

SEGMENT COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-3-R-11

Fisheries Investigations and Surveys of the Waters of Region 3-B

Job No. B-21 A Fisheries Evaluation of Commercial Moss Har-
vesting on Caddo Lake

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ABSTRACT

Nineteen netting collections were made on Caddo Lake during this segment to determine the availability of fish and fishing pressure in those areas of the lake where submerged aquatic plants were harvested. Due to the rapid regrowth of plants in the harvest areas only a short time interval was available to net cleared areas. The resulting data indicated little change in fish movement or fishing pressure in harvested areas as compared to uncut areas. A proposed commercial harvest of much larger scale is now being considered. This would enable the necessary long term netting survey to be made which would produce more accurate data on fish population movements and the resulting change in fishing pressure.

SEGMENT COMPLETION REPORT

State of Texas

Project No. F-3-R-11

Name: Fisheries Investigations and Surveys
of the Waters of Region 3-B.

Job No. B-21

Title: A Fisheries Evaluation of Commercial
Moss Harvesting on Caddo Lake.

Period Covered: February 1, 1963 - January 31, 1964

OBJECTIVES:

To determine the availability of fish in those areas of Caddo Lake that are cleared of submerged aquatic plants by a commercial harvest. Also to determine the change in fishing pressure.

TECHNIQUES USED:

Eight netting stations were established in different areas of Caddo Lake. One experimental type gill net was set at each station. These nets are 125 feet in length, 6 and 8 feet deep, with mesh sizes of 1, 1 1/2, 2, 2 1/2 and 3 inches in 25 foot sections.

Total numbers and weights of each species were recorded for each station. Data collected before the commercial harvest were compared to data collected during the harvest. Spot checks were made by instantaneous counts of fishermen and boats at every station during each netting collection.

Nineteen separate netting collections were made on the lake. The first 13 collections were made before any harvesting activities began. The latter six collections were made during a preliminary feasibility harvesting program. During this harvesting period, however, only five of the permanent netting stations were in a harvested area.

A spot check of fishermen was made at each netting station during the harvesting to determine if they were utilizing the cut areas.

Standard water analysis was made for each netting station during the harvesting to determine if water quality would vary in the cut areas.

FINDINGS:

A total of 2,115 fish were collected by nets in the nineteen collections. There were 1,174 fish taken prior to any harvesting activity and 941 were netted during the harvest period. The six collections made during the harvesting activity indicate a considerable increase over the earlier collections when expressed in fish per square foot of net. It is the writer's belief that natural increases in fish movement during early spring contributed much to the higher netting ratio. The harvesting began in early March and continued into April 1963.

Game fish taken before and during the harvest period comprised 31.52 and 32.09 per cent, respectively, of the total catch. This indicated that the ratio of movement between rough and game fish species remained stable in both harvested and uncut areas.

The harvesting activity was not concentrated in any one area of the lake. Several species of aquatic vegetation were collected. The major species were coontail (Ceratophyllum sp.), parrotfeather (Myriophyllum sp.) and waterweed (Elodea sp.). Only areas containing an abundant growth of one or more of these species were harvested. The vegetation was cut off several feet below the surface but the cutting stimulated the growth rate of the plants. In most harvested areas the plants reached the surface again in 1 or 2 weeks. This presented the problem of having a very short time interval to determine if fish would tend to move into the cut areas before the vegetation regrew to its original density.

Table 1 contains the number and weight of each species netted prior to the harvesting activity. It also lists the per cents of total number and weight for each species. The total number and weight of game fish and rough fish is listed for each netting station.

Identical data on the six collections made during the harvesting are contained in Table 2.

Water analysis made for each station included pH, chlorides and total methyl-orange alkalinity. Table 3 lists the average data for each collection on a comparative basis between cut and uncut areas. The total figures indicate only a slight variation in the water quality of the harvested areas.

Average coefficients of condition ("K" factor) of several game fish species collected before and during the harvesting are compared in Table 4. All but the redear sunfish (Lepomis microlophus) show a slight decrease in "K" during the harvesting period. These decreases are only minor and a longer term study is needed to express any conclusive results in relation to condition.

As each net was picked up during a collection a visual check was made of the number of boats and fishermen in sight. A total of 11 boats containing 16 fishermen were seen in the harvested areas. In the uncut areas 17 boats containing 31 fishermen were seen.

According to these data approximately twice as many fishermen were utilizing the uncut areas. This does not indicate any increase in fishing pressure, however, because the surface acreage of the uncut areas is many times that of the harvested areas. If the harvested areas had remained clear of vegetation for a longer period perhaps more fishermen would have found these areas and an increase in fishing pressure could be seen.

CONCLUSIONS AND RECOMMENDATIONS:

Submerged aquatic plants in moderate numbers are important necessities to a balanced fish habitat. It is only when they become overly abundant that they create a problem. The plants provide protective cover for small food organisms and fish. If the plants become so dense as to inhibit the larger fish species in feeding on these organisms, they are detrimental. It is difficult to determine how dense this "moss" must be before fish are adversely effected.

Table 2. Caddo Lake Netting Data (Collections 14-19. During Plant Harvest)

Species	Sta. 1		Sta. 2		Sta. 3		Sta. 4		Sta. 5		Sta. 6		Sta. 7		Sta. 8		Totals		Per cents	
	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.										
* Shortnose gar	0	0	0	0	0	0	0	0	0	0	1	5.62	1	2.88	0	0	2	8.50	.21	.88
* Spotted gar	8	16.25	3	4.00	5	8.00	12	13.88	0	0	12	15.31	2	4.62	3	5.19	45	67.25	4.78	6.94
* Longnose gar	1	5.50	1	6.88	7	51.75	1	8.31	2	28.00	2	12.75	1	5.94	0	0	15	119.13	1.59	12.30
* Bowfin	0	0	1	2.25	0	0	1	6.00	1	3.88	3	30.94	0	0	3	9.75	9	52.82	.96	5.45
* Gizzard shad	58	49.88	53	43.25	59	48.75	47	36.12	81	69.88	12	11.56	44	34.81	11	0.31	365	294.56	38.79	30.42
* Chain pickerel	6	7.88	5	7.37	0	0	5	9.25	9	10.13	4	5.31	6	7.75	4	3.37	39	51.06	4.14	5.28
* Spotted sucker	20	33.13	24	49.31	11	17.37	11	6.06	11	17.94	8	9.94	3	5.00	2	2.50	90	141.25	9.57	14.58
* Chubsucker	7	3.00	8	4.12	7	4.25	5	3.88	9	7.50	5	3.75	2	2.13	4	1.50	47	30.13	4.99	3.11
* Carp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* Golden shiner	1	.25	3	.75	0	0	0	0	0	0	0	0	0	0	0	0	4	1.00	.43	.11
* Channel cat	4	7.50	9	11.62	1	.75	0	0	1	.50	0	0	0	0	0	0	15	20.37	1.59	2.11
* Black bullhead	0	0	0	0	2	2.62	4	9.06	0	0	1	1.50	0	0	8	10.62	15	23.80	1.60	2.46
* Yellow bullhead	0	0	0	0	0	0	2	2.67	0	0	2	1.62	0	0	3	2.88	7	7.17	.74	.74
* Flathead cat	0	0	1	5.75	0	0	0	0	0	0	0	0	0	0	0	0	1	5.75	.11	.59
* White bass	0	0	2	1.25	2	1.37	1	1.31	2	2.31	0	0	0	0	0	0	7	6.24	.74	.64
* Yellow bass	36	11.06	57	26.56	24	10.67	15	9.00	21	11.25	14	7.19	6	2.88	3	1.37	176	79.98	18.70	8.26
* Largemouth bass	0	0	0	0	2	2.00	1	1.75	1	1.00	0	0	1	1.00	0	0	5	5.75	.53	.59
* Warmouth	1	.37	1	.37	4	1.88	6	3.00	3	1.62	2	.94	5	2.06	5	1.31	27	11.55	2.87	1.19
* Spotted sunfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* Redear sunfish	1	.31	1	.25	0	0	3	1.44	0	0	2	1.50	2	.56	6	1.56	15	5.62	1.60	.58
* Bluegill sunfish	2	.88	1	.13	1	.13	4	1.50	1	.31	2	.62	3	1.06	2	.94	16	5.57	1.70	.58
* White crappie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* Black crappie	2	1.67	2	2.00	13	8.81	3	1.75	8	5.12	6	6.31	1	1.25	5	3.44	40	30.35	4.25	3.13
* Freshwater drum	1	.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	.50	.11	.06
Totals	148	138.18	172	165.86	138	158.35	121	114.98	150	163.44	76	114.86	77	71.94	59	44.74	941	968.35	100.00	100.00
Game Fish	46	21.79	74	47.93	47	25.61	33	19.75	37	22.11	26	16.56	18	8.81	21	8.62	302	171.18	32.09	17.68
Rough Fish	102	116.39	98	117.93	91	132.74	88	95.23	113	137.33	50	98.30	59	63.13	38	36.12	639	797.17	67.91	82.32

* Denotes rough fish

Table 3. Average Water Analysis Data

Collection Number	Unharvested Areas				Harvested Areas		
	pH	M.O. Alkalinity P.P.M.	Chlorides P.P.M.	pH	M.O. Alkalinity P.P.M.	Chlorides P.P.M.	
14	6.9	14	44.91	7.2	16	42.55	
15	7.0	19	39.00	7.1	19	42.55	
16	6.6	16	39.71	6.7	15	42.55	
17	6.9	17	42.55	6.7	17	42.55	
18	6.9	16	42.55	6.8	16	42.55	
19	6.0	15	35.46	6.2	20	35.46	
Average	6.7	16	40.70	6.8	17	41.36	

Table 4. Average Coefficients of Condition ("K" Factors)

Species	Before Harvest		Species	During Harvest	
		Average "K"			Average "K"
Largemouth bass		2.57	Largemouth bass		2.43
Channel catfish		1.96	Channel catfish		1.87
Black crappie		3.21	Black crappie		3.06
Warmouth		4.27	Warmouth		3.85
Redear sunfish		4.29	Redear sunfish		4.40

The netting records prove that fish are present in very heavily infested areas although it is doubtful that a sport fisherman could harvest them due to the inaccessability caused by the dense aquatic plants.

A proposed commercial harvest of much larger scale is being considered at present. It is recommended that this job be continued, with the belief that a netting program conducted when areas would be clear of vegetation for a longer period of time, would supply more conclusive data. Excessive aquatic vegetation is becoming an increasing problem in this area. Its total effects on aquatic animal life is unknown and should be further studied.

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