

JOB COMPLETION REPORT

FILE

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-4-R-13

REGION 2-A FISHERIES STUDIES

Job No. D-2: Investigations of River Carpsucker Die Off in Lake Kemp

Project Leader: Dwane Q. Smith

J. R. Singleton
Executive Director
Texas Parks and Wildlife Department
Austin, Texas

Marion Toole
D-J Coordinator

E. A. Walker
Director, Wildlife Services

December 6, 1967

Abstract

During the summer months of 1964 and 1965, a heavy die-off of river carpsucker (Carpionodes carpio) occurred in Lake Kemp. This investigation was started in order to determine cause or causes.

A number of probable causes were to be checked--agriculture spraying, parasites, bacteria and/or fungus, etc. Netting of live fish showed no apparent cause of the prior die-off. Dead fish were to be examined for probable cause of death but no fish died during this segment. Since no fish died it was recommended that the job be terminated.

Job Completion Report

State of Texas

Project No. F-4-R-13

Name: Region 2-A Fisheries Studies

Job No. D-2

Title: Investigation of River Carpsucker Die-Off
in Lake Kemp

Period Covered: November 1, 1965 - October 31, 1966

Objectives:

To determine the cause or causes of die-off of river carpsucker (Carpiodes carpio) in Lake Kemp.

Techniques Used:

An investigation was made to determine why river carpsucker die during the summer months in Lake Kemp, Baylor County, Texas.

Basic investigations for the first segment consisted of collecting water samples for chemical analyses and collecting fish.

Basic water chemistry served as a beginning point. Two stations were selected. Water samples were analyzed for dissolved oxygen, dissolved carbon dioxide, pH, sodium chloride and hydrogen sulfide.

Live fish were collected with standard sampling gill nets (150 feet long, 6 feet deep with graduated mesh from 1-inch square to 3½-inches square, changing every 25 feet.) All fish collected were weighed, measured and given a cursory examination.

Should a die-off of fish occur in the lake, it was planned that dead fish would be collected and preserved for laboratory examination in an effort to determine cause of death. Specimens of dead fish would be preserved in formalin or frozen. Live fish, netted during the die-off period, would also be preserved for laboratory examination in order that a comparison with the dead fish could be made. The fish would be examined to determine if their death could be attributed to pesticides or to the presence of parasites and/or bacteria.

Weekly lake observations, by the local game warden, were conducted in order to determine the onset of a die-off and the exact time the heaviest die-off occurred.

As time permitted, an investigation was conducted to determine what, if any, agriculture chemicals were being used on the immediate watershed above the lake.

Information about agriculture chemicals used within the immediate and small watershed was obtained for several sources. All sources contacted indicated that very

little, if any, chemicals were used during the months of June, July and August. If any fish lethal chemicals were entering the lake they probably came from the Rolling Plains area of Texas and would likely have been used prior to the above mentioned months.

A number of people and/or laboratories were contacted to make pesticide analyses, check for disease and examine for parasites. Two laboratories replied and offered their facilities for parasite identification and would assist in the pesticide analysis needed. The offering of their time and facilities is appreciated by the Texas Parks and Wildlife Department. Thanks is also in order to Dr. Walter Dalquest, Biology Department, Midwestern University, Wichita Falls, to Mr. Fred Parkey of the Wichita Water District and to Mr. W. W. Gorham with the Wichita Falls Water Purification Division, for their time and assistance.

No fish died in Lake Kemp during the work segment; therefore, no specimens could be sent to either laboratory for examination.

Due to the delay caused by ordering and receiving equipment, monthly water samples could not be obtained throughout the segment. Surface samples were taken during the months of February, May, June, July and September while the bottom samples were obtained during the months of May, June and July (Table 1).

Results:

The largest die-off of carpsucker occurred during the summer of 1964 but a large die-off also occurred in the summer of 1965 and no die-off of carpsucker in 1966.

No carpsucker died during this segment of work at which time the lake level was normal. During the 2 years in which fish died the lake was extremely low. Netting results for the past three years are given in Table 2.

Net data for 1964-1965 shows a reduction in the total fish population, when compared with the 1963-1964 data, which tends to indicate that other species may have been killed with the carpsucker. The 1965-1966 netting results show an increase in the fish population which would seem likely since no fish were killed during this segment. This also indicates that the fish population made a rapid recovery or that they suffered only slightly from the die-off.

The efforts, in trying to determine the cause or causes involved in the carpsucker die-off, were impossible since no fish died during this segment of work.

Since no fish died during this segment it is recommended that the job be terminated until the carpsucker die-off reoccurs.

Prepared by: Dwane Q. Smith Approved by: Marion Toole
Project Leader Coordinator

Date: December 6, 1967 FRED G. LOWMAN
Inland Fisheries Supervisor

Table 1. Results of Water Analysis for Lake Kemp, May, June and July 1966

	May 1966				June 1966				July 1966			
	Site No. 1		Site No. 2		Site No. 1		Site No. 2		Site No. 1		Site No. 2	
	Surface	Bottom										
Oxygen ^{1/}	7.6	8.8	8.8	10.8	8	7	9	7	9	6	7	8
Carbon dioxide ^{1/}	0.0	0.0	0.0	0	0	0	0-5	0	0	5	0	0
pH	7.4	7.5	8.0	8	8	8	8.5	7.5	85	85	8	8
Chlorides ^{1/}	260	275	275.0	290	-	-	950	1050	2/	2/	2/	2/
Hydrogen sulfide ^{1/}	0.0	0	0.0	0	0	0	0	0	0	0	0	0
Total alkalinity	45	45	45	46	-	-	-	-	-	-	-	-

^{1/} Given in ppm

^{2/} Discarded due to faulty reagents

Table 2. Netting Results for Lake Kemp

Species	F-4-R-11 1963-1964		F-4-R-12 1964-1965		F-4-R-13 1965-1966							
	No.	Per cent Weight Per cent	No.	Per cent Weight Per cent	No.	Per cent Weight Per cent						
Spotted gar	15	8.77	58.81	38.37	1	0.97	1.15	0.72	4	1.23	7.42	1.81
Shad	46	26.90	14.29	9.32	5	4.85	2.23	1.39	51	15.75	16.07	3.93
Smallmouth buffalo					4	3.89	23.17	14.53	16	4.94	76.42	18.67
Carp sucker	42	24.56	44.36	28.95	36	34.96	45.00	28.23	144	44.44	195.13	47.69
European carp	14	8.19	15.35	10.01	25	24.27	43.13	27.04	41	12.65	60.12	14.70
Channel catfish	14	8.19	6.53	4.26	5	4.85	3.03	1.90	11	3.40	2.86	0.69
Flathead catfish	1	0.59	1.74	1.14					6	1.85	29.97	7.33
Largemouth bass					6	5.82	30.59	19.18				
Longear sunfish					2	1.95	0.61	0.39				
Bluegill sunfish	9	5.26	1.00	0.65	5	4.85	0.57	0.35	35	10.80	6.04	1.48
White crappie	11	6.43	4.16	2.72	2	1.95	1.66	1.05	1	0.31	9.17	2.25
Freshwater drum	8	4.68	1.73	1.13	7	6.79	5.74	3.60	6	1.85	2.63	0.64
Totals	171	100.00	153.26	100.00	103	100.00	159.46	100.00	324	100.00	409.17	100.00

Table 3. Chloride Content - Rainfall - Lake Elevation for Lake Kemp
November 1, 1965 - October 31, 1966

Month & Year	Day	PPM Chloride	Rainfall	Lake Elevation
November 1965	18	1260	—	1137.54
December 1965	18	1270	—	1137.54
January 1966	18	1270	1.29	1137.29
February 1966	18	1050	1.14	1137.41
March 1966	18	1200	4.57	1136.95
April 1966	18	1270	0.12	1137.58
May 1966	18	1110	1.02	1137.85
June 1966	18	1200	0.79	1137.11
July 1966	18	1244	5.84	1136.57
August 1966	18	1244	5.84	1135.60
September 1966	18	700	4.46	1141.22
October 1966	18	770	—	1141.50

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
LABORATORY OF ORGANIC CHEMISTRY

Run	Time	Temp	Pressure	Yield
1	10:00	100°C	1.0 atm	100%
2	10:30	100°C	1.0 atm	100%
3	11:00	100°C	1.0 atm	100%
4	11:30	100°C	1.0 atm	100%
5	12:00	100°C	1.0 atm	100%
6	12:30	100°C	1.0 atm	100%
7	13:00	100°C	1.0 atm	100%
8	13:30	100°C	1.0 atm	100%
9	14:00	100°C	1.0 atm	100%
10	14:30	100°C	1.0 atm	100%
11	15:00	100°C	1.0 atm	100%
12	15:30	100°C	1.0 atm	100%
13	16:00	100°C	1.0 atm	100%
14	16:30	100°C	1.0 atm	100%
15	17:00	100°C	1.0 atm	100%
16	17:30	100°C	1.0 atm	100%
17	18:00	100°C	1.0 atm	100%
18	18:30	100°C	1.0 atm	100%
19	19:00	100°C	1.0 atm	100%
20	19:30	100°C	1.0 atm	100%
21	20:00	100°C	1.0 atm	100%
22	20:30	100°C	1.0 atm	100%
23	21:00	100°C	1.0 atm	100%
24	21:30	100°C	1.0 atm	100%
25	22:00	100°C	1.0 atm	100%
26	22:30	100°C	1.0 atm	100%
27	23:00	100°C	1.0 atm	100%
28	23:30	100°C	1.0 atm	100%
29	00:00	100°C	1.0 atm	100%
30	00:30	100°C	1.0 atm	100%
31	01:00	100°C	1.0 atm	100%
32	01:30	100°C	1.0 atm	100%
33	02:00	100°C	1.0 atm	100%
34	02:30	100°C	1.0 atm	100%
35	03:00	100°C	1.0 atm	100%
36	03:30	100°C	1.0 atm	100%
37	04:00	100°C	1.0 atm	100%
38	04:30	100°C	1.0 atm	100%
39	05:00	100°C	1.0 atm	100%
40	05:30	100°C	1.0 atm	100%
41	06:00	100°C	1.0 atm	100%
42	06:30	100°C	1.0 atm	100%
43	07:00	100°C	1.0 atm	100%
44	07:30	100°C	1.0 atm	100%
45	08:00	100°C	1.0 atm	100%
46	08:30	100°C	1.0 atm	100%
47	09:00	100°C	1.0 atm	100%
48	09:30	100°C	1.0 atm	100%
49	10:00	100°C	1.0 atm	100%
50	10:30	100°C	1.0 atm	100%
51	11:00	100°C	1.0 atm	100%
52	11:30	100°C	1.0 atm	100%
53	12:00	100°C	1.0 atm	100%
54	12:30	100°C	1.0 atm	100%
55	13:00	100°C	1.0 atm	100%
56	13:30	100°C	1.0 atm	100%
57	14:00	100°C	1.0 atm	100%
58	14:30	100°C	1.0 atm	100%
59	15:00	100°C	1.0 atm	100%
60	15:30	100°C	1.0 atm	100%
61	16:00	100°C	1.0 atm	100%
62	16:30	100°C	1.0 atm	100%
63	17:00	100°C	1.0 atm	100%
64	17:30	100°C	1.0 atm	100%
65	18:00	100°C	1.0 atm	100%
66	18:30	100°C	1.0 atm	100%
67	19:00	100°C	1.0 atm	100%
68	19:30	100°C	1.0 atm	100%
69	20:00	100°C	1.0 atm	100%
70	20:30	100°C	1.0 atm	100%
71	21:00	100°C	1.0 atm	100%
72	21:30	100°C	1.0 atm	100%
73	22:00	100°C	1.0 atm	100%
74	22:30	100°C	1.0 atm	100%
75	23:00	100°C	1.0 atm	100%
76	23:30	100°C	1.0 atm	100%
77	00:00	100°C	1.0 atm	100%
78	00:30	100°C	1.0 atm	100%
79	01:00	100°C	1.0 atm	100%
80	01:30	100°C	1.0 atm	100%
81	02:00	100°C	1.0 atm	100%
82	02:30	100°C	1.0 atm	100%
83	03:00	100°C	1.0 atm	100%
84	03:30	100°C	1.0 atm	100%
85	04:00	100°C	1.0 atm	100%
86	04:30	100°C	1.0 atm	100%
87	05:00	100°C	1.0 atm	100%
88	05:30	100°C	1.0 atm	100%
89	06:00	100°C	1.0 atm	100%
90	06:30	100°C	1.0 atm	100%
91	07:00	100°C	1.0 atm	100%
92	07:30	100°C	1.0 atm	100%
93	08:00	100°C	1.0 atm	100%
94	08:30	100°C	1.0 atm	100%
95	09:00	100°C	1.0 atm	100%
96	09:30	100°C	1.0 atm	100%
97	10:00	100°C	1.0 atm	100%
98	10:30	100°C	1.0 atm	100%
99	11:00	100°C	1.0 atm	100%
100	11:30	100°C	1.0 atm	100%

All data were recorded on a digital data logger. The temperature was maintained at 100°C ± 0.1°C. The pressure was maintained at 1.0 atm ± 0.01 atm. The yield was determined by gravimetric analysis.