SEGMENT COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-3-16

Region 3-B Fisheries Studies

Job No. 15 Fishery Management Recommendations

Project Leader: Joe E. Toole

J. R. Singleton
Executive Director
Texas Parks and Wildlife Department
Austin, Texas

Marion Toole
D-J Coordinator

Eugene A. Walker
Director, Wildlife Services

March 25, 1969

ABSTRACT

A preliminary meeting of Department field biologists, game management officers, and supervisory personnel was held in Palestine on May 15, 1968, to discuss proposed regulation changes for the Northeast Texas, Southeast Texas and Trinity-Brazos Regulatory Areas. Public hearings were held in all regulatory counties within Region 3-B in June 1968, for the presentation of proposed proclamations.

Quarterly field collections were conducted on the six major reservoirs in Region 3-B in regulatory areas. These reservoirs include Sam Rayburn, Dam "B", Murvaul, Striker, Palestine and Caddo.

Netting, seining and rotenone data indicated adequate populations and reproduction of most game fish species in these lakes. Channel catfish populations are increasing in Dam "B", Caddo and Lake Striker, but declining in Sam Rayburn, Lake Palestine and Lake Murvaul. Additional stocking of advanced channel catfish fingerlings is recommended in Lake Palestine with the completion of the third stage now under construction.

Submerged aquatic vegetation is a continuing problem in all of the reservoirs but chemical or mechanical controls are not possible due to water uses or requirements in the reservoirs.

Flea beetles may provide biological control of alligator weed in Dam "B" and recommendations are made to continue spot treatment eradication of water hyacinths on Caddo Lake.

Newly impounded Lake Livingston, an 82,000 surface acre reservoir on the lower Trinity River will be included in the coming segment of this study.

It is recommended that this job be continued to provide current fish population data, vegetation control needs, and stocking needs in these major reservoirs.

SEGMENT COMPLETION REPORT

State of Texas

Project No. F-3-16 Name: Region 3-B Fisheries Studies

Job No. 15 Title: Fishery Management Recommendations

Period Covered: February 1, 1968 - January 31, 1969

PS OBJECTIVES: To determine, in Region 3-B waters, the need for:

1. changes in fish harvest regulations
2. fish population control
3. stocking of game fish species
4. noxious vegetation control
5. emergency measures needed to correct unpredictable events adversely effecting fish populations.

SEGMENT OBJECTIVES: Same

PROCEDURES:

1. a. Field data from quarterly surveys in Sam Rayburn Reservoir, Dam "B" Reservoir, Lake Murvaul, Lake Striker, Lake Palestine, and Caddo Lake were analyzed to formulate advantageous fishery regulations.

   b. Proposed fishery regulations will be presented at public hearings in regulatory authority counties within Region 3-B.

2. a. Quarterly surveys were made on each of the above listed reservoirs this segment. Experimental gill nets and bag seines were utilized for making fish collections. Rotenone sampling supplemented seining activities in some collections to better determine spawning success of game fish species. Experimental gill nets used in these collections are 150 feet in length and 8 feet in depth, with square mesh ranging from 1 to 3-1/2 inches. Mesh size increases in 1/2 inch increments every 25 feet. One 16-foot nylon bag seine with 1/4-inch mesh and a 32-foot bag seine with 3/8-inch mesh was used for seining collections.

3. a. Each of the candidate waters in this study contain established game fish populations. Criteria for making stocking recommendations consist primarily of food availability and degree of reproduction. Where field sampling indicates little or no successful reproduction, the normal stocking recommendation rate will be 100 bass fry or 50 bass fingerlings and 25 channel catfish fingerlings per acre. Of course, in large reservoirs such as Sam Rayburn, this rate cannot feasibly be maintained.

4. a. In conjunction with fisheries surveys, visual observations of aquatic vegetation were made and recorded to determine those areas infested with noxious plants detrimental to fisherman access and useage.

   b. Control recommendations for such areas of noxious vegetation were made if feasible.

5. a. Whenever conditions or events that would threaten fish life come to the attention of project personnel, circumstances will be investigated and reported along with recommendations for remedial action.

FINDINGS:

A preliminary meeting was held in Palestine on May 15, between Parks and Wildlife field biologists, game management officers, and supervisory personnel for the discussion of proposed regulation changes.

Inland Fisheries Region 3-B includes counties in three regulatory areas; the Northeast Texas Area, the Southeast Texas Area, and the Trinity-Brazos Area. No fisheries changes were proposed for Region 3-B counties this year.

Public hearings were attended in each regulatory county. The following schedule lists the respective regulatory counties with their meeting dates and time.

1968 PUBLIC HEARING SCHEDULE

Northeast Texas Regulatory Area

County	Date	Time
Harrison	June 11	10:00 am
Panola	June 11	2:00 pm
Rusk	June 11	8:00 pm

Southeast Texas Regulatory Area

Newton	June 11	2:00 pm
Jasper	June 11	10:00 am
Tyler	June 11	8:00 pm
Polk	June 13	10:00 am
Trinity	June 13	2:00 pm
Houston	June 13	8:00 pm
Sabine	June 13	10:00 am
Nacogdoches	June 14	2:00 pm
Angelina	June 14	10:00 am
San Augustine	June 13	2:00 pm

Trinity-Brazos Regulatory Area

County	Date	Time
Anderson	June 11	2:00 pm

- -

The following resumes are submitted for the six major reservoirs in Region 3-B which lie within areas of regulatory responsibility.

Table 1 is a checklist of all fish species collected during this study with notations of location and collection method.

Table 1. A checklist of fish species collected from all waters in 1968. Note: Abbreviations are as follows: SR - Sam Rayburn Reservoir, B - Dam "B" Reservoir, M - Lake Murvaul, S - Lake Striker, P - Lake Palestine, C - Caddo Lake, n - netting, s - seining, r - rotenone.

SCIENTIFIC NAME	COMMON NAME	LOCATION	COLLECTION METHOD
Lepisosteus spatula	alligator gar	SR	n
L. platostomus	shortnose gar	P	n
L. oculatus	spotted gar	ALL	n
L. osseus	longnose gar	SR,B,P	n
Amia calva	bowfin	SR,B,M,P,C	n
Dorosoma petenense	threadfin shad	SR,B,M	s,r
D. cepedianum	gizzard shad	ALL	n,s,r
Esox americanus	grass pickerel	SR,M,P,C	n,s,r
E. niger	chain pickerel	S,C	n,s
Ictiobus cyprinellus	bigmouth buffalo	SR,B	n
I. bubalus	smallmouth buffalo	SR,B,P,C	n
Carpiodes carpio	river carpsucker	SR,B,C	n
Minytrema melanops	spotted sucker	SR,B,P,C	n
Erimyzon succetta	lake chubsucker	ALL	n,r
Cyprinus carpio	carp	SR,B,S,P	n
Notemigonus crysoleucas	golden shiner	SR,B,M,P,C	n,s,r

Table 1. (continued)

SCIENTIFIC NAME	COMMON NAME	LOCATION	COLLECTION METHOD
Opsopoeodus emiliae	pugnose minnow	B,P	s
Notropis venustus	blacktail shiner	SR,B	s,r
N. lutrensis	red shiner	SR,B	s
N. stramineus	sand shiner	SR,B,P	s,r
N. maculatus	taillight shiner	SR,B,C	s
Hybognathus nuchalis	silvery minnow	B	s
Pimephales vigilax	bullhead minnow	SR,B	s
*Ictalurus punctatus	channel catfish	ALL	n
*I. furcatus	blue catfish	B,C	n
I. melas	black bullhead	SR,B,M,P,C	n,s,r
I. natalis	yellow bullhead	SR,B,M,P,C	n,s,r
*Pylodictis olivaris	flathead catfish	M,S,P,C	n
Fundulus chrysotus	golden topminnow	SR,M,C	s
F. notti	starhead topminnow	SR,B,M,S,P	s
F. notatus	blackstripe topminnow	SR,B,M,S,P	s,r
Gambusia affinis	mosquitofish	ALL	s,r
Labidesthes sicculus	brook silversides	SR,B,S,P,C	s,r
Aphredoderus sayanus	pirate perch	SR	r
*Roccus chrysops	white bass	B,S	n
*R. interruptus	yellow bass	C	n
*Micropterus punctulatus	spotted bass	SR,B,S,P	n
*M. salmoides	largemouth bass	ALL	n,s
*Chaenobryttus gulosus	warmouth	ALL	n,s,r
*Lepomis cyanellus	green sunfish	S	n
*L. punctatus	spotted sunfish	SR,B,M,P	n,s,r
*L. microlophus	redear sunfish	ALL	n,s,r

Table 1. (continued)

SCIENTIFIC NAME	COMMON NAME	LOCATION	COLLECTION METHOD
*L. macrochirus	bluegill sunfish	ALL	n,s,r
*L. auritus	redbreast sunfish	SR,B,M,P	n,s
*L. megalotis	longear sunfish	ALL	n,s,r
*Pomoxis annularis	white crappie	ALL	n,s,r
*P. nigromaculatus	black crappie	ALL	n,s,r
*Centrarchus macropterus	flier	SR	n
Percina caprodes	logperch	SR	s,r
Etheostoma proeliare	cypress darter	C	s
Aplodinotus grunniens	freshwater drum	SR,B,C	n

* designates game fish species

Table 2 contains netting collection totals for each water. These data are consolidations of individual field collections conducted this segment.

Table 2. Consolidated netting data ratios for 1968.

2a. Sam Rayburn Reservoir

	NUMBER COLLECTED	PER CENT BY NUMBER	TOTAL WEIGHT(lbs)	PER CENT BY WEIGHT
ROUGH FISH	772	64.45	1235.44	87.75
GAME FISH	426	35.55	172.60	12.25
TOTAL	1198	100.00	1408.04	100.00

2b. Dam "B" Reservoir

ROUGH FISH	523	61.96	982.38	83.75
GAME FISH	321	38.04	190.49	16.25
TOTAL	844	100.00	1172.87	100.00

Table 2. (continued)

2c. Lake Murvaul

	NUMBER COLLECTED	PER CENT BY NUMBER	TOTAL WEIGHT(lbs)	PER CENT BY WEIGHT
ROUGH FISH	534	51.50	522.53	65.50
GAME FISH	502	48.50	275.24	34.50
TOTAL	1036	100.00	797.77	100.00

2d. Lake Striker

ROUGH FISH	255	52.40	206.21	62.20
GAME FISH	232	47.60	125.32	37.80
TOTAL	487	100.00	331.53	100.00

2e. Lake Palestine

ROUGH FISH	220	42.15	204.53	56.40
GAME FISH	303	57.85	158.12	43.60
TOTAL	523	100.00	362.65	100.00

2f. Caddo Lake

ROUGH FISH	500	80.51	634.76	87.55
GAME FISH	121	19.49	90.27	12.45
TOTAL	621	100.00	725.03	100.00

2g. Region totals

ROUGH FISH	2804	59.55	3538.56	73.75
GAME FISH	1905	40.45	1259.33	26.25
TOTAL	4709	100.00	4797.89	100.00

Individual percentages by weight and number for each species, K-factor data for game fish species, and seining-rotenone collection data were also compiled but are not listed in table form. Significant aspects of these field data are included in the resumes for given waters.

Sam Rayburn Reservoir

First impounded in 1966, this 114,000 surface acre reservoir filled to conservation pool level in early 1968. A two-year basic survey was conducted in 1966-67. (Job B-22, F-3-R-13 and 14). Data from these surveys indicated adequate game fish reproduction in the new reservoir with the exception of channel catfish (Ictalurus punctatus), blue catfish (Ictalurus furcatus), and flathead catfish (Pylodictus olivaris).

Due to the large size of Sam Rayburn, six separate field collections were made this segment on the reservoir. Table 2a contains data totals from the combined collections. A very poor sample of largemouth bass (Micropterus salmoides) was netted. Sam Rayburn has a tremendous sport fishery for bass and is rated as one of the finest bass lakes in the Nation. Total game fish percentages by weight would no doubt have exceeded 20 per cent with an adequate representation of largemouth bass.

Smallmouth buffalo (Ictiobus bubalus) was the most numerous rough fish species netted. A total of 246 buffalo was collected with an average weight of 2.41 pounds.

Only 14 channel catfish were netted in these collections and no blue or flathead catfish were taken. These data indicate a lack of successful reproduction of these catfish species. Due to the large size of the reservoir, additional stocking of catfish is not feasible. Present netting regulations allow catfish to be taken in nets with a minimum of 3-1/2 inch square mesh, set at least 4 feet below the surface. It is the writer's belief that such nets are not detrimental to channel catfish populations but may well be to flathead or blue catfish adults.

Seining and rotenone collections contained good samples of forage fish and young-of-the-year largemouth bass (Micropterus salmoides), black crappie (Pomoxis nigromaculatus), white crappie (P. annularis), bluegill sunfish (Lepomis macrochirus) and warmouth (Chaenobryttus gulosus).

Dam B Reservoir

Dam B, located in Jasper and Tyler counties below the confluence of the Angelina and Neches Rivers, continues to be a very productive reservoir. Primarily constructed for the purpose of storing water for coastal irrigation, Dam B remained highly turbid due to water fluxuation. Because of this high turbidity and exposure during drawdowns, submerged aquatics were no problem. With the completion of Sam Rayburn Reservoir however, Dam B now remains relatively stable in water level and consequently lower in turbidity. A variety of submerged plants are increasing in the lake. Alligator weed (Althernanthera philoxeroides) is an even greater nuisance to fishermen on Dam B. Releases of flea beetles (Agasicles sp.) were made in 1967 and it appears that these insects may provide a biological control on this noxious plant in Dam B.

Table 2b contains consolidated data of the four field collections made on Dam B this segment. Total game fish percentages were good, being 38.04 per cent by number and 16.25 per cent by weight. Dam B continues to be a good producer of largemouth bass, both species of crappie, and channel and blue catfish. Smallmouth buffalo was the most numerous rough fish netted with a total of 146 and an average weight of 3.31 pounds.

Seining collections contained excellent samples of threadfin shad (Dorosoma petenense), blacktail shiners (Notropis venustus), red shiners (N. lutrensis), and other forage fish species.

Lake Murvaul

Lake Murvaul, a 3,800 surface acre impoundment in Panola County, is controlled by the Panola County Freshwater District No. 1. Murvaul is famous for its continued production of lunker size largemouth bass. This lake has consistently maintained higher game fish populations than any reservoir in Region 3-B. Game fish comprised 48.50 per cent by number and 34.50 per cent by weight of this segment's collection. These unusually high game fish percentages are in part due to very high populations of bluegill and redear sunfish.

Since impoundment, Murvaul has produced only limited numbers of channel catfish. In 1967, a program of raising and stocking advanced fingerling catfish was initiated by the Panola County Freshwater District. To date, evidence of the success of this stocking program is not reflected in collection data as only two channel catfish were netted this year.

Seining collections revealed good reproduction of largemouth bass in Murvaul. Table 2c contains netting data totals for the lake.

Submerged aquatic plants are an increasing problem in Lake Murvaul. Bladderwort (Utricularia sp.) and water milfoil (Myriophyllum sp.) are the most common species. A winter drawdown would aid in controlling this vegetation in marginal areas. Chemical control is not possible due to domestic water use and regardless of this, only spot treatments would be economically feasible.

Lake Striker

Constructed in 1956 by the Angelina and Nacogdoches Counties Water Control and Improvement District No. 1 in cooperation with Texas Power and Light Company, Lake Striker was impounded in 1957. This 2,300 surface acre lake has been a consistant producer of largemouth bass as well as channel and flathead catfish. White bass (Roccus chrysops) were introduced in the lake in 1962 and have established a fishable population. This species provides additional winter sport to Striker fishermen.

Game fish comprised 47.50 and 37.80 per cent by number and weight respectively of this segment's collection. These data indicate only limited populations of white and black crappie in Striker. The increase of white bass and corresponding decreases in crappie populations since 1962 suggest that these species may be competitive, perhaps due to food habit similarities.

Gizzard shad is the dominant rough fish species in the lake, followed by carp. Buffalo are not present in Lake Striker. Table 2d contains netting data totals for Lake Striker.

Submerged aquatic vegetation, primarily water milfoil, chokes the upper half and entire marginal area of the lake during the summer months. Dense timber and brush combined with low turbidity provide optimum habitat for the submerged plants. Again, chemical control of this noxious vegetation is not feasible and water fluxuation is not possible due to power plant operations.

Lake Palestine

Lake Palestine, constructed in 1961 by the Upper Neches River Municipal Water Authority, contains 6,000 surface acres. The lake is now drawn down to the Neches River channel for construction of the third stage. Upon completion the third stage level will cover 21,000 surface acres.

Early reconnaissance data from newly impounded Lake Palestine in 1963-65 revealed good populations of channel and flathead catfish. Later surveys indicated a decline of catfish and it is suspected that hydrogen sulfide gas prohibited catfish reproduction in the lake.

Two field collections were made this year prior to the drawdown and one in October when the lake contained only approximately 2,500 surface acres of water. Numerous large bass were netted in the May collection as well as 85 bluegill sunfish. A correlation of bass and bluegill populations with those of Lake Murvaul is noted. Gizzard shad was the only rough fish species netted in significant numbers in Lake Palestine this segment. Table 2e contains netting data totals for Lake Palestine.

Inadequate marginal clearing during second stage construction in 1961 provided excellent habitat for submerged vegetation and prevented fishing access to many areas of the lake. Recommendations were made in basic survey reports that more proper clearing be conducted during third stage construction. (Job B-19, F-3-R-9). A recent survey of possible seining area sites revealed that adequate marginal clearing is now in progress on some areas of the lake.

Seining collections included numerous largemouth bass fingerlings as well as bluegill and redear sunfish. Recommendations were made earlier this segment to close Lake Palestine to contract commercial fishing during the drawdown period. With the completion of the third stage, it is anticipated that Lake Palestine will again provide optimum fishing for bass, crappie and sunfish.

Caddo Lake

Lying in Texas and Louisiana, Caddo Lake is unique in legend and appearance. Still a favorite to many fishermen despite the numerous new reservoirs in northeast Texas, Caddo contains more fish species than any other lake in the State.

Game fish percentages comprised 19.50 per cent by number and only 12.45 per cent by weight of the total collection this year. This is considerably less than previous segment percentages for the lake.

Bass and crappie fishing is periodically very good on Caddo and the chain pickerel is regarded as a game fish by many Caddo fishermen during the winter. The most common rough fish species are gizzard shad and spotted suckers (Minytrema melanops). Table 2f contains netting data totals for Caddo.

With the upstream construction of Lake O' the Pines on Cypress Bayou, Caddo does not receive the annual flood waters that, in previous years, served to increase turbidity and discourage the vegetation. Without this flooding action the shallow, clear waters of Caddo become filled with submerged plants each summer. Large areas are also covered with american lotus (Nelumbo lutea). However, the lotus leaves shade out the

submerged aquatics and provide good fishing water in the fall and winter months. The extensive system of boatroad cutting and marking completed in 1967 has greatly improved fisherman access on Caddo.

Water hyacinths are becoming an increasing problem on the lake. Spot treatments with 2,4-D amine prevented excessive growth of the hyacinths during the summer of 1968. Continued eradication of the scattered plants will be necessary during the coming year to control them.

CONCLUSIONS AND RECOMMENDATIONS:

Netting data from the six major reservoirs included good representations of most game fish species. Successful reproduction of largemouth bass, crappie and sunfish was indicated by seining and rotenone collection data.

Channel catfish populations are increasing in Lake Striker, Dam "B" and Caddo Lake, but decreasing in Sam Rayburn, Lake Murvaul, and Lake Palestine. Additional stocking is not feasible in Sam Rayburn due to the large size of the reservoir. The private channel catfish stocking at Murvaul is continuing although its success is doubtful. With the completion of the third stage of Lake Palestine, additional stocking of advanced fingerling channel catfish is recommended.

Submerged aquatic vegetation is a continuing problem in all of the reservoirs. Chemical control is not feasible, either economically or because of domestic water uses. Water drawdowns are also impractical due to power plant operation on Lake Striker and water conservation or use requirements on Dam "B", Lake Murvaul, and Sam Rayburn.

Noxious emergent vegetation observed this segment included alligator weed in Dam "B" and water hyacinths on Caddo. The flea beetle releases on Dam "B" may provide biological control of the alligator weed which is preferable to a chemical control. It is recommended that continued spot treatments be conducted on the Caddo hyacinths with 2,4-D amine.

It is concluded that present fish harvest regulations for these major reservoirs are adequate.

It is recommended that this job be continued to provide valid fish harvest regulations through population sampling data, vegetation control needs, and stocking needs where feasible. Lake Livingston, a newly impounded 82,000 acre reservoir on the lower Trinity River, will be included in the coming segment of this study.

Prepared by Joe E. Toole and Stephen F. Smith
Project Leader Asst. Project Ldr.

Approved by Marion Toole
Coordinator

Date March 25, 1969

Charles E. Gray
Fisheries Supervisor