Report of Fisheries Investigations

A Study of Crappie in Lake Whitney

by

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Dingell-Johnson Project F-4-R-7, Job E-4
November 1, 1959 - October 31, 1960

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A B S T R A C T

The study of crappie, Pomoxis annularis, 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.

Fish to be tagged were taken primarily in wire traps and by hook and line and, beginning in July, small crappie entered the trap catch. This seemed to indicate a successful spawn during the previous year. Efforts to sample crappie fry during the present year's spawning season resulted in the capture of only a single specimen in seines.

Most of the tagging occurred in the middle third of the lake, even though traps were used in all other areas of the lake.

A total of 1,493 crappie were tagged during the year and 47, or 3.14 percent of these were recaptured. Five crappie from previous years' tagging were also recaptured. The greatest distances traveled by tagged crappie were 30 miles each by two specimens, however, over half the tagged crappie recaptured travelled less than 100 yards from the point of release. The greatest length of freedcm for a crappie recaught this year was 1,030 days. This individual was recaptured within one mile of the original point of release. Another, free for 405 days, was retaken within two miles of where it was released.

Since the emphasis of the study thus far has been on tagging and recapture, and since it is indicated that tagged crappie tend to remain near the original point of release, it is intended that future emphasis will be placed on the study of crappie fry and spawning success.

Job Completion Report

State of TEXAS

Project No. F-4-R-7 Name: Fisheries Investigations and Surveys of the Waters of Region 4-B.

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

Period Covered: November 1, 1959 - October 31, 1960

OBJECTIVES

To determine the population of crappie 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.

PROCEDURE

The trapping of crappie, Pomoxis annularis, in Lake Whitney during the period covered by this report continued along the same general lines as in previous segments. Two changes, however, were the use of a gang net, in an effort to capture crappie fry, and the use of the size three, self-piercing, strap type, monel metal tag on the larger crappie taken in traps.

Most of the traps used were constructed of 9-gauge concrete reinforcement wire, with a six-inch square mesh, covered with one-inch mesh poultry wire. All but one of the traps are five feet long and 29 inches in diameter, and all are of either single- and double-throat construction. The throat openings are from three to five inches in diameter. The one exception is a trap constructed with a throat extending from the top to the bottom of the trap; whereby the trap could be set in a vertical position (Figures 1 and 2).

In addition to the described traps, three small traps were constructed with no frame using one-inch poultry wire.

The gang net is made up of a series of hoop nets attached one to another by small mesh leads. It was used to capture crappie fry in shallow water during the spawning season but was not as successful as anticipated. This was felt due to rapid water temperature fluctuations in the shallows brought about by sudden changes in the weather.

All traps were placed at locations believed to be good crappie habitats. It was intended that these would be permanent locations. After several collections, however, it was decided that to catch more crappie for tagging, it would be necessary to move the traps from time to time.

Whenever a trap was set in a given location and the resulting take in crappie was considered good, this trap location was used until the crappie catch diminished. If a

location was used for a period of approximately two weeks and few crappie were taken, the trap was moved to what was considered a better location. This procedure of moving traps from place to place was repeated in order to capture as many crappie as possible.

Figures 1, 2, 3, and 4 illustrate the wire traps used to take crappie from Lake Whitney. Figures 1 and 2 show an experimental trap which was constructed to catch crappie near the thermocline. The throat, which extends vertically from top to bottom, would extend through the thermocline.

Baiting of the traps was not practiced although one trap was baited with a cake of pressed cotton seed meal. The trap was checked the following morning when it was found that only 13 carp were taken. Consequently no more traps were baited. No types of attractors were experimented with during this study period.

Trapping stations were established from Little Rocky Creek, near the dam, and extended to the Nolan River, near the head of the lake. This is a distance of from 20 to 30 miles of lake and river. Many of the stations used during the segment are new, although some were used during previous segments.

The work of trapping was divided among five sections of the lake. The Brazos River Area extends upstream from the Santa Fe Railroad Bridge (Station No. 34). What has been called the Upper Lake Area extends downstream from the same bridge to the vicinity of the White Bluffs (Station No. 31). The Nolan River Area lies within this portion of the lake but the Nolan River arm extends from the lake proper. The Middle Lake Area includes that portion of the lake from White Bluffs downstream to the Katy Railroad Bridge (Station No. 17). The Lower Lake Area includes the remainder of the lake, downstream to the dam.

Traps could be set in only three of the above mentioned areas at a time because of the lack of traps. No traps were set in the Brazos River Area because the Nolan River was utilized during this segment. Not more than 25 traps were set an any one given time during the study period.

The method of tagging crappie in past segments of the study was continued. Strap type, monel-metal, jaw tags were placed on the left premaxillary of all fish tagged. 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. Prior to release, tagged fish were cursorily examined for external parasites and for a bacterial type of infection noted in previous study periods. None of the fish tagged this year appeared to have this bacterial infection.

Posters were placed in conspicuous places around the lake and newspaper articles were published informing the public about the work being done. It was hoped that the public would cooperate by providing information concerning any tagged fish caught. Card forms, with blanks for the information desired, were given to camp operators on the lake, local stores, and cafes. These cards, when properly filled out either by individuals or by project personnel, provided needed information concerning the tagged fish. The information received on these cards was later transferred to a ledger for a permanent record.

Gill net collections were made in the vicinity of the wire traps to provide comparative information concerning the relative abundance of crappie in the area. This

also served as a check on the efficiency of the traps in taking crappie.

Common sense minnow seines and small mesh wire traps were used along the shoreline in an attempt to sample crappie fry during and after the spawning season. In addition, two rotenone samples were taken from restricted areas to sample crappie fry.

RESULTS

Data concerning the number of each species taken in wire traps are given along with the percentages of the total trap catch represented by each species. The results of trapping are presented in Table 1. The data presented covers the period from November, 1959 through June, 1960.

The data for the months of July, August, September, and October were omitted from Table 1 because they were inaccurately recorded by a summertime student employee. This employee attended the traps and tagged and released all crappie taken but failed to keep records of fish other than crappie caught in the traps. Therefore the data for the four months were discarded.

It is interesting that white crappie, Pomoxis annularis, comprised 47.56 percent of the total catch in traps for the eight months represented in Table 1. Bluegills, Lepomis macrochirus, comprised 26.43 percent. Compared to data from the previous study period, crappie increased slightly in the catch from 44.38 to 47.56 or 3.18 percent. Bluegills decreased from 44.78 to 26.43 or a total decrease of 18.35 percent.

There were only 47 gizzard shad, Dorosoma cepedianum, comprising 3.23 percent of the total trap catch. Yet, as shown in **Table** 2, 894 gizzard shad were taken in gill nets set near the traps. Of the total catch in gill nets, shad comprised 61.15 percent. The data given in Table 2 is a consolidation of data which served as the basis for locating or relocating the wire traps.

In Table 3 consolidated gill net collection data are broken down to show area of netting and the ratio of crappie to all other species caught. The number and percentages of crappie tagged are given by area in Table 4. In all, a total of 1,493 crappie were tagged during the eight months covered by this report.

In the Nolan River Area, 144 crappie were caught in the wire traps. These represent 9.64 percent of the total tagged during the year. Of these, five were recaptured in the same area and represent 0.03 percent of the total crappie tagged or 10.63 percent of the 47 tags recovered during the study period.

In the Upper Lake Area, 238 crappie, or 15.94 percent of the total, were tagged during this segment. Seventeen tagged fish were recovered, which accounted for 0.06 percent of the total tagged fish released, or 34.05 percent of the total tagged fish recovered during the year. One fish that had been tagged the previous year was also recovered.

There were 1,109 crappie tagged in the Middle Lake Area, which amounted to 74.28 percent of the yearly total of marked fish. In this same area 25, or 0.02 percent of the total fish tagged this year, were recovered along with four crappie that had been tagged and released in earlier study periods. The 29 returns comprised 53.19 percent

of the total tagged fish recovered during the year.

Four traps were used in the Lower Lake Area, but only during the months of November, 1959 through January, 1960. Two crappie were caught and tagged during that period. A fisherman later recovered one of these and it comprised 2.13 percent of the total tagged fish recovered during the year.

Information concerning all tagged crappie recaptured by either fishermen, gill nets, or traps is listed in Table 5. Two crappie traveled 30 miles, one traveled three miles and four traveled two miles each. The remaining tagged crappie either traveled shorter distances or had no travel at all. With the exception of the few fish mentioned, the movement of crappie based on tagged fish recaptured during periods other than the spawning season is indistinct. No pattern or trend of movement is indicated. As a matter of fact 33 tagged crappie, recaptured during the year, traveled less than 100 yards, and are shown in the distance traveled column of Table 5 as "none".

It seems apparent that tagged crappie do not tend to move very far from the place where they were released. For example, Tag Number 287 was placed on a crappie on June 12, 1957. This fish was recaptured on April 6, 1960, after a period of almost three years, within one mile of the place where it was originally tagged and released. A fish, with Tag Number 2,264, was recaptured after being free for 405 days within two miles of the place of tagging. Another, with Tag Number 1,028, remained free for 280 days and was recaptured at the original point of tagging and release. Still another fish, carrying Tag Number 2,974 and free for 258 days, was recaught within two miles from where it was released. The only other fish to remain free more than 100 days was recaptured within 100 yards of the point of release.

Weekly lake level elevation readings are presented in Table 6. The lake maintains an almost constant level throughout the year, varying only 3.2 feet from its lowest level to its highest. Week to week changes in lake level were slight, and so far as is known had little or no effect upon the crappie in Lake Whitney.

As a matter of record, Table 7 includes temperatures taken at the mouth of Cedar Creek on Lake Whitney for the months of June, July, and August. Comparable temperatures are given for June 1957; July 1957 and 1959; and August 1957.

As shown in Table 8, only one crappie was taken in seine samples and this was a crappie fry. Gizzard shad were predominant in the catch, comprising 84.28 percent of the fish seined. The sharpnose shiner, Notropis oxyrhynchus, was next in abundance with 4.90 percent of the seined specimens, and Gambusia affinis followed with 3.10 percent. Bluegills, easily caught in the wire traps, comprised only 2.58 percent of the 388 specimens seined.

The study thus far has been primarily concerned with the tagging and recapture of adult crappie and this work has indicated that, barring exceptions, tagged crappie tend to remain relatively near the original point of capture and release. With this in mind, it seems apparent that the emphasis of the study should be shifted to the study of crappie fry and spawning success. This will be the major part of the work during the coming year's study.

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Date February 14, 1961

Table 1. Fish caught in wire traps in Lake Whitney, November 1959 through June, 1960.

Species	Scientific name	Number Trapped	Percent of Total
Spotted gar	Lepisosteus oculatus	9	0.61
Longnose gar	L. osseus	38	2.62
Gizzard shad	Dorosoma cepedianum	47	3.23
Smallmouth buffalo	Ictiobus bubalus	12	0.83
River carpsucker	Carpiodes carpio	48	3.30
Carp	Cyprinus carpio	100	6.89
Channel catfish	Ictalurus punctatus	13	0.89
White bass	Roccus chrysops	64	4.41
Flathead catfish	Pylodictus olivaris	2	0.13
Largemouth bass	Micropterus salmoides	21	1.45
Warmouth	Chaenobryttus gulosus	3	0.20
Bluegill	Lepomis macrochirus	384	26.43
White crappie	Pomoxis annularis	691	47.56
Freshwater drum	Aplodinotus grunniens	21	1.45
Totals		1,453	100.00

Table 2. Results of gill net collections, Lake Whitney, November 1, 1959 through October 31, 1960.

Species	Number	Percent of Total number	Weight in pounds	Percent of Total weight	Average weight in pounds	Fish per 100 feet of net	Weight (lbs.) per 100 feet of net
Spotted gar	18	1.23	24.74	2.55	1.37	0.30	0.41
Longnose gar	128	8.75	261.62	26.98	2.04	2.10	4.29
Gizzard shad	894	61.15	342.53	35.32	0.38	14.66	5.62
Smallmouth buffalo	12	0.82	23.84	2.46	1.99	0.20	0.39
River carpsucker	44	3.01	45.76	4.72	1.04	0.72	0.75
Carp	10	0.68	15.74	1.63	1.57	0.16	0.26
Channel catfish	110	7.53	122.68	12.65	1.12	1.80	2.01
White bass	76	5.20	44.20	4.56	0.58	1.25	0.72
Spotted bass	1	0.07	0.77	0.08	0.77	0.02	0.01
Largemouth bass	29	1.98	38.56	3.97	1.33	0.48	0.63
Warmouth bass	1	0.07	0.30	0.03	0.30	0.02	0.05
Bluegill sunfish	13	0.89	2.85	0.30	0.22	0.21	0.05
White crappie	102	6.97	37.17	3.83	0.36	1.67	0.61
Freshwater drum	24	1.65	8.86	0.92	0.37	0.39	0.15
Totals	1,462	100.00	969.62	100.00			

Table 3. Crappie and other species caught in gill nets in Lake Whitney, November 1959 through October 1960.

Area	Period	Feet of netting used.	Crappie				Fish caught other than crappie.
			Number	Percent of total crappie caught	Average length in millimeters	Average weight in grams	
Brazos River	July 1960	600	2	1.96	187	175	113
Upper Lake Area	November 1959 thru October 1960	2,000	37	36.27	208	165	490
Middle Lake Area	November 1959 thru October 1960	3,500	63	61.77	190	166	757
Totals		6,100	102	100.00			1,360

Table 4. Summary of crappie tagging and recapture data, Lake Whitney, November 1959 through October 1960.

Area	Trapping and Tagging						Recaptures		
	Period	Number traps used	Number trapped	Number taken on hook and line	Total crappie tagged	Percent of total tagged	Number of crappie recaptured	Percent of total tagged in area	Percent of total tagged fish recaptured in area
Nolan River	March thru June	4	144	0	144	9.64	5	0.03	10.63
Upper Lake Area	November thru October	4 to 8	219	19	238	15.94	17	0.06	34.05
Middle Lake Area	November thru October	8 to 15	1,091	18	1,109	74.28	29	0.02	53.19
Lower Lake Area	November thru January	4	2	0	2	0.14	1	0.50	2.13
Totals			1,456	37	1,493		52*		100.00

*Includes five crappie tagged during previous segments.

Table 5. Tagged crappie recaptures in Lake Whitney, November 1, 1959 through October 31, 1960.

Tag No.	Tagging Information		Recapture Information			
	Date	Location	Date	Location	Days of Freedom	Distance Traveled
287	6-12-57	Juniper Cove	4- 6-60	Air Force Base	1030	1 mile upstream
1024	8-27-59	Near Herringtons	9-27-60	Hillcrest Dock	31	2 miles downstream
1028	9- 3-59	Near Herringtons	6-10-60	Near Herringtons	280	none
1073	1-18-60	Deep Canyon	4-10-60	Hillcrest Dock	83	½ mile
1108	1-27-60	Mesquite Creek	4- 2-60	Mesquite Creek	66	none
1112	1-27-60	Lakeside Village	3-17-60	Greer's Barge	50	"
1116	2- 3-60	Juniper Cove	4-10-60	Juniper Cove	67	"
1132	2- 8-60	Juniper Cove	4-16-60	Juniper Cove	68	"
1150 *	2-18-60	Mesquite Creek	4-18-60	Mesquite Creek	60	"
1150 *	2-18-60	Mesquite Creek	5- 3-60	Mesquite Creek	15	"
1160	3- 3-60	Deep Canyon	4-22-60	Air Force Base	50	½ mile
1165	3- 4-60	Nolan River	4- 3-60	Nolan River	30	none
1173	3- 4-60	Nolan River	3- 5-60	Nolan River	1	"
1199	3-17-60	Nolan River	4- 1-60	Nolan River	14	"
1202	3-17-60	Mesquite Creek	4-21-60	Mesquite Creek	35	"
1221	3-21-60	Mesquite Creek	4- 4-60	Mesquite Creek	14	"
1235	3-22-60	Juniper Cove	4-10-60	Juniper Cove	19	"
1237	3-22-60	Juniper Cove	4- 7-60	Wann Canyon	16	½ mile
1259	3-25-60	Deep Canyon	3-30-60	Deep Canyon	5	none
1276	3-28-60	Mesquite Creek	3-30-60	Greer's Barge	2	2 miles
1277	3-28-60	Mesquite Creek	5-11-60	Mesquite Creek	44	none
1283	3-28-60	Near Herringtons	3-30-60	Near Herringtons	2	"
1291	3-28-60	Juniper Cove	4-24-60	Air Force Base	27	½ mile
1292 *	3-28-60	Juniper Cove	3-29-60	Juniper Cove	1	none
1292 *	3-28-60	Juniper Cove	4- 4-60	Juniper Cove	6	"
1303	3-28-60	Cedar Creek	4-19-60	Air Force Base	22	½ mile
1315	3-29-60	Wann Canyon	4- 7-60	Wann Canyon	9	none
1329	3-29-60	Mesquite Creek	4- 4-60	Mesquite Creek	6	"
1339	3-29-60	Juniper Cove	4- 7-60	Wann Canyon	9	½ mile
1341	4- 5-60	Nolan River	4- 5-60	Nolan River	0	none
1355	4- 5-60	Nolan River	4-21-60	Nolan River	16	"
1390	4- 5-60	Juniper Cove	4- 7-60	Juniper Cove	2	"
1429	4- 7-60	Wann Canyon	4-23-60	Wann Canyon	16	"

Table 5. Tagged crappie recaptures in Lake Whitney, November 1, 1959 through October 31, 1960. (continued)

	Tagging Information		Recapture Information			
Tag No.	Date	Location	Date	Location	Days of Freedom	Distance Traveled
1436	4- 7-60	Wann Canyon	4-16-60	Air Force Base	9	½ mile
1440	4- 7-60	Wann Canyon	4-22-60	Wann Canyon	15	none
1463	4- 8-60	Mesquite Creek	4-21-60	Mesquite Creek	13	"
1472	4-11-60	Nolan River	July	Little Rocky	90**	30 miles downstream
1487	4-12-60	Mesquite Creek	7-23-60	Mesquite Creek	102	none
1494	4-12-60	Lakeside Village	5-22-60	Near Brazos Point	40	30 miles upstream
1495	4-12-60	Lakeside Village	5-17-60	Lakeside Village	35	none
1514	4-13-60	Near Herringtons	4-31-60	Cedar Creek area	19	"
1563	4-18-60	Mesquite Creek	5-11-60	Mesquite Creek	23	"
1619	4-21-60	Juniper Cove	4-22-60	Cedar Creek Dock	1	¼ mile
1651	5- 3-60	Mesquite Creek	5-14-60	Near Circle "D"	11	3 miles
1665	5- 4-60	Lakeside Village	5-17-60	Lakeside Village	13	none
1726	5-19-60	Juniper Cove	6- 4-60	Cedar Creek	16	¼ mile
2264	2-24-59	Lakeside Village	4- 3-60	Mesquite Creek	405	2 miles
2974	7-21-59	Near Herringtons	4- 4-60	Juniper Cove	258	2 miles
720	9-19-60	Bluff #8 Marker	9-27-60	Bluff #8 Marker	8	none
920	9-14-60	Bluff #8 Marker	10-13-60	Bluff #8 Marker	29	"
928	9-14-60	Bluff #8 Marker	10-13-60	Bluff #8 Marker	29	"
936	9-14-60	Bluff #8 Marker	10-13-60	Bluff #8 Marker	29	"

* These fish were recaptured more than once.

** Approximate

Table 6. Lake Whitney water level elevations, November, 1959 through October, 1960.*

Date	Lake Elevation (m.s.l.)
November 4, 1959	519.94
November 11, 1959	519.88
November 18, 1959	519.65
November 25, 1959	519.98
December 2, 1959	520.00
December 9, 1959	519.66
December 16, 1959	520.16
December 23, 1959	519.89
December 30, 1959	519.86
January 6, 1960	521.15
January 13, 1960	520.34
January 20, 1960	520.00
January 27, 1960	519.76
February 3, 1960	520.00
February 10, 1960	519.05
February 17, 1960	519.36
February 24, 1960	520.16
March 2, 1960	519.90
March 9, 1960	519.97
March 16, 1960	519.82
March 23, 1960	519.92
March 30, 1960	519.69
April 6, 1960	519.48
April 13, 1960	519.03
April 20, 1960	518.76
April 27, 1960	519.63
May 4, 1960	519.76
May 11, 1960	519.97
May 18, 1960	519.75
May 25, 1960	519.85
June 1, 1960	520.02
June 8, 1960	519.76
June 15, 1960	519.70
June 22, 1960	519.20
June 29, 1960	519.10
July 6, 1960	518.80
July 13, 1960	518.67
July 20, 1960	520.17
July 27, 1960	519.94
August 3, 1960	520.00
August 10, 1960	519.96
August 17, 1960	519.82
August 24, 1960	519.75
August 31, 1960	519.60
September 7, 1960	519.28
September 14, 1960	518.92
September 21, 1960	518.50
September 28, 1960	518.71
October 5, 1960	518.36
October 12, 1960	517.98
October 19, 1960	518.03
October 26, 1960	520.22

*Normal surface elevation is 520 m.s.l.

Table 7. Lake Whitney water temperatures.*

Depth in feet	June		July			August	
	June 27, 1957	June 22, 1960	July 30, 1957	July 28, 1959	July 30, 1960	August 19, 1957	August 13, 1960
Surface	83.0° F.	83.4° F.	93.8° F.	84.1° F.	86.7° F.	84.9° F.	86.6° F.
4	82.6	82.8	89.8	83.5	86.7	84.2	86.0
8	82.4	82.6	88.9	83.2	86.7	84.1	85.0
12	82.0	82.4	87.8	83.2	86.6	84.1	84.8
16	81.7	82.0	87.7	83.1	86.2	84.4	84.7
18	81.2	81.6	--	--	--	--	--
20	--	--	86.5	82.8	85.5	84.0	84.7
22	80.9	81.5	--	--	--	--	--
24	--	--	85.6	82.2	84.7	84.0	84.6
26	80.7	81.4	--	--	--	--	--
28	--	--	85.5	82.0	84.5	83.9	84.6
30	80.4	81.3	--	--	--	--	--
32	--	--	85.4	81.7	84.3	83.7	84.6
34	80.0	80.4	--	--	--	--	--
36	--	--	85.3	81.4	83.6	83.4	84.6
40	79.7	--	--	--	--	82.6	84.4
46	--	--	--	--	--	81.4	83.0

*Temperatures recorded at regular station located at mouth of Cedar Creek.

Table 8. Results of seine collections, Lake Whitney, November 1959 through October, 1960.

Species	Scientific name	Number	Percent of Total
Spotted gar	Lepisosteus oculatus	1	0.26
Gizzard shad	Dorosoma cepedianum	327	84.28
River carpsucker	Carpiodes carpio	1	0.26
Sharpnose shiner	Notropis oxyrhynchus	19	4.90
Brazos shiner	Notropis brazosensis	6	1.54
Blacktail shiner	Notropis venustus	2	0.51
Red shiner	Notropis lutrensis	2	0.51
Gambusia	Gambusia affinis	12	3.10
Largemouth bass	Micropterus salmoides	7	1.80
Bluegills	Lepomis macrochirus	10	2.58
White crappie	Pomoxis annularis	1	0.26
Totals		388	100.00

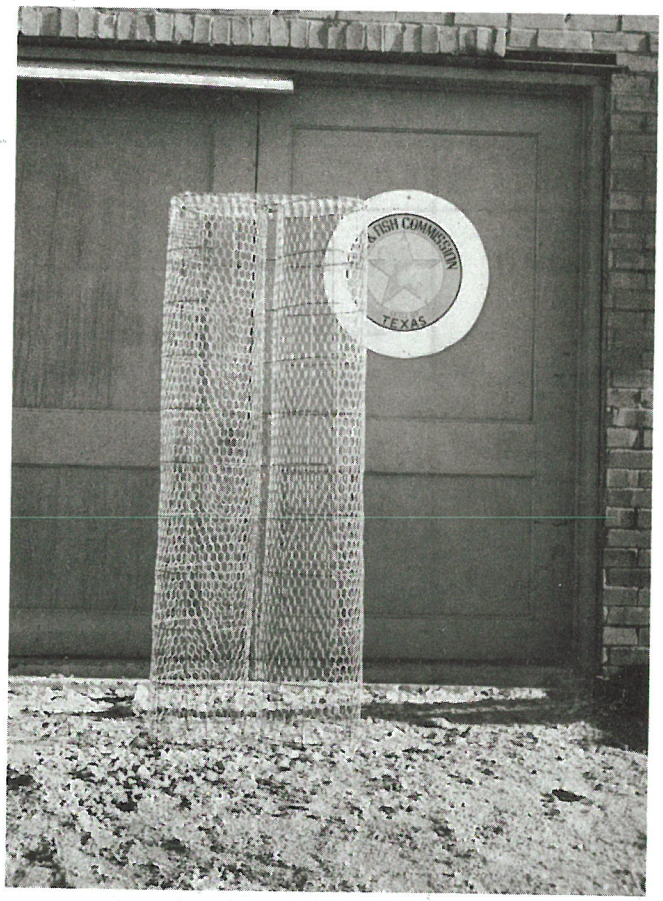


Figure 1. Side of an experimental trap which was designed to extend through the thermocline, showing throat extending vertically from top to bottom.

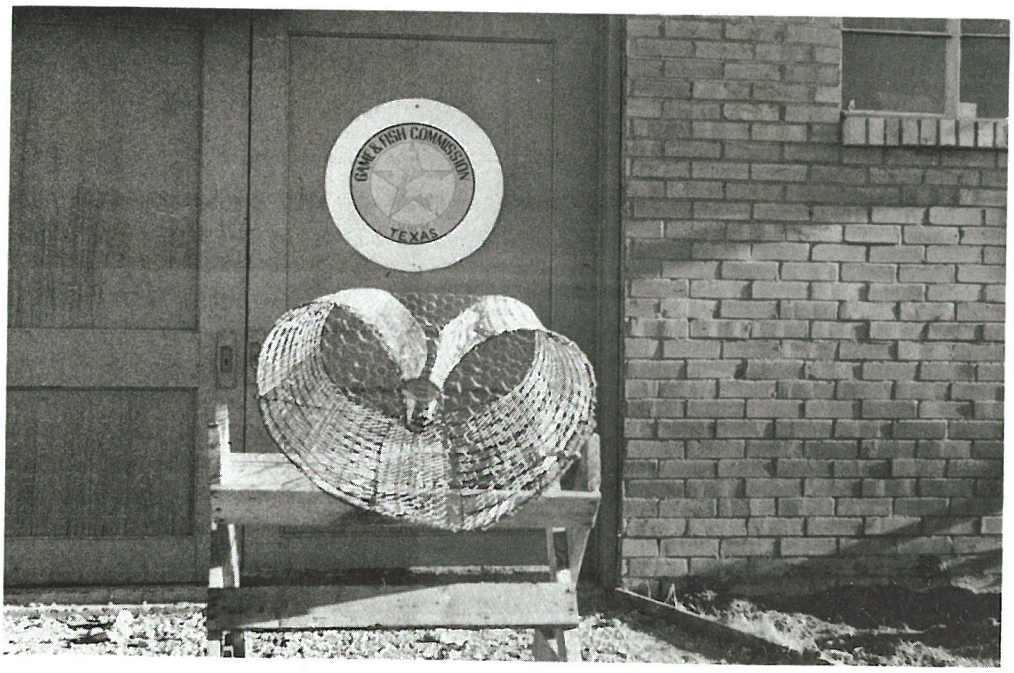


Figure 2. End view of same trap.

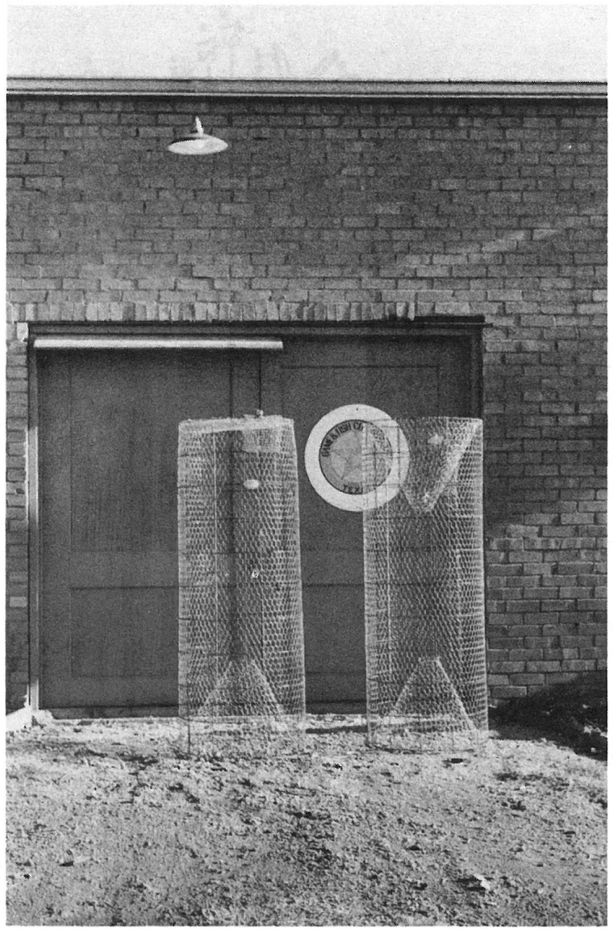


Figure 3. Two type of traps used to capture crappie.

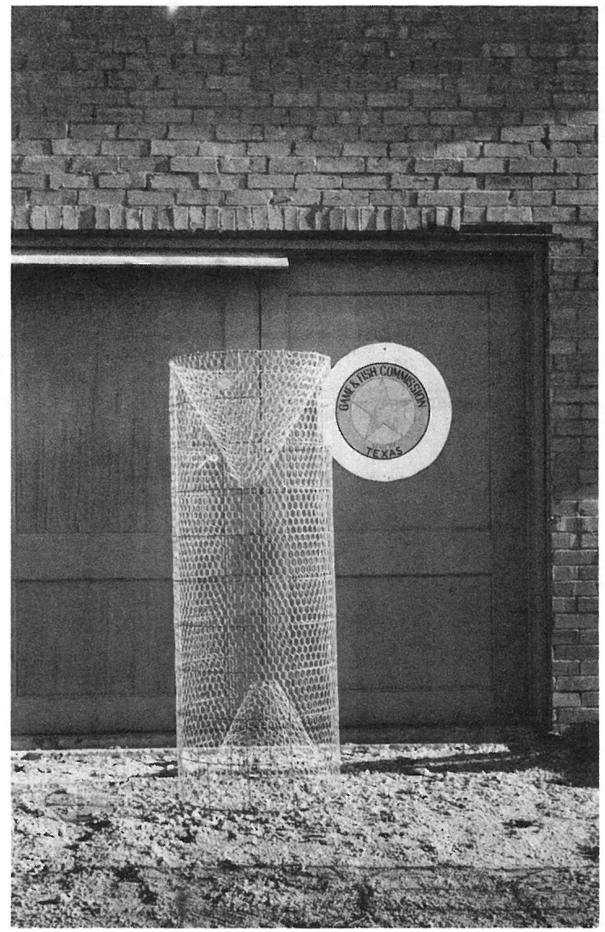
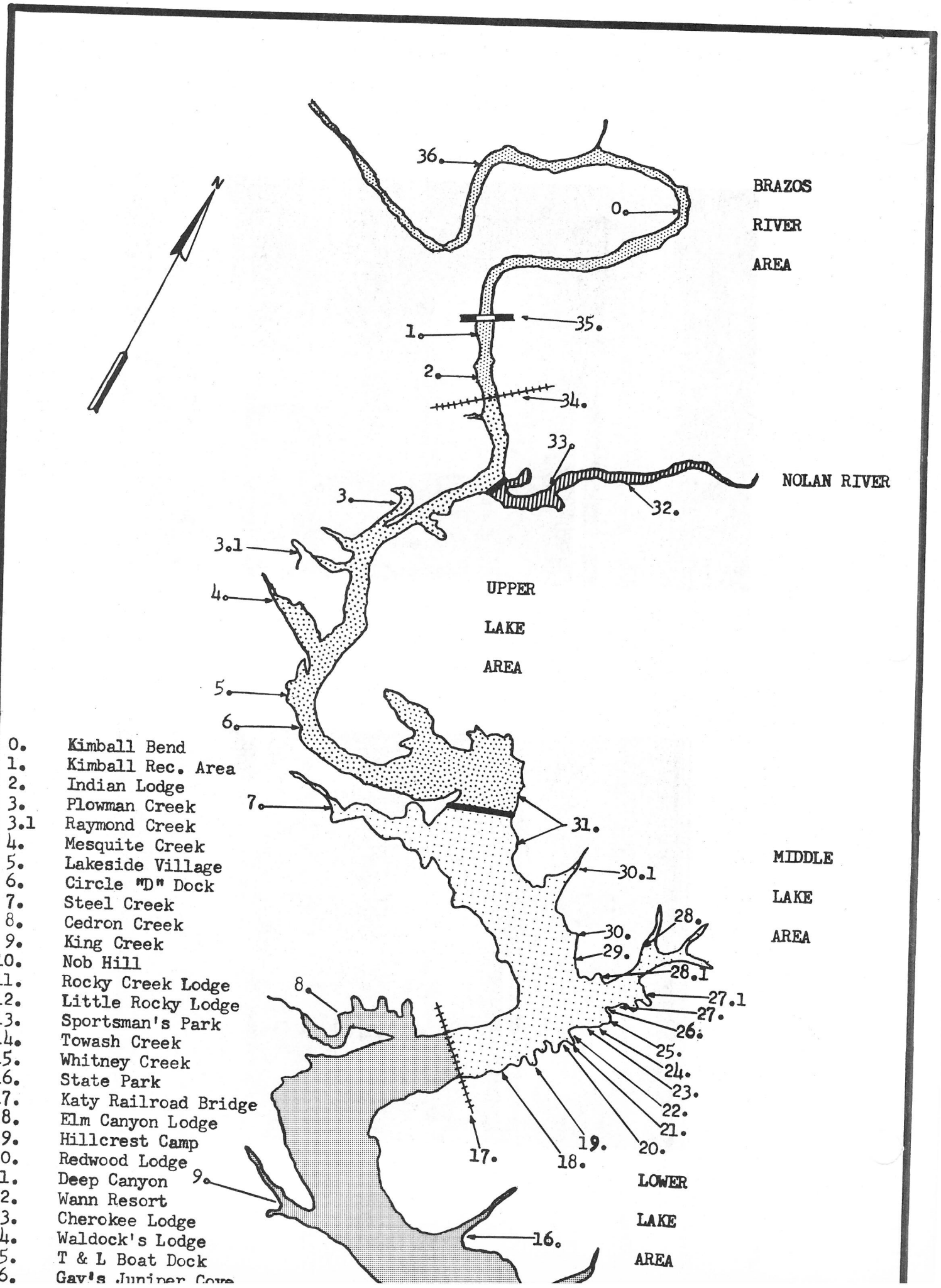


Figure 4. Trap with a funnel type throat at either end.


N
BRAZOS
RIVER
AREA
NOLAN RIVER
UPPER
LAKE
AREA
MIDDLE
LAKE
AREA
LOWER
LAKE
AREA
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