TEXAS
PARKS AND WILDLIFE DEPARTMENT
OFFICE MEMORANDUM
2 4 Oct. 70

TO: Jim Vynalek

FROM: Bob Bounds

SUBJECT: Trout Report

Please excuse my lack of promptness at getting this report to you, but. The trout didn't get in until late Thursday and I had to attend a meeting in Austin on Friday. I hope the report will be of use to you and TU. If I can be of any help to you or TU in the future please don't hesitate to call.

Bob

Deal with only one subject in each letter — WRITE —
Do not telegraph or telephone except in emergency.

PW   5

JOB PROGRESS REPORT

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-2-R-17

REGION 2-B FISHERIES STUDIES

Job No. E-9: Evaluation of Catchable Rainbow Trout Fishery

Project Leader: Richard L. White

J. R. Singleton
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Marion Toole
D-J Coordinator

Eugene A. Walker
Director, Wildlife Services

July 23, 1970

Abstract

A total of 9,000 rainbow trout was stocked in the tailrace waters of Canyon Reservoir, Comal County, Texas, in the spring of 1969. Approximately 10% of the fish were dead or dying when taken from the delivery truck. Creel census revealed an angler harvest of 43.4 percent of the rainbow trout.

Water quality studies indicated the continuance of the area as a suitable trout habitat.

State of_____Texas_____

Project No.___F-2-R-17____   Name: Region 2-B Fisheries Studies_____

Job No._____E-9_____   Title: Evaluation of Catchable Trout Fishery

Period Covered:_____February 1, 1969 to January 31, 1970_____

Background:

   Background information on this project may be found in Job Progress Report
E-9, Project No. F-2-R-15, Evaluation of Catchable Rainbow Trout Fishery, 1968,
and Job Progress Report E-9, Project No. F-2-R-16, Evaluation of Catchable Trout
Fishery, 1969.

Objectives:

   1. To determine the percent of return of stocked fish.

   2. To determine the length of time a plant of trout contributes to the
       fishery.

   3. To determine the average catch per man hour of fishing.

   4. To determine the average catch per fishing trip.

   5. To determine the average length of time per fishing trip.

   6. To determine through monthly water quality studies the continuance of
       Canyon Dam Tailwaters to provide suitable trout habitat.

Segment Objectives: From Job Description

Procedures:

   On February 17, 1969, Project F-2-R personnel traveled to the U. S. Fish and
Wildlife Service Hatchery at Mescalero, New Mexico and fin-clipped 9,000 rainbow
trout to be delivered to the Canyon Lake Tailrace. The left pectoral fin was re-
moved, and the fish were incubated approximately three weeks on the hatchery to
note any mortality or ill effects which might result from the excision. On March 7,
1970, the trout were delivered to and stocked in the tailrace waters of Canyon Lake.

   Creel census operations were begun immediately and each drop site was checked
every two hours from dawn til dusk. A more detailed description of the creel
census method can be found in Job Progress Report E-9, F-2-R-16 and 17. The week-
day census was discontinued after the first two days, as the manpower was needed
on other jobs of the project. The week-end census was continued as in years past.

   Water quality studies were periodically run on the tailrace in order to
determine the continuing suitability of water for trout. Dissolved oxygen, carbon
dioxide, akalinity, and temperature were recorded.

Findings:

Creel census procedures and compilations used in this report are described in Job E-9, F-2-R-15, Evaluation of Catchable Rainbow Trout Fishery.

The total harvest estimate was obtained by the regression method described by Leslie and Davis (1939) which is based on the principle that population size can be estimated from the day to day decline in catch per unit of effort as the population size decreases. In the application of this method, daily catch per man hour (Y axis) has been plotted against cumulative catch (X axis) of marked fish.

A number of the fish appeared to be in distress while still in the U. S. Fish and Wildlife Service delivery truck, and soon after stocking, many trout floated dead up near the bank. Project personnel began collecting the dead trout so that an approximate mortality figure could be determined. The majority of the dead fish were at the initial dropsite, and this would be expected since the distressed or dead fish would be near the top of the tank and more easily dip netted. The number of dead fish at each site thereafter was correspondingly less. It was determined that approximately 10% or 1,000 trout were lost, but no definite cause of death was determined. However, it was thought that a malfunction in the aerating system could have resulted in a lack of sufficient oxygen to support the large number of trout being transported.

The projected catch on week-ends was calculated to be 2,471 fish. Data and compilations for this projection are given in Tables 1, 1a, and Graph 1.

Because the catch on week-days had remained at about 1,000 fish for the past two years, it was decided to curtail the week-day creel census operations and use this figure. This procedure enabled project manpower to be utilized on other facets of F-2-R.

The sum of these two projections, 3,471 fish reveals an angler harvest of 43.4 percent of the 8,000* fish stocked in March, 1970.

These trout contributed to the fishery approximately seven months. Although the creel census was run for only two months, spot checks revealed anglers harvesting trout as late as October.

The average catch per man hour on week-ends during the census period was 0.70 fish. The catch per man hour decreased steadily over the next few months.

During the census period, week-end fishermen spent an average of 3 hours per trip and harvested 2.6 fish per trip.

Water quality studies continued to reveal suitable conditions for rainbow trout in the fishery. Temperature and dissolved oxygen readings were well within the desired range throughout the segment.

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* Corrected figure based on mortality estimates

Table 1

Weekend Trout Creel Census Summary

| | Seen on Census | | | | Expanded from Use Counts | | |
| | | Catch | | | | | |
Date	Hours Fished	Total Trout	Catch Per Angler Hour	Use Hours	Total Angler Hours	Total Daily Catch	Mean Daily Cumulative Catch
March 8	786	201	1.08	86	272	294	147
March 9	191	250	1.31	123	313	398	493
March 15	105	159	1.51	130	235	355	870
March 16	119	123	1.03	73	192	198	1146
March 22	142	155	1.09	99	241	263	1377
March 23	73	48	0.66	33	106	70	1543
March 29	81	43	0.53	74	155	82	1619
March 30	121	70	0.58	64	185	107	1714
April 12*							
April 13	104	21	0.20	54	156	31	1783
April 19	53	20	0.33	24	77	25	1810
April 20	27	11	0.41	29	56	23	1835
April 26	54	14	0.28	59	113	32	1862
April 27	34	4	0.12	16	50	6	1881
Totals	1,890	1,119		864			

* Data collected on this day was deleted in the compilations because a severe rainstorm prevented fishing for all but about the last hour of daylight.

Table 1a

Mean Daily Cumulative Catch	X^2	Catch Per Hour = Y	XY
147	21,609	1.08	158.76
493	243,049	1.31	645.83
870	756,900	1.51	1,313.70
1,146	1,313,316	1.03	1,180.38
1,377	1,896,129	1.09	1,500.93
1,543	2,380,849	0.66	1,018.38
1,619	2,621,161	0.53	858.07
1,714	2,937,796	0.58	994.12
1,783	3,179,089	0.20	356.60
1,810	3,276,100	0.33	597.30
1,835	3,367,225	0.41	752.35
1,862	3,467,044	0.28	521.36
1,881	3,538,161	0.12	225.72

$\Sigma X = 18,080$ $\Sigma X^2 = 28,998,428$ $\Sigma Y = 9.13$ $\Sigma XY = 10,123.50$

$(\Sigma X)^2 = (18,080)^2 = 326,886,400$ $N = 13$

$(\Sigma X)(\Sigma Y) = (18,080)(9.13) = 165,070.40$

$$\text{Slope of line} = b = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\Sigma X^2 - \frac{(\Sigma X)^2}{N}} = \frac{10,123.50 - \frac{165,070.4}{13}}{28,998,428 - \frac{326,886,400}{13}}$$

$$= \frac{10,123.50 - 12,620.8}{28,998,428 - 25,145,108}$$

$$= \frac{-2,497.30}{3,853,320}$$

$$b = -0.000648090$$

In the formula Y= a + bX, we now have b and can find a by substituting the average values for X and Y in the formula.

$$\bar{X} = \frac{\Sigma X}{N} = \frac{18,080}{13} = 1390.77 \qquad \bar{Y} = \frac{\Sigma Y}{N} = \frac{9.13}{13} = 0.70$$

$$\bar{Y} = a + bX \text{ or } 9.70 = a + (-0.00064809)(1390.77)$$

$$\text{or } 0.70 = a + (-.9013441293)$$

$$\text{or } a = 1.60134$$

Table 1a (continued)

The equation of the line is: $Y = (1.60664) + (-0.006628909) (X)$.

If we set Y (catch per hour) = 0 (which it theoretically will become only when no more fish are to be caught), then:

$$0 = (1.60134) + (-0.00064809) (X) \text{ then,}$$

$$X = \frac{1.60134}{0.00064809} = 2,471$$

or X = 2,471 = estimated eventual return of marked fish on weekends.
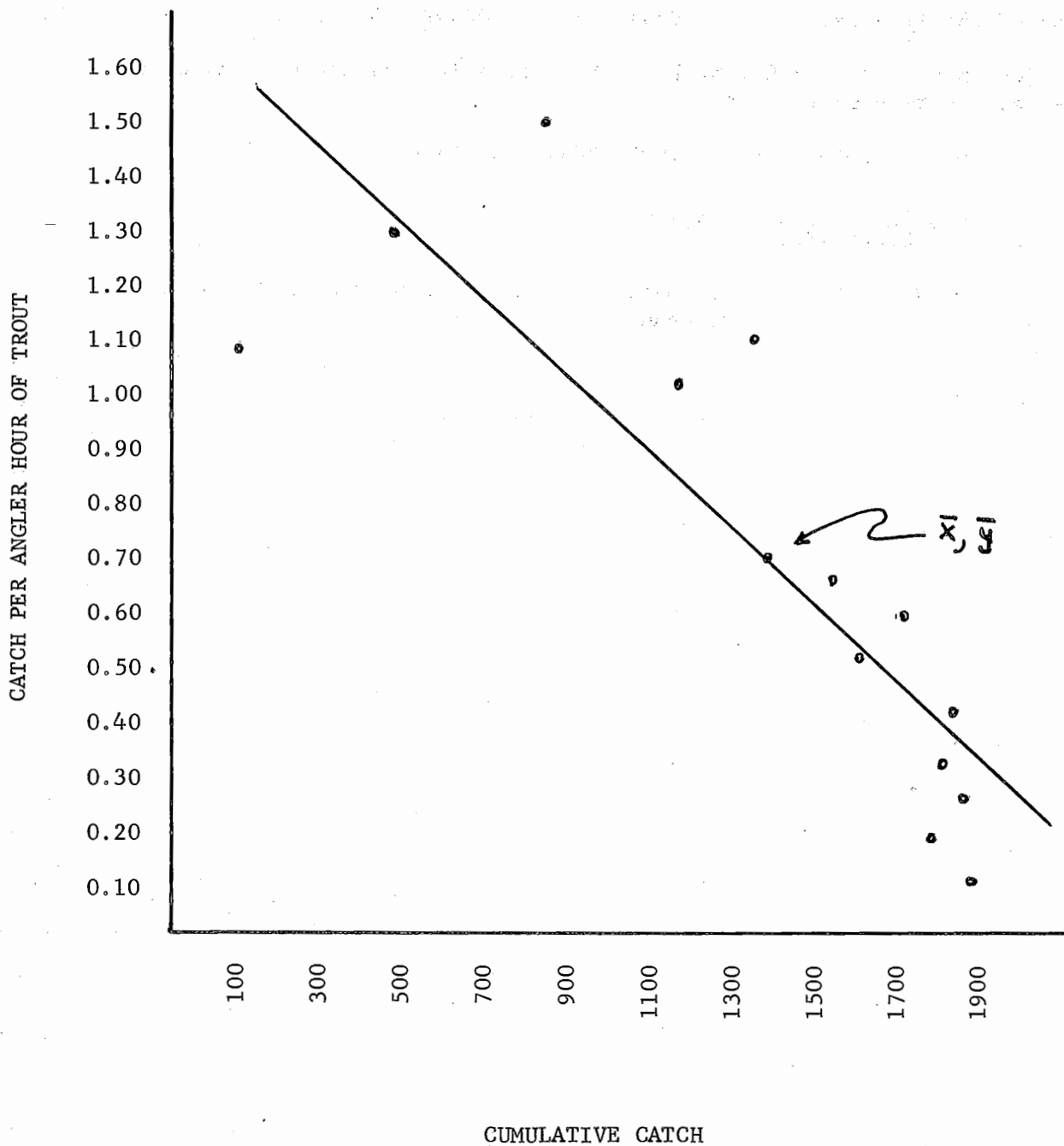
Graph 1

WEEKEND PROJECTED CATCH

Fig. Regression line if catch per hour plotted against cumulative catch.

Discussion:

    The total harvest of trout by fishermen in 1969 represented an 8 percent increase over the 1968 harvest. Sporadic thunderstorms together with large releases of water from the dam inhibited the fishermen somewhat, or the percent harvest would have been even greater.

    Stocking of the fish only in prime access areas undoubtedly contributed to the increase in harvest in 1969 as opposed to 1968. The success of the program has stimulated some landowners into discussing the possibility of opening "fee fishing" areas on their property, and this would significantly benefit the fishery.

    Continued electrofishing sampling by project personnel has revealed the trout to be in excellent condition. No disease or die-offs were noted in the trout population.

Recommendations:

    Because of the success of the program to date, it is recommended that this job be continued for another segment.

Prepared by:____Richard L. White_____   Approved by: _Marion Poole_
                Project Leader   Coordinator

Date:_____July 23, 1970_____   _____RICHARD L. WHITE_____
                                              Inland Fisheries Supervisor

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