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Retrieval of Lost Gillnets at Ilulissat Kangia.

by

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Introduction.

During the last decade an unknown number of gillnets have been lost, on the traditional inshore Greenland halibut fishing grounds in North Greenland. Lost gillnets are supposed to continue fishing (ghost nets) and thereby causeing unnecessery losses to the local stock. In addition lost gillnets are a nuisance for other fishermen, who often loose their fishing gears when these are caught in the 'ghost nets'. Anecdotes from local fishermen in Greenland tells how the fish change behavior in areas with many 'ghost nets', and simply leave these areas.

There are many stories told about the effects of lost gillnets, and the point of each single story is very dependend on whether the narrator is an opponent or a supporter of gillnet fishing. However the number of reports about this particular subject is very small, despite the fact that the local authorities often considers a high number of lost gillnets as a problem.

These problems seems to be at a constant state because the materials used in manufacturing gillnets are synthetic, and extremely slow deteriorating in water.

In Greenland gillnets have been used in the Greenland halibut fishery since the middle of 1980s (Boje et. al., 1994), especially in the North Greenland inshore fishing grounds at Ilulissat and Uummannaq (Division 1A). Untill 1989 longlines and gillnets accounted equally for the catches in Division 1A. Since then the proportion of gillnets and longlines has been variable from year to year, and in 1994 gillnet catches comprised 32 % in Division 1A, where 99 % of the inshore catches were taken.

In July and December 1994 the Greenland Homerule Government, Ilulissat municipality and the local union of fishermen made a cooperative gillnet retrieval project at Ilulissat Kangia (fig. 1). The purpose of the project was to clean up lost gillnets from the traditional Greenland halibut fishing grounds off Ilulissat and in the icefjord. Greenland Fisheries Research Institute (GFRI) participated as observer in this retrieval project.

Materials and Methods.

The gillnet retrieval project was conducted in the area just outside Ilulissat, between Nuuaarsuk and Kingitoq, and as far as possible into the Ilulissat Kangia (fig. 2). The survey area was determined from the knowledge of local fishermen, about where the highest number of gillnets have been lost. The net recovery was performed by dredging.

The dredging was mainly conducted from 30-foot fishing vessels, but a small shrimp trawler did participate in the first phase.

There was used one type of grapnel constructed by a steel pipe with barbes welded on with 90° space(fig. 3). The grapnel was constructed in two sizes, one weighing 30 kg, which could be used from small vessels, and the other weighing 60 kg to be used from larger vessels. Every grapnel was equipped with a 16 mm line.

From the recovered gillnets informations were collected about the following items:

a. degree of overgrowth with algae.
b. degree of coiling (horisontal axis).
c. degree of winding (vertical axis).

d. subjective judgement of fishing effectivity (100 %=full effectivity, 75 %=more than half, 25 %=lesser than half, 0%= none).
e. diametre of buoy line(mm).
f. mesh size.
g. number of net sections.

If any catch was present in the recovered nets, the fish were weighed by species, and their stage of freshness was evaluated (fresh, partly degraded, skeletons).

Results.

The project was performed in two phases. In July attempts to dredge in the Kangia was abandoned because of high activity in the glacier, and the effort was concentrated in the area between Kingitoq and Nuuaarsuk (fig. 2). It was therefore decided to try again in December, before the icecover in Kangia and Disko Bay was total. At that time of the year the activity of the glacier is low because of low temperatures. Once again dredging in the icefjord was abandoned, and the area outside Ilulissat, Ilulissat saava, was surveyed again.

In July 67 dredgings were performed while 34 were made in December, which gives a total of 101 dredgings in 7 days (3 days in July and 4 in December). In July three 30-foot fishing vessels used the 30-kg dredge type, while a small shrimp trawler used the 60-kg type. In December four 30-foot vessels used the small dredge type.

The duration of hauls variated between 15 minutes and 8 hours. The surveyed depths were mainly between 170 to 400 m, some hauls went down to 600 m.

A total of 12 gillnets were recovered, which gives 12 % recovery. 8 gillnets (67 %) had a winded vertical axis at recovery and four were extended (table 1). All of the gillnets had a more or less coiled horisontal axis, and none had a full fishing effectivity (table 1).

All gillnets were retrieved from depths between 200 to 350 m. 4 (33 %) of the recovered gillnets had possibly been lost recently because of missing overgrowth with algae, the remaining 8 had clear signs in their appearance that they were lost long time ago.

11 of the gillnets had a mesh size of 110 mm, and 1 had a mesh size of 90 mm. On 11 (92 %) of the gillnets the buoy lines were teared apart, and the last net was recovered intact with the buoies standing just underneath the water surface. The buoy line diametres could only be measured on 5 of the gillnets and were between 4 and 12 mm. Five of the recovered gillnets consisted of 1 net section, three of 2 sections, one of 5 sections, two of 6 sections and one of 8 sections.

Despite the fact that none of the recovered gillnets were evaluated to have retained their full fishing effectivity, a total catch of 375 kg fresh Greenland halibut were taken by 'ghost netting'. In one single gillnet 300 kg were recovered. This gillnet was recently lost and consisted of 6 net sections. The fishing effectivity was evaluated to app. 25 %. Another gillnet was recovered with 60 kg fresh Greenland halibut and 5 kg cod. It was also lost recently and had a fishing effectivity on app. 75 %, and consisted of 2 net sections. The rest of the gillnets had no or only minor catches at recovery, except for one old gillnet which was recovered with 164 snow crabs (*Chionoecetes opilio*).

In 4 (33 %) of the recovered gillnets were found longlines or part of lost longlines. A single net had 20 entangled longlines.

Beside the retrieved gillnets a total of 80 lost longlines (dm: 3 mm) were recovered. The total catch of Greenland halibut on the lost longlines was app. 2 tons, but only recently lost longlines still carrying baited hooks were ' ghost fishing'.

Discussion.

The 12 % recovery is in the same order of magnitude as the 15 % in a canadian retrieval project for salmon gillnets (Barney, 1984). Only two gillnets (17 %) had continued fishing, and taken noteworthy catches. Both these gillnets were lost recently, but had taken relatively large catches despite the fact that their fishing effectivity was evaluated to be reduced.

The judgement of the fishing effectivity is however very uncertain, because the coiling , winding and extension of the gillnet just as well can be a product of the retrieval process. It is possible that it does not describe the stage of the gillnet on the seabed.

It is certain that 6 (50 %) of the gillnets only were partly recovered, because they only consisted of one or two net sections. The

The fate of the remaining three to eight sections which are normally used in gillnets is unknown.

The amount of data is small, and this held together with the fact that the number of lost gillnets in this particular area is unknown, makes it difficult to describe the full extent of the problem. The data collected suggests that the 'ghost–netting' problem is exaggerated at Ilulissat. After a gillnet is lost it will probably continue fishing for a short period of time. However in the rough environment in the icefjord with drifting icebergs and strong currents, the net will probably collapse or be teared apart and then stop fishing. However there is no doubt that these 'ghost nets' are the cause of many losses of longlines, and they will continue to be a problem because of slow deterioration. The canadian retrival project found only few fish caught in 'ghost–nets', and this was explained with low presence of fish in the area at the survey period (Barney, 1984). An earlier gillnet retieval project made at Paamiut in South Greenland reported of large cathes of different species in recovered nets, but no weights were given (Anon. ,1985)

Most of the lost gillnets had no or broken buoy lines, and these seems to be the weak point of the gillnets. In Paamiut they concluded that the majority of gillnets were lost because the wrong materials were used in manufacturing the nets (Anon. , 1985). This is understated by the fact that different buoy lines were seen at Ilulissat, and a minimum criteria to the gillnet manufacturing must be to use sufficient heavy gear.

The retrieval gear used was insufficient. Often the barbes were broken or bended, and a number of times fishing gear were lost during recovery. This could partly be due to too high hauling speed, which must not exceed 2 knots (Anon. 1985), but the low effectivity could also arrive from the fact that the grapnel type used, was suspected to jump over a rough bottom. An altenative retrieval gear is suggested (fig. 4) which will probably be more effective as creeping device (Barney, 1984). This gear will however demand the use of larger vessels than the 30' fishing vessels used at Ilulissat.

The Greenland authorities are preparing an owner identification mark on fishing gear. This will be followed by a duty to report the loss of a fishing gear to the local authorities, immidiately after the loss has been discovered. A registration of when and where the gear was lost, may help to illuminate the extent of the problem with lost gill nets, and may also help future retrieval projects to get more precise information than local anecdotes.

Litterature cited.

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Table1. Stage of vertical axis on recovered gillnets and their judged fishing effectiy.

Stage	Fishing effectivity				Total
	100%	75 %	25 %	0 %	
winded	0	1	6	1	8
%	0	13	75	13	67
extended	0	3	1	0	4
%	0	75	25	0	33
total	0	4	7	1	12
%	0	33	58	8	100

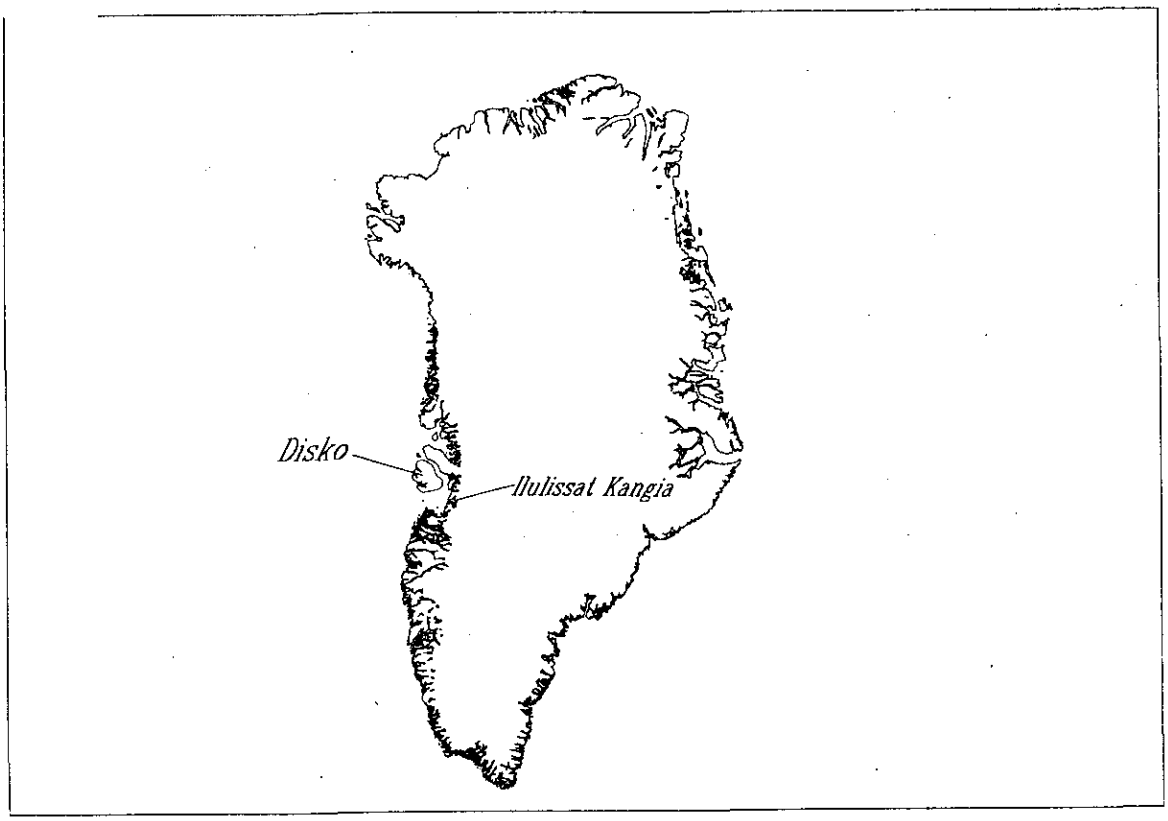

Fig. 1. Placement of surveyed area.

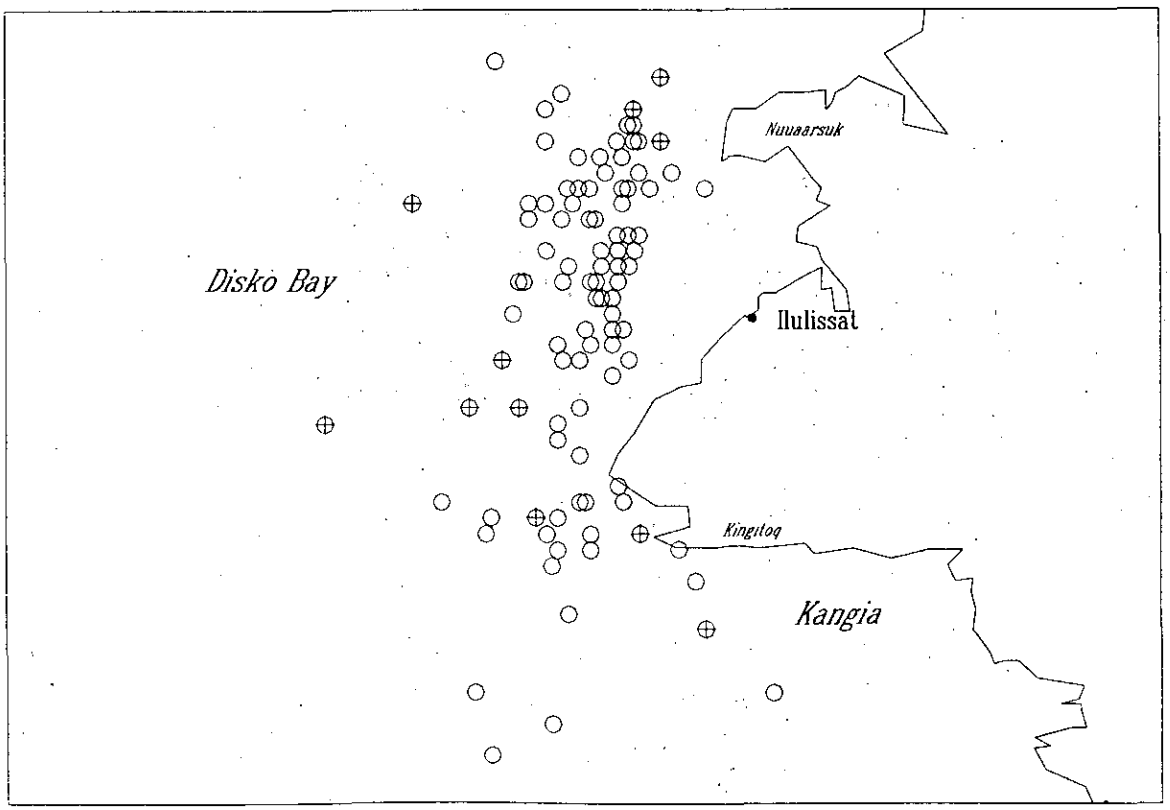

Fig. 2. Location of hauls (o=mean position; + = gilnets recovered).

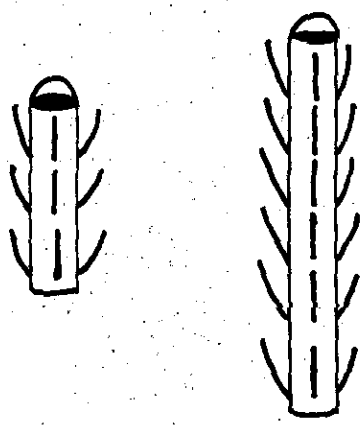

Fig. 3. Grapnel type used in retrieval project.

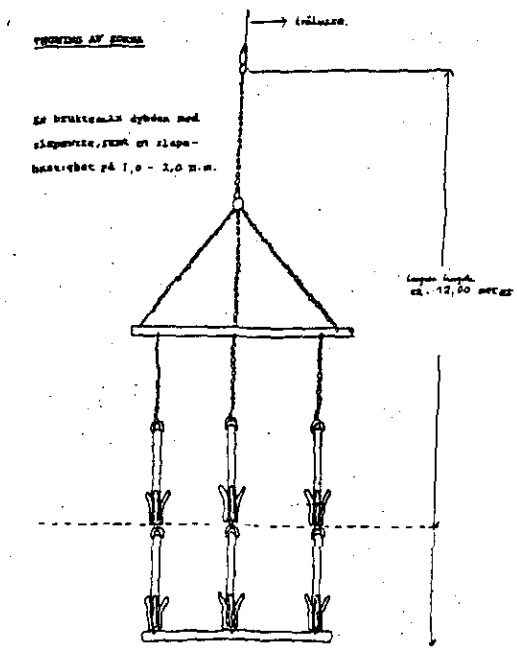

Fig 4. Alternative creeping gear.