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Jim Vynalek
HC 67, Box 8C
Pleasanton, TX 78064

Dear Jim:

Attached are the statewide results for this years trout angler survey. Thanks again for helping make this program a success. I have also included the approved research proposal for the Canyon Lake tailrace. Unfortunately we have been unable to start the project due to the unusually high water. We'll try to get started this fall. The results should prove to be interesting.

Sincerely,

Steve
Steve Magnelia

RESEARCH PROPOSAL

Oversummer Survival of Rainbow and Brown Trout in the
Canyon Reservoir Tailrace, Comal County, Texas

Prepared by: Stephan J. Magnelia
Michael E. Costello Date: 05/19/92

Approved by: Phil Durocher
Philip P. Durocher Date: 6/11/92
Chief, Inland Fisheries

Project Title: Oversummer Survival of Rainbow and Brown Trout in
the Canyon Reservoir Tailrace, Comal County, Texas

Objectives: 1) Document and quantify oversummer survival of stocked rainbow and brown trout in the Canyon Reservoir tailrace; 2) develop baseline age and growth and length frequency data on the Canyon Reservoir tailrace trout population.

Status:

The Texas Parks and Wildlife Department (TPWD) has annually stocked rainbow trout (Oncorhynchus mykiss) in Texas public waters since 1966. Stockings normally provide a winter put-and-take fishery only, as summer water temperatures exceed the tolerance of trout. However, trout stocked in reservoir tailraces having cold hypolimnetic discharges may oversummer, providing more than a simple put-and-take trout fishery.

Water quality is suitable for trout survival in the Canyon Reservoir tailrace for a distance of 16 river km below the stilling basin of the dam (White 1968). Water temperature in this stretch normally remains under the lethal limit (25 C) for rainbow and brown trout (Piper et al. 1982) during all times of the year. However, during extended periods of low water release

(approximately 50 cubic feet/second) and high ambient temperatures water temperatures would be suitable for a distance of only 11 km (White 1968).

Rainbow trout were first stocked in the Canyon Reservoir tailrace in 1966 (White 1969). TPWD has annually stocked the tailrace with rainbow trout (200-254 mm TL) since 1980. Additionally, intermittent stockings of brown (Salmo trutta) and brook trout (Salvelinus fontinalis) were made by TPWD throughout the 1970's and 1980's. Trout Unlimited has also periodically stocked adult rainbow and brown trout, and rainbow, brown, brook, and golden trout (O. aquabonita) fry since 1972. Through stocking a put-and-take trout fishery has been developed. Although successful, evidence of oversummer survival has stimulated interest in the development of a put-grow-take trout fishery.

Oversummer survival of stocked rainbow trout in the Canyon Reservoir tailrace was first documented by TPWD in 1966 (White 1968). Evidence of oversummer survival during the interim has come from angler catches of trout 350-600 mm TL. These included a 3.4-kg brown trout and a 2.8-kg rainbow trout (both state records). Because the majority of stocked trout are 200-254 mm TL, catches of fish larger than 350 mm TL suggests post-stocking survival and growth has occurred. However, the extent of survival and growth is unknown. If adequate numbers of trout can avoid initial post-stocking harvest and survive through the summer, a more diverse

It is felt that

fishery might be developed through changes in management strategy. This might include restrictive angling regulations (Nehring 1987) on part of the tailrace or stocking of specialized trout strains (Sonski 1983, 1984; Fay and Pardue 1986).

Pulsed-DC electrofishing is used extensively to sample stream trout populations. However, recent studies indicate that pulsed-DC current may cause serious spinal injuries in large (^{over 14"}>381mm) rainbow trout (Reynolds and Kolz 1988; Sharber and Carothers 1988; Holmes et. al 1990). New electrofishing technology may minimize these injuries (N.G. Sharber, Coffelt Corporation, personal communication). However, this technology has not been extensively tested and may induce equally serious hemorrhage injuries (J.B. Reynolds, Alaska Cooperative Fisheries Unit, personal communication). The consequences of hemorrhage or spinal injuries to trout are unknown. Continuous-DC electrofishing has been used without any deleterious effects to trout (J.B. Reynolds, Alaska Cooperative Fisheries Unit, personal communication).

mm =
.03937 in

Justification:

Recent literature describing the Canyon Reservoir tailrace trout population and associated fishery is unavailable. Electrofishing surveys have not been conducted since 1973 (Butler 1973). While oversummer survival (White 1969) and growth (White 1969, Butler

1973) of trout in the tailrace have been documented, quantitative estimates of oversummer survival and recent estimates of growth are unavailable. This information would aid in further developing the trout fishery. If growth and survival are adequate a trophy trout fishery might be developed on a section of the tailrace through the use of a restrictive length limit.

Procedures:

- 1) The study area is defined as the section of the Canyon Reservoir tailrace where water temperatures are most suitable for trout survival during periods of low water discharge and high ambient temperatures. At 50 CFS White (1968) predicted this to be an 11 km stretch of the tailrace downstream from the stilling basin of the Canyon Dam. The study area will be broken into 10 1.1 km blocks, with four permanent 15 minute electrofishing stations within each block to facilitate statistical analysis.
- 2) Each block will be sampled during daylight hours in June and October. The June survey will be used as "before" data and the October survey as "after" data.

- 3) Each block will be sampled with two standardized electrofishing boats equipped with bow-mounted electrodes and Coffelt Model VVP-15 pulsators producing continuous-DC current. Sampling will proceed in a downstream direction, each boat working half the river and shocking continuously. Stunned fish will be netted and immediately placed in an aerated livewell. Trout will be; identified to species, anesthetized, measured (TL-mm), weighed (g), tagged with an individually coded visible implant tag (Haw et al. 1990), allowed to recover in an aerated livewell and then released near the midpoint of the station from which they were captured. The block and electrofishing station from which each trout was captured will be recorded. Otoliths and scales will be removed from a stratified sub-sample of trout in the October sample. Water temperature will be recorded in each block.

- 4) Electrofishing CPUE data will be used as a measure of population abundance. Abundance estimates obtained from June and October samples will be compared using a two-way analysis of variance (ANOVA) on transformed data or a Kruskal-Wallis analysis. Longitudinal differences in CPUE between blocks within samples and temporal differences between samples will be tested. Re-captures of tagged trout will be used for movement information. Fish collected during the October sample will be assumed

to have oversummered.

- 5) Growth will be estimated from scales/otoliths using methods described by Gutreuter (1987). Re-captures of individually tagged fish will also provide growth information. Mean length and weight of fish will be compared between samples using statistical methods similar to those described in (4).
- 6) Prepare a final report.

Schedule:

<u>Year</u>	<u>Procedure</u>	<u>Man-days</u>
1992	1,2,3,4,5	25
1993	2,3,4,5	20
1994	6	20

Geographic location:

Fisheries Management Field Offices , San Marcos and Mathis,
TX
Canyon Reservoir Tailrace, Comal Co., TX

Related Federal Aid Projects:

F-30-R

Cooperators:

None

Personnel:

Stephan Magnelia, Michael Costello and David Terre, Principal
Investigators
District II-C and I-E Management Staff

Literature Cited:

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RAINBOW TROUT UTILIZATION REPORT 1991-92

Year	Name	District	State Park	Location Size(Acr)	≤16 Mean	17-64 Mean	≥65 Mean	Total Anglers	Mean Angler	Total Spectators	Mean Spectator	Total Stocked	Mean Stock	Times Surveyed	Notes											
09	NOLAN CREEK	2B	N	1	12.0	35.0	6.0	106	53.0	34	17.0	3418	1709.0	2	*											
02	OAK STREET	1C	N	10	10.0	24.0	14.0	48	48.0	4	4.0	1993	1993.0	1												
09	PEDERNALES RIVER	3C	Y	0	0.0	8.0	5.0	13	13.0	8	8.0	2000	2000.0	1	*											
36	PICKENS	2A	N	30	7.0	28.0	8.0	43	43.0	42	42.0	700	700.0	1												
39	POSSUM KINGDOM TAILRACE	2F	N	1	19.0	152.0	9.0	180	180.0	11	11.0	2500	2500.0	1	*											
39	PURTIS CREEK (E)	3C	Y	3	10.0	27.0	29.0	66	66.0	3	3.0	2003	2003.0	1	*											
40	PURTIS CREEK (F)	3C	Y	2	9.0	38.0	13.0	60	60.0	6	6.0	2002	2002.0	1	*											
21	RIBBLE PARK	1A	N	3	1.0	13.0	11.0	25	25.0	0	0.0	915	915.0	1	*											
33	RUSK STATE PARK	3C	Y	20	44.0	51.0	85.0	180	180.0	34	34.0	2724	2724.0	1	*											
14	SALADO CREEK	2B	N	0	9.0	19.5	20.5	98	49.0	24	12.0	3937	1968.5	2												
21	SAN ANTONIO RIVER	1D	N	0	47.0	98.0	29.0	174	174.0	47	47.0	3014	3014.0	1												
97	SOFTBALL COMPLEX LAKE	2F	N	5	33.0	95.3	38.3	500	166.7	53	17.7	4885	1628.3	3	*											
86	SPRING LAKE PARK	3A	N	1	14.5	41.0	18.0	147	73.5	66	33.0	2733	1366.5	2	*											
87	SPRINGFIELD	2E	N	5	10.0	8.0	8.0	26	26.0	6	6.0	2733	2733.0	1	*											
04	SULPHUR SPRINGS CITY PARK	3B	N	5	123.0	35.0	8.0	166	166.0	55	55.0	1796	1796.0	1	*											
16	TAYLOR CITY #4	2C	N	3	9.0	18.0	6.0	33	33.0	13	13.0	2025	2025.0	1	*											
18	TEAGUE PARK	3A	N	2	3.0	25.0	6.0	34	34.0	17	17.0	1788	1788.0	1	*											
28	THEO	1A	N	70	6.5	17.5	34.5	117	58.5	16	8.0	4307	2153.5	2	*											
33	TOWNE LAKE	2A	N	10	32.0	35.0	19.0	86	86.0	48	48.0	2347	2347.0	1	*											
52	TYLER STATE PARK	3C	Y	65	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT											
STATEWIDE 1991-92														16	18.0	16.9	51.5	20.2	8510	88.6	1451	15.1	183600	1912.5	96	38

* Legend ***

*** Either the surveys were not done or less than 3 days were done
 There was a note of some kind about this site. (See the Data Sheet for that location)

Note: All data based only on surveyed stockings and does not necessarily reflect actual stocking data.

Name: CANYON TAILRACE ✓
 District: 2C
 State Park: N
 Size (Acres): 120
 Water Body Code: 144

Stocking Day Data

Date	Angler Age Groups			#Anglers	#Spectators	#Stocked	Notes
	≤16	17-64	≥65				
12- 5-91	0	57	14	71	2	5002	
Totals	0	57	14	71	2	5002	
Means	0.0	57.0	14.0	71.0	2.0	5002.0	

Weekday Data

Date	Angler Age Groups			#Anglers	#Spectators
	≤16	17-64	≥65		
12- 6-91	4	65	19	88	7
Totals	4	65	19	88	7
Means	4.0	65.0	19.0	88.0	7.0

Weekend Data

Date	Angler Age Groups			#Anglers	#Spectators
	≤16	17-64	≥65		
12- 7-92	31	130	3	164	2
Totals	31	130	3	164	2
Means	31.0	130.0	3.0	164.0	2.0

Grand Totals	35	252	36	323	11
Grand Means	35.0	252.0	36.0	323.0	11.0

*** Legend ***

SD-Stocking Day, WD-Weekday, WF-Weekend
 WT-Wrong Time, WTS-Wrong Times (multiple days), NTG-No Time Given
 ANAP-As Near As Possible
 OMIT-Either the surveys were not done or less than 3 days were done