

SOME OBSERVATIONS ON THE PERFORMANCE OF 10.5 m MID-WATER TRAWL OPERATED OFF VERAVAL

T. M. SIVAN, S. D. DESHPANDE AND S. V. S. RAMARAO

Central Institute of Fisheries Technology, Sub-station, Veraval, Gujarat State

The communication presents the results of fishing trials conducted off Veraval with a 10.5 m four-seam unequal paneled mid-water trawl with vertically curved otter boards. The design and structural details of net and otter boards are described in detail. Particulars such as the fish caught during experimentation, horizontal spread of the net as well as towing resistance offered in action are also incorporated.

INTRODUCTION

Though much work has been done abroad to increase the vertical opening of otter trawls for capture of fishes swimming above the sea bed or in the column region (Larsson, 1952; Barraclough and Jonson, 1956; Takayama and Koyama, 1959; Okonski and Sadowski, 1959; Phillips, 1959; Catasta, 1959; Sand, 1959; Benyami, 1959; Burgess, 1964; Garner, 1965 and 1966; Kawakami, 1965 and Hunter, 1965), very little has been done in this country to introduce new designs of trawls for capture of off bottom fishes. Perumal (1966) and Varghese *et al* (1968) communicated the results of their experiments with a floating trawl and trawl with bulged belly respectively placing more stress on the under-water performance of the gear. Attempts were therefore made to assess the suitability of an altogether new design

of otter trawl. Field trials with this new net were initiated during the first half of 1967 and the catch obtained has been considered as the main criterion of its performance. The results obtained along with other noteworthy features of the fishing operations are presented here.

PERIOD OF OPERATION, FISHING GROUND, MATERIALS AND METHODS

Field trials with the net were carried out during the period from 2-5-1967 to 12-5-1967 employing investigational fishing vessel 'Fishtech No. IV', particulars of which are given elsewhere (Deshpande and Kartha, 1964). In all 50 hauls of 48 hours 40 minutes total duration were taken at depths ranging from 22.5 to 38 m. The grounds explored were within 70° 5' to 70° 22'E Longitude and 20° 50' to 21° 5'N Latitude. Actual fishing operations with

10.5M. FOUR SEAM MIDWATER TRAWL.

10.5 m trawl were carried out by operating the net either off bottom or in the column region employing 1:5 as the depth-warp ratio and 3 knots per hour as the trawling speed.

10.5 m nylon, four-seam, unequal paneled trawl net (Fig 1) and Japanese vertical curved otter boards (Fig 2) were engaged for carrying out the field studies. Full particulars of the accessory gear used during the course of these trials are given in Table I.

RESULTS AND DISCUSSION

Details of fish landed during the course of present studies are presented in Table II. It would be obvious from Table II that 2939.75 kg of fish and 9 kg of prawns were landed by the net during the period of present studies. The average catch per hour of trawling when worked out comes to 61 kg.

To determine the varieties of fishes caught by 10.5 m mid-water trawl, the

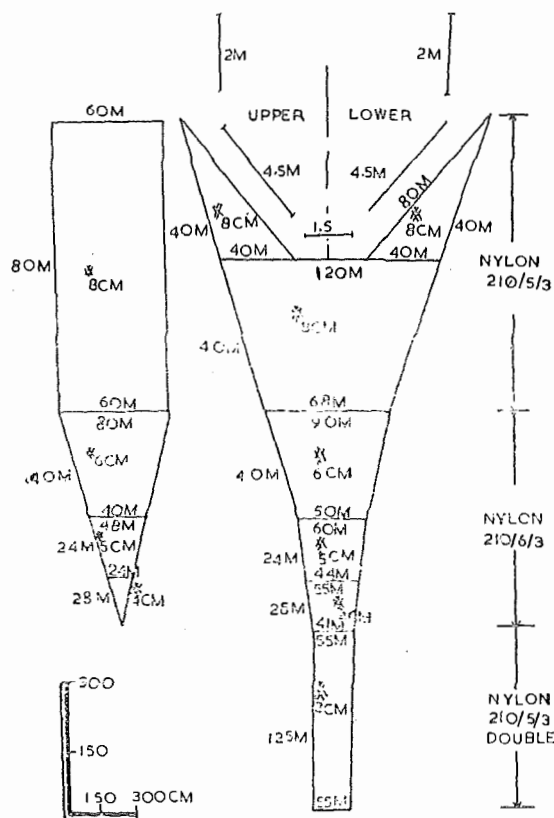


Fig 1. Constructional details of 10.5m mid-water trawl.

VERTICAL CURVED OTTER BOARD.

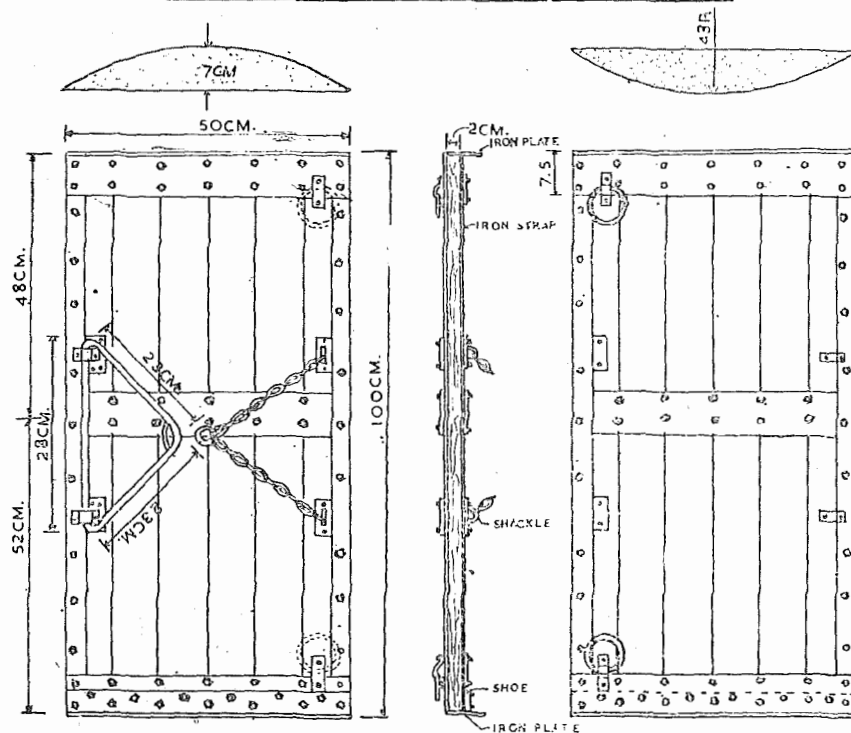


Fig 2. Design details of vertical curved otter boards.

TABLE I PARTICULARS OF ACCESSORY GEAR

Head-rope	:	Manila, 10.5m Dia: 12.7 mm.
Foot-rope	:	Manila, 10.5m Dia: 12.7 mm.
Sweeps:-		
Head-rope	:	Manila, 12 m Dia: 12.7 mm.
Foot-rope	:	Manila, 12 m Dia: 12.7 mm.
Floats	:	9, Spherical, Alum- inium alloy, Dia : 10.16 cm.
Total extra-buoy- ancy along the		
Head-rope	:	3.6 kg.
Total weight along the Foot-rope	:	6 kg (570 g/m.)
Particulars of Otter boards:-		
Type	:	Vertical curved
Size	:	100 cm x 50 cm.
Thickness	:	20 mm.
Weight in air	:	25 kg each.

catch landed during each haul was sorted out, weighed and recorded. The data are presented in Table III.

It would be evident from Table III that Sciaenids constituted about 38% of

the total catch followed by Indian salmon (21.7%) and lactarius (16.3%). The remaining catch of 24% was accounted by the other varieties landed by the gear.

HORIZONTAL SPREAD AND TOWING RESISTANCE

Horizontal spread between two otter boards in action was recorded during each haul following the method described by Benyami (*op cit.*) and Deshpande (1960). The information gathered indicated that the average horizontal distance between two boards in action was 17.15 m which in turn worked out to 50% of the head-rope length including sweeps. The towing resistance offered by the entire gear while in operation was recorded with the help of a tension meter (Satyanarayana and Nair, 1965). The resistance was 476 kg as the total tension of the underwater gear including warps.

ACKNOWLEDGEMENT

The authors are grateful to Shri G. K. Kuriyan, Director-in-Charge, Central Institute of Fisheries Technology; Ernakulam, for his keen interest and helpful suggestions.

TABLE II PARTICULARS OF FISHING OPERATION

Date	Depth of water (m)	Length of warp (m)	Speed per hour (knots)	Total no of hauls	Total duration of hauls			Catch in kg.			Catch per hour (kg)
					Hrs	—	Mnts	Prawn	Fish	Total	
2-5-67	36	180	3	6	4	—	40	...	678.75	678.75	145.87
4-5-67	38	189	„	5	5	—	00	...	176.50	176.50	35.30
5-5-67	29	126	„	6	6	—	00	...	221.00	221.00	36.85
6-5-67	25	„	„	5	5	—	00	...	156.00	156.00	31.50
8-5-67	„	„	„	6	6	—	00	...	471.00	471.00	78.58
9-5-67	„	„	„	„	6	—	00	...	330.00	330.00	55.04
10-5-67	24.5	121.5	„	„	6	—	00	...	261.00	261.00	45.16
11-5-67	23	117	„	„	6	—	00	8	497.00	505.00	84.16
12-5-67	„	„	„	4	4	—	00	1	147.50	148.50	37.12
Total & Average	...	...	...	50	48	—	40	9	2939.75	2948.75	61.06

TABLE III PARTICULARS OF VARIETIES
OF FISH CAUGHT

Name of fish	Total catch (kg)	%
Cuttle fish (<i>Loligo sp.</i>)	6.50	0.22
Silver belly (<i>Leiognathus sp.</i>)	7.50	0.26
Cat fish (<i>Arius sp.</i>)	43.50	1.48
Silverbar (<i>Chiro- centrus dorab</i>)	15.50	0.52
Anchoviella (<i>Engraulis sp.</i>)	58.50	1.70
Rays (<i>Rhinoptera sp.</i>)	220.00	7.47
White fish (<i>Lactarius sp.</i>)	479.50	16.26
Lobster (<i>Panulirus sp.</i>)	12.75	0.43
Kati (<i>Pellona elongata</i>)	15.50	0.52
Indian Salmon (<i>Polynemids</i>)	642.00	21.70
Eels (<i>Muraena sp.</i>)	76.00	2.58
Koth (<i>Otolithoides brunneus</i>)	27.00	0.92
Sciaenids (<i>Otolithus sp.</i>)	1109.50	37.63
Caranx (<i>Caranx sp.</i>)	45.50	1.55
Ribbon fish (<i>Trichiurus savala</i>)	127.00	4.31
Silver-pomfret (<i>Pampus argenteus</i>)	15.50	0.52
Moon fish (<i>Drepane punctata</i>)	12.50	0.42
Prawn (<i>Metapenaeus sp.</i>)	9.00	0.30
Golden Anchovy (<i>Coilia dussumieri</i>)	3.75	0.13
Miscellaneous ...	31.75	1.08
TOTAL	2948.75	100.00

REFERENCES

- Benyami, M. 1959 *Modern fishing gear of the world*, Fishing News (Books) Ltd., London. 213-221.
- Burgess 1964 *Fishing News International*, 3; 351-352.
- Barraclough, A.E. and Jonson, W.W. 1956 *Bull. Fish. Res. Bd. Canada*, No. 104; 25.
- Catasta, L. 1959 *Modern Fishing Gear of the World*, Fishing News (Books) Ltd., London, 251-253.
- Deshpande, S. D. 1960 *Indian, J. Fish.*, VII(2), 458-470.
- Deshpande, S. D. and Kartha, K. N. 1964 *I. P. F. C. Proc.*, Sec. II(2), 184-190.
- Garner, J. 1965 *World Fishing*, 14(1), 51-53.
- 1966 *Ibid*, 15(7), 42-43.
- Hunter C. J. 1965 *Com. Fish Rev.*, 27, 1-9.
- Larsson, K. H. 1952 *Fishing News No. 2067* Fine Technical publication Ltd., 9 Noting St., London.
- Nakasai, K. and Kawakami, T. 1965 *Bull Jap. Soc. Sci. Fish.*, 31(4).
- Okonski S. and Sadowski S. 1959 *Modern Fishing Gear of the World* Fishing News (Books) Ltd., London, 196-198.
- Phillips, J. 1959 *Ibid.*, 200-203.
- Perumal, M. C. 1956 *Fish Technol*, 3(1) 72-80.
- Satyanarayana, A. V. V. and Nair, R. S. 1965 *Res. & Ind.*, 10(8), 229.
- Sand, R. F. 1959 *Modern Fishing Gear of the World*, Fishing News (Books) Ltd., London. 209-212.
- Takayama, S. and Koyama, T. 1959 *Ibid.*, 185-193.
- Varghese, C. P., Vijayan, V. and Kuriyan, G. K. 1968 *Fish. Technol.*, 5(1), 9-14.