Number and Distribution of Crab Traps in Texas Bays

by Paul C. Hammerschmidt and Richard L. Benefield

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ABSTRACT

The number and distribution of crab traps fished in Texas bays was determined by aerial surveys conducted during fall-spring 1977-1978 and fall 1985. The mean number of traps counted on a given day in 1977-1978 was about 6000. The number ranged from 3574 in winter to 6967 in fall. Data indicated that between 1967 and 1977 crab fishing effort expanded from the upper and middle Texas coast to include the lower coast. A 1985 followup survey indicated that fishing effort increased about 64% (11,189 traps) from the 1977 survey, and crab traps were observed in each bay system.

INTRODUCTION

The blue crab, Callinectes sapidus Rathbun, currently supports the third largest commercial fishery in Texas with a 1977-1981 average of 3.6 million kg landed with a dockside value of $2.0 million (Hamilton and Saul 1984). There was a large increase in landings from 1.9 million kg in 1968 to 3.7 million kg in 1977 (National Marine Fisheries Service 1971, 1978). Available data were inadequate to determine the most likely cause for this increase, since no fishery-independent assessments of crab populations had been conducted since 1967 (More 1969), and the amount of commercial fishing effort was generally unknown. The number of operating units coastwide had increased since 1969 (NMFS 1972, 1980), but their distribution was unknown. This study was conducted to determine the relative number and distribution of crab traps in Texas bays.

MATERIALS AND METHODS

The number of crab traps fished/day in each Texas bay system (Figure 1) from Louisiana to Mexico was determined from aerial counts in fall (October 1977 and 1985), winter (February 1978), and spring (May 1978). Airplane flights were made along pre-selected transects over each bay system. Transects were generally oriented parallel to shore along the long axis of each bay within each bay system. Crab trap floats were counted and it was assumed that each float represented one trap. All floats in a bay were counted on 1 day in each month, but 2 days were required to complete counts in all bays.

RESULTS

During 1977-1978 a mean of 5855 ± 1051 crab traps were fished in all bays and seasons combined (Table 1). The number of traps coastwide was about 50% lower in winter than in fall or spring except in Sabine Lake and lower Laguna Madre. The number of traps in these two systems was higher in winter than fall. No traps were observed in Corpus Christi Bay and the upper Laguna Madre in winter.

There was a 64% increase in crab traps in 8 years. During October 1985, 11,189 crab traps were counted coastwide (Table 2). The number of crab traps increased from 22% in San Antonio Bay to 241% in Matagorda Bay and declined 43 and 94% in Corpus Christi Bay and the lower Laguna Madre, respectively.

DISCUSSION

The large increase in crab landings in 1977 was a function of increased fishing effort. During 1969-1976, the number of crab traps used along the Texas coast increased more than 60% from 14,440 in 1969 to 23,375 in 1976 (NMFS 1972, 1980).

This study determined that as crab fishing increased, its distribution

expanded from almost exclusively the upper Texas coast (Sabine Lake to San Antonio Bay) in 1967 (More 1969) to include the lower coast by 1977-1978 (Aransas Bay to the lower Laguna Madre). By fall 1985, aerial counts of crab traps indicated that the number of traps fished on any 1 day had increased again about 60%. The changes in distribution of effort, however, varied from bay to bay. The reasons for these differences in spatial distributions are unknown. However, they may be determined by using appropriate fishery-dependent data.

This study demonstrates that it is possible to determine relative number and distribution of crab traps fished along the Texas coast using fishery-independent surveys. Frequent surveys done routinely in conjunction with ground verification could increase the precision of these estimates.

LITERATURE CITED

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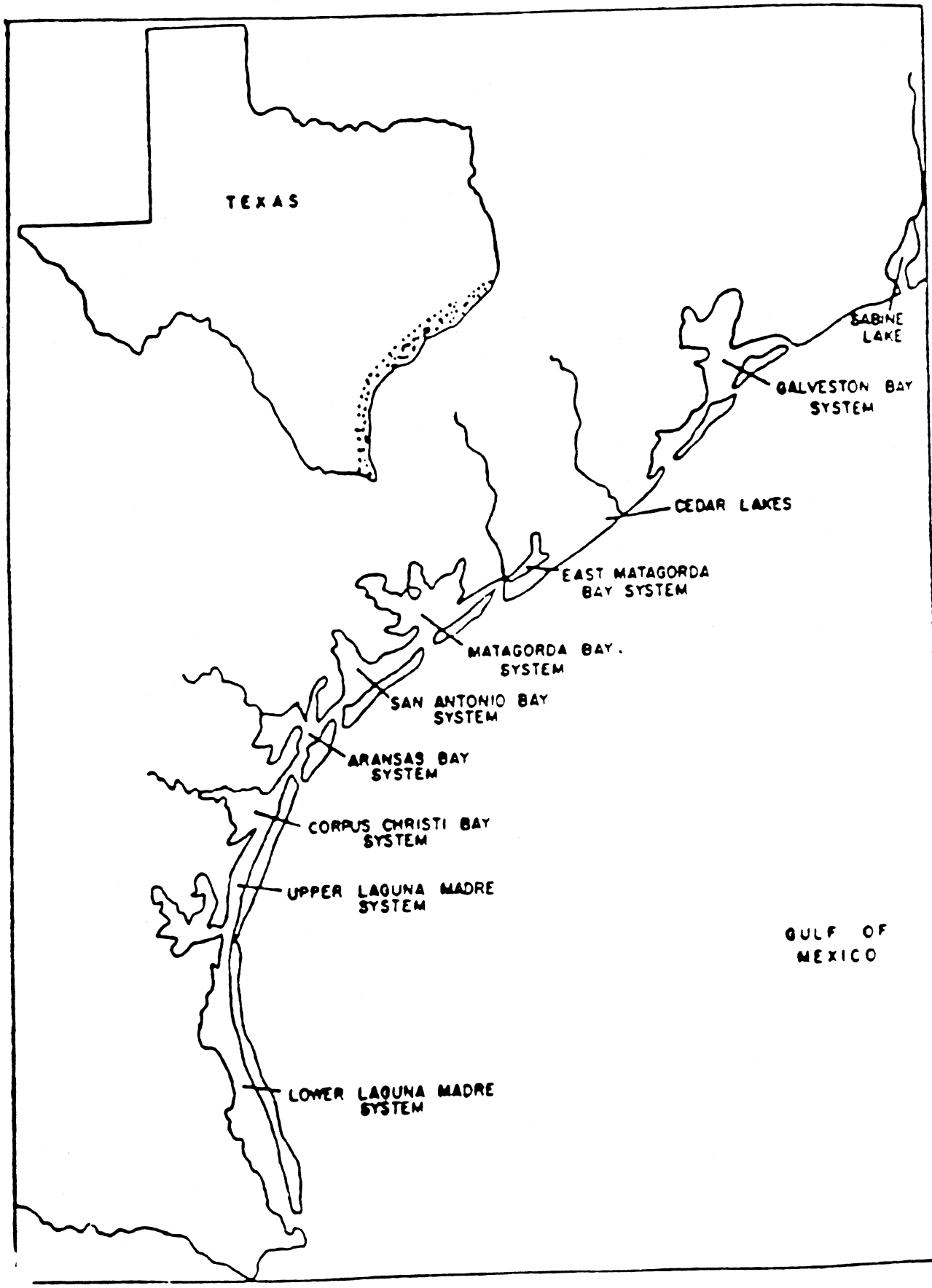
Table 1. Number of crab traps counted in each bay system during October 1977-May 1978.

Bay system	Fall	Winter	Spring	Mean ± 1 SE
Sabine Lake	326	411	495	411 ± 49
Galveston Bay	1487	1156	2393	1679 ± 370
East Matagorda Bay	346	186	372	301 ± 58
Matagorda Bay	456	238	921	538 ± 201
San Antonio Bay	1264	221	830	772 ± 302
Aransas Bay	1113	481	953	849 ± 190
Corpus Christi Bay	713	0	418	377 ± 207
Upper Laguna Madre	425	0	149	191 ± 124
Lower Laguna Madre	713	1061	436	737 ± 181
Coastwide Total	6843	3754	6967	5855 ± 1051

Table 2. Number of crab traps counted in each bay system during October 1985 and percent increase over October 1977 counts.

Bay system	October	Percent Increases
Sabine Lake	823	152
Galveston Bay	3613	143
East Matagorda Bay	540	56
Matagorda Bay	1557	241
San Antonio Bay	1545	22
Aransas Bay	1550	39
Corpus Christi Bay	404	-43
Upper Laguna Madre	1102	159
Lower Laguna Madre	45	-94
Coastwide Total	11,189	64

Figure 1. Texas bay systems


TEXAS
SABINE LAKE
GALVESTON BAY SYSTEM
CEDAR LAKES
EAST MATAGORDA BAY SYSTEM
MATAGORDA BAY SYSTEM
SAN ANTONIO BAY SYSTEM
ARANSAS BAY SYSTEM
CORPUS CHRISTI BAY SYSTEM
UPPER LAGUNA MADRE SYSTEM
LOWER LAGUNA MADRE SYSTEM
GULF OF MEXICO