JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-5-R-13

REGION I-B FISHERIES STUDIES

Job No. 4 Population Control Recommendations

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ABSTRACT

Gill nets and seines were used at seven public lakes to determine if chemical renovation was needed. The criteria for considering treatment procedures were that rough fish percentages exceed 80 per cent by either weight or number and that water volumes not be great enough to make costs prohibitive.

San Angelo Reservoir qualified for a partial renovation under these criteria. This was effectuated under Job 16a49 of Project F-14-D-8.

Lakes not currently meeting the criteria outlined were J. B. Thomas, Valley Creek, Old Winters, Elm Creek, Old Robert Lee and Towle Park.

JOB COMPLETION REPORT

State of Texas

Project No. F-5-R-13 Name: Region I-B Fisheries Studies

Job No. 4 Title: Population Control Recommendations

Period Covered: March 1, 1965 - February 28, 1966

Objectives:

To determine those waters which would benefit from population control.

Procedures:

The schedule of netting and seining, included in the job description for this job, was followed except for minor deviations noted in the findings. Forty-one netting and thirty-one seining collections were obtained from the seven lakes investigated.

Standard gill nets were used. These are composed of six 25- by 8-foot sections. The first section has 1-inch mesh and in each succeeding section the mesh is ½-inch larger.

Dimensions of the various seines used are described, along with their catches, in the findings. The term "seining collection" is used to designate one or two drags of a 20-, 30- or 40-foot seine in an area no larger than 2 acres, or one drag of a 100-, 200- or 300-foot seine.

Fish captured in seines were counted and a length range was determined. Unusual specimens were preserved in 10 per cent formalin solution and identified in the laboratory.

All fish captured in nets were counted, weighed and measured. The stomach and gonads of most game fish were examined. A few valuable specimens, not obviously harmed by the netting process, were released without dissection.

Water conditions, such as temperature and turbidity, were recorded on the days nets were run. Hydrological information, such as lake elevation and catchment records, were obtained when available.

Total numbers, total weights, per cents, average weights and "K" factors were tabulated with an automatic calculator. It was set to automatically round off percentages to two decimal places. These statistics were then examined to determine which lakes could be considered for renovation under job description criteria. These criteria are that the rough fish percentages surpass 80 per cent by either weight or number and that water levels permit economical chemical treatment.

A job description was submitted under the Statewide Rough Fish Control Project for the one lake qualifying under the criteria outlined. The need for this rotenone renovation was justified and documented and plans for its enactment were approved by the controlling agencies (see Job 16-a-49 of Project F-14-D-8).

A checklist of scientific names is presented so that common names may be used in this report. These names are specified in "A List of Common and Scientific Names of Fishes from the United States and Canada", Second Edition, American Fisheries Society, Special Publication Number 2, 1960.

Longnose gar	Lepisosteus osseus
Gizzard shad	Dorosoma cepedianum
carp	Cyprinus carpio
Golden shiner	Notemigonus crysoleucas
Red shiner	Notropis lutrensis
Blacktail shiner	Notropis venustus
Fathead minnow	Pimephales promelas
Bullhead minnow	Pimephales vigilax
River carpsucker	Carpiodes carpio
Smallmouth buffalo	Ictiobus bubalus
Black bullhead	Ictalurus melas
Channel catfish	Ictalurus punctatus
Flathead catfish	Pylodictis olivaris
Mosquitofish	Gambusia affinis
White bass	Roccus chrysops
Green sunfish	Lepomis cyanellus
Orangespotted sunfish	Lepomis humilis
Bluegill	Lepomis macrochirus
Longear sunfish	Lepomis megalotis
Redear sunfish	Lepomis microlophus
Largemouth bass	Micropterus salmoides
White crappie	Pomoxis annularis
Freshwater drum	Aplodinotus grunniens

Lake J. B. Thomas

Findings:

This major reservoir is located in Borden and Scurry Counties. It contains 203,600 acre-feet of water and covers 7,850 acres when full. On May 19, 1965, when netting collections were taken, the lake was 15.55 feet below spillway level and contained approximately 110,000 acre-feet.

When the fish captured by the netting sample are classified according to desirability, game fish compose 41.17 per cent by number and 62.75 per cent by weight. Included as game fish are the catfishes, white bass, sunfishes, largemouth bass and crappie. This is a high game fish ratio for an older lake. A resurgence of flathead and channel catfish populations in the past

two years is largely responsible for this high percentage (Table 1).

The seining sample indicates that forage for larger game fishes is plentiful, and that gizzard shad are probably more abundant than the netting reflects. Seining further documents the netting indication that white crappie are extremely abundant (Table 2).

Conclusions and Recommendations:

Lake Thomas does not meet the criteria set out for considering renovation. The rough fish population is not excessive enough to justify treatment and the water volume is too great to economically permit it.

It is recommended that this lake be sampled under the stocking recommendations job during the next segment and deleted from the description for this objective.

Table 1. Results of 12 Gill Nets Set in Lake J. B. Thomas on May 18, 1965. Water Temperature 71°F. General Turbidity 12 Inches.

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Gizzard shad	138	26.79	15.44	.11	2.33	1.93
Carp	17	3.30	48.43	2.85	7.34	2.65
River carpsucker	148	28.74	181.12	1.22	27.45	2.49
Channel catfish	39	7.57	20.50	.53	3.10	1.88
Flathead catfish	40	7.77	347.93	8.70	52.72	2.44
White bass	16	3.11	16.58	1.04	2.51	2.49
Bluegill	7	1.36	.64	.09	.10	4.08
Longear sunfish	2	.39	.15	.07	.02	3.64
Largemouth bass	12	2.33	15.24	1.27	2.31	2.49
White crappie	89	17.28	13.11	.15	1.99	2.97
Freshwater drum	7	1.36	.85	.12	.13	2.26
Totals	515	100.00	659.99		100.00	

Table 2. Results of Eight Seining Collections From Lake J. B. Thomas on May 17 and August 30, 1965.
(5 collections with a 100-foot straight seine, 10 feet deep with 1-inch mesh).
(3 collections with a 20-foot straight seine, 6 feet deep with 1/8-inch mesh).

Species	Number	Size Range In Inches
Gizzard shad	183	3-7
Golden shiner	11	2-2½
Blacktail shiner	32	1½-4
White bass	1	17
White crappie	54	5-6
Totals	281	

Valley Creek Reservoir

Findings:

This is a water supply lake for the city of Ballinger, in Runnels County. When full, as it was when nets were run on September 29, 1965, the lake contains 1,350 acre-feet and covers approximately 150 acres.

Five nets were set in the lake. Gizzard shad and river carpsucker dominated this sample. Problematic species accounted for 73.25 per cent of the sample, by number, and 70.87 per cent by weight. However, those game fish present were of good quality. Several large crappie, weighing up to 1-pound and 4-ounces, were captured and channel catfish of all sizes were taken (Table 3).

One additional net was set in the creek; above a low water crossing at the upper end of the lake. Land access to this area is privately controlled but water access is available. Two flathead catfish were the only game fish netted (Table 4).

Seining was limited to a boat launching area in the main body of the lake. Small forage fishes were very abundant (Table 5).

Conclusions and Recommendations:

This lake does not currently qualify for total renovation. However, the magnitude of the rough fish population justifies periodic netting and seining surveys to determine when chemical treatment will be appropriate. City officials and sportsmen of Ballinger have requested a lake improvement program.

A selective and/or spot treatment type renovation, similar to the one done at San Angelo Reservoir, may be worthy of consideration when estimates of rough fish populations exceed present indications. This technique's primary benefit is in providing an opportunity to successfully stock game species.

Table 3. Results of Five Gill Nets Set in Valley Creek Lake on September 29, 1965. Water Temperature 78°F. General Turbidity 10 Inches

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Longnose gar	1	.27	4.00	4.00	2.03	.45
Gizzard shad	182	50.70	20.52	.11	10.45	1.67
Carp	5	1.39	32.25	6.45	16.41	2.26
River carpsucker	63	17.55	73.47	1.17	37.41	2.33
Black bullhead	1	.28	.22	.22	.11	2.56
Channel catfish	18	5.01	32.08	1.78	16.33	1.70
Flathead catfish	1	.28	3.31	3.31	1.68	1.95
Bluegill	16	4.46	1.37	.09	.70	3.66
Largemouth bass	6	1.67	5.64	.94	2.87	2.38
White crappie	55	15.32	14.81	.27	7.54	2.52
Freshwater drum	11	3.07	8.77	.80	4.47	2.26
Totals	359	100.00	196.44		100.00	

Table 4. Results of One Gill Net Set Above The Low Water Crossing in Valley Creek on November 16, 1965.

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Longnose gar	11	52.38	41.87	3.81	60.13	.43
Gizzard shad	8	38.09	2.51	.31	3.60	1.74
Flathead catfish	2	9.53	25.25	12.63	36.27	2.06
Totals	21	100.00	69.63		100.00	

Table 5. Results of Two Seining Collections From Valley Creek Reservoir on September 28, 1965.
(2 collections with a 20-foot straight seine, 6 feet deep with ¼-inch mesh).

Species	Number	Size Range In Inches
Gizzard shad	2	4
Golden shiner	342	1-2
Blacktail shiner	275	½-2½
Bullhead minnow	2	2½
Mosquitofish	12	½-1
Bluegill	8	1-3
Largemouth bass	1	3
Total	642	

Old Winters Lake

Findings:

This 50-acre lake is in Runnels County. It was once a water supply reservoir for the city of Winters. Years of siltation have created a shallow, turbid lake with a flat, boggy bottom. Present maximum capacity is probably less than 200 acre-feet. It was 1½ feet low during the August netting and seining trip.

Complete chemical renovation was attempted in 1961. Heavy runoff within two days prevented a complete kill of undesirable fish. However, fishing was excellent for about two years after the stocked game fish grew to a desirable size.

Gizzard shad populations are high but not excessive. The absence of river carpsucker in the netting is significant. The lake was heavily infested with this species before renovation (Table 6).

Seining supports the netting indication that shad are abundant. It also reveals that there are many shiners and young largemouth bass (Table 7).

Conclusions and Recommendations:

Channel catfish are sufficiently abundant to provide good fishing. Some of the crappie are large enough to catch. If the lake level does not drop excessively, largemouth bass fishing should continue. The presence of many largemouth bass fingerlings and small forage fishes looks promising.

It is concluded that this lake currently needs no renovation. If gizzard shad populations become excessive in future years, they can be selectively controlled with powdered rotenone for only a few dollars.

Because of the relatively good fish population, this lake should be deleted from this job for the next segment and included under the job designed to determine stocking needs (Job 5).

Table 6. Results of Four Gill Nets Set in Old Winters Lake on August 19, 1965. Water Temperature 83°F. General Turbidity 8 Inches

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Gizzard shad	51	31.67	5.91	.12	11.64	1.95
Carp	6	3.73	2.25	.38	4.43	2.93
Black bullhead	1	.62	.16	.16	.32	2.60
Channel catfish	15	9.32	13.53	.90	26.65	1.71
Flathead catfish	2	1.24	14.50	7.25	28.57	1.92
Bluegill	17	10.56	1.26	.07	2.48	4.37
White crappie	69	42.86	13.15	.19	25.91	3.38
Totals	161	100.00	50.76		100.00	

Table 7. Results of Six Seining Collections From Old Winters Lake on August 18, 1965.
(6 collections with a 20-foot straight seine, 6 feet deep with ¼-inch mesh).

Species	Number	Size Range In Inches
Gizzard shad	222	2-4
Carp	2	3-4
Golden shiner	77	1-1½
Red shiner	420	1-2
Blacktail shiner	3	1-2
Channel catfish	1	2½
Mosquitofish	73	½-2
Green sunfish	56	1-3
Bluegill	184	1-3
Largemouth bass	164	2-4
White crappie	54	3-7
Total	1256	

Elm Creek Reservoir

Findings:

A small dam, in the Ballinger City Park, in Runnels County, retards Elm Creek for several miles. Ballinger owns public access from the dam to the first low water crossing, a distance of approximately one mile. Above this crossing the public can fish by boat, but the shoreline is privately controlled.

A water area below the first crossing is about 25 acres and the volume is approximately 100 acre-feet. Because of this limited area only two nets were set. White crappie composed 54.60 per cent of this netting sample. This appears to be the only significant game fish population available. Some crappie weighed as much as 13 ounces (Table 8).

An additional net was set above the low water crossing, which can technically be considered as a separate body of water. The fish in this sample were all undesirable (Table 9).

Seining was impossible because of shoreline obstructions.

Conclusions and Recommendations:

Renovation procedures are not immediately justifiable. This lake should be carried under this same job for the next segment. If gizzard shad and river carpsucker follow their frequent pattern of extreme domination and existing crappie do not continue to grow, a chemical treatment and restocking program might be appropriate. Several landowners, above the public access area, would reportedly cooperate in a watershed treatment. Only short-term benefits could be expected from such a program since the Winters City Lake and several other smaller impoundments are on the same watershed.

Table 8. Results of Two Gill Nets Set in Elm Creek Lake on September 30, 1965.
Water Temperature 78°F. General Turbidity 10 Inches

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Longnose gar	3	2.30	7.16	2.39	7.19	.49
Gizzard shad	21	16.16	12.77	.61	12.83	1.99
Carp	2	1.54	6.50	3.25	6.52	2.59
River carpsucker	14	10.76	28.68	2.05	28.81	2.44
Smallmouth buffalo	3	2.31	15.00	5.00	15.07	3.52
Black bullhead	4	3.08	1.89	.47	1.90	2.57
Channel catfish	1	.77	1.81	1.81	1.82	1.80
White crappie	71	54.61	14.10	.20	14.16	3.05
Freshwater drum	11	8.47	11.64	1.06	11.70	2.25
Totals	130	100.00	99.55		100.00	

Table 9. Results of One Gill Net Set Above the Low Water Crossing in Elm Creek on November 16, 1965.

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Longnose gar	7	26.92	22.67	3.24	32.37	.39
Gizzard shad	8	30.77	9.88	1.24	14.11	2.15
River carpsucker	4	15.38	6.49	1.62	9.26	2.67
Smallmouth buffalo	6	23.08	30.91	5.15	44.13	3.17
White crappie	1	3.85	.09	.09	.13	2.70
Totals	26	100.00	70.04		100.00	

San Angelo Reservoir

Findings:

From data collected under this job and the F-5-R-12 reconnaissance job it was concluded that a partial rotenone renovation was needed. This treatment was effectuated on April 16, 1965. A complete description of the treatment and the pre-treatment and post-treatment netting and seining data is included in the report for Job 16a49 of Statewide Rough Fish Control Project F-14-D. To prevent duplication only those data collected after the 16a49 report was written are presented here (Tables 10, 11, and 12).

Conclusions and Recommendations:

Gizzard shad were reintroduced into the lake during a period of water influx, following treatment. Shortly thereafter they successfully reproduced and are once again numerous. However, the primary intent of the renovation, to re-establish a game fish population, appears to have been realized. Largemouth bass are much more abundant than before the treatment. Many of the crappie have grown to a desirable size. Anglers report that fishing is much improved.

This lake should be included under the stocking recommendations job during the next segment. If a significant increase in water volume occurs, additional stocking might be beneficial.

Table 10. Results of Six Gill Nets Set in San Angelo Reservoir on May 27, 1965.
Water Temperature 73°F. General Turbidity 24 Inches

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Longnose gar	49	38.58	127.06	2.59	41.95	.40
Gizzard shad	3	2.36	.35	.12	.12	1.98
Carp	19	14.96	54.56	2.87	18.01	2.56
River carpsucker	35	27.56	61.15	1.75	20.20	2.54
Channel catfish	8	6.30	9.87	1.23	3.25	2.00
Flathead catfish	4	3.15	48.31	12.08	15.96	2.35
Bluegill	8	6.30	1.43	.18	.47	4.69
Longear sunfish	1	.79	.11	.11	.04	5.62
Totals	127	100.00	302.84		100.00	

Table 11. Results of Six Gill Nets Set in San Angelo Reservoir on October 27, 1965.
Water Temperature 65°F. General Turbidity 10-16 Inches

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Longnose gar	6	4.08	10.56	1.76	6.46	.41
Gizzard shad	17	11.56	2.78	.16	1.70	1.86
Carp	16	10.89	23.32	1.46	14.28	2.73
River carpsucker	56	38.09	84.32	1.51	51.63	2.65
White bass	8	5.44	3.21	.40	1.96	2.62
Channel catfish	15	10.21	24.32	1.62	14.89	1.73
Bluegill	7	4.76	1.31	.19	.80	4.56
Largemouth bass	6	4.08	6.34	1.06	3.89	2.25
White crappie	10	6.80	4.26	.43	2.60	2.92
Freshwater drum	6	4.09	2.91	.49	1.79	2.63
Totals	147	100.00	163.33		100.00	

Table 12. Results of Six Seining Collections From San Angelo Reservoir on November 10, 1965.
(2 collections with a 200-foot straight seine, 10 feet deep with 1-inch mesh).
(4 collections with a 20-foot straight seine, 6 feet deep with 1/4-inch mesh).

Species	Number	Size Range In Inches
Gizzard shad	213	5-12
Carp	1	7
Golden shiner	1	6
Blacktail shiner	1	2½
White bass	1	8
Longear sunfish	11	3-5
Redear sunfish	3	4-5
Largemouth bass	11	3-11
Total	242	

Old Robert Lee Lake

Findings:

This small lake is owned by the city of Robert Lee in Coke County. Its only use is fishing. The lake is divided by a levee. One pool covers approximately 5 acres and the other covers about 25 acres.

Since the water level of these pools was low, only two nets were set. Fifty per cent of the catch were game fish (Table 13).

Seining produced many small centrarchidae of several species. Black bullheads were the only rough fish captured (Table 14).

Conclusions and Recommendations:

A renovation program cannot be currently considered. Since no channel catfish were captured there may be a need for hatchery stocking. This lake should be switched from this job to the stocking recommendations job during the next segment.

Table 13. Results of Two Gill Nets Set in Old Robert Lee Lake on June 29, 1965.
Water Temperature 77°F. General Turbidity 6 Inches

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Golden shiner	2	14.28	.47	.24	3.57	2.38
Black bullhead	5	35.72	.87	.17	6.62	2.40
Flathead catfish	2	14.28	3.50	1.75	26.62	2.04
Largemouth bass	2	14.29	4.92	2.46	37.41	2.80
White crappie	3	21.43	3.39	1.13	25.78	3.30
Totals	14	100.00	13.15		100.00	

Table 14. Results of Six Seining Collections From Old Robert Lee Lake on June 29, 1965.
(4 collections with a 20-foot straight seine, 6 feet deep with ¼-inch mesh).
(2 collections with a 100-foot straight seine, 8 feet deep with ½-inch mesh).

Species	Number	Size Range In Inches
Golden shiner	27	1½-9
Black bullhead	10	4-6
Green sunfish	4	3-5
Bluegill	74	2-4
Largemouth bass	4	4½-13
White crappie	9	4-9
Total	128	

Towle Park Lake

Findings:

This lake is in a county park, within the city limits of Snyder, in Scurry County. It is often fished by children. During May, when sampling was conducted, it covered 11 acres and contained approximately 55 acre-feet of water.

Because of the small size of the lake only two nets were set. No rough fish were captured in either the nets or seines (Tables 15 and 16).

Conclusions and Recommendations:

Too many small sunfish are present. There is no known method to effectively control them. Since renovation may not be needed for several years, if ever, and since no stocking needs are indicated, field investigations should not be required under Project F-5-R-14.

Table 15. Results of Two Gill Nets Set in Towle Park Lake on May 18, 1965.

Species	Number	Per Cent by No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent by Wt.	Average "K"
Golden shiner	1	8.33	.12	.12	1.28	2.10
Channel catfish	4	33.33	8.99	2.24	95.94	2.23
Bluegill	5	41.67	.18	.04	1.92	3.58
White crappie	2	16.67	.08	.04	.86	2.50
Totals	12	100.00	9.37		100.00	

Table 16. Results of Six Seining Collections From Towle Park Lake on May 17, 1965.
(6 collections with a 20-foot straight seine, 6 feet deep with ¼-inch mesh).

Species	Number	Size Range In Inches
Golden shiner	39	2-6
Red shiner	48	1-3
Fathead minnow	3	2½
Mosquitofish	9	1-2
Green sunfish	93	2-4
Orangespotted sunfish	224	2-2½
Bluegill	351	1-3
Largemouth bass	1	14
White crappie	86	2-4
Total	854	

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Date February 4, 1966

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