

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-4-R-8

FISHERIES INVESTIGATION AND SURVEYS OF THE WATERS OF REGION 2-A

Job No. E-4 A Study of Crappie in Lake Whitney

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ABSTRACT

A study of crappie in Lake Whitney was continued in an effort to learn something of the size of the crappie population, the reasons for the recent small harvest, the movement of tagged crappie, the ecological factors influencing their distribution and to develop satisfactory methods for sampling crappie fry.

A total of 1,677 crappie were taken in wire traps and only 86 crappie, or 6.74 per cent, were taken in gill nets. Over 50 per cent of those taken were small crappie that began to enter the traps in July. These crappie were just large enough to be retained by the traps which are made of one-inch mesh wire. This tends to indicate a successful spawn during the previous year and that the number of crappie has not become critical. The weight of each crappie has decreased to a critical point as shown by the average weight of crappie.

A total of 1,855 crappie were tagged during the year and 69 or 3.71 per cent of these were recaptured. The greatest distance traveled by a tagged crappie was 13 miles. The greatest length of freedom for a crappie recaptured this year was 251 days. This crappie was recaptured at the point of release. The next greatest distance traveled was 11 miles. This fish was free for only 8 days before being recaptured. Two other crappie each traveled 10 miles from the point of tagging.

It is intended that the crappie study continue and all the data which has been gathered be compiled in order that a long range, year to year, movement of the crappie can be predicted. Further emphasis will be placed on the study of crappie spawning success.

JOB COMPLETION REPORT

State of TEXAS

Project No. F-4-R-8

Name: Fisheries Investigations and Surveys of
the Waters of Region 2-A

Job No. E-4

Title: A Study of Crappie in Lake Whitney

Period Covered: November 1, 1960 - October 31, 1961

Objectives:

To determine the population of white crappie (Pomoxis annularis) in Lake Whitney and the reasons for the recent small harvest. To study the pattern and extent of travel of tagged or marked crappie and the ecological factors influencing their distribution. To develop satisfactory methods of sampling crappie fry.

Techniques Used:

The tagging of crappie, in Lake Whitney, during the period covered by this report, continued along the same general lines as in previous segments. A majority of the traps used were constructed of No. 9 gauge concrete reinforcement wire, with a six-inch square mesh, covered with one-inch mesh poultry wire. The wire traps are five feet long and 23 inches in diameter, and are of either single or double throat construction. The throat openings are from three to five inches in diameter.

In addition to the wire traps, two "gang nets" and two hoop nets were used. The gang net is made up of a series of hoop nets attached one to another by small mesh leads.

The painting of traps was tried in this segment of work. The use of yellow traffic paint was applied to one trap and two traps were sprayed with anti-fouling bottom paint of copper green color.

All of the traps were built in the fisheries laboratory headquarters and transported to the lake. Traps were then set in a selected area which was considered to be a good place to take crappie. These wire traps were left in this location as long as fish were taken but when no fish were caught, the trap was moved to a new location. All traps were left in continuous operation until it became necessary to make repairs or the trap was lost through flooding or theft. Yellow colored wooden markers were attached to the traps to identify them as belonging to the Texas Game and Fish Commission.

The work of trapping was divided among three sections of the lake (Lake-Map), the Nolan River Area, the Upper Lake Area and the Middle Lake Area. No traps were set in the Lower Lake Area because of the small number of crappie taken during the prior two segments of work and the distance that would have to be covered to work this area.

Strap type, monel-metal, jaw tags were placed on the left premaxillary of all fish tagged. This is the same method of tagging used in past segments of the crappie study. The tag sizes used were either No. 1 or No. 3. Data recorded for each tagged specimen were: Total length in millimeters, tag number, date and place of capture and release.

Gill net collections were made in the area in order to determine the population ratios and to take tagged crappie. This information also served as a check on the effectiveness of the traps in taking crappie.

Findings:

The data presented in table No. 1 shows the numbers and per cent of the total trap catch represented by each species. Crappie comprise 55.36 per cent of the total catch. Bluegills represent 27.11 per cent. The catch of bluegills has increased over the previous year from 26.43 per cent to 27.11 per cent. A greater number of crappie were captured this year than in any prior segment. A total of 1,456 crappie were taken in the 1959-60 segment. This segment a total of 1,677 crappie were taken by traps, 47.56 per cent of the total trap catch.

Gill nets were set in order to provide comparative data and to serve as a check on the existing fish population, (Table 2). The catch of crappie was 6.74 per cent of the total fish taken in gill nets while the wire traps took 55.36 per cent crappie. The wire traps still provide the best method for obtaining crappie to be tagged and released. Gill nets took 63.25 per cent shad compared to the small amount (2.47 per cent) taken in wire traps.

It is interesting to note that during 1958-59, 1959-60, 1960-61, gill net collections produced 46.26, 61.15 and 63.25 per cent shad respectively. In the same gill net collections crappie comprise 11.29, 6.97 and 6.74 per cent respectively. Each year the shad taken in gill nets has increased while that of the crappie has decreased. This factor is believed to have some influence on the small crappie that are being caught from the lake.

In table 3, consolidated data from gill net collections are broken down to show both area of netting and ratio of crappie to all other species caught. The two areas which were netted show only 86 crappie compared to 1,190 fish other than crappie.

Trapping and tagging of crappie are shown on table No. 4 along with the recapture data. Data shown on this table is given by areas which were worked during this segment and the months that the work was accomplished.

In the Nolan River 78 crappie were caught in wire traps. This represents 4.20 per cent of the total tagged during the year. Two of the tagged crappie were recaptured or 2.89 per cent of the total tagged fish recovered.

The number of crappie tagged in the upper lake area totaled 721 or 38.87 per cent of the entire number tagged. A total of 49 crappie were recaptured in this area which represents 71.02 per cent of the total tagged fish recovered. This also includes fish tagged during the previous segment.

That part of the lake designated as the Middle Lake Area produced 1,056 fish for tagging purposes, 56.93 per cent of the total number tagged. In this same area 18 tags were recovered or 26.09 per cent of the total tagged fish recovered.

A total of 1,855 crappie were tagged and 69 tagged fish were recaptured, either by fishermen or Game and Fish Commission personnel. The 69 tagged fish which were recaptured represents 3.71 per cent of the total fish tagged. All tagged fish which were caught by Game and Fish Commission personnel were released after data had been recorded, which leaves these fish free to be recaptured. Three fish were caught after being released for the second time (Table 5). These fish remained near the original place of tagging.

Information concerning all tagged crappie recaptured by either fishermen, gill nets or traps is listed in table No. 5. The longest distance of travel is thirteen miles. This crappie (Tag No. C-1693) was tagged and released in Mesquite Creek then traveled down stream to Cedar Creek. The fish was tagged after spawning season (5-10-60) which could possibly mean that it was moving into deeper water. No date of recapture could be determined as the tag was returned without this information.

Another crappie, (Tag No. A-4135) which was tagged and released in the slough at Lakeside Village, traveled down stream and was caught near Hillcrest fishing pier. This is a distance of approximately eleven miles. This fish was tagged and recaptured during the month of September which does not indicate a movement that could be considered spawning migration. The water level of the lake changed only 0.06 and the thermocline remained unchanged. No reason is known for this movement.

Another crappie (Tag No. C-4071) was caught, tagged, and released near Lakeside Village and was also recaptured at Hillcrest fishing pier. This fish was free 186 days after tagging.

Tag Number C-4478 was placed on a crappie which was caught and released near the number 8 marker, May 30, 1961. This fish was recaptured on June 10, 1961, across the channel from Lakeside Village, 10 miles upstream from the point of release. Another ten mile trip was made by crappie tagged number D-127 which was an upstream movement. This fish was tagged on January 5, 1961 and after 57 days of freedom was recaptured on March 3, 1961, which tends to indicate a spawning movement.

Crappie tagged number A-4030 remained free for 42 days before being recaptured. This crappie was tagged on February 20, 1961, and traveled five miles upstream from the original point of tagging.

Another crappie, (Tag No. C-4173), tagged on March 13, 1961, near Circle "D" dock, traveled upstream to Mesquite Creek before being caught on May 9, 1961. A total of 57 days of freedom existed before this fish was recaptured 2.5 miles from Circle "D" dock.

Five crappie (Tag Numbers D-87, D-283, C-4120, C-4146 and C-4195) each traveled two miles from the point of tagging. Two crappie traveled 1.5 miles, while five other crappie traveled one mile each. All other crappie either traveled shorter distances or had no travel at all. A total of 31 crappie, recaptured during the year, traveled less than 100 yards and are shown in the distance traveled column of table 5 as "none".

The gang net was used to take crappie during the spawning season when the crappie were in shallow water. This net is made up of a series of hoop nets attached to each other by small mesh leads. After several unsuccessful attempts to catch large numbers of crappie in the gang nets they were removed from the lake. Crappie were not taken in large numbers as was planned due to the cooler water which prevailed during the spawning season. Because of the coolness of the water the crappie either had a small spawn or the spawning took place in deeper water.

Painting of traps proved to be of some benefit. Two colors of paint were used on the wire traps, yellow traffic paint and an anti-fouling bottom paint of copper green color. The anti-fouling paint was sprayed on to prevent the traps from being covered with algae. An algae covered trap greatly reduces the catch of crappie. However, after the trap had been in the lake a short time, it also became covered with algae; so the anti-fouling paint was not used on any more of the wire traps.

In order to test the yellow painted trap, it was placed in the lake alongside test traps. These test traps were either new unpainted traps, old traps, or the green colored traps. All traps were set a few feet above the thermocline during the summer months. Old traps covered with silt and algae took less crappie than either of the others. New unpainted traps as well as the yellow colored traps were comparable in taking fish but as the new trap became fouled with algae they took less crappie than did the yellow colored traps; consequently, it is intended that the yellow colored traps be used experimentally in the next segment.

Seining of the shallow water did not prove effective in taking crappie fry. It was intended to use a shrimp trawl in order to take crappie fry in the deeper parts of the lake. Due to the difficulty in obtaining one, the plan was not carried out. Some small mesh wire traps were used during this segment but they also proved ineffective in taking crappie fry. The large numbers of small crappie which are taken during the late summer months tends to indicate that the crappie were spawning, but the habitat of the crappie fry has not been determined. From spawning time until the crappie are large enough to be taken by one-inch wire mesh (25-50 grams of body weight) their habitat is undetermined.

Table number 6 is a week by week list of the water level of Lake Whitney. As shown on this table the water varied from the low of 518.83 to a high of 523.83 feet.

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Date April 17, 1962

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Table 1. Fish caught in wire traps in Lake Whitney, Nov. 1960 - Oct. 1961.

		Number Trapped	Per Cent of Total
Spotted gar	<u>Lepisosteus oculatus</u>	3	0.09
Longnose gar	<u>L. oseus</u>	38	1.26
Gizzard shad	<u>Dorosoma cepedianum</u>	75	2.47
Smallmouth buffalo	<u>Ictiobus bubalus</u>	16	0.53
River carpsucker	<u>Carpiodes carpio</u>	52	1.72
Carp	<u>Cyprinus carpio</u>	69	2.28
Channel catfish	<u>Ictalurus punctatus</u>	58	1.91
Flathead catfish	<u>Pylodictis olivaris</u>	5	0.17
White bass	<u>Roccus chrysops</u>	87	2.87
Largemouth bass	<u>Micropterus salmoides</u>	50	1.65
Bluegill sunfish	<u>Lepomis macrochirus</u>	821	27.11
White crappie	<u>Pomoxis annularis</u>	1,677	55.36
Freshwater drum	<u>Aplodinotus grunniens</u>	78	2.58
Totals		3,029	100.00

Table 2. Results of gill net collections, Lake Whitney, November 1, 1960 through October 31, 1961

Species	Number	Per Cent of Total Number	Weight in Pounds	Per Cent of Total Wt.	Average Weight in Pounds	Fish per 100 Feet of Net	Weight (lbs.) per 100 feet of Net
Spotted gar	2	0.15	3.23	0.37	1.61	0.04	0.07
Longnose gar	134	10.50	285.60	32.78	2.13	2.91	6.20
Gizzard shad	807	63.25	325.38	37.36	0.40	17.55	7.07
Smallmouth buffalo	8	0.62	24.05	2.76	3.00	0.17	0.52
River carpsucker	14	1.10	22.01	2.53	1.57	0.30	0.47
Carp	5	0.39	7.79	0.89	1.55	0.11	0.16
Channel catfish	77	6.04	95.09	10.92	1.23	1.68	2.06
White bass	111	8.70	65.96	7.57	0.59	2.41	1.43
Largemouth bass	10	0.78	6.48	0.74	0.64	0.22	0.14
Bluegill sunfish	18	1.41	3.96	0.46	0.22	0.39	0.08
White crappie	86	6.74	29.93	3.43	0.34	1.87	0.65
Freshwater drum	4	0.32	1.57	0.19	0.39	0.08	0.03
Totals	1,276	100.00	871.05	100.00			

Table 3. Crappie and other species caught in gill nets in Lake Whitney, Nov. 1960 - Oct. 1961.

	Period	Feet of Netting Used	Crappie				Fish Caught Other Than Crappie
			Number	Per Cent of total crappie caught	Average length in millimeters	Average weight in grams	
Upper Lake Area	November 1960 thru October 1961	4,100	74	86.05	186	152.3	945
Middle Lake Area	November 1960 thru October 1961	500	12	13.95	195	142.6	245
Totals		4,600	86	100.00			1,190

Table 4. Summary of crappie tagging and recapture data, Lake Whitney, November 1960 - October 1961

Area	Trapping and Tagging						Recaptures	
	Period	Number Traps Used	Number Trapped	Number Taken On Hook and Line	Total Crappie Tagged	Per Cent of Total Tagged	Number of Crappie Recaptured in Area	Per Cent of Total Tagged Fish recaptured in Area
Nolan River	February March July August 1961	6	78	0	78	4.20	2	2.89
Upper Lake	November 1960 thru October 1961	8 to 12	543	178	721	38.87	49	71.02
Middle Lake	November 1960 thru October 1961	6 to 10	1,056	0	1,056	56.93	18	26.09
Totals		1,677	1,855	178	1,855	100.00	69	100.00

Tab. 5. Tagged crappie recaptures in Lake Whitney, September 1, 1960 through October 31, 1961

Tagging Information			Recapture Information			
Tag No.	Date	Location	Date	Location	Days of Freedom	Distance Traveled
D- 22	10-31-60	Bluff #8 Marker	11- 1-60	Bluff #8 Marker	1	none
D- 70	11-21-60	Near Lakeside V.	3-13-61	Near Circle "D"	110	1 Mile
D- 86	11-30-60	Near Lakeside V.	3-27-61	Near Lakeside V.	117	none
D- 87*	11-30-60	Near Lakeside V.	2- 1-61	Lakeside V. Barge	62	½ Mile
D- 87*	11-30-60	Near Lakeside V.	4-22-61	Mesquite Creek	143	2 Miles
D- 118	12-30-60	Near Lakeside V.	4-26-61	Below Lakeside	117	½ Mile
D- 121	12-30-60	Near Circle "D"	2- 7-61	Near Lakeside V.	39	½ Mile
D- 126	1- 5-61	Bluff #8 Marker	4- 1-61	Redwood Lodge	86	½ Mile
D- 127	1- 5-61	Bluff #8 Marker	3- 3-61	Near Lakeside V.	57	10 Miles
D- 129	1- 5-61	Bluff #8 Marker	5- 3-61	Cedar Creek	119	½ Mile
D- 150	2- 2-61	Bluff #8 Marker	4-23-61	Hillcrest Dock	80	½ Mile
D- 155	2- 3-61	Near Lakeside	5-26-61	Near Circle "D"	112	½ Mile
D- 167	2-10-61	Near Lakeside	4-19-61	Near Circle "D"	98	½ Mile
D- 168	2-10-61	Near Lakeside	3- 4-61	Mesquite Creek	22	1½ Mile
D- 132	1-23-61	Near Lakeside	3- 7-61	Near Lakeside	40	none
D- 283	8-14-61	Bluff #8 Marker	8-26-61	Katy R.R. Bridge	12	2 Miles
D- 802	10- 3-61	Bluff #8 Marker	10-16-60	Hillcrest Dock	13	½ Mile
D- 852	10- 5-60	Bluff #8 Marker	-----	Cedar Creek	--	½ Mile
D- 918	10-13-60	Bluff #8 Marker	4-23-61	Hillcrest Dock	191	½ Mile
A-4025	2-16-61	Near Circle "D"	4-28-61	Near Lakeside	71	½ Mile
A-4026=	2-16-61	Nolan River	4-17-61	Nolan River	60	none
A-4030	2-20-61	Near Lakeside	4- 3-61	Plowman Creek	42	5 Miles
A-4135	9- 7-61	Near Lakeside	9-15-61	Hillcrest Dock	8	11 Miles
A-4256	9-30-61	Near Lakeside	10-31-61	Near Lakeside	31	¼ Mile
C-1693	5-10-60	Mesquite Creek	---	Cedar Creek	---	13 Miles
C-1915	8-15-60	Near Hillcrest	4-23-61	Hillcrest Dock	251	none
C-4057	3- 3-61	Near Circle "D"	3-13-61	Near Circle "D"	10	none
C-4059	3- 3-61	Near Circle "D"	3-27-61	Near Lakeside	24	½ Mile
C-4071	3-13-61	Lakeside Village	9-15-61	Hillcrest Dock	186	11 Miles
C-4078	3-13-61	Lakeside Village	3-17-61	Lakeside Village	4	none
C-4085	3-13-61	Near Circle "D"	6-13-61	Near Lakeside	92	½ Mile
C-4098	3-13-61	Near Circle "D"	5-29-61	Near Lakeside	77	none
C-4100	3-13-61	Near Circle "D"	4- 6-61	Near Circle "D"	24	none
C-4120	3-21-61	Lakeside Village	5- 8-61	Mesquite Creek	48	2 Miles
C-4135	3-28-61	Mesquite Creek	5-10-61	Mesquite Creek	43	none
C-4146	3-28-61	Mesquite Creek	6-17-61	Near Lakeside	81	2 Miles
C-4172	3-14-61	Nolan River	4- 8-61	Nolan River	25	none

Table 5. (continued) Tagged crappie recaptures in Lake Whitney, Nov. 1960 - Oct. 1961.

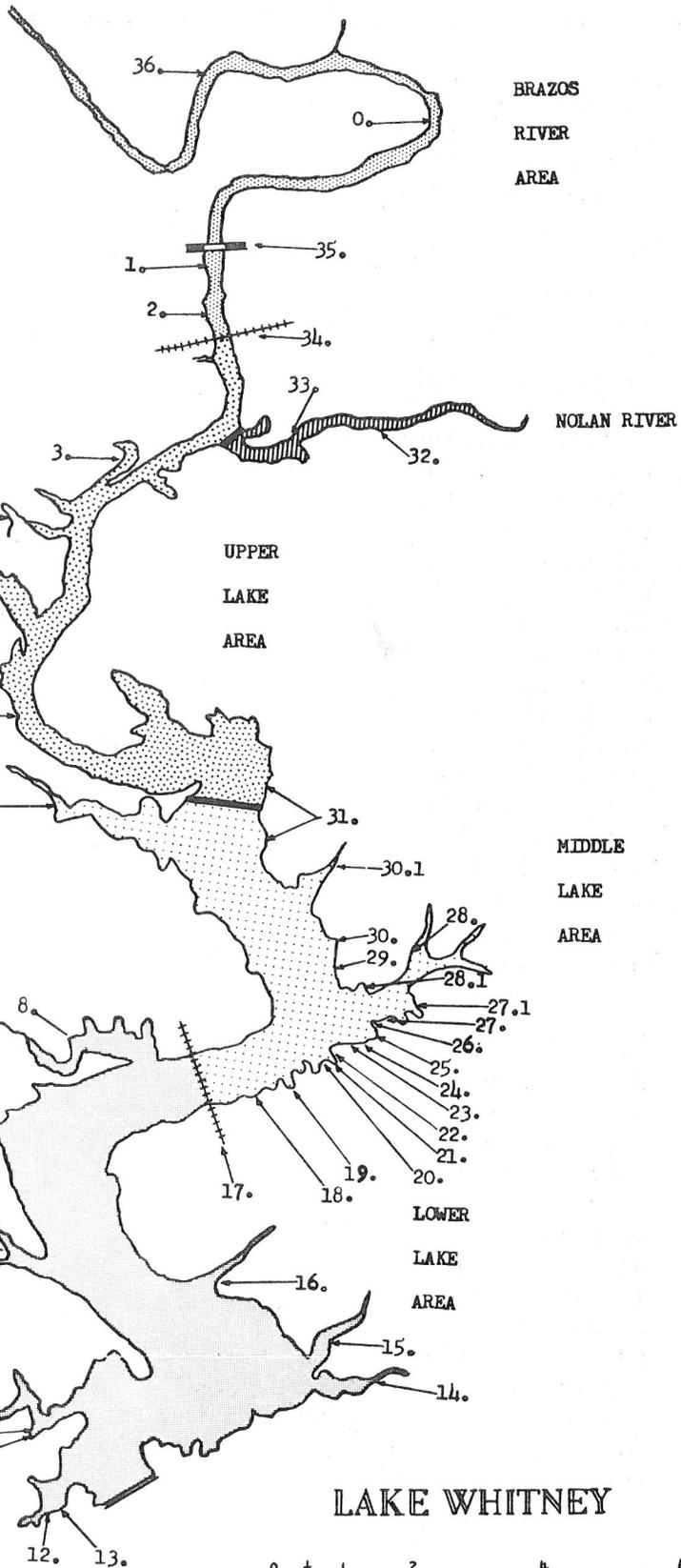
Tagging Information			Recapture Information			
Tag No.	Date	Location	Date	Location	Days of Freedom	Distance Traveled
C-4173	3-13-61	Near Circle "D"	5- 9-61	Mesquite Creek	57	2½ Miles
C-4175	3-14-61	Mesquite Creek	3-26-61	Mesquite Creek	12	none
C-4177*	3-14-61	Lakeside Village	3-20-61	Near Circle "D"	4	1 Mile
C-4177*	3-14-61	Lakeside Village	3-20-61	Near Circle "D"	4	1 Mile
C-4181	3-14-61	Near Lakeside	3-25-61	Near Lakeside	11	none
C-4186	3-15-61	Cedar Creek	4- 3-61	Cedar Creek	19	none
C-4195	3-14-61	Lakeside Village	4- 4-61	Mesquite Creek	21	2 Mile
C-4202	3-28-61	Mesquite Creek	3-29-61	Mesquite Creek	1	none
C-4224	3-29-61	Mesquite Creek	4- 4-61	Mesquite Creek	6	none
C-4226	4- 6-61	Mesquite Creek	4-21-61	Mesquite Creek	15	none
C-4263	4-11-61	Mesquite Creek	4-14-61	Mesquite Creek	3	none
C-4264	4-12-61	Mesquite Creek	6- 4-61	Near Lakeside	53	1½ Miles
C-4269	4-12-61	Lakeside Village	8-19-61	Near Lakeside	129	¾ mile
C-4279	3-29-61	Mesquite Creek	4- 2-61	Mesquite Creek	5	none
C-4290	4- 3-61	Mesquite Creek	4-15-61	Mesquite Creek	12	none
C-4327	4-18-61	Mesquite Creek	5- 9-61	Mesquite Creek	21	none
C-4333	4-18-61	Mesquite Creek	8-20-61	Mesquite Creek	124	none
C-4347	4-19-61	Mesquite Creek	5- 3-61	Mesquite Creek=	14	none
C-4380	4-25-61	Mesquite Creek	9-28-61	Near Lakeside	156	1 Mile
C-4422	5- 3-61	Mesquite Creek	5-21-61	Mesquite Creek	18	none
C-4444	5- 9-61	Mesquite Creek	10- 8-61	Near Lakeside	152	1 Mile
C-4478	5-30-61	Bluff #8 Marker	6-10-61	Near Lakeside	11	10 Miles
C-4550*	7- 6-61	Lakeside Village	7- 7-61	Near Lakeside	1	½ Mile
C-4550*	7- 6-61	Lakeside Village	7-25-61	Lakeside Village	19	none
C-4554	7- 6-61	Lakeside Village	7- 8-61	Lakeside Village	2	none
C-4559	7- 6-61	Lakeside Village	7-22-61	Lakeside Village	16	none
C-4565	7- 6-61	Lakeside Village	7- 8-61	Lakeside Village	2	none
C-4622	7-11-61	Bluff #8 Marker	9- 8-61	Cedar Creek	59	½ Mile
C-4642=	7-11-61	Bluff #8 Marker	7-11-61	Bluff #8 Marker	0	none
C-4647	7-11-61	Bluff #8 Marker	7-12-61	Bluff #8 Marker	1	none
C-4664	7-11-61	Bluff #8 Marker	7-12-61	Bluff #8 Marker	1	none
C-4786	7-26-61	Bluff #8 Marker	9-----61	Hillcrest Dock	35	½ Mile

* These fish were recaptured more than once.

Table 6. Lake Whitney Water Level Elevations, November, 1960 - October, 1961.

Date	Lake Elevation (m.s.l.) *
November 2, 1960	520.20
November 9, 1960	520.16
November 16, 1960	520.24
November 23, 1960	519.90
November 30, 1960	519.65
December 7, 1960	519.80
December 14, 1960	520.02
December 21, 1960	519.98
December 28, 1960	520.13
January 4, 1961	520.10
January 11, 1961	523.82
January 18, 1961	519.97
January 25, 1961	519.73
February 1, 1961	520.23
February 8, 1961	521.72
February 15, 1961	520.30
February 24, 1961	519.42
March 1, 1961	520.04
March 8, 1961	520.05
March 15, 1961	519.96
March 22, 1961	520.14
March 29, 1961	520.00
April 5, 1961	519.85
April 12, 1961	520.10
April 19, 1961	520.02
April 26, 1961	520.09
May 3, 1961	519.82
May 10, 1961	519.62
May 17, 1961	519.54
May 24, 1961	519.56
May 31, 1961	519.23
June 7, 1961	518.83
June 14, 1961	518.87
June 21, 1961	523.18
June 28, 1961	520.36
July 5, 1961	520.03
July 12, 1961	519.96
July 19, 1961	520.51
July 26, 1961	520.07
August 2, 1961	519.00
August 9, 1961	520.00
August 16, 1961	519.94
August 23, 1961	520.04
August 30, 1961	519.81
September 6, 1961	519.33
September 13, 1961	519.38
September 20, 1961	520.05
September 27, 1961	520.07
October 4, 1961	520.51
October 11, 1961	522.14
October 18, 1961	520.00
October 25, 1961	520.01

* Normal surface elevation is 520.00 m.s.l.



- 0. Kimball Bend
- 1. Kimball Rec. Area
- 2. Indian Lodge
- 3. Plowman Creek
- 3.1 Raymond Creek
- 4. Mesquite Creek
- 5. Lakeside Village
- 6. Circle "D" Dock
- 7. Steel Creek
- 8. Cedron Creek
- 9. King Creek
- 10. Nob Hill
- 11. Rocky Creek Lodge
- 12. Little Rocky Lodge
- 13. Sportsman's Park
- 14. Towash Creek
- 15. Whitney Creek
- 16. State Park
- 17. Katy Railroad Bridge
- 18. Elm Canyon Lodge
- 19. Hillcrest Camp
- 20. Redwood Lodge
- 21. Deep Canyon
- 22. Wann Resort
- 23. Cherokee Lodge
- 24. Waldock's Lodge
- 25. T & L Boat Dock
- 26. Gay's Juniper Cove
- 27. Cedar Creek Lodge
- 27.1 **Air Force Base**
- 28. Herringtons Park
- 28.1 Bluff #8 Marker
- 29. Helm Lodge
- 30. Pioneer Lodge
- 30.1 Bear Creek
- 31. White Bluffs
- 32. Nolan River
- 33. Wall's Place
- 34. Santa Fe Railroad Bridge
- 35. Kimball Highway Bridge
- 36. John Roach's Place

