

## Small Mesh Trawling

By

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### INTRODUCTION

Experimental trawling operations for bottom fish were first begun in 1920 and consisted of surveys of the continental shelf around Ceylon and the west and east coasts of India. These preliminary surveys showed that the continental shelf of Ceylon was either very poor in bottom fish or that the ground was so rough that trawling proved uneconomical (Malpas, 1926). The trawl used in these investigations was the Granton Trawl which was made of 3 to 4 ply stout manila twine. The meshes were large in order to capture large fish and varied from 6" mesh in the wings and bellies to 4" mesh in the cod end. These investigations revealed the presence of large concentrations of poor quality fish in the Palk Bay. Apart from this there is no report on the availability of resources of small fish or crustaceans in the waters of Ceylon. This was no doubt due to the fact that the trawl used was of such large meshes that it did not retain small fish or other crustaceans, unless the ground was literally teeming in fish as in the Palk Bay area.

The first attempt at trawling with small-meshed nets was made in 1950 off the m.f.v. Halpha, under the control of Mr. Allan Glanville, a F. A. O. Master Fisherman. Investigations were made off Colombo and in the north, north-west and north-eastern regions of Ceylon. These operations showed considerable concentrations of small fish such as *Leiognathus*, *Drepane*, *Ephippus*, *Gerres* and *Otolithes*, on the mud banks of these regions. Between 1950 and 1953, experimental trawling operations showed good concentrations of fish on the mud banks off Colombo, Negombo, Chilaw, Karaduwa, Palk Bay and off Mullaitivu. These trawling operations, which were conducted during the day, showed the presence of prawns as well off Colombo, Negombo, and Chilaw, but not in the other areas referred to above. The presence of prawns in these particular areas was known to local fishermen who have been exploiting these resources over a long period using simple gear from orus and teppams.

Although a considerable amount of trawling has been carried out using small-meshed trawls, there is no record of the details of the gear used or any account of the relative efficiency of the different designs of trawls used in the operations. Experimental operations were, therefore, carried out off 80 h.p. boats such as m.f.v. Canadian and North Star, to select the most effective gear for these boats. In more recent times experiments were also conducted to select the most effective trawling gear for the 11-Ton boats of the Ceylon Fisheries Corporation. The results are reported in this publication.

### TRAWL FISHING GEAR

#### Otter Doors

Several types of otter doors of different sizes were tried in association with nets of different head-line length. The otter door most suitable for use with the most effective net was the flat type measuring 6 ft. in length and 3 ft. in height with fixed towing brackets. This was for the 80 h.p. boats "North Star" and "Canadian". Otter doors, employing chains as towing brackets, were

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found to be inconvenient and ineffective under certain circumstances, especially when the trawling ground was of very soft mud. In these circumstances the otter door was found to dig into the mud and fall flat on its outer face. An improvement in the otter door design for fishing on a very soft bottom is the attachment of a broad keel measuring 8" in width. This keel tends to stabilise the otter door while fishing in very soft mud. The optimum weight of each otter door for the 24 ton boat was found to be 200 lbs. when completed. The best wood for the construction of otter doors was 1½ inch mature Hora planks which were fitted neatly together leaving no spaces in between. For the 90 h. p. 11-Ton boats of the Ceylon Fisheries Corporation the most suitable otter door was 5 ft. in length and 2½' in height with fixed towing brackets and 150 lbs. in weight.

**Otter Trawls**

(a) *Balloon Trawl*.—The most popular otter trawl used in the Mexican prawn fishery is the balloon type which is constructed with 2 inch mesh webbing from bosom to cod end. This type was used during experimental operations but the catch was found to be considerably less than that obtained by smaller meshed try-nets of shorter head-line length, made up of 2 inch mesh webbing in the wings and the bosom and 1" webbing in the cod-end. When the balloon trawl was constructed with 2 inch mesh webbing in the wings and bosom and 1 inch mesh webbing in the cod end catches were consistently higher, showing a considerable escape of fish through the net of larger mesh size. This particular design using the smaller mesh webbing was used in subsequent experimental fishing operations, but large numbers of smaller varieties of prawns were seen to escape through the meshes of the cod end at the time of hauling. The mesh size of the cod end of the net was reduced further to ½" stretched mesh and this net appeared to retain a large percentage of the smaller varieties of prawns. The

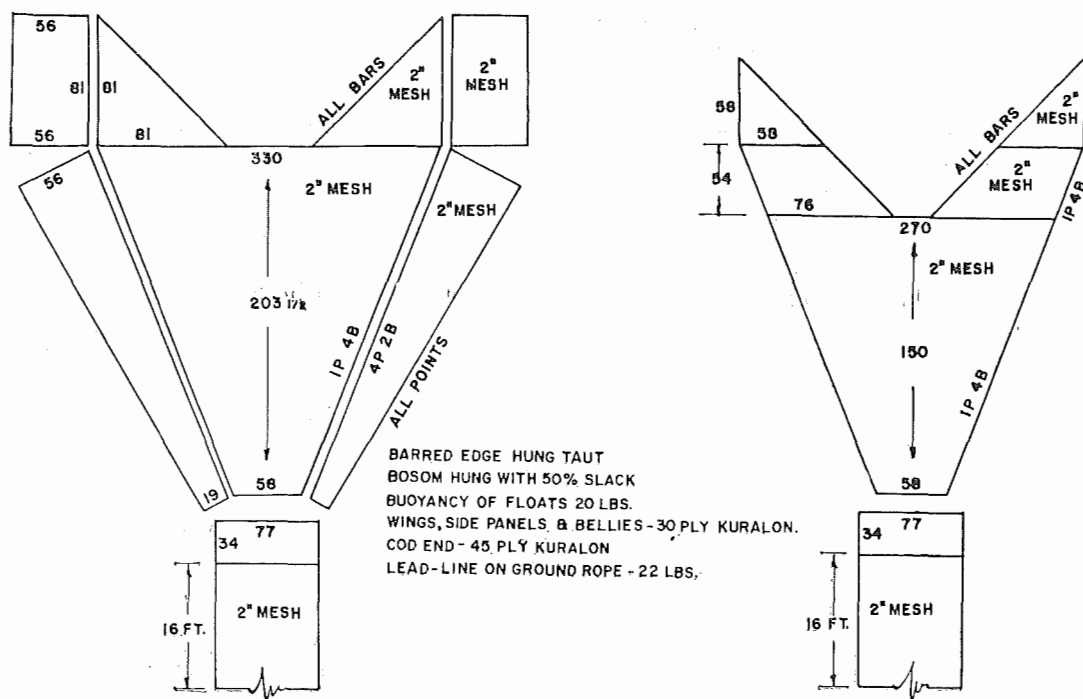


Fig. 1. Balloon Trawl

otter trawls now in use on the 11-Ton boats of the C. F. C. are of the balloon type and the design is illustrated in Fig. 1. An improvement in the design would be the use of 1" mesh netting in the codend for small fish and ½" mesh netting in the cod end for small prawns.

(b) "Yankee Doodle" Flat Trawl.—A popular design in the Queensland Prawn Fishery of Australia is the "Yankee Doodle" Flat Trawl. Here, as compared with the Balloon Trawl, the head-line is the same length as the ground rope and, in contrast to the former type, there is no overhang.

This trawl was used in experimental trawl-fishing off the - m f.v. "North Star" and "Canadian" in association with 6' x 3' flat otter doors and off the 11-Ton boats of the C. F. C. with 5' x 2½' flat otter doors and proved to be very efficient.

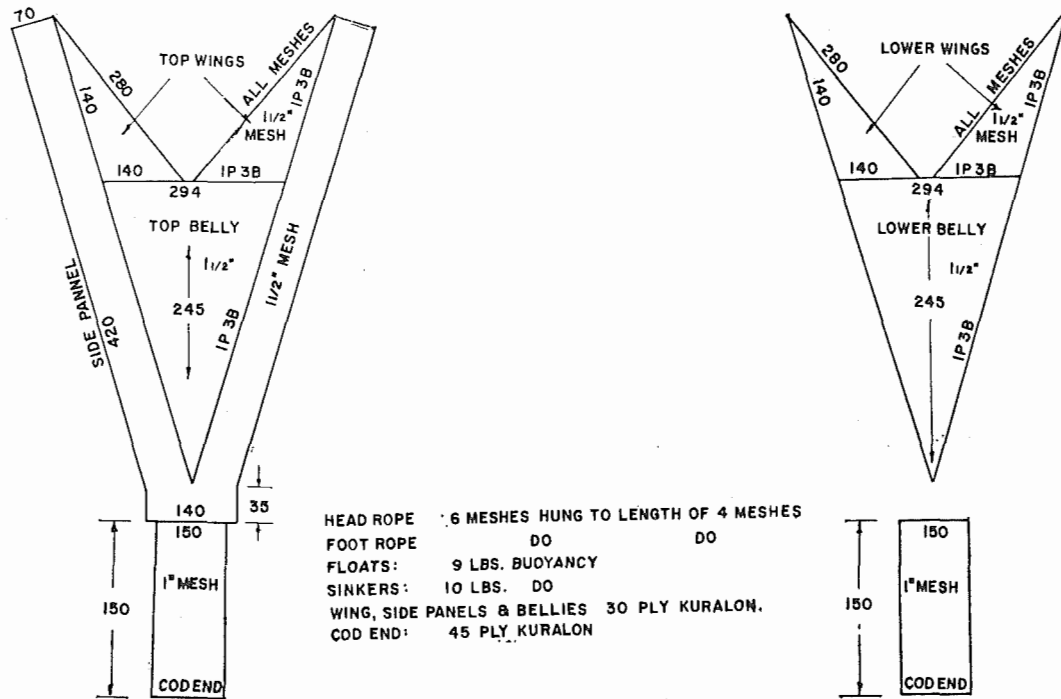


Fig. 2.—Plan of Yankee Doodle Shrimp Trawl—40ft. Head Lines.

The design of the "Yankee Doodle" Trawl is illustrated in Fig. 2. Methods of fabricating the wings and bellies of this trawl are illustrated in Figs. 3 and 4.

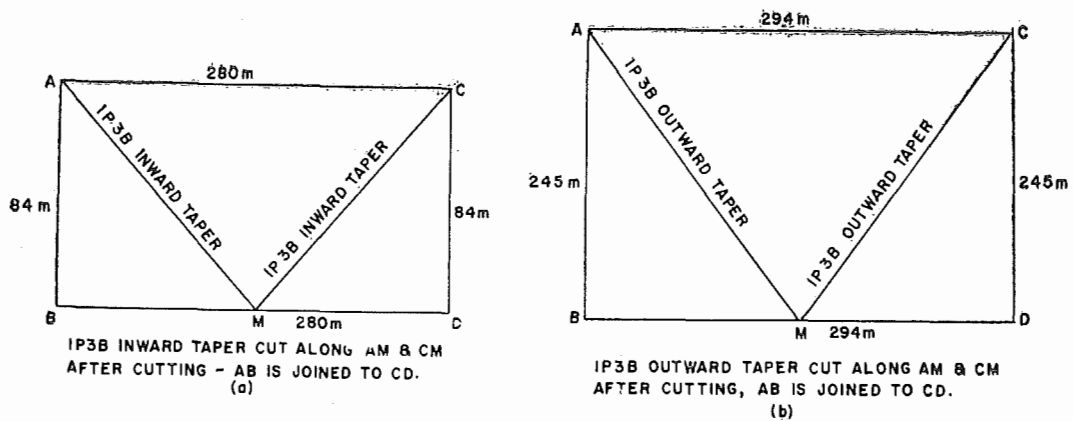


Fig. 3.—Construction of (a) Wings and (b) Bellies of Yankee Doodle Trawl.

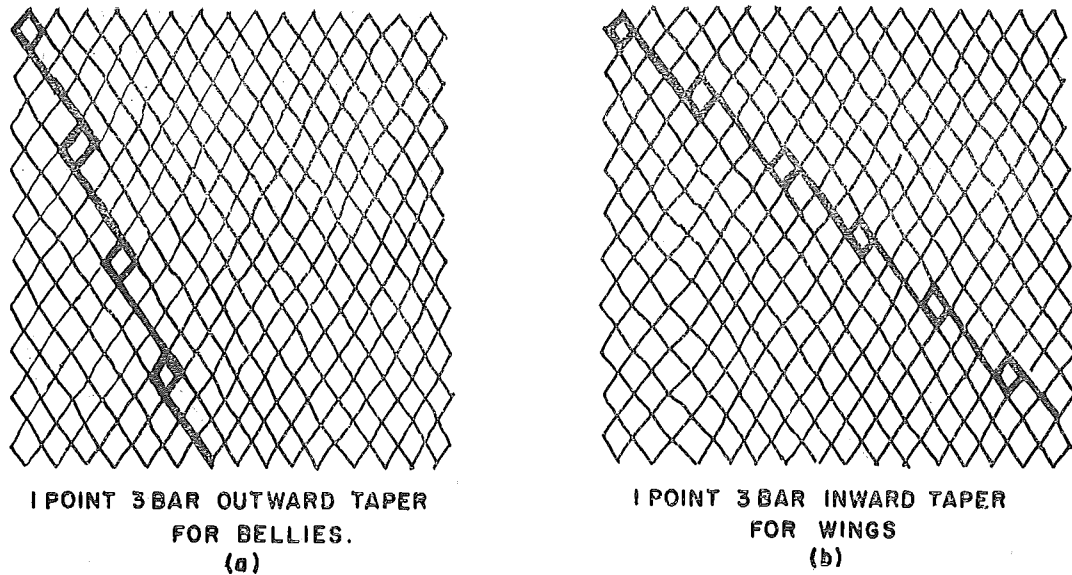


Fig. 4.—Method of cutting out (a) bellies and (b) wings of “Yankee Doodle Trawl”.

### COMPARATIVE FISHING TRIALS

Comparative fishing trials with the two designs of trawls in association with the same type of otter door ( $5' \times 2\frac{1}{2}'$ ) were conducted on the same fishing grounds off Pesalai and the results are tabulated in Table I below. The towing speed was regulated at 2 knots.

TABLE I

Results of Experimental Trawling Operations with Balloon Trawl and Yankee Doodle Trawl

<i>Balloon Trawl</i>		<i>Yankee Doodle Trawl</i>	
<i>Fishing Time</i>	<i>Catch lbs.</i>	<i>Fishing Time</i>	<i>Catch lbs.</i>
2 hrs. 50 mins.	847	2 hrs. 50 mins.	2,567
5 hrs.	1,369	5 hrs.	2,194
4 hrs.	918	4 hrs.	2,184
4 hrs.	359	4 hrs.	3,130
5 hrs.	1,343	4 hrs.	2,748
4 hrs.	968	4 hrs.	2,101
5 hrs.	1,274	5 hrs.	3,556
6 hrs.	1,969	4 hrs.	1,867
<hr/> 35 hrs. 50 mins. <hr/>	<hr/> 9,047 <hr/>	<hr/> 32 hrs. 50 mins. <hr/>	<hr/> 20,087 <hr/>

Av. Catch per hour : 252 lbs.

Av. Catch per hour : 618 lbs.

It is clear that the “Yankee Doodle” Trawl fished much more efficiently than the Balloon Trawl.

### ACKNOWLEDGEMENTS

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### REFERENCES

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