMENDATIONS: (Cont.)

management surveys of these waters at the end of segment 19. Under Job VI (Pollution Investigations), semiannual water analyses will be done at permanent sampling stations; pollution and fish kill investigations will be conducted when necessary.

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Approved by Lonnie Peters

Date October 19, 1972

Elgin M. C. Dietz
Regional Director for Inland Fisheries