

FILE

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-5-R-10

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION I-B

Job No. F-1 Experimental Stocking of Marine Fish Species
in Saline Waters of Western Texas

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ABSTRACT

Evidence obtained is insufficient and inconclusive. Data obtained indicates that at least two species of marine fish introduced into inland waters continue to survive and exhibit remarkable growth. Fish recaptured from Imperial Reservoir suggest that red drum have grown from the 7 pound class in their third year to the 15 pound class in their fourth year. Post-mortem examination of two of these fish indicated gonadal development was normal. Data from flounders recovered from the same waters implies growth from 4 pounds to nearly 7 pounds within the past year. In Red Bluff Reservoir red drum apparently grew from about 2 pounds, at ages of approximately one year, to over 7 pounds within the second year of growth. Data confirming reproduction has not been obtained; however, natural reproduction may not be absolutely essential to the success of the program. Sportsmen have reported many catches of red drum from both reservoirs, and it is doubtful if adequate breeding potential continues to exist. Failure to secure any fish for releases during the 1962 period makes the procurement of additional fish for release a critical factor in determining the practicality of continuing this effort. At least four additional marine species may be potentially adaptable to inland waters or at least warrant further investigation.

JOB COMPLETION REPORT

State of Texas

Project No. F-5-R-10

Name: Fisheries Investigations and Surveys of the Waters of Region 1-B

Job No. F-1

Title: Experimental Stocking of Marine Fish Species in Saline Waters of Western Texas

Period Covered March 1, 1962 - February 28, 1963

Objectives:

To experimentally introduce desirable marine game fish species into saline waters of western Texas.

Techniques Used:

1. Contact was maintained with personnel of the Coastal Fisheries Division in an attempt to determine the time when an abundant supply of fingerling sized fish would be concentrated in shore waters. It was proposed to collect the required supply of juvenile fish with drag seines. The fish would then immediately be transported to previously selected sites for their release. Misfortune, in adverse and unpredictable weather conditions, prevented an accurate prediction of when the fish would be concentrated near the beaches and thus available for capture. The single field trip to the coast met with failure.
2. Attempts to secure striped bass (Roccus saxatilis) were equally unsuccessful.
3. Five periodic field trips were made to Imperial Reservoir, and three field trips were made to Red Bluff Reservoir. Sixty-four gill nets were set in Imperial Reservoir and 21 seining efforts were made. Twenty-five gill nets were set in Red Bluff Reservoir and seining was attempted at six locations.
4. A more detailed study of salinity and biological conditions was planned, but the loss of the assistant project leader and subsequent failure to secure a replacement until the last two months of the segment prevented completion of that work.

Marine species of fish totalling 1,723 individuals have been introduced into saline waters in western Texas. Except for a few yearling fish introduced into the Pecos River (Figure 1), fingerling size fish were used. Most of these smaller fish were released in Red Bluff Reservoir and Imperial Reservoir. Red drum (Sciaenops ocellatus), atlantic croaker (Micropogon undulatus), spotted seatrout (Cynoscion nebulosus) and southern flounder (Paralichthys lethostigmus) were the species introduced. Previous reconnaissance data has indicated survival of four species in undetermined quantity and has also established exceptionally high rate of growth for all fishes recaptured. Additional details of previous findings are in the completion report for Job F-1, Project F-5-R-9.

Distribution of Species Introduced into Red Bluff Reservoir,
Imperial Reservoir and the Pecos River

Date	Species	Number	Average Size (inches)	Arrival Condition
Red Bluff Reservoir				
4-10-61	Red drum	50	2.7	Poor
	Seatrout	30	3.8	Poor
	Flounder	25	3.3	Poor
4-12-61	Red drum	183	3.0	Good
	Seatrout	24	4.9	Fair
	Flounder	14	3.3	Good
	Croakers	470	3.5	Good
Imperial Reservoir				
4-15-60	Red drum	246	3.0	Good
	Seatrout	50	4.9	Poor
	Flounder	75	3.8	Good
	Croakers	500	3.8	Fair
Pecos River				
9-18-59	Red drum	50	12.0	Fair

Results:

The number of fish recaptured per netting effort dropped significantly during the period. However, survival of two species, red drum (Sciaenops ocellata) and southern flounder (Paralichthys lethostigma), was confirmed in the sampling effort that followed the most severe winter ever recorded for the concerned area.

Recaptures for Marine Fish Introduced into Western Reservoirs

Imperial Reservoir					
Species	No.	Tenure (Months)	Avg. Length (Inches)	Avg. Weight (Pounds)	Average K Factor
Red drum	2	5	15.0	1.15	1.22
Red drum	1	12	17.0	1.90	1.43
Red drum	4	14	20.0	3.20	1.37
Red drum	19	18	26.0	6.75	1.94
Red drum	1	24	21.25	6.00	1.72
Red drum	1	32	27.36	12.25	1.65
Red drum *	2	34	29.00	17.00	-
Flounder	1	18	18.00	4.20	2.38
Flounder	1	25	19.88	7.50	2.61
Flounder	1	34	19.00	6.50	2.57
Croakers	1	5	7.00	.30	2.07
Croakers	2	18	8.4	.75	2.36

Red Bluff Reservoir

Species	No.	Tenure (Months)	Avg. Length (Inches)	Avg. Weight (Pounds)	Average K Factor
Red drum	3	5	16.90	1.95	1.60
Red drum	1	12	17.00	3.50	1.96
Red drum	1	20	22.54	7.26	1.75

* These fish were not taken in gill nets, but were found dead on the shores of Imperial reservoir. Mutilation and desiccation prevented obtaining accurate length-weight data. Weights are best available estimate.

Discussion:

Relatively few final conclusions are possible from the evidence available. Probably, of the four marine species introduced, only red drum and flounder have survived in significant numbers. Since atlantic croakers have not been recaptured in the past 14 months, this species is considered unsuited for the primary purpose of their introduction, that of providing a game fishery. Spotted seatrout have not been recovered and their survival is doubted. Positive evidence of reproduction by any of the species introduced is lacking. However, post-mortem examination of two red drum indicated that gonadal development was apparently normal. One of these fish may have spawned or otherwise discharged eggs. Data obtained proves that red drum have survived and exhibited remarkable growth, and that this species has probably grown more rapidly in Red Bluff Reservoir than in the smaller lake at Imperial. Of 1,723 fish released 4.13 per cent have been recaptured.

Over 12.19 per cent of the 246 red drum released in Imperial reservoir have been recovered, and 4 per cent of the flounder have been recaptured. In addition to fish recovered by project personnel, a significant number of red drum have been taken by sportsmen. At least four of the catches reported during the past five months are probably authentic. In these instances records of the length and weight of fish caught were available and this information is relatively consistent with data taken from fish captured in gill nets. Sportsmen probably would not have an accurate enough concept of this relationship to fabricate such evidence. If 25 per cent of reported catches are assumed to be authentic, and the natural propensity of fish populations within a specific age group to decrease is considered, probably few red drum remain of original releases. It may even be doubtful if adequate breeding potential has existed since the fish have reached maturity. For these reasons it is absolutely essential that additional fish be secured for release. A failure of natural spawning may not be prohibitive to the development and maintenance of an inland marine fishery. An economical method of trapping an adequate supply of fingerling sized fish from coastal waters may be developed and/or a practical means of artificially propagating the fish may be evolved through research. It is difficult to estimate the true recreational value of catching a 20-pound red drum from an inland lake 500 miles from the Texas coast, but there is little doubt such a value is exceedingly high.

Recommendations:

Having acquired the knowledge that marine fish will survive in these saline waters and experience a high degree of fitness, it is recommended that this

investigation be continued and supplemented as follows:

- (1) Additional introductions of species whose survival and growth has been established should be made in order to assure a breeding potential in the event of reproduction.
- (2) Additional protection will be afforded fish introduced through regulatory acts that permit the Texas Game and Fish Commission to legally determine seasons, bag, and possession limits for waters of the concerned area.
- (3) Additional species may be introduced. Common pompano (Trachinotus carolinus), striped bass, snook (Centropomus undecimalis) tripletail, (Lobotes surinamensis), sheepshead (Archosargus probatocephalus), and tarpon (Megalops atlanticus), are marine species considered worth trying.
- (4) A more thorough knowledge of spawning requirements and other life history habits of these species should be acquired.
- (5) More frequent reconnaissance surveys should be conducted to determine species condition, development and possible reproduction.

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Date March 28, 1963

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