

# CONCHO RIVER

STATE Texas  
PROJECT NO. F-5-R-1, Job B-7  
PERIOD June 22, 1953 - June 22, 1954

## Job Completion Report

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### TITLE

Inventory of species present in those portions of the North Concho River occurring within Tom Green, Coke, Sterling and Glasscock Counties, Texas.

### OBJECTIVES

To determine the distribution of species present, their relative abundance and the ecological factors influencing their distribution.

### PROCEDURE

Forty-six seining collections were made at fifteen locations on the North Concho watershed. In nearly all collections both 26 ft.  $\frac{1}{4}$ " bag seines and 15 ft.  $\frac{1}{4}$ " mesh common sense seines were used. To estimate relative abundance a count was made of all individuals taken in sixteen collections. Four collections were taken in each type stream habitat and the resulting data analyzed on a seasonal basis. In other collections data pertaining to species distribution only was recorded and in addition to the above equipment, 6 ft. and 4 ft. common sense seines and  $\frac{1}{8}$ " mesh fry seines were employed.

Ten gill net collections were made. Experimental nylon gill nets measuring 125 ft. long x 8 ft. in depth and made up in five, 25 ft. sections, were set at three stations. Mesh size for these nets increased progressively in each following section at one-half inch intervals beginning with one inch mesh and terminating with a 3" mesh section.

Two rotenone collections were made, one for the stream area previously treated in 1952 and one for the untreated stream area. Data pertaining to numerical and weight percentages was taken for each species recovered and the volume of water treated estimated.

In all collections most of the fish taken were identified and counted in the field. However, some individuals whose identity was questionable were preserved in 10% formalin and a sample of each species collected saved for laboratory study.

### FINDINGS

For reasons discussed in the completion report for Job A-2 and to illustrate the differences in population abundance and species distribution for stream areas previously treated with rotenone, as compared with untreated areas, all fishery data obtained is organized and presented in accordance with that arbitrary division in the watershed.

1. Stream Areas Treated with Rotenone in 1952. Primarily clear water and murky water associations described in report for Job A-2. On appended map stations 15 to 5, inclusive.

### Seining Collections

Estimate based on four seasonal collections. Stations 5, 7, 11, 13 and 15

Species	Number	% Total
Dorosoma cepedianum	211	10.3
Carpiodes carpio	21	1.0
Moxostoma congestum	4	.1
Cyprinus carpio	8	.3
Aplodinotus grunniens	8	.3
Pimephales vigilax	84	4.1
Gambusia affinis	154	7.6
Notropis lutrensis	571	28.4
Notropis venustus	262	13.1
Ictalurus punctatus	114	5.6
Micropterus salmoides	48	2.3
Lepomis megalotis	108	5.2
Lepomis cyanellus	143	7.1
Lepomis macrochirus	140	6.9
Lepomis auritus	22	1.0
Lepomis microlophus	51	2.5
Pomoxis annularis	89	4.4
Totals	2,038	100.2

## Netting Collections

Species	Number	% Total
Dorosoma cepedianum	82	30.2
Carpiodes carpio	61	22.4
Moxostoma congestum	11	4.1
Lepisosteus osseus	15	5.5
Cyprinus carpio	9	3.3
Aplodinotus grunniens	14	5.2
Pomoxis annularis	21	7.8
Ictalurus punctatus	38	14.0
Lepomis cyanellus	8	2.9
Lepomis auritus	4	1.5
Lepomis macrochirus	9	3.3
Totals	272	100.2

Totals for four seasonal collections, Station 7 and 10.

## Rotenone Collection

Pool treated approx.  $1\frac{1}{2}$  acre ft., approx. 200 yds. east of Station 12

Species	Number	Total		% by	% by
		Wt.	oz.	No.	Wt.
Dorosoma cepedianum	31	3	1	6.89	4.9
Carpiodes carpio	12	18	0	2.67	29.6
Aplodinotus grunniens	8	5	1	1.78	8.3
Micropterus salmoides	17	3	9	3.78	5.8
Ictalurus punctatus	12	6	15	2.67	11.5
Lepomis cyanellus	41	5	8	9.12	9.1
Lepomis megalotis	13	1	10	2.82	2.7
Lepomis auritus	6	1	2	1.33	1.9
Lepomis microlophus	11		9	2.45	.8
Lepomis macrochirus	38	2	7	8.45	4.1
Pomoxis annularis	21	11	4	4.67	18.5
Notropis and other small forage fish	240	61	14	53.40	100.9
Totals	450	60	14	100.03	100.1

Clear and murky associations of the previously treated area appear to be dominated numerically by sunfishes (62.29% of all game fish and 21.58% of all sampling totals), by species of the genus *Notropis* (primarily *N. lutrensis* and *N. venustus*, 30.70% of all collections) and to a lesser degree by Gizzard shad (*Dorosoma cepedianum*, 12.45% of all collections). Where shad appear to become more abundant in proportion to the number of small forage fishes, in the murkier reservoirs, river carp suckers (*Carpionodes carpio*) apparently increase progressively with this turbidity (29.6% of collections by weight). Accompanying these ratio changes, southern channel catfish (*Ictalurus punctatus*, 11.5% by weight) and white crappie (*Pomoxis annularis* 18.5% by weight) and white crappie (*Pomoxis annularis*, 18.5% by weight) increase in importance as predacious fishes. Blue gill sunfish (*Lepomis macrochirus*) and green sunfish (*Lepomis cyanellus*) are the most abundant of sunfishes. However, western longear sunfish (*Lepomis megalotis*) and yellowbelly sunfish (*Lepomis auritus*) are usually larger.

11. Stream areas untreated with rotenone in 1952, all of North Concho River, west of Cret Clark Ranch. (Map stations 1, 2, 3 and 4.) Turbid intermittent pool associations.

#### Seining Collections

Estimate based on four seasonal collections. Stations 1, 2, 3 and 4.

Species	Number	% Total
<i>Ictiobus bubalus</i>	21	.81
<i>Dorosoma cepedianum</i>	181	6.97
<i>Carpionodes carpio</i>	89	3.44
<i>Moxostoma congestum</i>	13	.52
<i>Cyprinus carpio</i>	12	.46
<i>Aplodinotus grunniens</i>	21	.81
<i>Pimephales vigilax</i>	101	3.90
<i>Notropis venustus</i>	332	12.95
<i>Notropis lutrensis</i>	401	15.39
<i>Notropis volucellus</i>	11	.42
<i>Notropis amabilis</i>	8	.31
<i>Hybognathus placitus</i>	14	.54
<i>Percina caprodes</i>	14	.54
<i>Notemigonus chrysoleucas</i>	60	2.32
<i>Amerius natalis</i>	321	12.35
<i>Amerius melas</i>	18	.70
<i>Chaenobryttus coronarius</i>	12	.46
<i>Lepomis cyanellus</i>	312	12.02
<i>Lepomis megalotis</i>	227	8.75
<i>Lepomis macrochirus</i>	187	7.20
<i>Lepomis punctatus</i>	42	1.62
<i>Lepomis microlophus</i>	62	2.40
<i>Lepomis humilis</i>	37	1.43
<i>Micropterus salmoides</i>	11	.43
<i>Pomoxis annularis</i>	77	2.79
<i>Ictalurus punctatus</i>	4	.15
Totals	2,594	100.67

#### Netting Collections

Estimates based on four seasonal collections. All netting collections from Station 2, because only pool in untreated area suitable for setting gill nets.

4.

Species	Number	% Total
<i>Dorosoma cepedianum</i>	47	21.6
<i>Carpiodes carpio</i>	38	17.4
<i>Moxostoma congestum</i>	10	3.2
<i>Lepisosteus osseus</i>	11	5.1
<i>Ictiobus bubalus</i>	4	1.9
<i>Aplodinotus grunniens</i>	13	5.9
<i>Ictiobus niger</i>	2	.9
<i>Pilodictus olivaris</i>	1	.5
<i>Amerius natalis</i>	47	21.6
<i>Ictalurus punctatus</i>	9	4.9
<i>Pomoxis annularis</i>	2	1.0
<i>Lepomis cyanellus</i>	8	3.7
<i>Lepomis auritus</i>	8	3.7
<i>Lepomis macrochirus</i>	13	5.9
<i>Lepomis punctatus</i>	4	1.9
<i>Chaenobryttus coronarius</i>	3	1.7
Totals	217	100.1

## Rotenone Collection

Station 4. Area treated approx. 3 acre ft.

Species	Number	Total		% by No.	% by Wt.
		Wt.	lbs. oz.		
<i>Dorosoma cepedianum</i>	38	4	0	6.8	5.7
<i>Carpiodes carpio</i>	21	7	9	3.8	10.7
<i>Moxostoma congestum</i>	8	2	0	1.4	2.9
<i>Ictiobus bubalus</i>	8	14	2	1.4	20.3
<i>Cyprinus carpio</i>	8	18	4	1.4	26.6
<i>Aplodinotus grunniens</i>	14	3	5	2.5	4.7
<i>Lepisosteus osseus</i>	4	6	9	.7	9.4
<i>Ameiurus natalis</i>	13	1	5	2.3	1.8
<i>Ameiurus melas</i>	7		11	1.2	1.0
<i>Ictalurus punctatus</i>	4		14	.7	1.3
<i>Pilodictus olivaris</i>	1	1	2	.2	1.6
<i>Micropterus salmoides</i>	5	2	2	.9	3.0
<i>Micropterus punctulatus</i>	2		14	.4	1.3
<i>Lepomis cyanellus</i>	12	1	0	2.1	1.4
<i>Lepomis megalotis</i>	12		13	2.1	1.1
<i>Lepomis humilis</i>	4		3	.7	.3
<i>Lepomis macrochirus</i>	31	1	10	5.5	2.3
<i>Lepomis microlophus</i>	7		15	1.2	1.3
<i>Lepomis auritus</i>	2		5	.4	.4
Pimephales, Notropis and other small forage fishes	362	2	1	64.3	3.0
Totals	563	69	12	99.9	100.1

The turbid intermittent pool associations found in the untreated portions of the upper watershed are apparently dominated by river carp suckers (*Carpiodes carpio*), German carp (*Cyprinus carpio*), smallmouth buffalo (*Ictiobus bubalus* and *I. niger*) and by bullheads (*Ameiurus natalis* and *A. niger*.) Gizzard shad and game species are less abundant than in treated areas and lack of condition in bass (*Micropterus salmoides* and *M. punctulatus*) was evident. In some pools stunted sunfish populations were observed. A greater number of species were found in turbid waters and log perch (*Percina caprodes*), Texas shiners (*Notropis amabilis*) and mimic shiners (*Notropis voluella*) were found in the untreated areas only.

## SUMMARY

1. Field work for this job was done in conjunction with Job A-2. (Basic Survey of the North Concho River.
2. Forty-seven seining collections were made at fifteen stations, ten gill net collections were made. Experimental gill nets were used.
3. Two areas were rotenoned and a record made of the number and total weight of each species taken.
4. Thirty-two species were taken by all methods of collection from the watershed.
5. In 1952 all areas of stream below Cret Clark Ranch Stations 15 to 5, inclusive, were treated with rotenone. Species distribution and population ratios differ between this area and untreated pools.
6. The treated portion of the watershed is a series of reservoirs and pools and is clear water and murky water association. Clear water communities are dominated by sunfishes and shiners and to a lesser extent by gizzard shad. Murky associations are dominated by river carp suckers and gizzard shad. However, southern channel catfish and white crappie become the most important predacious species in this environment.
7. Stream areas untreated with rotenone in 1952 are turbid intermittent pool associations. Although a greater number of species are found in this association, untreated portions of the upper watershed are apparently dominated by river carp suckers, German carp, smallmouth buffalo and by bullheads. Game species are less abundant than in treated areas. Largemouth black bass were in poor condition and some pools had stunted sunfish populations.

Checklist of Species of Fish from North Concho River, July 22, 1953  
to June 30, 1954

Common Name	Scientific Name
1. Longnose gar	Lepisosteus osseus
2. Gizzard shad	Dorosoma cepedianum
3. Smallmouth buffalo	Ictiobus bubalus
4. Black buffalo	Ictiobus niger
5. River carpsucker	Carpionodes carpio
6. Gray redhorse sucker	Moxostoma congestum
7. German carp	Cyprinus carpio
8. Golden shiner	Notemigonus crysoleucas
9. Blacktail shiner	Notropis venustus
10. Red shiner	Notropis lutrensis
11. Texas shiner	Notropis amabilis
12. Mimic shiner	Notropis volucellus
13. Plains minnow	Hybognathus placitus
14. Parrot minnow	Pimephales vigilax
15. Southern channel catfish	Ictalurus punctatus
16. Black bullhead	Ameiurus melas
17. Yellow bullhead	Ameiurus natalis
18. Flathead catfish	Pilodictus olivaris
19. Common mosquitofish	Gambusia affinis
20. Spotted black bass	Micropterus punctulatus
21. Largemouth black bass	Micropterus salmoides
22. Warmouth bass	Chaenobryttus coronarius
23. Green sunfish	Lepomis cyanellus
24. Spotted sunfish	Lepomis punctatus
25. Redear sunfish	Lepomis microlophus
26. Bluegill	Lepomis macrochirus
27. Orangespotted sunfish	Lepomis humilis
28. Yellowbelly sunfish	Lepomis auitus
29. Western longear sunfish	Lepomis megalotis
30. White crappie	Pomoxis annularis
31. Logperch	Percina caprodes
32. Freshwater drum	Aplodinotus grunniens

Hybrids

Lepomis macrochirus x L. punctatus

Lepomis humilis x L. cyanellus

