

OBSERVATIONS OF FINFISH STANDING CROP,  
SABINE NATIONAL WILDLIFE REFUGE

W. GUTHRIE PERRY

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## OBSERVATIONS OF FINFISH STANDING CROP, SABINE NATIONAL WILDLIFE REFUGE

W. Guthrie Perry

Louisiana Department of Wildlife and Fisheries  
Grand Chenier, LA 70643

**ABSTRACT.** *Standing crop samples were collected at four stations on Sabine National Wildlife Refuge from 1979–1981. Annual estimates of finfish collected were extremely variable. The shallow Brown's Lake station estimates were 8.41–38.28 kg/ha, Back Ridge Canal, 22.44–110.66 kg/ha, Beach Canal, 3.92–411.00 kg/ha, and North Bayou, 5.16–16.69 kg/ha. The overall mean standing crop was 60.92 kg/ha. However, caution must be used in extrapolation of marsh standing crop values of fishes. Many areas are not necessarily optimum habitat and these samples were not intended to represent the entire refuge for the study period.*

### INTRODUCTION

Sabine National Wildlife Refuge, one of the largest wildlife refuges on the Gulf Coast, was established in 1937. The Refuge, owned and managed by the United States Department of Interior, Fish and Wildlife Service, protects 57,953 ha of wetlands for wildlife. Despite the magnitude of the area and its potential importance to wildlife, the management program has been hampered by having very little control of aquatic conditions. Only 13,365 ha of wetlands on the Refuge are presently under an improved system of management.

At the time of acquisition, vegetation type was mainly freshwater emergent with a ribbon of wiregrass, *Spartina patens*, meandering along Sabine and Calcasieu Lakes. In the late 1950's, large mudflats began to appear as saw-grass, *Cladium jamaicense*, and other plants began to disappear.

The construction of the Calcasieu Ship Channel seems to have stimulated these changes in vegetative composition where tidal flooding and evaporation have concentrated salts in previously freshwater marshes. Management through water-level control could provide conditions conducive to the production of choice wildlife habitat.

In 1979, marsh management projects were proposed by the U.S. Fish and Wildlife Service for the Sabine National Wildlife Refuge. The installation of two weirs and an earthen plug in channels connecting the Refuge with Calcasieu Lake was one of the projects. However, before construction began a cooperative agreement was initiated in 1979 between the Louisiana Cooperative Fishery Unit of Louisiana State University and the U. S. Fish and Wildlife Service to obtain life history information on marine organisms using that ecosystem and to document the importance of the area to these organisms. These data will be used in making decisions on the operation of the structures with minimum interference to marine organisms.

In support of this study, the Louisiana Department of Wildlife and Fisheries agreed to conduct standing crop estimates of finfish in selected areas before and after weir construction. This report presents data gathered during

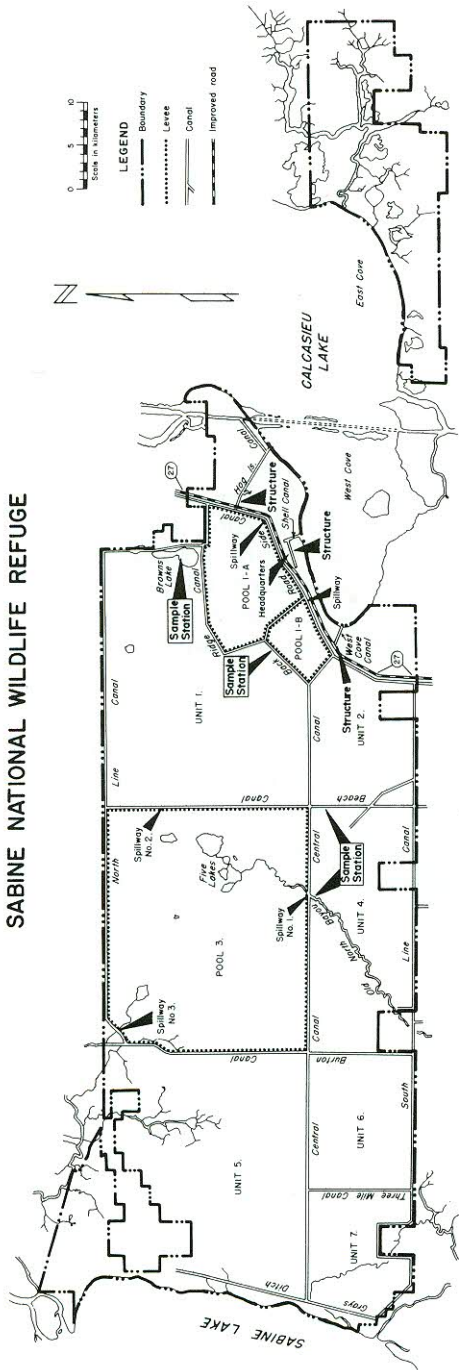


FIGURE 1. Locations of stations sampled for standing crop, Sabine National Wildlife Refuge, 1979-81.

TABLE 1. Physicochemical data for sample stations, Sabine National Wildlife Refuge, 1979-1981.

Station	Depth (m)			Salinity (ppt)			Oxygen (ppm)			Temperature (°C)		
	1979	1980	1981	1979	1980	1981	1979	1980	1981	1979	1980	1981
Brown's Lake	0.4	0.6	0.5	2.6	14.7	7.5	4.6	7.0	4.0	29.5	28.7	28.9
Back Ridge Canal	0.9	1.2	0.9	1.6	15.8	3.6	2.4	2.5	3.0	28.0	28.3	31.9
Beach Canal	1.2	0.9	1.1	1.3	18.2	3.9	<1.0	5.0	2.0	27.3	29.6	28.8
North Bayou Canal	0.6	0.8	0.8	0.8	4.0	3.1	2.6	1.0	4.0	30.3	28.6	28.7

three consecutive years of sampling prior to the installation and operation of the structures.

#### MATERIALS AND METHODS

The study was conducted on the Sabine National Wildlife Refuge, a federally owned and operated area in the coastal prairie marshes of extreme southwestern Louisiana.

The locations of the two proposed weirs were east of La. Highway 27 in West Cove Canal and Hog Island Canal (Fig. 1). The earthen plug with a water control gate was located behind the Sabine Refuge office in Headquarters Canal. Construction of the three management structures began in February, 1981, and was completed in September, 1981.

Four 0.4 ha sample stations were established in 1979 (Fig. 1). Station 1 was located in the southeastern corner of Brown's Lake approximately 2.8 km inland of the proposed Hog Island Canal weir. Back Ridge Canal, the second station, was approximately 6.4 km inland from the proposed West Cove Canal structure. The other stations, Beach Canal and North Bayou, were approximately 10.5 and 15.3 km, respectively, inland from the proposed West Cove weir.

Throughout the 3-year study, each station was sampled only during August. Samples were made by utilizing block-off nets of 1.3 cm bar mesh walls and 0.6 cm bar mesh netting over the float lines to barricade the waterway. The nets were especially constructed to reach from the bottom to several centimeters above the water (Lambou 1959). The width of the canal determined the distance nets were placed apart to yield 0.4 ha. Noxfish containing 5% active rotenone was applied at each station at a concentration of 2 ppm rotenone. Fish were captured with 0.5 cm bar mesh dip nets as they surfaced. Collection of fish on the first day continued for approximately one hour. Block-off nets were left in place and the fish which surfaced overnight were picked up the second day. Fishes were identified to species, grouped in 10 mm total length intervals, counted, and weighed. Occasionally it was necessary to subsample when large numbers of fish were encountered. Before each sample, which was taken just after daylight, data on dissolved oxygen, salinity, depth, and temperature was recorded.

