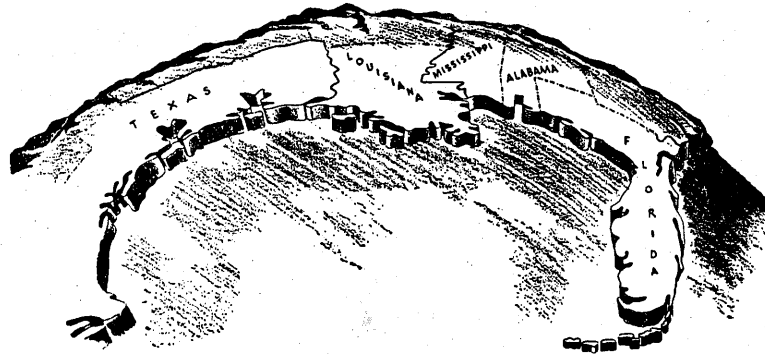


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Gulf States Marine Fisheries Commission



INFORMATIONAL SERIES No. 2

THE SHRIMP FISHERY OF THE GULF OF MEXICO

(Rio Grande River to St. Marks, Florida)

BIOLOGICAL NOTES AND RECOMMENDATIONS

by

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This revision of Informational Series No. 1 has been published by the Gulf States Marine Fisheries Commission as information to the governors, legislators and marine fisheries administrators of the several compacted Gulf States, and for such consideration as may be deemed appropriate in the development of laws and regulations pertaining to the shrimp fishery of their respective states.

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The Commission wishes to express its appreciation to the authors for the considerable amount of time and effort which has been devoted to the preparation of the following presentation.

INTRODUCTION

Ideally, recommendations such as those presented here should be derived from a complete scientific knowledge of the organisms concerned. This ideal may never be attained and in the meantime the demand for shrimp and the encroachment of our industrial civilization upon the coastal environment constitute increasing threats to the stability of this resource. Therefore we offer our best thinking in terms of existing knowledge. In the past several years production of brown shrimp in the area from the Rio Grande River to St. Marks, Florida, has exceeded that of other species. There are sufficient differences in the biology of the white shrimp and the brown shrimp to require that they be treated separately rather than collectively. The pink shrimp, of lesser commercial importance in the subject area, is not being treated in this publication.

We would like to add an additional comment on the attitude of the fishery biologist in recommending regulations. Strictly speaking a conservation measure should be written purely in terms of the known biology of the species concerned, but this is rarely feasible because of the vicissitudes of enforcement in the field and considerations of equity where different economic and social strata are involved. These items are outside the purview of the biologist.

Recommendations such as are presented here should come as a proper synthesis of ideas originating in the minds of the fishery biologist, the fishery industrialist, and the fishery administrator. This committee did its best to recognize all the needs of the fishery, but because of its reluctance to assume knowledge of law enforcement limitations, the needs of industry, and the sociological make-up of the industry population, the results given here lean strongly on purely biological premises.

BIOLOGICAL NOTES

The White Shrimp

The following statements concerning the life history of the white shrimp, *Penaeus setiferus*, we consider to be fundamental for the framing of regulations of the fishery:

1. Most spawning occurs from April through August in the offshore¹ waters. The eggs are laid directly into the water and are not carried by the female. A female shrimp will lay between 500,000 and 1,000,000 eggs at a spawning.

¹ We define nursery areas for this species to be those areas landward of the three fathom line, and offshore waters to be those seaward of the three fathom line, in the Gulf of Mexico.

2. The eggs hatch within a few hours and the young become part of the plankton, being carried about by oceanic currents. Only those young survive which are carried into favorable nursery areas in relatively fresh estuarine waters.
3. In Louisiana, Mississippi, and Alabama the young appear in abundance on the inside fishing grounds by mid-June; in Texas and west Florida by mid-July. In the nursery areas during the summer the young shrimp as individuals grow very rapidly, generally increasing their weight more than four times each month.
4. The larger shrimp eventually find their way to the spawning grounds in offshore waters of higher salinity.
5. As winter approaches, the larger shrimp move from nursery grounds to offshore waters, leaving the smaller shrimp in the nursery areas, where growth is retarded by lower temperatures.
6. With the advent of spring and the warming of the waters, the small shrimp which wintered over in the nursery areas resume a very rapid rate of growth, and consequently they move to the offshore waters where spawning takes place. At their first spawning period, these shrimp are approximately one year old.

The Brown Shrimp

Although research on the brown shrimp, *Penaeus aztecus*, has not yet produced information comparable to that available for the white species, the following statements can be made at this time:

1. Spawning definitely precedes that of the white shrimp, usually by two to three months. It occurs farther offshore.
2. As far as is known growth rates approximate those of the white shrimp.
3. Brown shrimp leave the nursery grounds at a smaller size than the white shrimp. This migration takes place sometime during the period May through September, the time varying somewhat according to locality.
4. The adults are active at night, apparently burying themselves during the day. The smaller sizes found in the nursery areas do not seem to be as strongly nocturnal.

RECOMMENDATIONS

The unexpected and unexplained drop in white shrimp production gives reason to pause about the idea that the size of spawning stock is not related to the resulting crop and requires no protection. Since we have no information on which to establish the need for regulations to protect the spawning stock, to say

nothing of formulating them, the recommendations which follow are based only upon the assumption that it is advantageous to protect the small shrimp.

CLOSED SEASONS

Nursery areas

White shrimp: The first closed season for nursery areas should be, for the area east of the Louisiana-Texas boundary, to and including St. Marks, Florida, from July 1 to August 31 (both dates inclusive). The closed season for the nursery areas of Texas should be from July 15 to September 15 (both dates inclusive).

The second closed season for the nursery areas in all states should be from November 1 of one year to March 31 (both dates inclusive) of the following year.

The first closed season is suggested to protect the small shrimp during the period of their most rapid growth. The different season suggested for Texas waters results from the fact pointed out above that there the young shrimp appear later in the nursery areas.

The second closed season is suggested for the purpose of protecting the small shrimp that are wintering over in the nursery areas. These shrimp produce the spring run.

Brown shrimp: When the migrations of young brown shrimp in all of the Gulf states are considered as a whole, a universal closed season for conserving the young would be from March 1 through April 30 (both dates inclusive). On going from state to state the opening date could be delayed a month or more as required.

Offshore waters

White shrimp: The offshore waters should remain open to fishing in all states throughout the entire year. Generally, small individuals do not predominate in the shrimp population in offshore waters.

Brown shrimp: In recent years there have been cases of excessive catches of unduly small shrimp by trawlers operating in offshore waters. At this time we can only recommend that the possibility of discretionary regulation and its consequences be carefully studied by those concerned. See below.

Note: Time and dates shown for white and brown shrimp are only approximate for Florida which has already adopted the system of regulation recommended in the concluding comments below.

White and brown shrimp: We recommend no size limits and that those now in effect be abolished.

When a size limit is imposed the basic purpose of the regulation is defeated by culling. Shrimp smaller than the legal

size which have been killed in the fishing operation are discarded. The closed seasons recommended above, if **strictly enforced**, should provide adequate controls. While of no biological significance it is a fact that size limits are difficult to enforce, which further detracts from their usefulness.

NIGHT FISHING

White and brown shrimp: Night fishing should be permitted in all waters during open seasons.

GEAR

White and brown shrimp: No limitations are suggested on size of trawls. We have no evidence that trawling is harmful or beneficial to the bottoms. The criticism that large trawls take an undue quantity of shrimp from the inside waters is not sound since it makes no difference to the shrimp population whether or not the shrimp are caught by a large or a small trawl. Competition between units of the fleet is an economic rather than a biological problem. Again we believe that the recommended closed seasons properly enforced should suffice for adequate control.

The size of mesh used in a trawl controls to a marked degree the size of shrimp caught. Where enforcement is feasible, mesh regulations are useful.

The data we have shows that no significant quantities of important commercial or sport fishes are taken in shrimp trawling operations. In order to permit the escape of the small numbers of important fish which are caught, it would be necessary to increase the size of the mesh to an extent which would seriously decrease the ability of the trawl to catch shrimp. The value of the shrimp caught by trawling operations is so vastly greater than the value of the fish incidentally caught, that to curtail shrimping in order to prevent the capture of these fish would be unjustified.

BAIT SHRIMP

The problems of the live bait shrimp fishery should be recognized as being separate and distinct from those of the commercial food shrimp fishery.

CONCLUDING COMMENT

One of the Gulf states has been opening and closing some of its waters according to the prevailing size of the shrimp as determined by sampling the population. Elsewhere a segment of the industry itself has taken the initiative in promoting the enactment of legislation which is intended to prevent undesirable

destruction of small brown shrimp, and which incidentally would reduce the fishing pressure on white shrimp during spawning. If adopted by the legislature of the state concerned, the proposed act would provide limited discretionary regulation by its conservation agency. Both of these programs are admittedly experimental in nature, the latter more so than the former.

This type of "trial and error" regulation was suggested a number of years ago, and we believe that it can be very useful, provided it is developed in the light of existing scientific knowledge and calls for its own evaluation by a properly planned and concurrent biological program.