PESCA Funded Fisheries Trials - Deep Water Netting Trials

Consultancy Report No. CR123

May 1998

The Sea Fish Industry Authority

Seafish Technology

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Summary

Trials with deep water specification monk tangle nets were carried out on board the MFV *Siarach II* over a 15 day period.

Fleets containing 25 x 30m nets were shot at depths ranging from 74 fathoms to 210 fathoms. Soak times varied between 48 hours and 144 hours.

Species composition is reported in weight and by catch rates.

The trial was of a limited nature and insufficient data was obtained in order to make definitive conclusion. Further trials are therefore necessary, however there was a feeling by the researchers that such a fishery could be viable.

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1 INTRODUCTION

The Authority was requested by the Western Isles Island's Council to supervise various PESCA funded trials in June 1996. One of these trials was to investigate the feasibility of netting in deep water west of St. Kilda and to asses the economic potential for such a fishery.

This project is part financed by the European Union under the Western Isles PESCA programme.

Netting for dogfish by Western Isles vessels already occurs to the west of the Hebrides and the aim of this trial was to explore the possibility of netting in two or three deep-water locations off St. Kilda at different depths.

The objectives of the trial were to investigate catch rates, species composition, levels of by-catch and financial returns. The main target species was monk fish (*Lophius piscatorius).*

2 MATERIALS AND METHODS

The vessel used for the trials was the Stornoway based MFV *Siarach II* (SY85) which was built in 1989 and has specifications of:

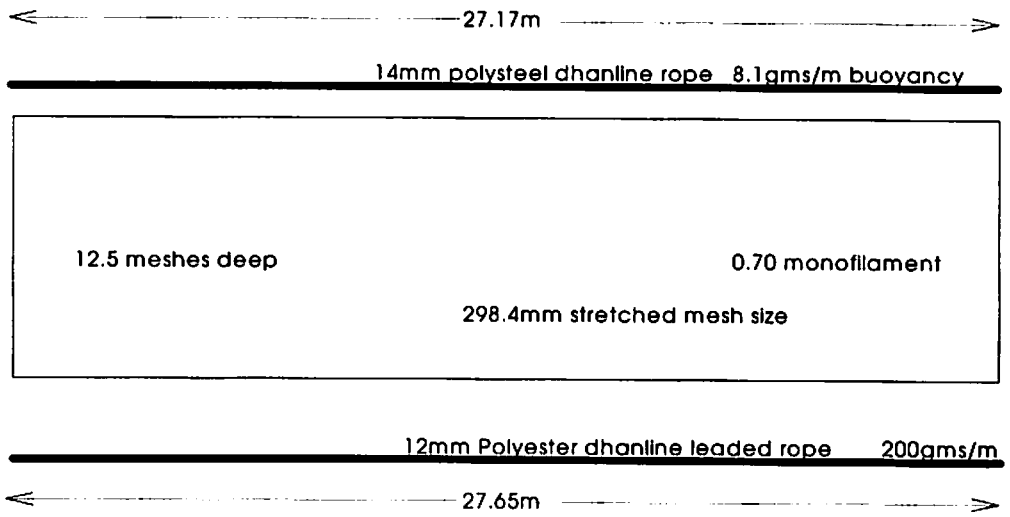
Registered Length:	14.38m
Gross Tonnage:	28.5t
Power:	149kW

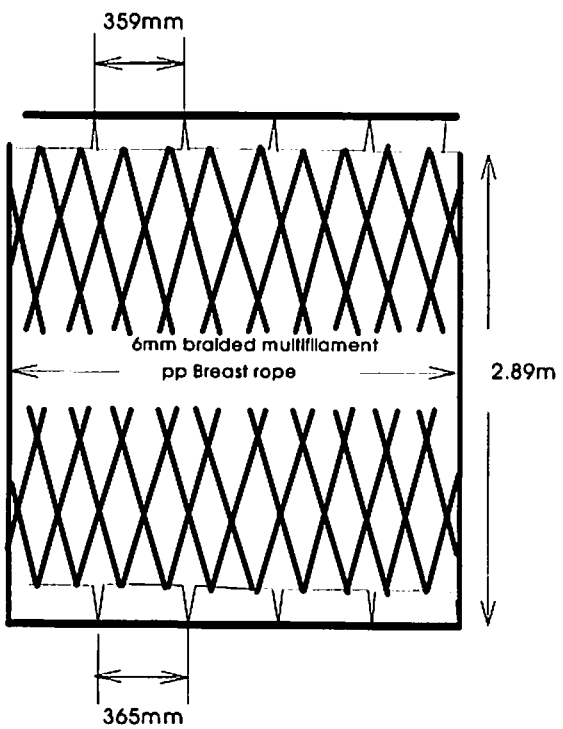
The winch was a Hydema Maxi-Net HMN 10 with a pull of 230lbs and a speed of 60rpm enabling it to heave at 197ft per minute.

2.1 Gear specification.

The nets used during the trials were Norwegian deep water monk nets (Figure 1) made up into five fleets of 25 nets. The anchor was made up from eight steel bars approximately 450mm long, with small teeth and lashed together with rope. The rope used between the anchor and the bridles was 55m in length and the bridles were 18.3m and 20.2m long. A 14" pellet was used in place of a dahn flag and was connected to the anchor with 14mm blue steel rope at a ratio of 2:1 the depth of water shot in.

Figure 1: Deep water monk net specification.





E=0.33

4 MESHES/STAPLE

E=0.32

S.F.I.A.	DEEP WATER MONK NETS
type:Monofilament	date:02/6/97

2.2 Gear deployment and hauling

Single fleets of nets were shot in different locations (see Table 1) to the west and east of St. Kilda in depths of water ranging from 74 fathoms (135m) to 210 fathoms (384m). Soak times varied considerably between 48 hours and 144 hours due to inclement weather preventing the vessel from going out to the nets.

Table 1: Net deployment and soak times.

Position - Fleet I.D.	Depth(fathoms)	Depth (m)	Soak time(hrs)
58 16'N 8 05'W - a	74	135	84
58 19'N 8 54'W - b	170	310	84
58 12'N 9 01'W - c	145	265	48
58 13'N 8 36'W - d	120	219	48
58 17'N 8 57'W - e	160	292	120
58 20'N 8 59'W - f	184	336	48
58 01'N 9 28'W - g	210	384	144
58 12'N 9 01'W - h	145	265	130
58 15'N 8 59'W - i	150	274	Lost

The gear was shot over the stern of the vessel whilst steaming at 7 knots. The gear streamed out easily with few problems. The lack of weight (anchor and ground line) meant that the nets took quite a long time to settle and in some instances settled on the sea bed up to 0.5 nautical miles away from the position it was shot from the vessel.

The hauling procedure took an average of 40 minutes and presented few problems. The nets however almost always came aboard with the netting rolled up on the headline. This caused significant problems such that it could take as long as two and a half hours to clear the gear to make it ready for shooting away again.

3 RESULTS

3.1 Catch composition

The catches were usually made up of three main species:

- Monk fish *(Lophius piscatorius)*
- Skate *(Raja nidarosiensis)*
- Crab *(Paramola cuvieri)*

None of the other species caught were present in large numbers. They were:

Cod *(Gadus morhua)*, Ling *(Molva molva)*, Turbot *(Scophthalmus maximus)*, Tusk *(Brosme brosme)* and brown crab *(Cancer pagurus)*.

The catches were logged against each haul and can be seen in Table 2.

Table 2 Catch composition.
Fleet size - 25 nets at 30m/net ≈ 750m of net fishing.

Fleet ID	Soak time (Hrs)	Monk (Kgs)	Skate (Kgs)	Ling (No)	Brown crab (No.)	Crab *(Paramola cuvieri)* (No.)	Other	Carcases
a	84	1	196	1	38	0	cod, turbot	3*
b	84	87	174	2	5	16	0	31
c(50nets)	48	89	0	2	3.	0	turbot	4*
d	48	32	0	1	0	8	0	0
e	120	86	7	1	0	10	0	19
f	48	8	48	0	2 No.	7	tusk	14
g	144	28	48	2	0	18	0	55**
h	130	61	1	2	0	8	cod, turbot	7*
i(lost)	-	-	-	-	-	-	-	-

* These carcases were due to the fish rotting - no lice present
** 50% were rotten and 50% had lice present

There were two species caught which have not as yet been identified. One was a small shark measuring 870mm and similar in appearance to a small blue shark. The other was a member of the crab family similar in size and shape to the brown crab but with distinctive orange spots on its carapace.

The most significant feature of the catches was the number of carcases found in the nets. These were quite literally just a series of bones with no flesh or skin left. On each occasion when the nets came aboard containing skeletons, there was a significant amount of as yet unidentified sea lice present in the nets and on other fish. No lice were present on fish caught in depths less then 145 fathoms (265m). It appears that the lice attack the fish as soon as it dies or is captured and the longer a net is down the more fish are attacked. Unfortunately the nets fished better the longer they were left and 48 hours would be the minimum soak time required with 72 hours being the preferred.

There was very little by-catch of brown crab in depths greater then 100 fathoms (182m) where it was replaced by the crab (*paramola cuvieri*). It is not thought that this species would have any commercial prospects although it is edible with a strong and distinctive flavour.

3.2 Catch rates.

Using a base line of 24 hours soak time and a fleet length of 25 nets (750m), the catch rates for the two main species can be seen in Table 3.

Table 3: Catch Rates for Monk and skate.

Catch rates quoted are rounded kg per 24 hours soak per fleet (25 nets/750m)

Fleet ID	Monk	Skate
a	< 0.5	56
b	25	50
c	22	0
d	16	0
e	17	1.5
f	4	24
g	4.5	8
h	11.5	< 0.5

Catch rates of monk varied considerably between O.3kg/24hrs/fleet in 74 fathoms (135m) and ~25kg/24hrs/fleet in 170 fathoms (310m). Catch rates of skate were erratic and probably area rather then depth specific. They varied between 0kg/24hrs/fleet in 120 fathoms (219m) and 145 fathoms (265m) and ~50kg/24hrs/fleet and 56kg/24hrs/fleet in 74 fathoms (135m) and 170 fathoms (310m) respectively. There is very little market interest in the larger skates in the west of Scotland so they have little impact on the commercial viability of deep water netting in this area.

4 CONCLUSIONS AND RECOMMENDATIONS

The principal area of interest to consider when assessing the feasibility of netting in the deep water to the west of Scotland is the economic viability of the operations. When considering this there are certain aspects of the operations that are vital to the overall success of such a venture:

i) Gear requirements.

ii) Vessel requirements.

iii) Catch composition, quality and quantity.

4.1 Gear requirements.

The nets used during this trial were, with a few modifications, adequate for the task. The modifications needed are simple to implement. There is a need to ensure that the float line has been run out sufficiently to reduce the rolling up of the net around the headline. A second headline should also be added to further alleviate the problem. There is a requirement for more weight to be used on the ground gear to increase the sinking rate of the gear. This is essential if there is a need for accurate gear placement. Fleet lengths would need to be increased to around 30 nets giving a fleet length of around 900m.

Based on catch rates encountered during the trials at least 10 fleets per day would need to be lifted. A soak time of 72 hours is thought to be ideal and therefore there would be a requirement to have around 30 fleets fishing in the water at any one time. This involves a very high initial capital outlay and would be a barrier to many vessels. One method of being able to reduce the amount of netting in the water would be to land fish every two days.

4.2 Vessel requirements.

The type of vessel used in these operations is a very important consideration. The exposed waters of Western Scotland can produce fierce and at times unexpected storms with heavy ocean swells. Any vessel fishing in these areas would need to be able to first of all stay out and patrol its nets and be able to ride out any bad weather. The vessel would have a shelter deck and sufficient deck space to be able to turn over a large amount of nets. It would be preferable for the vessel to be geared up for netting alone which would enable all potential snagging areas(items such as blocks, shackles etc. which easily catch up monofilament netting) to be eliminated. This allows much easier and faster handling of the gear, thus enabling the vessel to work more nets.

4.3 Catch composition quality and quantity.

The area used for fishing in these trials was relatively small but did show some potential for further development. The catch composition from a financial point of view was very good, consisting of monk, skate, ling and an as yet unidentified species of crab. From a resource point of view there were no fish caught below the minimum landing size of all the species encountered.

The principal problem in the area fished, is the presence of large numbers of sea lice. At times a large proportion of the catch was destroyed leaving only bones that were identified as monk, ling and possibly hake. Along with losing fish through prolonged exposure to the water after capture, these parasites would seem to pose the biggest threat to catch quality.

It should be noted that this exercise was of a very limited nature, taking place in a small area approximately 32 miles west of St. Kilda. The data gathered was also of such a limited nature and rigorous analysis was not possible. Being severely constrained by time and vessel size, it was not possible to carry out a rigorous experimental design. Limited hauls provided a limited amount of fish leading, inevitably to poor quantitative data. More time and effort is required to be employed to gather further data which would necessitate funding to be sourced to explore this fishery further. The instinctive feeling was that deep water netting for monk fish and other species could be a viable proposition. Quota allocations would have to be taken into consideration when assessing the economic aspect of this type of fishing.