JOB PROGRESS REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-6-R-17

FISHERIES INVESTIGATIONS - REGION 5-B

Job No. II Stocking Recommendations

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## SUMMARY

There were no newly constructed or renovated public waters in Region 5-B which warranted stocking surveys. Basic inventory samples were taken from the Frio, Nueces, and San Antonio Rivers and from Corpus Christi and Alice Lakes.

Various sizes of straight mesh and experimental gill nets and seines were used during sampling efforts. Spring and fall collections were conducted for gathering physical data and game fish-rough fish percentages.

Surface water samples were tested for temperature, pH, alkalinity, dissolved oxygen, carbon dioxide, and turbidity. No detrimental readings were revealed from waters investigated.

The Frio and Nueces Rivers exhibited large rough fish population and poor catfish reproduction. The overall game fish populations at the San Antonio River and Lakes Corpus Christi and Alice were considered satisfactory, although flathead catfish numbers seem to be declining in Lake Corpus Christi.

Additional channel catfish stockings are recommended for the Frio and Nueces Rivers in the amounts of 1,000 and 5,000 fingerlings, respectively. Concentrated efforts in rough fish removal by contract fishermen should be encouraged in the lower Nueces River.

Flathead catfish releases should be carried out at Lake Corpus Christi as fingerlings become available from State hatcheries.

JOB PROGRESS REPORT

State Texas

Project No. F-6-R-17 Project Title: Fisheries Investigations - Region 5-B

Job No. II Job Title: Stocking Recommendations

Period Covered: January 1, 1969 to December 31, 1969

Objectives:

To determine the waters in Region 5-B which would benefit from stocking.

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

2. To determine the abundance of age group 0-1 in waters having established fish populations.

3. To recommend stocking of waters having established fish populations but lack game species in age group 0-1.

Procedures:

There were no newly constructed or renovated public waters in Region 5-B which warranted stocking surveys during this segment; therefore, investigations were made in basically the same areas as in 1968.

Sampling was conducted on the Frio, Nueces, and San Antonio Rivers and at Corpus Christi and Alice Lakes. Spring and fall collections were made on all except Lake Corpus Christi, where data were gathered from one survey and six supplemental sampling trips made in conjunction with a fish aging study (Job IV) being conducted there.

Collections were made using various sizes and numbers of nylon straight mesh (100- to 400-foot) and standard experimental (150-foot) gill nets, a 20-foot straight seine, and a 32-foot bag seine. Gill net mesh sizes ranged from one to four inches square, while both seines were constructed of one-fourth of an inch mesh nylon material. Gill nets were set overnight at each of the locations. Seine drags varied from two to eight, due to inhibitive conditions found at some of the sampling sites.

Collections were categorized and counted, then weighed and measured for physical data. These data were tabulated by species and game fish - rough fish percentages were calculated.

Procedures: (Continued)

Basic water tests were run at each location to determine general water quality. Surface samples were tested for temperature, pH, alkalinity, dissolved oxygen, carbon dioxide, and turbidity.

Findings:

Frio River

A two-mile portion of the Frio River located one-half mile west of Three Rivers, Live Oak County, was sampled during May and December. The average width of the river at this location is approximately 40 feet and the average depth is about six feet. Steep banks occur on either side except in the area of a pool created by a small dam located at the Tips County Park site. Large numbers of fish congregate in this pool and fishing pressure is relatively heavy. Night fishing is popular; therefore, netting in the pool itself is difficult. Gill net productivity is usually low for game species above and below the pool, as can be seen in Table 1.

Approximately 8,000 fingerling channel catfish were released in this area of the Frio River on September 18, 1968. Extremely heavy rains and consequent flooding occurred soon after the release and many of these catfish were believed to have relocated.

Seining yielded numerous yearling channel catfish, white crappie, and black crappie. Several 0-1 age group largemouth bass and adult bluegill and redear sunfish were also taken. Abundant red shiners, tidewater silversides, gizzard shad, pugnose minnows, and mosquitofish comprised the forage species.

Results of the water analyses (Table 2) revealed no adverse conditions at the time of sampling. Discharge from the city water filtration plant in the immediate area apparently renders no harmful effects.

Nueces River

The lower portion of the Nueces River between Wesley Seale Dam and U. S. Highway 77, lying mostly in Nueces County, was also sampled during May and December. Steep banks and deep water characterize this portion of the river.

Fishing pressure varies throughout this 20-mile stretch. Trotlining is popular in many areas, while rod-and-reel fishermen frequent Bazemore and Nueces River Parks. Channel and blue catfishes are the most sought-after game species.

Rough fish species are well established in the river and comprise a large percentage of the gill net catches (Table 3). Blue crabs are relatively abundant in the lower extremity and cause heavy gill net damage.

Table 1
Frio River Netting Results, 1969

| Species | No. | Per Cent No. | Wt. | Per Cent Wt. | Ave. Wt. |
|---|---|---|---|---|---|
| Alligator gar | 1 | 1.1 | 3.6 | 2.5 | 3.6 |
| Spotted gar | 8 | 9.0 | 9.8 | 6.7 | 1.2 |
| Longnose gar | 26 | 29.2 | 67.1 | 45.8 | 2.6 |
| Gizzard shad | 10 | 11.2 | 4.0 | 2.7 | 0.4 |
| Smallmouth buffalo | 3 | 3.4 | 9.4 | 6.4 | 3.1 |
| Channel catfish* | 2 | 2.3 | 0.5 | 0.3 | 0.3 |
| Black bullhead | 1 | 1.1 | 0.1 | 0.1 | 0.1 |
| Flathead catfish* | 1 | 1.1 | 6.1 | 4.2 | 6.1 |
| White crappie* | 1 | 1.1 | 0.6 | 0.4 | 0.6 |
| Freshwater drum | 36 | 40.5 | 45.2 | 30.9 | 1.3 |
| Total | 89 | 100.0 | 146.4 | 100.0 | |
| Game fish | 4 | 4.5 | 7.2 | 4.9 | |
| Rough fish | 85 | 95.5 | 139.2 | 95.1 | |

* denotes game fish

Table 2
Frio River Water Analyses Results, 1969

| Date: | May 23 | May 23 | Dec. 11 |
|---|---|---|---|
| Location: | Above dam | Water Plant Discharge | Water Plant Discharge |
| Depth: | Surface | Surface | Surface |
| Temperature: | 78° F | 78° F | 54° F |
| Dissolved Oxygen (ppm): | 8.0 | 7.0 | 9.0 |
| Carbon Dioxide (ppm): | <5.0 | <5.0 | 5.0 |
| M. O. Alkalinity (ppm): | 256.5 | 256.5 | 188.1 |
| Turbidity (Secchi): | 104 mm. | 104 mm. | 110 mm. |
| pH: | 8.5 | 8.0 | 8.5 |

Table 3
Nueces River Netting Results, 1969

| Species | No. | Per Cent No. | Wt. | Per Cent Wt. | Average Wt. |
|---|---|---|---|---|---|
| Alligator gar | 6 | 5.5 | 104.4 | 34.0 | 17.4 |
| Spotted gar | 23 | 21.3 | 37.5 | 12.2 | 1.6 |
| Longnose gar | 24 | 22.2 | 62.1 | 20.2 | 2.6 |
| Gizzard shad | 30 | 27.8 | 27.2 | 8.9 | 0.9 |
| Smallmouth buffalo | 11 | 10.2 | 63.1 | 20.6 | 5.7 |
| Carp | 2 | 1.9 | 4.8 | 1.6 | 2.4 |
| Channel catfish* | 4 | 3.7 | 3.0 | 1.0 | 0.3 |
| Blue catfish* | 2 | 1.9 | 2.0 | 0.6 | 1.0 |
| Striped mullet | 1 | 0.9 | 0.9 | 0.3 | 0.9 |
| White bass* | 1 | 0.9 | 0.6 | 0.2 | 0.6 |
| White crappie* | 3 | 2.8 | 1.0 | 0.3 | 0.3 |
| Freshwater drum | 1 | 0.9 | 0.2 | 0.1 | 0.2 |
| Total | 108 | 100.0 | 306.8 | 100.0 | |
| Game fish | 10 | 9.3 | 6.6 | 2.1 | |
| Rough fish | 98 | 90.7 | 300.2 | 97.9 | |

* denotes game fish

Findings: (Continued)

Seining areas are extremely limited and only a few 0-1 age largemouth bass and sunfish were captured during the two sampling surveys. Forage species were abundant, with red shiners, sheepshead minnows, pugnose minnows, bullhead minnows, and sailfin mollies comprising the majority of the yield.

A total of 5,500 fingerling channel catfish were released in this portion of the Nueces River on September 18, 1968. It is believed that the survival of these catfish was greatly reduced due to predation and competition with the existing population.

No abnormal conditions were revealed from water analyses (Table 4).

San Antonio River

May and November sampling was carried out on a three-mile portion of the San Antonio River in Karnes County from the FM 791 crossing to Conquista Park. Steep banks and deep water predominate, although limestone bedrock underlying shallow areas provides fast moving water in several locations.

Fishing pressure is consistently moderate at Conquista Park and adjoining areas. Good catches of channel catfish are commonly taken on trotline and rod and reel, while flathead catfish are reportedly taken less frequently.

The game fish-rough fish ratio for this river was noticeably better than the two preceeding rivers, which can be attributed to more conducive habitat. Table 5 shows netting results for the spring and fall surveys. Several yearling channel catfish were taken with gill nets and numerous 0-1 age group catfish were captured with seines and released. A single 0-1 age group largemouth bass was also captured during spring seining.

Dissolved oxygen readings were slightly lower than normal during both surveys and the carbon dioxide was slightly higher (Table 6). Alkalinity readings were high, as usual, due to the large expanses of limestone outcroppings along the river basin.

Lake Corpus Christi

This 22,000-acre impoundment lies within Live Oak, Jim Wells, and San Patricio Counties and is the largest lake in Region 5-B. It is controlled by the Lower Nueces Water District and provides the domestic and industrial water supply for the city of Corpus Christi and much of the surrounding area.

Data from the November fisheries survey were supplemented with those from six sampling trips made in conjunction with an experimental fish aging study. Game species accounted for 52.2 per cent by number but only 23.3 per cent by weight of the total netting yield for November (Table 7). As Table 7 indicates, only one white bass was taken during the fall survey.

Table 4
Nueces River Water Analyses Results, 1969

| | | |
|---|---|---|
| Date: | May 21 | December 19 |
| Location: | Nueces River Park | Bazemore Park |
| Depth: | Surface | Surface |
| Temperature: | 78° F | 62° F |
| Dissolved Oxygen (ppm): | 7.0 | 8.0 |
| Carbon Dioxide (ppm): | < 5.0 | < 5.0 |
| M. O. Alkalinity (ppm): | 223.3 | 239.4 |
| Turbidity (Secchi): | 240 mm. | 240 mm. |
| pH: | 8.5 | 8.5 |

Table 5
San Antonio River Netting Results, 1969

| Species | No. | Per Cent No. | Wt. | Per Cent Wt. | Average Wt. |
|---|---|---|---|---|---|
| Spotted gar | 1 | 2.2 | 1.1 | 1.9 | 1.1 |
| Longnose gar | 23 | 50.0 | 32.8 | 57.7 | 1.4 |
| Gizzard shad | 1 | 2.2 | 1.3 | 2.3 | 1.3 |
| Smallmouth buffalo | 4 | 8.6 | 5.1 | 9.0 | 1.3 |
| Channel catfish* | 15 | 32.6 | 15.6 | 27.5 | 1.0 |
| White crappie* | 1 | 2.2 | 0.5 | 0.9 | 0.5 |
| Rio Grande perch | 1 | 2.2 | 0.4 | 0.7 | 0.4 |
| Total | 46 | 100.0 | 56.8 | 100.0 | |
| Game fish | 16 | 34.8 | 16.1 | 28.4 | |
| Rough fish | 30 | 65.2 | 40.7 | 71.6 | |

* denotes game fish

Table 6
San Antonio River Water Analyses Results, 1969

| | | |
|---|---|---|
| Date: | May 23 | November 13 |
| Location: | Conquista Park | Conquista Park |
| Depth: | Surface | Surface |
| Temperature: | 79° F | 71° F |
| Dissolved Oxygen (ppm): | 6.0 | 6.0 |
| Carbon Dioxide (ppm): | <5.0 | <5.0 |
| M. O. Alkalinity (ppm): | 307.8 | 290.7 |
| Turbidity (Secchi): | 150 mm. | 430 mm. |
| pH: | 8.5 | 8.5 |

Table 7
Lake Corpus Christi Netting Results, 1969

| Species | No. | Per Cent No. | Wt. | Per Cent Wt. | Average Wt. |
|---|---|---|---|---|---|
| Gizzard shad | 17 | 23.9 | 6.5 | 6.5 | 0.4 |
| Smallmouth buffalo | 14 | 19.7 | 60.9 | 61.3 | 4.4 |
| Golden shiner | 2 | 2.8 | 0.4 | 0.4 | 0.2 |
| Channel catfish* | 9 | 12.7 | 4.8 | 4.9 | 0.5 |
| Blue catfish* | 4 | 5.6 | 13.7 | 13.8 | 3.4 |
| White bass* | 1 | 1.4 | 0.5 | 0.5 | 0.5 |
| Largemouth bass* | 5 | 7.1 | 1.8 | 1.8 | 0.4 |
| Redear sunfish* | 5 | 7.1 | 0.4 | 0.4 | 0.1 |
| Bluegill* | 2 | 2.8 | 0.1 | 0.1 | 0.1 |
| Longear sunfish* | 1 | 1.4 | 0.1 | 0.1 | 0.1 |
| White crappie* | 3 | 4.2 | 0.4 | 0.4 | 0.1 |
| Black crappie* | 7 | 9.9 | 1.5 | 1.5 | 0.2 |
| Freshwater drum | 1 | 1.4 | 8.2 | 8.3 | 8.2 |
| Total | 71 | 100.0 | 99.3 | 100.0 | |
| Game fish | 37 | 52.2 | 23.3 | 23.5 | |
| Rough fish | 34 | 47.8 | 76.0 | 76.5 | |

* denotes game fish

Findings: (Continued)

However, this species was quite abundant in samples obtained for aging study purposes. Adequate numbers of adult and yearling blue catfish, channel catfish, largemouth bass, white crappie, black crappie, and sunfishes were captured by gill netting during all sampling efforts.

Flathead catfish were lacking in the November sample and were taken infrequently in aging study samples. Fishermen also reported fewer flathead catches than in the past.

Marginal seining failed to produce a single 0-1 age group channel or blue catfish in November, but these individuals were very evident on other sampling occasions. Numerous largemouth bass and sunfish young were taken. Few 0-1 age group crappie were captured, but these fish are believed to be reproducing satisfactorily. Threadfin shad and pugnose minnows were abundant forage species recorded.

No adverse water conditions were recorded during the sampling period. Results of water tests are given in Table 8.

## Alice Lake

At normal elevation, this lake inundates approximately 100 acres. In the past, it served as a water storage basin for the city of Alice in Jim Wells County. Well water is presently being used by the city and consequently no effort is made to maintain a constant water level in the lake. During extremely dry periods, the elevation may drop as much as three vertical feet.

Fishing pressure is moderate throughout the year. Channel catfish, largemouth bass, and crappie are taken most often. Very little trotline fishing is done here.

Netting data expressed favorable game fish-rough fish ratios (Table 9). Game fish comprised 59.6 per cent by number and 81.3 per cent by weight of the total catch. As at Lake Corpus Christi, good numbers of adult and yearling channel catfish, largemouth bass, white crappie, black crappie, and sunfishes were caught. Black bullheads, representing the 0-1 and yearling age groups, were also numerous.

Channel catfish, largemouth bass, redear sunfish and bluegill of the 0-1 age groups were very evident in seining collections. Large numbers of intermediate and adult gizzard shad, tidewater silversides, pugnose minnows, and bullhead minnows were also collected by seining.

Water conditions were considered normal for this lake during each of two surveys (Table 10).

Table 8
Lake Corpus Christi Water Analyses Results, 1969

| | |
|---|---|
| Date: | November 19 |
| Location: | State Park Cove |
| Depth: | Surface |
| Temperature: | 63.5° F |
| Dissolved Oxygen (ppm): | 10.0 |
| Carbon Dioxide (ppm): | <5.0 |
| M. O. Alkalinity (ppm): | 188.1 |
| Turbidity (Secchi): | 175 mm. |
| pH: | 8.5 |

Table 9
Alice City Lake Netting Results, 1969

| Species | No. | Per Cent No. | Wt. | Per Cent Wt. | Average Wt. |
|---|---|---|---|---|---|
| Gizzard shad | 56 | 20.0 | 14.9 | 9.4 | 0.3 |
| Golden shiner | 6 | 2.1 | 1.2 | 0.8 | 0.2 |
| Channel catfish* | 54 | 19.3 | 75.3 | 47.8 | 1.4 |
| Black bullhead | 49 | 17.5 | 9.9 | 6.3 | 0.2 |
| Largemouth bass* | 8 | 2.9 | 22.6 | 14.3 | 2.8 |
| Warmouth* | 1 | 0.3 | 0.2 | 0.1 | 0.2 |
| Redear sunfish | 20 | 7.1 | 6.3 | 4.0 | 0.3 |
| Bluegill sunfish* | 10 | 3.6 | 1.1 | 0.7 | 0.1 |
| White crappie* | 31 | 11.1 | 17.3 | 11.0 | 0.6 |
| Black crappie* | 43 | 15.4 | 5.3 | 3.4 | 0.1 |
| Freshwater drum | 2 | 0.7 | 3.5 | 2.2 | 1.8 |
| Total | 280 | 100.0 | 157.6 | 100.0 | |
| Game Fish | 167 | 59.6 | 128.1 | 81.3 | |
| Rough Fish | 113 | 40.4 | 29.5 | 18.7 | |

*denotes game fish

Table 10
Alice Lake Water Analyses Results, 1969

| | | |
|---|---|---|
| Date: | May 20 | October 30 |
| Location: | At dam | At dam |
| Depth: | Surface | Surface |
| Temperature: | 84° F | 70° F |
| Dissolved Oxygen (ppm): | 8.0 | 7.0 |
| Carbon Dioxide (ppm): | <5.0 | <5.0 |
| M. O. Alkalinity (ppm): | 205.2 | 205.2 |
| Turbidity (Secchi): | 210 mm. | 105 mm. |
| pH: | 8.5 | 8.5 |

Recommendations:

In view of the foregoing information, additional stockings of channel catfish are recommended at prescribed sites along the Frio and Nueces River in the amounts of 1,000 and 5,000 fingerlings, respectively. These areas exhibit good catfish habitat, but harbor large numbers of rough fish. Commercial fishermen working under rough fish removal contracts from the Texas Parks and Wildlife Department should be encouraged to concentrate netting efforts on the lower Nueces River below Wesley Seale Dam in an attempt to reduce undesirable species.

Flathead catfish numbers have apparently declined in Lake Corpus Christi and should be strengthened by stocking when and if they become available from area State hatcheries. This is a popular sport fish for trotliners and also provides an excellent predator for open water rough fish and stunted game fish populations.

No other fish stocking is recommended for public waters in Region 5-B this segment.

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Date October 26, 1970

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