

1985-096

ASSISTANCE WITH THE DEVELOPMENT OF A FISHERY FOR
SKIPJACK TUNA
OFF THE SOUTH COAST OF WESTERN AUSTRALIA
(FIRTA 85/96)

REPORT BY J P ROBINS

ON BEHALF OF
FISHERIES DEPARTMENT
WESTERN AUSTRALIA

6 NOVEMBER 1987

CONTENTS

1. Introduction
2. Programme Strategy
3. Results
4. Conclusions
5. Appendix - Net plans and specifications
6. References

1. Introduction

The aim of this project was to ascertain whether a viable fishery could be developed off the south coast of Western Australia for skipjack tuna using the gillnet method of capture.

Initially it was considered only as a potential opportunistic fishery, supplementary to the southern bluefin tuna fishery as well as the shark fishery. The proposal to determine the potential for gillnetting skipjack derived from the desire of Fishermen's Associations whose members had been displaced from the fishery for southern bluefin tuna, when catch quotas were imposed, to diversify into another mode of fishing.

Assistance was sought from and granted by the Fishing Industry Research Committee in 1985/86 to assist three south coast professional fishermen's associations to examine the feasibility of gillnet fishing for skipjack.

Funds amounting to \$35,000 were granted for the project. These moneys were to be expended for nets (\$15,000), aerial spotting (\$15,000) supervisory and other expenses (\$5,000). However due to the resignation by the proposed programme supervisor, Dr M Walker of the W A Department of Fisheries, FIRC gave permission for the project to be held over to 1986/87.

In the meantime acquisition from Japan of two fully made up gillnets and sufficient net material for an experimental net to be constructed by officers of the Department of Fisheries was effected. This was completed in early 1987.

Again after the resignation of the senior technical officer of the Development Section of the Department in October 1986, Mr J Robins was approached by the Department to supervise the project on a consultancy basis and to assist in the compilation of the final report.

2. Programme Strategy

Gillnetting, depending on net size, is a simple method of fishing where by the net is "set" over the stern of the fishing vessel, allowing for direction of wind, current and fish behaviour so that configuration of the net in the water allows for fish capture and easy recovery of the net.

Various methods of handling the net can be adopted -

- (i) by use of a powered net drum
- (ii) by use of a power block and "flaking" the net on deck
- (iii) by hand-hauling and "flaking" the net on deck.

Due to (1) the lengths (ca 500 m) and depths (22 m) of the two ready made nets as well as the variation in mesh sizes of the experimental net (see net specifications) and (2) the availability of vessels fitted with suitable handling equipment it was decided that, as a first approach, only vessels with shark net "shooting" and hauling reels would be appropriate for use in this feasibility study and the choice of shark fishing vessels with reels was made accordingly.

As no funds were made available for vessel charter, defrayment of vessel running costs etc. the number of applicants were few because of their need to earn an income in their particular fishery.

Thus the effort to be directed to gillnetting would be on an opportunistic basis ie. fishing by gillnet would only take place when skipjack were sighted in quantity in an area where the fisherman was carrying out his usual fishing activity.

Two fishermen members, of the Tunaboat Owners Association of Western Australia, based in Albany and one member of the South West Licensed Fishermen's Association (Augusta Branch) participated in the programme.

The nets were delivered to Albany from where they were distributed to the participating fishermen in Albany and to the Augusta based fisherman.

The two Japanese made-up nets were allocated to the Albany fishermen in mid-February 1987, and the experimental combination mesh size mono- and multifilament net to the fisherman in Augusta.

Sketches and specifications of nets (Appendix) were given to each of the fishermen as well as log books. For guidance in fishing techniques, descriptive papers on experimental gillnet fishing for skipjack in Hawaii in 1951 (Matsumoto) and off Lakes Entrance (Victoria) in early 1963 (Temple) were also distributed.

The behaviour patterns of skipjack in relation to gillnets as described in the fishery experiments off Lakes Entrance in 1963 were emphasised to the fishermen.

After discussion with the participating fishermen it was decided that the use of a spotting plane would only be required after they became familiar with use of the nets and successful capture of the skipjack. In the interim period they would rely on other fishermen along the south coast to report the positions of occurrence of schools of skipjack during the period.

It was agreed that experimental fishing by gillnet by the participants would be prosecuted on an opportunistic basis with aerial spotting as required during the period February to May inclusive.

4. Results

Only two of the three nets distributed were placed aboard the vessels.

Because of its multimesh structure and varying hanging ratios the combination mono and multifilament net proved to be too difficult to handle from the shark net reel and no further effort was made to use it after the first "shot" which was aborted when net over-run on the reel caused problems.

The nylon monofilament, 154 mm mesh size gillnet placed aboard one of the Albany-based vessels was used four times during March 1987 in the area between Eclipse Island and Cape Riche at no distance greater than nine miles offshore.

The nets were set on visually observed schools of skipjack without successful capture. The sets were made in moderate seas on each occasion and wind speeds ranged between five and ten knots.

The weight of the fish within the schools in these fishing trials during March were estimated to range between two and four kilogrammes.

Reports from a bluefin tuna fisherman operating in the western part of the Great Australian Bight indicated the size of the skipjack in that area during the period March to May were small (ca. 2 kg) but the school occurrences were estimated to amount to "thousands of tonnes".

After these fishing trials the skipjack did not occur in large schools in the Albany area and the experiment was terminated.

During the trials the fisherman experienced problems with stowing the deep (22 m) net on the drum and stated that he wish to try once again in the period December 1987-February 1988 when it is known that schools of larger sized skipjack (up to 6 kg) occur in the Albany area. Further his net handling technique would be altered to the extent that the net reel would be used for hauling but not stowing the net, which would be "flaked" on deck. This procedure would obviate the problem of the net "bellying" on the drum which causes over-run when "shooting" and hauling and would allow for an uncomplicated operation.

5. Conclusions

- (1) Adoption of the fishing techniques used in the Lakes Entrance experimental fishing operation, in 1963, could prove productive in any future experimental fishing.
- (2) Clear water appears to militate against skipjack capture for it is considered that the fish see the net and avoid it. This opinion was expressed also by

the Albany fisherman and was also suggested as a cause for the poor results obtained during the gillnet fishing experiments carried out in waters around the Hawaiian Islands in 1951.

- (3) It is impossible to make a firm judgement on the potential of this fishing method for skipjack capture because of the very limited effort expended in this experiment.

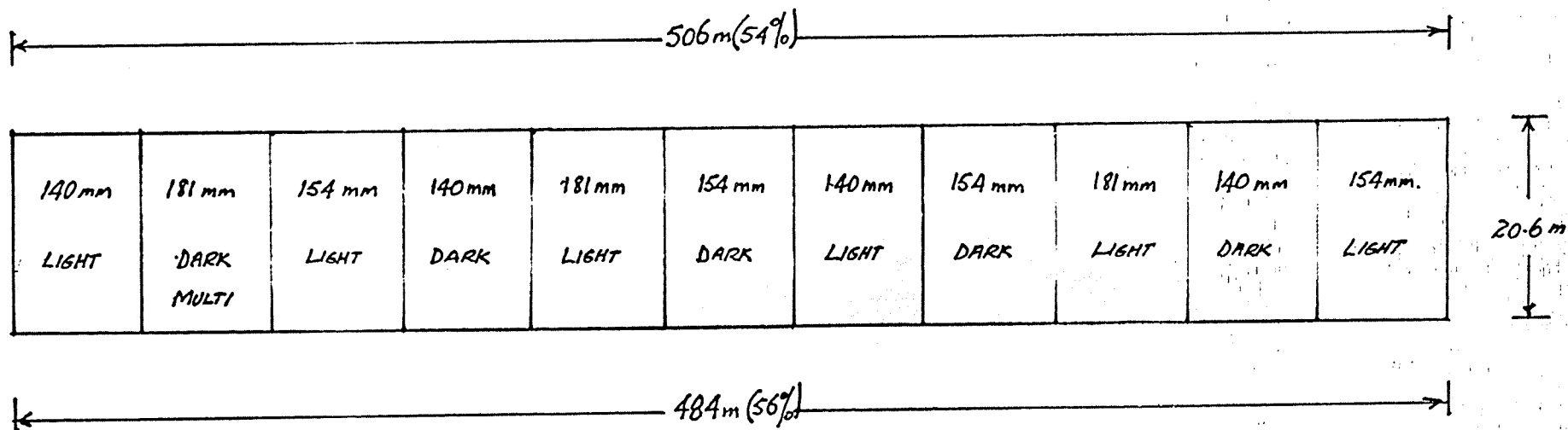
References

- 1952 Matsumoto, Walter M. - Experimental Surface Gill Net Fishing for Skipjack (*Katsuwonus pelamis*) in Hawaiian Waters - Special Scientific Report : Fisheries No. 90. US Fish and Wildlife Service.
- 1963 Temple, Alan - Monofilament netting of Striped Tuna. Fish. Newsl 22(6), June, 1963.
- 1963 Temple, Alan - Latest on monofilament netting of Tuna. Fish. Newsl. 22(7), July 1963.

EXPERIMENTAL SKIPJACK TUNA DRIFT GILL NET.

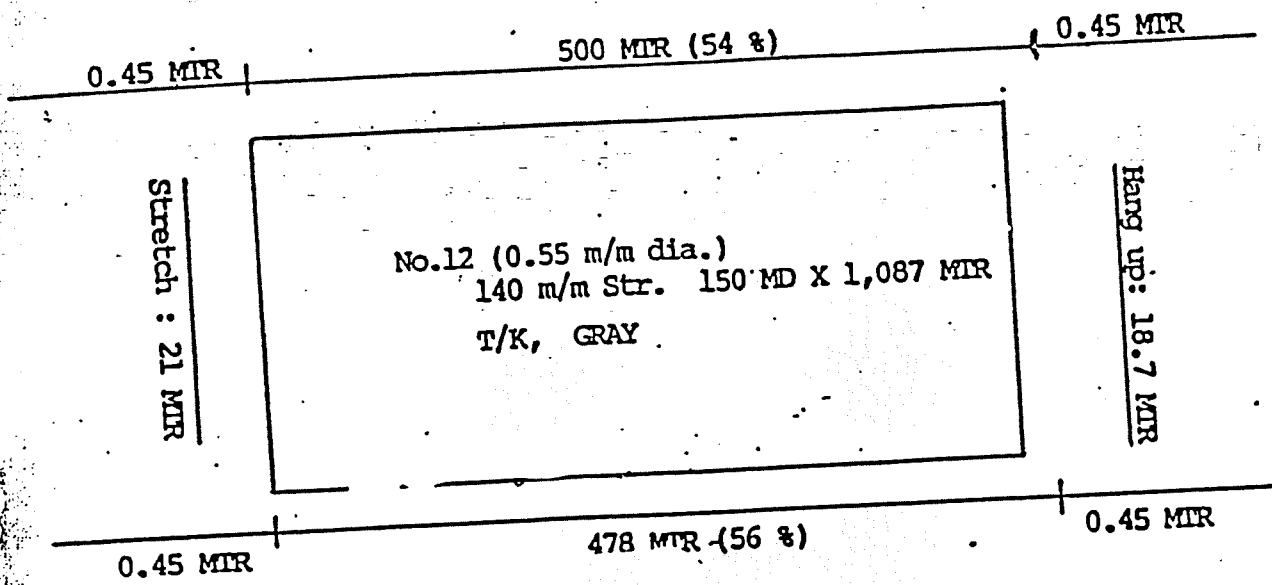
NETTING

2 PANELS - 140 mm x 100m x 165 md - monofilament - colour light
 " " " " " " " " " dark
 " " 154 " " 150 md " " light
 " " " " " " " " " dark
 " " 181 " " 128 md " " light
 / " " " " " " multifilament " dark



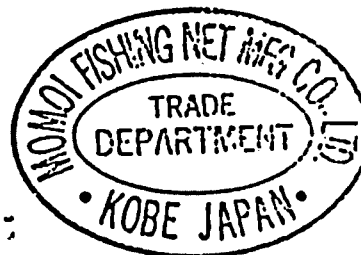
FLOATS, HEADLINE & LEADLINE AS PER PLANS 8507-5#6.

Drift Gill Net For Tuna And Skipjack
(140 m/m Type)

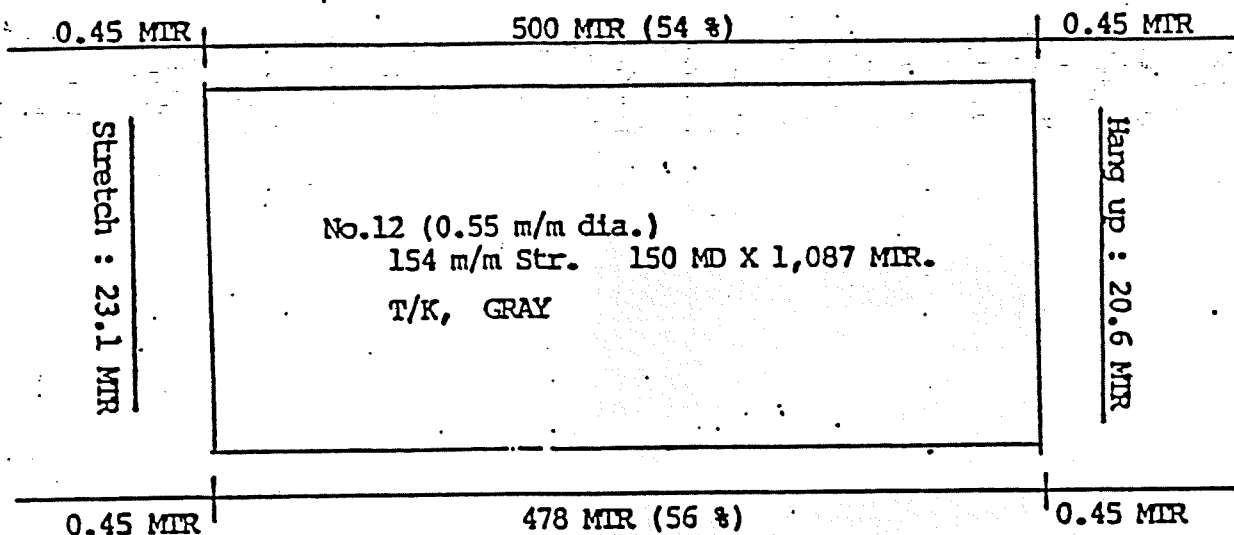


Materials:

- Netting : Triple knot
 Nylon No.12 (0.55 m/m dia.) 1 pc.
 140 m/m Str. 150 MD X 1,087 MTR.
- Float Line:
 P.P. Rope, About 7.0 m/m dia. Z_3 X 501 Mtr. 1 coil.
 P.P. Rope, " " S_3 X 501 Mtr. 1 coil.
- Lead Line:
 P.P. Lead Core Rope, About 9.5 m/m dia. Z_3 X 479 Mtr. 1 coil.
 (Lead Core: 57 gr/mtr.)
 P.P. Lead Core Rope, About 9.5 m/m dia. S_3 X 479 Mtr. 1 coil.
 (Lead Core: 57 gr/mtr.)
- Float: Naigai No.3 (Buoyancy: 266 gr/pc, 202 m/mL X 60 m/mW.) 478 pcs.
- Twine: Hanging Twine: Spun Nylon 10S¹/30L₃ 5.8 kg.
 Mounting Twine: Vinyon 20S¹/48L₃ 5.8 kg.



Drift Gill Net For Tuna And Skipjack
(154 m/m Type),

Materials:

Netting: Triple knot		
Nylon No.12 (0.55 m/m dia.)		
154 m/m Str. 150 MD X 1,087 MIR.		1 pc.
Float Line:		
P.P. Rope, About 7.0 m/m dia. Z ₃ X 501 mtr.		1 coil.
P.P. Rope, " S ₃ X 501 mtr.		1 coil.
Lead Line:		
P.P. Lead Core Rope, About 9.5 m/m dia. Z ₃ X 479 mtr.		1 coil.
(Lead Core: 57 gr/mtr.)		
P.P. Lead Core Rope, About 9.5 m/m dia. S ₃ X 479 mtr.		1 coil.
(Lead Core: 57 gr/mtr.)		
Float: Naigai No.3 (Buoyancy: 266 gr/pc, 202 m/mL X 60 m/m ²)		479 pcs.
Twine: Hanging Twine: Spun Nylon 10S'/30L ₃		5.8 kg.
Mounting Twine: Vinyon 20S'/48L ₃		5.8 kg.

