

Report of Fisheries Investigations
Basic Survey and Inventory of Fish Species Present in Resaca de las Palmas

by

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Dingell-Johnson Project F-6-R-6, Job B-13
July 1, 1958 - December 31, 1958

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Job Completion Report

State of TEXAS

Project No. F-6-R-6

Name: Fisheries Investigations and Surveys
of the Waters of Region 8-B.

Job No. B-13

Title: Basic Survey and Inventory of Fish
Species Present in Resaca de las
Palmas.

Period Covered: July 1, 1958 - December 31, 1958

Abstract:

The Resaca de las Palmas is situated just north of the Brownsville city limits, apparently an old bed of the Rio Grande. Water supply is partly from local rains but mostly from a river pumping station which furnishes water for a cooling system. Chemical analysis showed the water to be suitable for warm water fish production but very turbid due to rough fish agitation. Very little submerged aquatic vegetation was found but some areas were densely covered with cattails and water hyacinths. Netting and seining collections showed the population dominated by rough fish, as expected, with only 29% (channel and blue catfish and white crappie). Recommendations are made for further study of the Resaca under the Resurvey Job (B-11) to determine if a renovation and restocking development might be feasible.

Objectives:

The investigation of the Resaca was conducted under three parts:

- a. Water samples were taken from three stations and tested for the principle chemical factors. Physical factors and general ecological condition were observed and recorded.
- b. A map of the Resaca was made and information on the history, uses and connections of the lake were gathered by conferences with the Cameron County Surveyor and County Tax Assessor; the International Boundary and Water Commission; City of Brownsville employees and Water District officials.
- c. Seining and experimental gill netting collections were made in four sections of the Resaca. Data recorded were the number of each species taken and, except for small forage fish, the length, weight, sex and breeding condition of the fish.

Findings:

Water Analysis

Surface water samples were taken from three stations on July 15 and 16, 1958. Results are shown as follows:

	Station #1 County Club	Station #2 Charro Courts	Station #3 Media Luna
Degrees Fahrenheit	89	86	88
Oxygen, ppm.	5.6	8.8	7.0
Carbon Dioxide, ppm.	7.0	8.0	0
Methyl Orange Alkal.	314	182	178
pH	8.4	8.4	8.5
Secchi disk, inches	6.5	11.0	5.0

Chemically, the water is suitable for warm water fish although turbidity practically eliminates the growth of submerged vegetation and the successful spawning of largemouth bass. Since the Resaca is narrow and separated into rather short sections by road fills, it seems certain that the turbidity is due entirely to stirring of the bottom silts by rough fish rather than by wind action. The temperatures, oxygen, and carbon dioxide amounts recorded are, of course, reflections of the air temperatures at the time of year the samples were taken. The alkalinity and pH readings are normal for waters of this area.

Hand line soundings taken across two lines in the Country Club section showed a maximum depth of three feet with an average of 2.4 feet. The lower part of this section, densely covered with cattails, is probably shallow. Three lines in the Charro Courts section showed a maximum of 6.5 feet with an average of 4.2 feet. Soundings were not taken in the other sections but while setting nets, depths up to seven feet were found which is probably maximum for the resaca. Silt bottoms were the only type found. All shorelines were sharply cut, averaging about one foot above the normal water level. Almost all of the shoreline of the Resaca is privately owned, but the City of Brownsville has flooding easements for the storage of water. Free public access is restricted to the public road crossings along the resaca.

Except for a few small patches of Chara in one small, clear pool and scattered bunches of filamentous green algae, the turbidity of the water in the resaca prevented the growth of any submerged aquatic vegetation. Bermuda grass covered most of the banks and frequently hung over into the water extending as much as three or four feet from the bank. Only about a third of the water in the Country Club section was open; the rest was covered with solid mats of cattails and some small mats of water hyacinths.

Some small shoreline bunches of cattails were found in the other sections but were apparently controlled by the sharp cut banks and deeper water. The cattails and water hyacinths in the Country Club section and small sections of water were so thick and extensive that it was impossible to net or seine in these areas.

Mapping

A map of the Resaca De Las Palmas was traced from U. S. Department of Agriculture aerial photos obtained from the Cameron County Tax Assessor's office. These photos were at a scale of eight inches to the mile and the resulting map, in several parts, was so large and bulky that a reduced reproduction for inclusion in this report could not be made. A small scale map yet large enough to be usable was not available from the City of Brownsville, Water Districts of the International Boundary and Water Commission. A site location map is included.

The Resaca heads northwest of the City of Brownsville in Water District #6 and follows a winding, tortuous course eastward just north of the city limits and enters Water District #5, east of the City. In District #5 it is joined by canal with Resaca De La Guerra. The City of Brownsville constitutes Water District #6 and, for water storage, has dammed the Resaca near the northeast corner of the city limits. During heavy rains the Resaca carries runoff water from the area but the regular source of water is from City operated pumps on the Rio Grande. The water is first used in a cooling system and then flows by canal and pipes to enter the resaca in the Charro Courts section near U. S. Highway No. 77. The water in the resaca is used by adjacent land owners to a small extent but is chiefly used by the city as a standby domestic water source, providing water for Brownsville when water is not available from the river.

The resaca seemed to be an old, cut-off channel of the Rio Grande. The surrounding terrain was so flat and level that no creeks or gullies draining into the Resaca were found. The water in the sections studied was still, as in small, long pools, and no evidence of current was observed. The resaca is divided into the various sections by dirt fills, usually for road crossings. Most of these fills have one or more drain pipes through them to allow for drainage of the water.

Fish Collections

On July 15 and 16, 1958, the project leader and two field assistants set a total of five experimental gill nets in four sections of the Resaca. Station #1 was in the Country Club section, about 1/2 mile west of U. S. Highway No. 77 which was the upstream end of the resaca that was accessible. Station #2 was in the Charro Courts section, just east of U. S. Highway No. 77. Station #3 was in the Media Luna section, just east of Charro Courts and adjacent to Media Lake, on oxbow lake connected to the resaca by underground pipes. Stations #4 and #5 were in the Palo Verde section, east of the Los Fresnos Road. A total of 113 fish of eight species was taken in the gill nets as shown in Table 1. Only three species, channel and blue catfish and white crappie, were game fish and they comprised only 29% of the catch. Smallmouth buffalo, spotted gar and freshwater drum were the dominant species and, by predation and by stirring the bottom and muddying the water, prevent the development of sizable populations of bass, catfish, crappie and forage fish. Gizzard shad were very low in numbers compared to other waters of the area apparently due to heavy cropping by the gar and catfish. The remains of an alligator gar, a blue catfish and two spotted gar, apparently cleaned by fishermen,

were wind drifted into the net set in the Country Club section. Seining collections were difficult to make because of the sharp cut banks and the soft mud bottom. However, one collection with a 20' x 4' x $\frac{1}{4}$ " nylon seine was made in each of the first three sections and another in a small, clear pool next to U. S. Highway No. 77. Fish taken were 3 gizzard shad (Dorosoma cepedianum), 135 threadfin shad (Dorosoma petenense), 1 mosquito fish (Gambusia affinis), 3 Mollienisia (M. latipinna), 9 bluegill sunfish (Lepomis macrochirus), 2 white crappie (Pomoxis annularis) and 3 Rio Grande perch (Cichlasoma cyanoguttatum). Even though this list of small fish is probably incomplete, it is obvious from the small numbers of fish taken that there is a shortage of food, for the larger predacious species.

Recommendations:

At least one land owner on the resaca has voiced an interest in having a renovation job carried out to improve fishing in the resaca. At this time, there are several items that need more study before such a renovation could be recommended. Further study needs to be done on the aerial photos to determine if any other ox-bow lakes like Media Luna or branch resaca connect to the Resaca de las Palmas. The nature of connections (whether by underground drain pipe or drainage overflow) between the various sections, especially in the upper and lower ends of the resaca need to be determined. The inlet from the Rio Grande pumps and the cooling system need to be further studied to determine if any live fish can survive through that system. Some means of applying rotenone effectively to the areas covered by extensive cattail beds must be found and the water hyacinths must be eliminated from two or three of the areas. Property rights and from whom permission must be obtained to renovate the resaca must be determined. It is recommended that these items be further investigated under the Resurvey Job, B-11.

It is recommended that any further stocking of game fish from hatcheries be completely curtailed. The large numbers of rough fish now in the resaca would cause any stocking to be useless, the stocked fish serving only to feed the gar.

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Fish Taken in Five Experimental Gill Nets from Resaca de las Palmas.

	Station #1	Station #2	Station #3	Station #4	Station #5	Total	Percent
<u>Lepisosteus productus</u> (Spotted gar)	4	4	3	7	5	23	20.35
<u>Dorosoma cepedianum</u> (Gizzard shad)					2	2	1.77
<u>Ictiobus bubalus</u> (Smallmouth buffalo)	5	2	5	13	12	37	32.74
<u>Ictalurus punctatus</u> (Channel catfish)			1	8	13	22	19.47
<u>Ictalurus furcatus</u> (Blue catfish)			3	1	1	5	4.43
<u>Pomoxis annularis</u> (White crappie)			6			6	5.31
<u>plodinotus grunniens</u> (Freshwater drum)				10	7	17	15.04
<u>Mugil cephalus</u> (Striped mullet)			1			1	0.89
Total	9	6	19	39	40	113	
Percent	7.96	5.31	16.81	34.52	35.40		

