

# PRELIMINARY SHRIMP SURVEYS ON THE SOUTH COAST OF JAMAICA

By

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ABSTRACT: Surveys were carried out in 1958 and 1966-67 on the southern coast of Jamaica to evaluate the potential of the area for commercial shrimp fishing.<sup>3</sup> Try-net hauls of 15-minute duration yielded an average of 21-25 shrimp per haul; the species and count size varied with the depth. *Penaeus duorarum* and *P. schmitti* were the only commercial species encountered. The most extensive trawling grounds are in the Black River area, but adjacent nursery areas appear to be of limited extent. Smaller shrimp trawling grounds with ample nursery areas, are found in Portland Bight and Kingston Harbour. It is believed that a small, profitable trawl fishery might be developed in these areas. The feasibility of this suggestion should be tested by experimental fishing trials.

## 1. INTRODUCTION

JAMAICAN shrimp production is low. Shrimp are captured by means of beach seines and by cast-net and push-net fishermen who work the shallow areas. Monofilament nylon gill nets are used to capture shrimp in depths of 2-10 m. No trawls have been used on a commercial basis in Jamaica, but it has been suggested that the area might support a commercial trawl fishery.

During 1958 a two-week survey was carried out on parts of the southern coast of Jamaica to evaluate the possibilities in

the area for commercial shrimp fishing. Between November 1966 and May 1967 more extensive investigations were undertaken covering most of the southern shelf. The main object was to discover if the use of otter trawls was feasible.

In deciding whether an area appears to have the potential for a profitable commercial shrimp fishery three criteria must be considered.

1. Are there sizeable stocks of commercially valuable species present?
2. Are there trawlable areas of a reasonable size which have shrimp present?
3. Are there suitable nursery areas present for the species which utilize the region?

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## 2. METHODS

In the 1958 survey which took place between July 28 and August 8 the marsh areas were examined from the air and from shore to determine the probable extent of nursery areas. In addition, three sampling trips were made in Kingston Harbour, totaling 4 hours of trawling.

Between November 1966 and May 1967 five sampling trips were made in Kingston Harbour, totaling 12 hours of trawling. During both surveys trawling was conducted from a 8 m launch, using conventional 2.4 m shrimp try-nets of 1¼" (3.17 cm) stretched mesh size. Tows were normally of 15-minute duration.

In March 1967 the South Jamaica Shelf between Port Royal and Whitehouse Point, extending from shore to the steep drop-off at 45-50 m, was subjected to dredging and trawling at stations spaced 5 miles apart. Trawlable areas were charted and an extensive area of smooth muddy sea-floor was located to the southeast of Black River in the region of Pedro Bay.

## 3. RESULTS

Commercially valuable shrimp were taken in all areas having a relatively smooth muddy sea floor. No shrimp were found in sandy or coralline areas. *Penaeus duorarum*, *P. schmitti* and a few *Trachype-neus* sp. were encountered.

Commercial shrimp were taken only in shallow areas at the western end of Kingston Harbour (Hunts Bay) during 1958, while the 1966-67 survey yielded good catches in all parts of the harbour, mainly in depths of 5-18 m. In February 1958 over 75% of the shrimp taken were *P. schmitti*, whereas in the later survey over 95% of the shrimp were *P. duorarum*. However, most of the shrimp taken in 1958 were from depths of less than 9 m, while the 1966-67 survey was concentrated in greater depths.

During August 1958, catches averaged 24 shrimp per 15-minute drag, mostly in the 100-110 count (tails per pound) size range or 20-21 mm carapace length. Shrimp taken in Kingston Harbour in May 1967

averaged 25-26 mm carapace length (60-67 count), but catch rates were the same; an average of 25 shrimp per 15-minute haul. In depths of 30-40 m off Pedro Bay in March 1967 catch rates were slightly lower (21 shrimp per 15-minute haul), the size being about 60 count. Larger shrimp between 20-25 count size were rare. Between two and five pounds of edible fishes were taken with each pound of shrimp. These included *Eucinostomus gula*, *Lutjanus synagris*, and various sciaenids (mainly *Bairdiella ronchus*), sparids and pomadasyids. Despite their small size, these fishes are marketable and could form a valuable adjunct to the catch of shrimp.

The three areas of trawlable bottom on which shrimp were captured are shown in Figure 1.

3.1) *Kingston Harbour and adjacent waters*: This is an area of approximately 20 square nautical miles, the greater part of which has a soft grey-black muddy sea floor at depths of 11-18 m. Shallow nursery areas of adequate size relative to the area of the habitat of the adult shrimp occur in Hunts Bay and adjacent to Port Royal. Unfortunately, the nursery areas will soon be subjected to dredging and filling operations in the course of industrial development.

3.2) *Portland Bight*: Only two trawl hauls have been made in this area, both during daylight hour. Both hauls yielded small quantities of *P. duorarum*. Although the area is broken by small coralline cays, the area of trawlable muddy bottom appears to be extensive and may total about 20 square nautical miles. Much of the surrounding coastlands are mangrove swamps which, although probably of relatively high salinity, would appear to offer ample nursery areas. The area to the south of Port Royal and Portland Bight is an area of rough bottom comprised of coral rubble. As such it is not suitable for conventional otter trawls.

3.3) *The offshore shelf at Pedro Bay*: The area shown in Figure 1 comprises some 50 square nautical miles of flat muddy bottom, mostly at depths of 25-45 m. The

trawlable area probably has been formed by the deposition of silt in the pre-Pleistocene bed of the Black River. There is a large marsh area (the Great Morass) to the northwest of the trawling grounds. However, for this to be used as a nursery ground the post-larval shrimp would have to be carried over a bar and into a comparatively narrow opening formed by the river mouth in order to reach the marshy area. Within two or three miles from the sea, rice fields appear, and these fields are probably above the tide mark and of extremely low salinity. Thus it would seem that the area suitable for nursery grounds is small. The areas adjacent to the Pedro Bay trawling grounds are mostly sandy, with a covering of sea grasses interspersed with occasional reefs. No shrimp were taken in these areas.

The general impression gained from these surveys is that while the best trawling grounds are in the Black River-Pedro Bay area, the adjacent nursery grounds may be inaccessible to post-larval shrimp. Conversely, the Portland Bight region appears to have ample nursery grounds, but

the trawlable area is probably limited. Kingston Harbour has a trawlable muddy bottom and ample nursery areas, but pollution of the harbour by industrial effluents and destruction of the nursery by dredging may well destroy the stock within the next decade. It can therefore be stated that while none of the criteria mentioned in the introduction to this paper are completely fulfilled, there appear to be sufficient shrimp stocks now present to support a small industry. This industry could perhaps be based upon small 9-11 m trawlers supplying the local markets, in which the demand for seafoods is extremely high.

#### 4. ACKNOWLEDGEMENTS

The cooperation of the Woods Hole Oceanographic Institute in making the R. V. GOSNOLD available to the University of the West Indies is gratefully acknowledged. The operating costs of R. V. GOSNOLD during the offshore survey were borne by National Science Foundation Grant Ga-810 to the Woods Hole Oceanographic Institution.

FIG. 1. Map of Jamaica showing potential shrimp trawling areas on the south coast



