

PERFORMANCE REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

Texas

Federal Aid Project No. F-5-R-22

REGION I-B FISHERIES STUDIES

Objective 13: Fisheries Management Recommendations

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## Summary

The objective of this study is to recommend management practices for the public waters of Region 1-B.

This job was terminated 3 months early to facilitate the initiation of a New Statewide Fisheries Management Project, F-30-R. However surveys were conducted at the major public lakes this segment. These 12 surveys included fish sampling with gill nets and seines; collection of physical, hydrological and ecological data; aquatic vegetation checks, and water analysis.

Preliminary meetings and public hearings were attended for the Permian Basin and Edwards Plateau Regulatory Districts. The existing fishing regulations were adequate for the existing fisheries resources and changes were not necessary.

Stocking was the most common management activity recommended. This includes both native game species stocked at opportune times and the introduction of large open water predator species (striped bass, white bass - striped bass hybrid and walleye).

PERFORMANCE REPORT

State: Texas Project Number: F-5-R-22

Project Title: Region I-B Fisheries Studies

Project Section: Inventory

Study Title: Fisheries Management Recommendations

Contract Period: From March 1, 1974 To February 28, 1975

Program Narrative Objective No.: 13

PS Objectives:

To determine the need for in Region I-B waters,

1. Changes in fish harvest regulations
2. Population control
3. Stocking
4. Vegetation control
5. Updating public access information.

I. Segment Objectives:

One through five above.

- II. Summary of Progress: Proposed fishing regulations were discussed with concerned Department personnel at preliminary meetings in the Edwards Plateau and Permian Basin Regulatory Districts. Current fisheries survey data, existing fisheries regulations, and applicable developments in fisheries management elsewhere provided the basis for proposed fish harvest regulations. The resulting proposals were presented at public hearings in each county under regulatory authority.

Fish populations were sampled with standard gill nets and seines. The standard gill net used is 150 feet long and 8 feet deep with mesh sizes varying from 1 to 3½ square inches. Additional large mesh (3 - and 3½ - square-inch-mesh) gill nets were used to more adequately sample fishes of larger sizes.

The number of nets set was determined by the size of the impoundment, water conditions and time of year. The size of seines used is given with each survey results table.

All fish collected in gill nets were counted and weighed. A sample of fish, usually up to 15 of each game species, was measured and examined for sexual development and stomach content. Total numbers, total weights,

percentage composition, average weights and condition factors ("K") were tabulated. Fish taken in seines were counted and length ranges were recorded. Several specimens of each species were preserved in formalin and returned to the laboratory where identifications were confirmed.

Vegetation observations were made during each survey and records were made as to the kind and abundance. This information will be discussed only when significant.

Air and water temperatures, hydrological data, turbidity, weather conditions and other physical data were recorded in each survey. Water analyses, including dissolved oxygen, carbon dioxide, alkalinity, total hardness, chlorides and pH were conducted on most waters. This type of information will be discussed in this report only when pertinent.

Data for each body of water were examined to determine which waters would be considered for population control measures. The criteria for considering management efforts were population of undesirable species in excess of 80 per cent by weight and/or number, lake capacities, water usage, and the "cost-benefit ratio" of a treatment.

Several public waters surveyed during this segment were recommended for supplementary hatchery stocking of fingerling game fish for one or more of the following reasons: (1) the degree and survival of game fish reproduction, (2) reservoir capacities, (3) food abundance, (4) fishing pressure and (5) past production records.

III. Significant Deviation: To facilitate to the initiation of a new State-wide Fisheries Management Project, F-30-R, this job was terminated 3 months early. However the major public lakes of Region I-B were surveyed this segment.

Field data collections for the Statewide Walleye Evaluation, Job 18 , Project F-7-R, were made on Twin Buttes Reservoir. These samples included monthly water analysis, frame net collections, seining samples and rotenone cove samples.

No major improvements or developments of access and/or facilities were found, therefore updating of the Statewide Public Access Bulletin was not necessary.

IV. Conclusions, Evaluations and Recommendations: The existing fish harvest regulations for Region I-B were found to be satisfactory for the present resources and no changes were proposed or adopted.

The public waters of Region I-B surveyed during this segment are listed in Table 1. A comparison of the average coefficients of condition ("K" factors) for all game species collected with gill nets at all waters surveyed is presented in Table 2. The 1974 supplementary hatchery stocking of game fish recommended by this project is found in Table 3.

The evaluation, discussion, and recommendations for objectives 2,3, and 4 will be combined and reported separately for each concerned body of water

Table 1.

Waters Surveyed During Segment 22

<u>Name</u>	<u>County</u>	<u>Surface Acres Size</u>	<u>Number of Visits</u>
Amistad Reservoir	Val Verde	64,900	2
Ascarate Lake	El Paso	50	1
Balmorhea Reservoir	Reeves	573	1
Diablo 1 Lake	Hudspeth	84	1
E. V. Spence Reservoir	Coke	14,950	1
Macho Lake	Hudspeth	40	1
Mountain Creek Lake	Coke	95	1
Nasworthy Lake	Tom Green	1,596	1
Oak Creek Reservoir	Coke	2,375	1
Red Bluff Reservoir	Reeves	11,700	1
Twin Buttes Reservoir	Tom Green	9,080	1
Valley Creek Lake	Runnels	187	1

Table 2.

Comparison of Average "K" Factors of Game Species

Species

- Blue catfish
- Channel catfish
- Flathead catfish
- White bass
- Striped bass
- White x Striped bass hybrid
- Warmouth
- Redbreast sunfish
- Green sunfish
- Orangespotted sunfish
- Bluegill
- Longear sunfish
- Redear sunfish
- Largemouth bass
- White crappie
- Black crappie
- Walleye

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Lakes	Blue catfish	Channel catfish	Flathead catfish	White bass	Striped bass	White x Striped bass hybrid	Warmouth	Redbreast sunfish	Green sunfish	Orangespotted sunfish	Bluegill	Longear sunfish	Redear sunfish	Largemouth bass	White crappie	Black crappie	Walleye
Amistad	1.71	1.81	2.07	2.63			3.35	3.16	3.98		3.18	3.10	2.93	2.31	2.34		
Ascarate		1.52									3.56		2.88	3.18	2.77		
Balmorhea		1.84	2.52							3.60	3.58		3.73	2.45	2.49		3.19
Diablo 1		1.58	2.40											2.16	2.52		2.76
E. V. Spence	1.70	1.67	2.03	2.55	2.14						3.69		3.17	1.79	2.74		
Macho		2.28									3.43						
Mountain Creek		1.99	2.04				4.52		3.68		3.59		3.17	3.40			
Naworthy		1.81	1.92	2.53		2.59					3.92	4.45	3.18	2.21	2.74		
Oak Creek		1.61	2.19	2.31							3.33		3.59	2.04	2.40		
Red Bluff		1.79		3.39					3.88								
Twin Buttes		1.48	1.99	2.19							3.56	4.30	3.36	1.91	2.45		1.64
Valley Creek		2.12	2.83				2.98				4.28	4.70		2.63	2.56		
Average	1.71	1.79	2.22	2.60	2.14	2.59	3.62	3.16	3.85	3.60	3.61	4.14	3.26	2.41	2.56	2.98	1.64

Table 3. Stocking Records for Region 1-B Public Waters, 1974

<u>Lake or Stream</u>	<u>Species</u>	<u>Number Recommended</u>	<u>Number Stocked</u>
Amistad	Striped Bass	-	83,000
E.V. Spence	Blue Catfish	30,000	-
	Flathead Catfish	6,000	-
	Striped Bass	52,000	52,000
	Largemouth Bass	30,000	-
Nasworthy	Channel Catfish	10,000	10,000
	White-Striped Bass Hybrid	16,000	16,000
	Largemouth Bass	10,000	-
N. Concho	Blue Catfish	25,000	24,000
	Channel Catfish	75,000	66,800
	Hybrid Sunfish	100,000	100,000
	Largemouth Bass	10,000	4,500 *
	Walleye	-	50,000
Oak Creek	Channel Catfish	15,000	15,000
Red Bluff	Channel Catfish	19,000	19,900
San Saba River	Channel Catfish	20,000	20,000
Twin Buttes	Blue Catfish	25,000	4,840
	Channel Catfish	20,000	20,000
	Flathead Catfish	4,000	-
	Largemouth Bass	20,000	20,000
	Walleye	-	100,000

\* "Super Bass" (Florida - Texas Cross)

for expediency. Stocking requests for 1975 have been made but may require changes because of unpredictable water levels in West Texas.

#### Lake Amistad

Lake Amistad has gained a large volume of water because of heavy September rains in West Texas. The lake rose to within a few feet of maximum flood level in less than a week. The International Boundary and Water Commission released a 60,000-second-foot flow over the spillway to prevent overtopping the flood gates.

Fewer largemouth bass than usual were captured in gill nets this year (Table 4); future surveys will determine whether there is a significant trend. No evidence of detrimental factors is known. Extensive shallows newly inundated this fall should contribute to largemouth bass spawning and forage areas next year. The IBWC has cooperated in maintaining the water level during previous bass spawning seasons. In the future, however, Amistad requirements may have to yield to those of Falcon Lake in alternate years to assist in maintaining the largemouth bass population in the downstream reservoir.

The size of the river carpsucker fraction of total fish population appears to be increasing. As with largemouth bass, future surveys are necessary to determine whether this year's results represent a changing population or are simply minor variations due to weather conditions or net locations. The number and weight of smallmouth buffalo remain high and their mean weight continues to increase.

Although not requested by this project, striped bass were introduced into Amistad in 1974. The number of fingerlings stocked was inadequate to produce a significant population, in the opinion of the project leader.

#### Ascarate and Ascarate Fisherman's Lakes

Data for these lakes are presented together (Table 5) because the water supply and the fish population are shared. No differences were noted in netting results that could be ascribed to significant population changes. However, adult largemouth bass, which were not caught in gill nets in October 1973, were present in October 1974. Young of the year bass fingerlings were seined, although no fish were stocked in either lake this year. Channel catfish, however, showed decreasing numbers and increasing mean weight.

The suspension of stocking should be continued to determine the current level of natural recruitment of game fish in Ascarate Park. If catfish continue to decline in numbers, fingerling stocking should resume at levels low enough to avoid overcrowding and insure good growth in the 50 acres available in both lakes.

This lake needs a large predator species to utilize the larger gizzard shad. Striped bass x white bass hybrids have shown some potential in larger reservoirs. Ascarate should be considered as a candidate water for evaluation of this predator in smaller impoundments.

Table 4 Survey results Amistad Lake, May 21-24, and November 11-13, 1974.  
Results of forty standard gill nets, and eleven large mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Spotted gar	3	0.25	4.00	1.33	0.16	
Longnose gar	12	1.00	31.99	2.67	1.28	
Alligator gar	2	0.17	95.00	47.50	3.81	
Gizzard shad	383	31.88	212.00	0.55	8.49	
Goldfish	1	0.08	0.88	0.88	0.04	
Carp	40	3.33	110.78	2.77	4.44	
Golden shiner	1	0.08	0.14	0.14	0.01	
River carpsucker	137	11.41	268.20	1.96	10.75	
Smallmouth buffalo	371	30.88	1155.30	3.11	46.28	
Gray redhorse	5	0.42	7.95	1.59	0.32	
Blue catfish*	11	0.92	17.18	1.56	0.69	1.55
Channel catfish*	45	3.75	50.12	1.11	2.01	1.71
Flathead catfish*	46	3.83	469.13	10.20	18.79	2.03
White bass*	8	0.67	9.95	1.24	0.40	2.81
Warmouth*	2	0.17	0.42	0.21	0.02	3.08
Redbreast sunfish*	4	0.33	0.68	0.17	0.03	3.22
Bluegill*	64	5.32	7.17	0.11	0.29	3.24
Longear sunfish*	2	0.17	0.17	0.09	0.01	3.53
Redear sunfish*	5	0.42	0.59	0.12	0.02	2.93
Largemouth bass*	20	1.67	21.02	1.05	0.84	2.29
White crappie*	12	1.00	5.11	0.43	0.20	2.35
Freshwater drum	23	1.92	26.03	1.13	1.04	
Rio Grande perch	4	0.33	2.00	0.50	0.08	
<b>Total</b>	<b>1201</b>	<b>100.00</b>	<b>2495.81</b>		<b>100.00</b>	
Game Fish*	219	18.23	581.54		23.30	
Rough Fish	982	81.77	1914.27		76.70	

Seining results Amistad Lake, (Bag 26'x6'x $\frac{1}{4}$  inch mesh seine, and 20'x4'x $\frac{1}{8}$  inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	3	7-10
Threadfin shad	1	1
Mexican tetra	1	1 $\frac{1}{2}$
Devil's River minnow	6	1 $\frac{1}{2}$ -2
Golden shiner	2	2 $\frac{1}{2}$ -3
Tamaulipas shiner	6	1-4
Red shiner	3	2-2 $\frac{1}{2}$
Sand shiner	2	2
Blacktail shiner	333	1-3 $\frac{1}{2}$
Mosquitofish	8	1-1 $\frac{1}{2}$
Bluegill	17	2-5
Redbreast sunfish	1	3
Longear sunfish	1	3
Largemouth bass	1	1
Logperch	1	3
Rio Grande perch	1	8
Tidewater silversides	205	1-4 $\frac{1}{2}$
<b>Total</b>	<b>592</b>	

Table 5. Survey results Ascarate Lake, October 9, 1974.  
Results of five standard gill nets, and two large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Gizzard shad	79	58.08	46.00	.58	36.19	
Carp	15	11.03	41.64	2.77	32.76	
Smallmouth buffalo	1	.74	9.00	9.00	7.08	
Black bullhead	8	5.88	1.54	.19	1.21	
Channel catfish *	14	10.29	21.62	1.54	17.01	1.52
Bluegill *	7	5.15	.52	.07	.41	3.56
Redear sunfish *	1	.74	.16	.16	.13	2.88
Largemouth bass *	5	3.67	4.61	.92	3.62	3.18
White crappie *	2	1.47	.73	.36	.58	2.77
Black crappie *	4	2.95	1.28	.32	1.01	3.19
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Total	136	100.00	127.10		100.00	
Game Fish *	33	24.27	28.92		77.24	
Rough Fish	103	75.73	98.18		22.76	

Seining results Ascarate Lake, (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Green sunfish	1	2
Bluegill	25	1-3
Redear sunfish	4	2-3
Largemouth bass	7	1-5
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Total	37	

### Lake Balmorhea

Allowing for seasonal variations due to the different times of year in which the 1973 and 1974 surveys were conducted, the fish population at Balmorhea shows no significant trends (Table 6). Adult flathead catfish introduced in 1970 were recaptured, but no evidence of their reproduction has appeared.

No fish were stocked in 1974. No further stocking should be conducted until it becomes evident that the population and/or harvest of game fishes is declining.

### Lake Diablo I

Diablo I received a large volume of fresh water shortly before it was surveyed in October 1974. The result of this expansion was that fewer fish than last year were netted (Table 7). The population data obtained, however, showed no significant changes from October 1973 except that three of the large flathead catfish stocked in December 1973 were recaptured. The slight increase in the mean size of crappie from 0.08 to 0.09 pounds, might be attributable to predation on the smaller sizes by flatheads, but it is probably too soon to tell.

No Age Class 0 largemouth bass were seined, but seining sites were limited because of the high lake level and excessive trash around the shoreline. Bass reproduction is expected to be good next spring and the increase in volume should help improve the game fish standing crop and harvest if the level is maintained. Supplemental stocking of both largemouth bass and channel catfish should be considered to take immediate advantage of the new lake area.

### E. V. Spence Reservoir

Evaporation and municipal withdrawals lowered the level of Lake Spence 10 feet during the past year. However run-off from heavy rains in September 1974 raised the water level beyond its previous high capacity, to more than 150,000 acre-feet. This 5-year-old reservoir has yet to reach its conservation capacity, 488,760 acre-feet.

A standard survey was conducted at Spence in September. The netting results, shown in Table 8, indicate a decrease in the gizzard shad population. In 1972 gizzard shad accounted for 45.77 per cent by number of fish netted, 33.21 per cent in 1973, and only 22.19 per cent in this year's collections. This decline coincides with the steady increase in the mean size of striped bass in Lake Spence.

Largemouth bass were not collected in nets or seines in the 1973 survey and only one specimen of the popular sport fish was collected during this year's survey. However the harvest of largemouth bass appears to be similar to that of last year.

Table 6. Survey results Balmorhea Lake, June 3,4,5, 1974.  
Results of six standard gill nets, and two large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Carp	105	9.47	407.00	3.87	71.17	
Golden shiner	58	5.24	9.36	.16	1.64	
River carpsucker	3	.27	21.00	7.00	3.67	
Channel catfish *	12	1.08	12.59	1.04	2.21	1.84
Flathead catfish *	1	.09	16.13	16.13	2.82	2.52
Orangespotted sunfish *	4	.36	.29	.07	.05	3.60
Bluegill *	556	50.18	48.15	.08	8.42	3.58
Redear sunfish *	64	5.78	17.46	.27	3.05	3.73
Largemouth bass*	6	.54	6.67	1.11	1.17	2.45
White crappie *	297	26.80	32.32	.10	5.65	2.49
Black crappie *	2	.19	.83	.41	.15	2.76
<b>Total</b>	<b>1108</b>	<b>100.00</b>	<b>571.80</b>		<b>100.00</b>	
Game Fish *	942	85.02	134.44		23.52	
Rough Fish	166	14.98	437.36		76.48	

Seining results Balmorhea Lake, (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Golden shiner	1	6
Sheepshead minnow	1	2
Orangespotted sunfish	28	2-3
Bluegill	18	1-5 1/2
White crappie	1	3 1/2
Tidewater silversides	123	1/2-5 1/2
<b>Total</b>	<b>172</b>	

Table 7. Survey results Diablo I Lake, October 8, 1974  
Results of two standard gill nets, and one large-mesh net.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Carp	2	3.77	10.79	5.39	28.40	
Channel catfish *	1	1.89	.20	.20	.52	1.58
Flathead catfish *	3	5.65	18.77	6.25	49.41	2.40
Largemouth bass *	1	1.89	4.01	4.01	10.56	2.16
White crappie *	46	86.80	4.22	.09	11.11	2.52
<b>Total</b>	<b>53</b>	<b>100.00</b>	<b>37.99</b>		<b>100.00</b>	
Game Fish *	51	96.23	27.20		71.60	
Rough Fish	2	3.77	10.79		28.40	

Seining results Diablo I Lake (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Golden shiner	2	6
Red shiner	140	1 1/2-1
Mosquitofish	25	1 1/2-1
Bluegill	2	1 1/2-4
Largemouth bass	1	7
<b>Total</b>	<b>170</b>	

Table 8. Survey results E.V. Spence Lake, September 17, 18, 1974.  
Results of fifteen standard gill nets, and four large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Longnose gar	6	1.46	15.35	2.55	3.49	
Gizzard shad	91	22.19	19.00	.20	4.32	
Carp	14	3.42	12.00	.85	2.72	
River carpsucker	115	28.05	140.00	1.21	31.84	
Blue catfish *	3	.73	3.14	1.04	.71	1.70
Black bullhead	3	.73	.66	.22	.15	
Channel catfish *	18	4.39	23.29	1.29	5.30	1.67
Flathead catfish *	7	1.71	55.45	7.92	12.60	2.03
White bass *	28	6.83	19.14	.68	4.36	2.55
Striped bass *	29	7.07	93.46	3.22	21.25	2.14
Bluegill *	14	3.41	1.08	.07	.24	3.69
Largemouth bass *	1	.25	.27	.27	.06	1.79
White crappie *	30	7.32	9.96	.33	2.27	2.74
Freshwater drum	51	12.44	47.00	.92	10.69	
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Total	410	100.00	439.80		100.00	
Game Fish *	130	31.71	205.79		46.79	
Rough Fish	280	68.29	234.01		53.21	

Seining results E.V. Spence Lake, (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	18	3-9
Threadfin shad	1500	1-3
Golden shiner	1	3 1/2
Red shiner	54	1-2 1/2
Blacktail shiner	24	2 1/2-3 1/2
Channel catfish	4	2
Bluegill	12	1 1/2-2 1/2
Longear sunfish	7	2 1/2
Tidewater silversides	1010	2-4 1/2
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Total	2630	

Other important game fish include channel and flathead catfish, white bass and striped bass. The four species accounted for 43.51 per cent by weight of the netting collection. The introduced striped bass continue to show good survival and growth and are prominent in the harvest.

The average "K" factors of most game species have dropped below the regional average (Table 2) due to the receding water level.

Seining collections showed threadfin shad and tidewater silversides to be the most abundant forage.

The annual stocking of striped bass fingerlings should be continued since the reservoir is supplying brood fish for the statewide striper program. The stocking of blue and flathead catfish fingerlings is also recommended in 1975 to establish populations of these two valuable predator species in this new impoundment.

#### Lake Macho

Although it received run-off at the same time as Diablo I, Lake Macho did not increase comparably in size. Gill netting results in October 1974 (Table 9) were nearly identical with those of the previous year. However, one large channel catfish was captured this year instead of the 14 smaller fish caught in October 1973. This change may be due in part to the suspension of all stocking in Macho since August 1973.

No further stocking of largemouth bass or channel catfish should be conducted until fishing reports or survey results show a decline in the game fish harvest rates or population levels at Macho. However, if game fish populations in nearby Diablo I begin to show improvement attributable to the stocking of flathead catfish, the same technique should be tried on Macho to alleviate bluegill stunting and overpopulation.

#### Mountain Creek Lake

Located in the eastern limits of Robert Lee, this small municipal water reservoir has been drastically reduced by drought for the past several years. Heavy rains in September of this year filled it to its 75-acre capacity.

A survey conducted at Mountain Creek Lake prior to its filling showed good populations of game fishes.

Desirable species accounted for 82.67 per cent by number and 89.17 per cent by weight of the netting sample, (Table 10). With the additional water, substantial reproduction should occur and develop a significant fishery at Mountain Creek Lake.

#### Nasworthy Lake

This 1,600-acre impoundment is one of the most heavily used fishing and recreation sites in this area. Channel catfish, largemouth bass and white crappie are the most sought after sport fishes. The average size of white

Table 9. Survey results Macho Lake, October 8, 1974.  
Results of two standard gill nets, and one large-mesh net.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Carp	6	4.19	31.00	5.16	62.57	
Channel catfish *	1	.70	3.85	3.85	7.77	2.28
Bluegill *	130	90.92	14.09	.10	28.44	3.43
Redear sunfish *	6	4.19	.60	.10	1.22	3.17
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Total	143	100.00	49.54		100.00	
Game Fish *	137	95.81	18.54		37.43	
Rough Fish	6	4.19	31.00		62.57	

Seining results Macho Lake, (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Carp	1	6
Red shiner	401	<del>1/2</del> 3
Mosquitofish	4	<del>1/2</del> 2
Bluegill	30	<del>1/2</del> 2
Longear sunfish	2	<del>1/2</del> 5
Largemouth bass	2	2-4
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Total	440	

Table 10. Survey results Mountain Creek Lake, May 9, 1974.  
Results of two standard gill nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
River carpsucker	1	1.33	7.32	7.32	8.68	
Black bullhead	12	16.00	1.81	.15	2.15	
Channel catfish *	18	24.00	26.79	1.48	31.80	1.99
Flathead catfish *	1	1.33	.59	.59	.70	2.04
Warmouth *	13	17.34	4.05	.31	4.81	4.52
Green sunfish *	1	1.33	.10	.10	.12	3.68
Bluegill *	9	12.00	.81	.09	.96	3.59
Largemouth bass *	20	26.67	42.78	2.13	50.78	3.40
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Total	75	100.00	84.25		100.00	
Game Fish *	62	82.67	75.12		89.17	
Rough Fish	13	17.33	9.13		10.83	

Seining results Mountain Creek Lake, (20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Golden shiner	39	1½-2½
Warmouth	1	3
Bluegill	12	1-2½
Largemouth bass	1	5
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Total	53	

crappie has steadily increased since the threadfin shad introduction in 1969. Prior to the establishment of this forage population, the average weight of white crappie taken in netting surveys was 0.15 pounds. This segment's netting (Table 11) reveals that 83 crappie collected averaged 0.29 of a pound, a utilizable size for panfish.

Widespread siltation over this old lake limits game fish spawning. However, supplementary stocking of largemouth bass fingerlings was suspended to determine the natural reproductive success. Twenty seine drags with 26-foot bag and 20-foot straight seines yielded only three young-of-the-year bass.

White bass x striped bass hybrids were stocked this segment as an open-water predator. Survival was confirmed: five specimens were collected in this segment's survey. The stocking of fingerling hybrids is recommended again for 1975.

Seining collections at Nasworthy produced the largest variety and numbers of forage fishes found in Region I-B lakes.

#### North Concho Reservoir

Although North Concho Reservoir was too low to permit a standard fisheries survey, several activities occurred which will be reported.

Fisheries management plans were devised for North Concho Lake and presented to the U.S. Corps of Engineers along with similar recommendations of other lakes in the Fort Worth District.

The first management need for North Concho Lake was a firm agreement on the use of "dead storage" water. The city of San Angelo should be required to use water equally from available sources during drought periods and not completely to drain one reservoir.

The second recommendation was the construction of all-weather access roads to the low elevation pool with boat launching ramps usable at all elevations.

Late summer rains increased the size of the reservoir from 400 acres to 4,500 acres. Stocking recommendations were made immediately to utilize the newly impounded water. Stocking of hatchery fish this fall included 90,800 channel and blue catfish, 100,000 hybrid sunfish and 4,500 hybrid largemouth bass.

#### Oak Creek Lake

Municipal water useage is the primary purpose of this 2,375-acre impoundment in northern Coke County. It also provides water for steam generator cooling and public recreation. The water level fluctuation was about 12 feet this segment.

Table 12, 1974 survey results, indicates a desirable ratio in the fish population. Game species accounted for 41.98 per cent by number and 62.25

Table 11. Survey results Nasworthy Lake, October 8, 1974.  
Results of eight standard gill nets, and two large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Longnose gar	2	.40	3.96	1.98	1.70	
Gizzard shad	304	61.41	59.00	.19	25.37	
Carp	29	5.86	52.00	1.79	22.36	
River carpsucker	6	1.21	22.00	3.66	9.46	
Channel catfish *	21	4.25	35.76	1.70	15.37	1.81
Flathead catfish *	4	.80	16.40	4.10	7.06	1.92
White bass *	11	2.23	9.69	.88	4.16	2.53
White x striped bass *	1	.20	.23	.23	.10	2.59
Bluegill *	16	3.23	1.61	.10	.69	3.92
Longear sunfish *	1	.20	.08	.08	.04	4.45
Redear sunfish *	3	.61	.29	.09	.12	3.18
Largemouth bass *	4	.81	1.52	.38	.66	2.21
White crappie *	83	16.76	24.08	.29	10.35	2.74
Freshwater drum	10	2.03	5.94	.59	2.56	
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Total	495	100.00	232.56		100.00	
Game Fish *	144	29.09	89.66		38.55	
Rough Fish	351	70.91	142.90		61.45	

Seining results Nasworthy Lake (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	52	1 1/2-8
Threadfin shad	155	1-3 1/2
Plains minnow	5	2-2 1/2
Red shiner	1215	1-2 1/2
Blacktail shiner	2	1-1 1/2
Bullhead minnow	2010	1-3
Mosquitofish	801	1/2-1 1/2
White x striped bass hybrid	4	5-9
Warmouth	1	4
Green sunfish	18	1-3
Orangespotted sunfish	1	2 1/2
Bluegill	67	1-4
Longear sunfish	12	1-3
Largemouth bass	3	2-4
Tidewater silversides	2513	1-4
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Total	6859	

Table 12. Survey results Oak Creek Lake, June 4,5, 1974.  
Results of twelve standard gill nets, and three large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Gizzard shad	132	30.27	26.83	.20	5.12	
Carp	45	10.32	73.00	1.62	13.95	
River carpsucker	76	17.43	226.00	2.97	43.18	
Channel catfish *	35	8.03	28.31	.80	5.41	1.61
Flathead catfish *	15	3.44	136.20	9.08	26.03	2.19
White bass *	10	2.29	14.86	1.48	2.84	2.31
Bluegill *	44	10.10	4.14	.09	.79	3.33
Redear sunfish *	2	.45	.18	.09	.03	3.59
Largemouth bass *	3	.69	1.43	.47	.27	2.04
White crappie *	74	16.98	12.41	.16	2.38	2.40
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Total	436	100.00	523.36		100.00	
Game Fish *	183	41.98	325.83		62.25	
Rough Fish	253	58.02	197.53		37.75	

Seining results Oak Creek Lake, (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	11	7
Blacktail shiner	30	1 1/2-3
Redbreast sunfish	4	2-4
Green sunfish	1	2 1/2
Bluegill	35	1-4
Redear sunfish	3	2-3
Largemouth bass	18	1 1/2
Logperch	1	3
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Total	103	

per cent by weight of the gill netting sample. Largemouth bass continues to be the most popular sport fish species in this deep clear reservoir.

Submerged vegetation has presented problems of access for several years. Mechanical control was recommended to the controlling personnel and is now being performed with moderate success.

Supplementary stocking of channel catfish fingerlings was continued since their survival and growth was confirmed by data collected for Job 14 of this project.

#### Red Bluff Lake

Improved game fish standing crop and harvest are expected next year at Red Bluff because of the addition of more than 30 vertical feet of fresh water in September of this year. Appreciable amounts of fresh water enter the lake only about one year out of three, and usually in the late summer or fall. During the regular spring spawning period, the lake is often too saline for good centrarchid reproduction. Therefore, although a better than usual spawn is expected next spring, supplemental bass stocking is recommended to enhance the standing crop in subsequent years. Continued channel catfish stocking is also recommended. Survey results for this segment are given in Table 13.

This lake should be considered a good candidate for striped bass introduction whenever sufficient striper fingerlings in excess of primary state requirements become available. Open-water forage fish, such as threadfin and gizzard shad and silversides, are abundant in Red Bluff.

#### Twin Buttes Reservoir

This 183,000 acre-foot flood control reservoir received its first significant amount of run-off in 1970 when one-half the capacity was impounded. Heavy stockings of hatchery reared fingerling game fish have been made since that time. Rough fish, mainly gizzard shad and river carpsucker, continue to dominate the netting results, accounting for about 88 per cent of the fish netted in both number and weight (Table 14). Channel catfish and white crappie provide the sport fishery. Almost one million walleye have been stocked in Twin Buttes during the past 4 years by the Statewide Walleye Project. This stocking has yet to show a significant influence on the fish population or harvest. Additional water was impounded at Twin Buttes this segment and will increase the overall productivity in this shallow West Texas reservoir.

#### Valley Creek Lake

This 185-acre water supply for the city of Ballinger was sampled in June of this segment. Table 15 reveals very little change in the fish population from past surveys. Gizzard shad and river carpsucker continue to dominate the netting collection as they do in many other small turbid West Texas lakes. Channel catfish, white crappie and largemouth bass comprise the limited fishery found here. Heavy siltation and sparse cover

Table 13. Survey results Red Bluff Lake, October 10, 1974.  
Results of eight standard gill nets, and two large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Longnose gar	75	26.31	149.00	1.98	24.40	
Gizzard shad	23	8.07	18.56	.80	3.04	
Carp	31	10.88	24.00	.77	3.93	
River carpsucker	13	4.56	13.57	1.04	2.23	
Smallmouth buffalo	127	44.56	382.00	3.00	62.57	
Channel catfish *	6	2.11	9.01	1.50	1.47	1.79
White bass *	8	2.80	14.04	1.75	2.30	3.39
Green sunfish *	2	.71	.31	.15	.06	3.88
<b>Total</b>	<b>285</b>	<b>100.00</b>	<b>610.49</b>		<b>100.00</b>	
Game Fish *	16	5.62	23.36		3.83	
Rough Fish	269	94.38	587.13		96.17	

Seining results Red Bluff Lake, (20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	3	2-2½
Threadfin shad	5	2
Silvery minnow	1	4
Red shiner	50	1-2
Channel catfish	1	12
Mosquitofish	1	1
Tidewater silversides	531	1-3
<b>Total</b>	<b>592</b>	

Table 14. Survey results Twin Buttes Lake, June 19, 1974.  
Results of ten standard gill nets, and four large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Longnose gar	5	.55	10.00	2.00	1.56	
Gizzard shad	312	34.94	43.00	.13	6.73	
Carp	23	2.58	48.00	2.08	7.51	
River carpsucker	423	47.37	448.00	1.05	70.13	
Channel catfish *	33	3.69	28.74	.87	4.50	1.48
Flathead catfish *	4	.45	27.82	6.95	4.35	1.99
White bass *	15	1.68	8.20	.54	1.28	2.19
Bluegill *	28	3.14	2.75	.09	.44	3.56
Longear sunfish *	2	.22	.16	.08	.02	4.30
Largemouth bass *	1	.11	.22	.22	.03	1.91
White crappie *	18	2.02	6.14	.34	.97	2.45
Walleye *	3	.33	4.84	1.61	.75	1.64
Freshwater drum	26	2.92	11.00	.42	1.73	
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Total	893	100.00	638.87		100.00	
Game Fish *	104	11.64	78.87		12.34	
Rough Fish	789	88.36	560.00		87.66	

Seining results Twin Buttes Lake, (Bag 26' x 6' x 1/4-inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	14	1-6
Golden shiner	1	3
Red shiner	25	1-3
Blacktail shiner	8	2-3 1/2
Bullhead minnow	1	2
Longear sunfish	2	3-3 1/2
Redear sunfish	1	3
Largemouth bass	1	6
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Total	53	

Table 15. Survey results Valley Creek Lake, June 12, 1974.  
Results of six standard gill nets, and two large-mesh nets.

Species	Number	Per Cent By No.	Total Wt. Pounds	Avg. Wt. Pounds	Per Cent By Wt.	Average "K"
Longnose gar	1	.28	7.00	7.00	2.48	
Gizzard shad	140	39.77	26.71	.19	9.49	
Carp	14	3.98	64.97	4.64	23.08	
River carpsucker	83	23.58	110.90	1.33	39.40	
Channel catfish *	15	4.26	25.55	1.70	9.08	2.12
Flathead catfish *	2	.57	4.62	2.31	1.64	2.83
Warmouth *	1	.28	.09	.09	.03	2.98
Bluegill *	22	6.25	2.34	.10	.83	4.28
Longear sunfish *	4	1.14	.26	.06	.09	4.70
Redear sunfish *	1	.28	.27	.27	.10	3.36
Largemouth bass *	5	1.42	16.64	3.32	5.91	2.63
White crappie *	25	7.11	4.78	.19	1.70	2.56
Freshwater drum *	39	11.08	17.36	.44	6.17	
<b>Total</b>	<b>352</b>	<b>100.00</b>	<b>281.49</b>		<b>100.00</b>	
Game Fish	75	21.31	54.55		19.38	
Rough Fish	277	78.69	226.94		80.62	

Seining results Valley Creek Lake, (Bag 26' x 6' x 1/4-inch mesh seine, and 20' x 4' x 1/8-inch mesh seine).

Species	Number	Size Range in Inches
Gizzard shad	462	4-7
Red shiner	6	1 1/2-3
Blacktail shiner	156	1 1/2-4 1/2
Bluegill	1	2
Longear sunfish	9	2-4
White crappie	25	1 1/2-7
Logperch	1	3
<b>Total</b>	<b>660</b>	

inhibit game fish reproduction. Complete renovation of this lake may be possible in a few years as the city of Ballinger is planning the construction of a new water supply reservoir. Management recommendations will await development of such plans.

General Conclusions, Discussion and Recommendations

Water level fluctuation causes additional problems in the management of many West Texas reservoirs. Lake stabilization was discussed with several controlling agencies. With the exception of Amistad, water level manipulation for fisheries management could not be effectuated since the primary purpose of most West Texas reservoirs is municipal water supply.

Supplementary stocking of native game species at opportune times has shown improvements in some Region I-B waters. The stocking of large predator species, striped bass, white bass - striped bass hybrids and walleye is producing added fishery benefits in several West Texas reservoirs.

It is recommended that this job be incorporated in the Statewide Management Project, F-30-R, for more efficient use of funds, equipment and personnel.

V. Estimated Cost: \$28,600.00

VI. Prepared by: Billy J. Follis and David J. Morris  
Project Leader Assistant Project Leader

Date: November 15, 1974 Leo D. Lewis  
Regional Director, Inland Fisheries  
Region I

Approved by:   
Dingell-Johnson Coordinator

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.

<u>Common Names</u>	<u>Scientific Names</u>
Spotted gar	<u>Lepisosteus oculatus</u>
Longnose gar	<u>Lepisosteus osseus</u>
Alligator gar	<u>Lepisosteus spatula</u>
Gizzard shad	<u>Dorosoma cepedianum</u>
Threadfin shad	<u>Dorosoma petenense</u>
Goldfish	<u>Carassius auratus</u>
Carp	<u>Cyprinus carpio</u>
Devils River Minnow	<u>Dionda diaboli</u>
Silvery minnow	<u>Hybognathus nuchalis</u>
Plains minnow	<u>Hybognathus placitus</u>
Golden shiner	<u>Notemigonus crysoleucas</u>
Tamaulipas shiner	<u>Notropis braytoni</u>
Red shiner	<u>Notropis lutrensis</u>
Sand shiner	<u>Notropis stramineus</u>
Blacktail shiner	<u>Notropis venustus</u>
Bullhead minnow	<u>Pimephales vigilax</u>
River carpsucker	<u>Carpiodes carpio</u>
Blue sucker	<u>Cycleptus elongatus</u>
Smallmouth buffalo	<u>Ictiobus bubalus</u>
Gray redhorse	<u>Moxostoma congestum</u>
Blue catfish	<u>Ictalurus furcatus</u>
Black bullhead	<u>Ictalurus melas</u>
Channel catfish	<u>Ictalurus punctatus</u>
Flathead catfish	<u>Pylodictis olivaris</u>
Sheepshead minnow	<u>Cyprinodon variegatus</u>
Mosquitofish	<u>Gambusia affinis</u>
White bass	<u>Morone chrysops</u>
Striped bass	<u>Morone saxatilis</u>
Hybrid St. bass x White bass	<u>Morone sp</u>
Warmouth	<u>Lepomis gulosus</u>
Redbreast sunfish	<u>Lepomis auritus</u>
Green sunfish	<u>Lepomis cyanellus</u>
Orangespotted sunfish	<u>Lepomis humilis</u>
Bluegill	<u>Lepomis macrochirus</u>
Longear sunfish	<u>Lepomis megalotis</u>
Redear sunfish	<u>Lepomis microlophus</u>
Largemouth bass	<u>Micropterus salmoides</u>
White crappie	<u>Pomoxis annularis</u>
Black crappie	<u>Pomoxis nigromaculatus</u>
Walleye	<u>Stizostedion vitreum</u>
Logperch	<u>Percina caprodes</u>
Freshwater drum	<u>Aplodinotus grunniens</u>
Rio Grande perch	<u>Cichlasoma cyanoguttatum</u>
Tidewater silverside	<u>Menidia beryllina</u>