International Council for the Exploration of the Sea

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Fish Capture Committee

HEIGHT AND SPREAD OF THE DANISH SEINE

By

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ABSTRACT

Height and spread of trawls is successfully measured by the wireless "Scanmar" system. Several experiments made by fishermen have shown that this system will not work on the Danish seine. A modified version of the "Scanmar" system have been tested for geometrical measurements on the Danish seine.

During May 1987 a total of 11 valid hauls were made by two different types of Danish seines on fishing grounds in Northern Norway. Hauling and fishing procedures were carried out as in the normal, commercial fishery.

The measurements clearly demonstrated that it is possible to control the geometry of the Danish seine throughout the haul by this modified version of the "Scanmar" system. In addition

to read the height and spread of the net, it was possible to detect whenever a rope got fastened around rocks, and to see when it loosened again. Signals from the height and spread sensors were lost for shorter periods during the haul.

Using this (modified version of the) system, the skipper will get continuous information about the geometry of the Danish seine, and thereby know exactly when to start hauling the ropes and when to change the hauling speed, in order to keep a steady/continous closing of the wings.

INTRODUCTION

In order to achieve maximum efficiency of the Danish seine, it is important to have continous information about the geometry of the gear during the different stages of hauling.

Normally the skipper "reads" the geometry of the Danish seine by watching the ropes at the surface. From this "measurement" he estimates when to start first hauling phase (slow), and when to start second hauling phase (fast or maximum hauling speed) in order to close the net. Such technique may be insufficient as the Danish seine fishery has developed more into rough bottom and deep sea fishery (at 200 - 300 m depth).

Several attempts had been made by fishermen to use the wireless "Scanmar" system for measuring height and spread of Danish seine, but with poor or no success.

The lack of success can be explained through a combination of low "towing" speed and actual geometry of the gear in the beginning of a haul. The "Scanmar" height and distance sensors will in this way have no "stearing" towards the ship and the signal receiver (hydrophone) at the ship's hull.

MATERIAL AND METHODS

The experiments were carried out onboard the commercial seine netter "Karl-Viktor" (60 ft, 375 HP) on fishing grounds in northern Norway during May 1987. The fishing depth was approximately 50 m, using 3.5 coils (120 m each) of rope.

Two types of 180 mesh (300 m lumen size) Danish seine were used, one standard "Selstad" gear with lead ropes, and the other one a "REFA" gear with ropewings and a small "groundgear".

Throughout the test period the fishing and hauling procedure was performed as in the commercial fishery, and the skipper did not get any information about the geometry measurements.

Modifications of the attachment and construction of the "Scanmar" sensors were made, as shown in Figure 1 and 2.

All the information from sensors were stored on tapes, and printed on paper-recordings.

Recently the height and distance sensors have been observed during different stages of hauling (August 1988).

RESULTS AND DISCUSSION

For most of the time during the 11 hauls, it was possible to read the signals from both the height and distance sensors. However, signals were lost for (shorter) periods, especially from the height sensor, when the ropes fastened (got stuck) around rocks.

Underwater observations showed that the one point attachment to the bridle together with the plastic rudder gave a correct direction of the sensors towards the ship during the whole hauling cycle. On the other hand, when there was no or little movement in the seine net, the height sensor was tilted upwards in front giving no or poor signals.

Examples of recordings are given in Figures 3-6, showing two hauls for each type of gear. The thick line shows the height of the net (headline to bottom) during the haul, while the thin line gives the wingspread (note the two different Y-axis).

The first phase of hauling (slow speed on the drum) started when the wingspread had decreased from approximately 120 m, as measured when starting to stretch up the ropes, to 40-45 m. The height of the net decreased rapidly from 40 m to 15-20 m during this phase. "Slow" hauling speed lasted for a period of 4-5 minutes.

"Maximum" (fast) hauling started when the wingspread had decreased to 15-17 m, and measured height of the net was 10-12 m, and lasted until the gear was at the surface 3-5 minutes later.

As seen from the recordings, the skipper was not able to keep steady/continuous speed during the closing of the wings when using his standard procedure ("reading" the geometry at the surface). At this depth, the first phase of hauling (slow speed) should have started 3-4 minutes earlier, at a wing-spread of approximately 60 m, in order to keep a continuous speed of closing the ropes and the net.

It is demonstrated that by small modifications of the attachment and construction of the "Scanmar" sensors, it is possible to receive continous information about the geometry of the Danish seine throughout the haul. Such information may be very important to achieve the maximum efficiency of the Danish seine, and it is also a good tool for detecting when ropes are fastened on the ground and to detect when they are loose again. In this way the skipper can control the geometry of the Danish seine, and know exactly when to start the different hauling speeds.

During these experiments a towed, and submerged, hydrophone was used, and may explain why signals were lost for shorter periods. The attachment of the height sensor in a special "pocket" may have been insufficient, resulting into a bad tilt-angle.

It was not possible during these experiments to detect geometrical differences between the two types of Danish seines, due to few data.

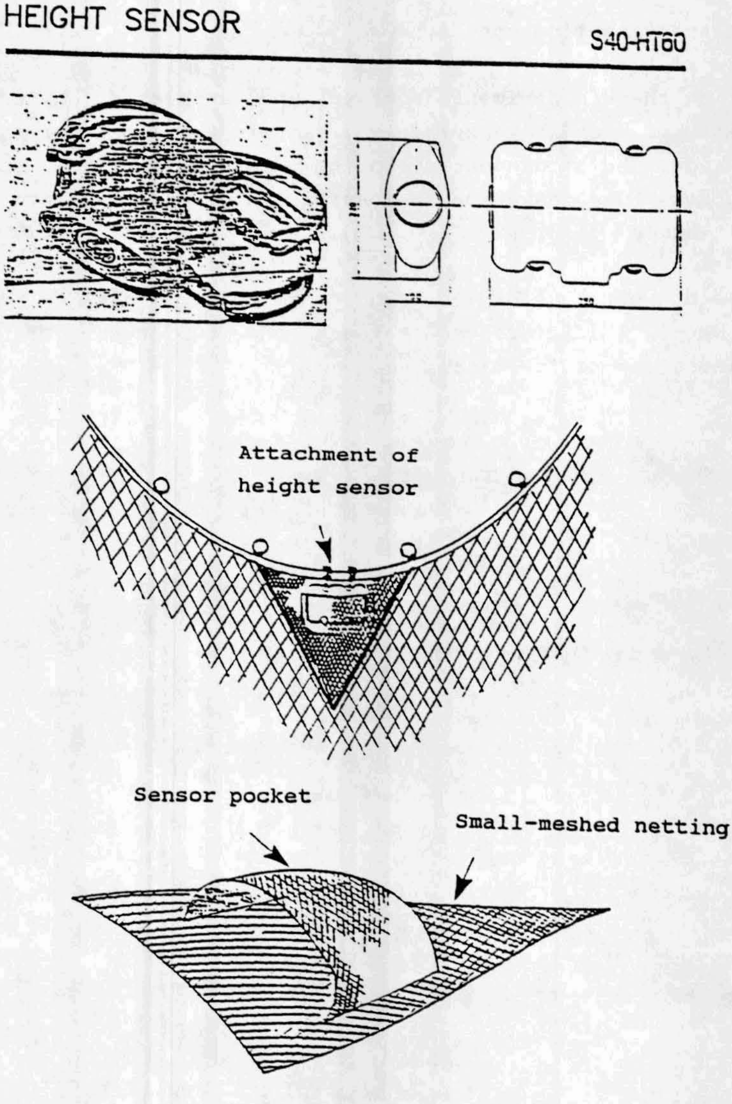


Figure 1: Scetch of the attachment for the height sensor on the headline of the Danish seine.

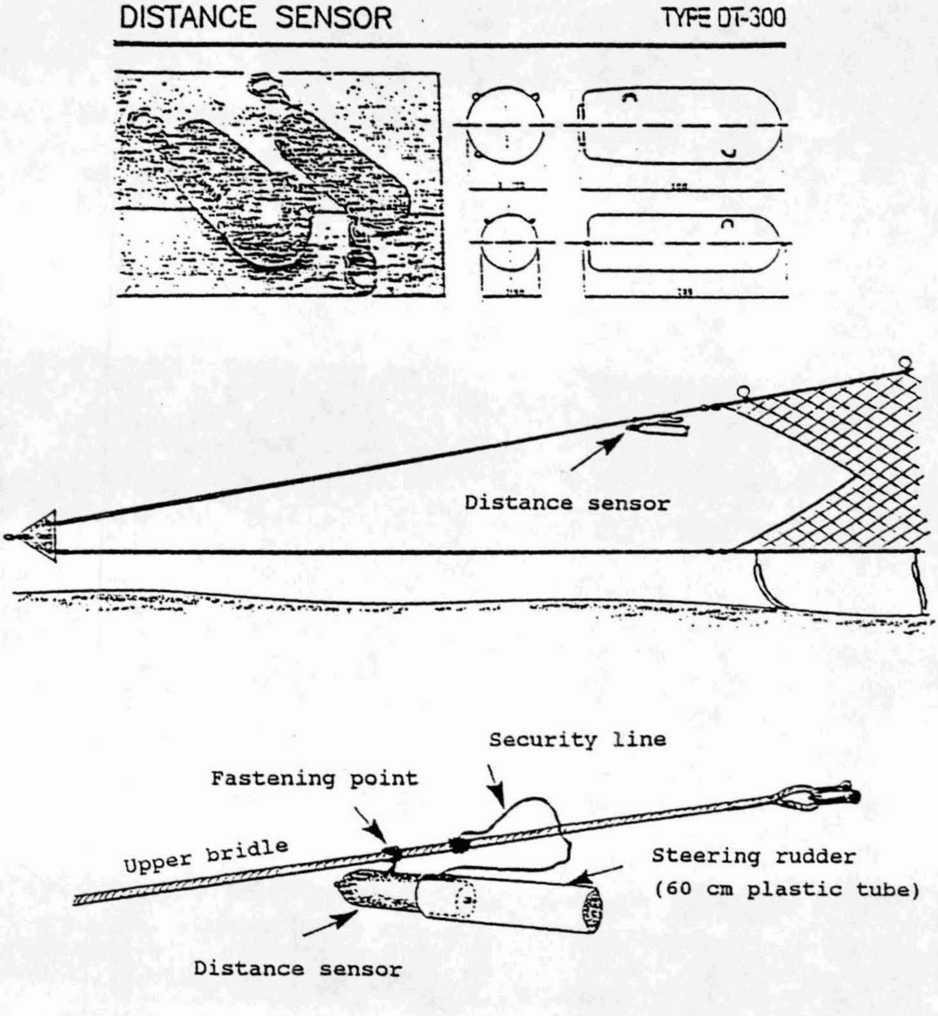
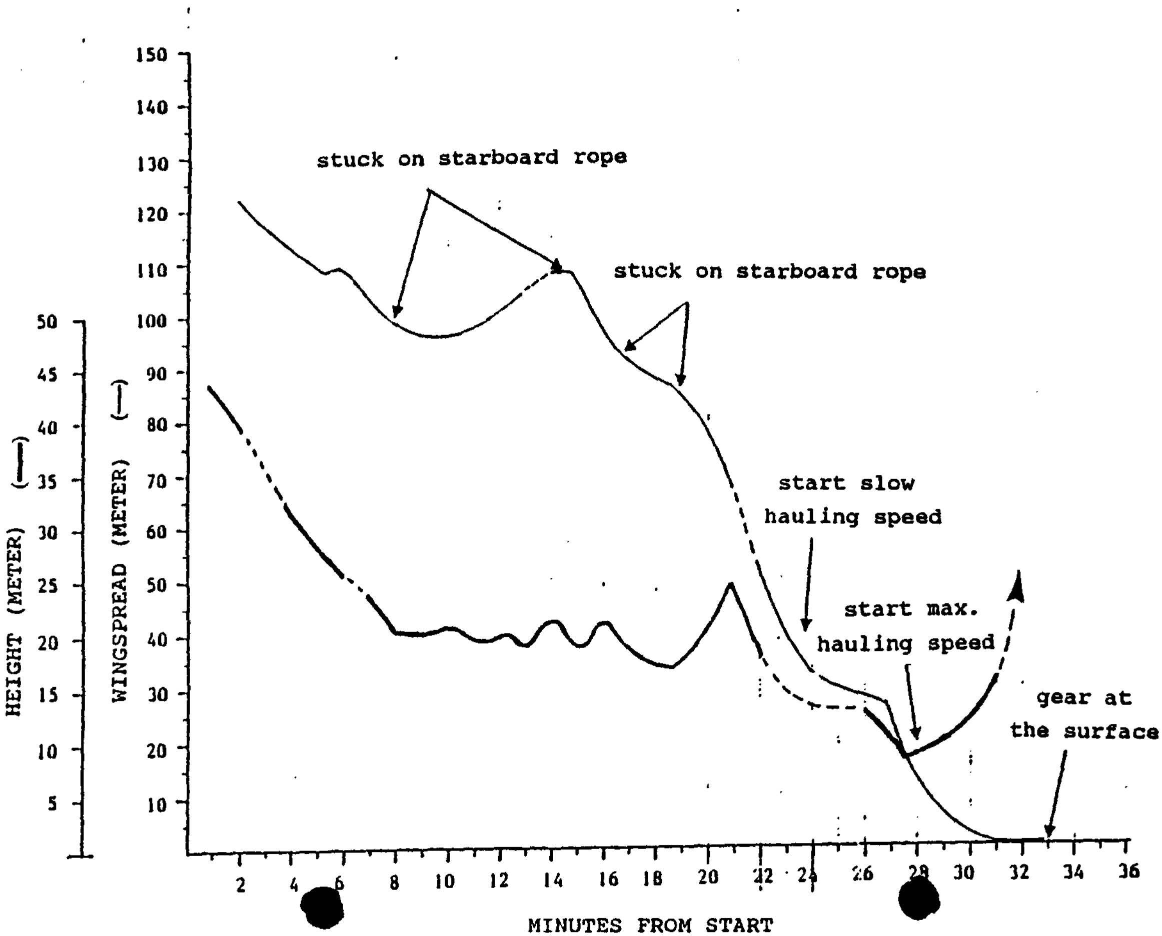


Figure 2: Scetch of the attachment for the distance sensors at the wingtips of the Danish seine.

Figure 3: The "Refa" ropewing Danish seine.



M/K "KARE VIKTOR"

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ANT. KVEILER TAU: 34

INGE ALBRIGTSEN

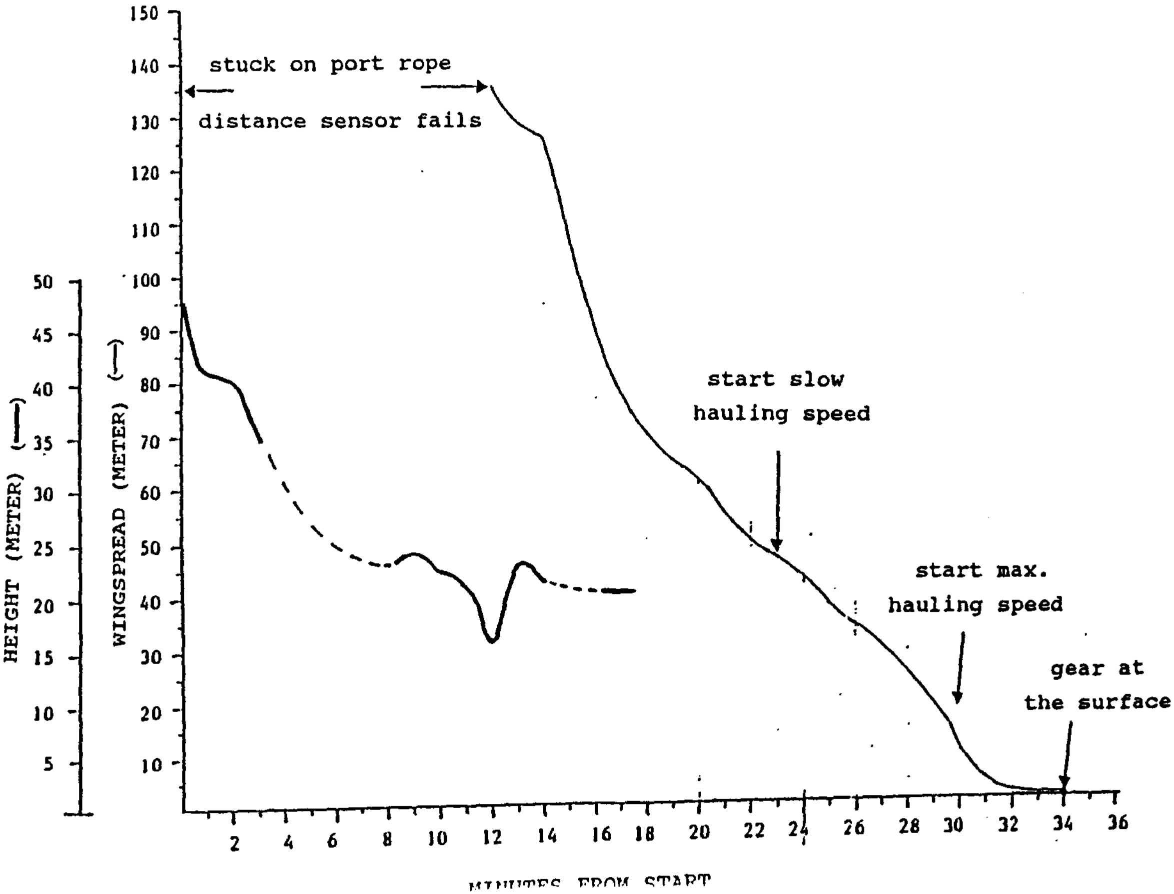

Figure 4: The "Selstad" standard Danish seine.

MAI 1987
M/K "KARL VIKTOR"
HAL NR.: 6
DYBDE (M): 46
DATO: 12.05.87
ANT. KVEILER TAU: 34
ROGER B. LARSEN
INGE ALBRIGTSEN

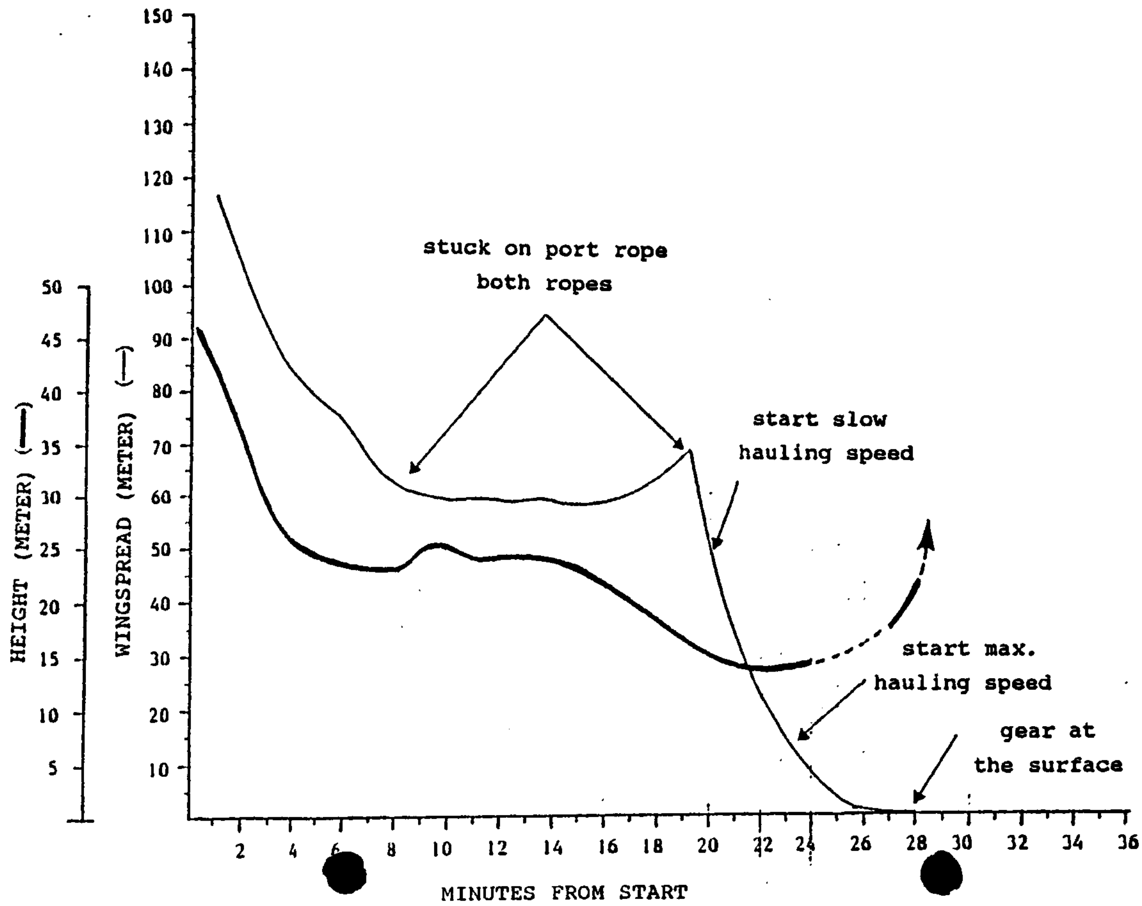

Figure 5: The "Selstad" standard Danish ...

MAI 1987

M/K "KARL VIKTOR"

HAL NR.: 10

DYBDE (M): 67

DATO: 12.05.87

ANT. KVEILER TAU: 34

ROGER B. LARSEN

INGE ALBRIGTSEN

MAI 1987	HAL NR.: 5	DATO: 11.05.87	ROGER B. LARSEN
M/K "KARL VIKTOR"	DYBDE (M): 45	ANT. KVEILER TAU: 3½	INGE ALBRIGTSEN

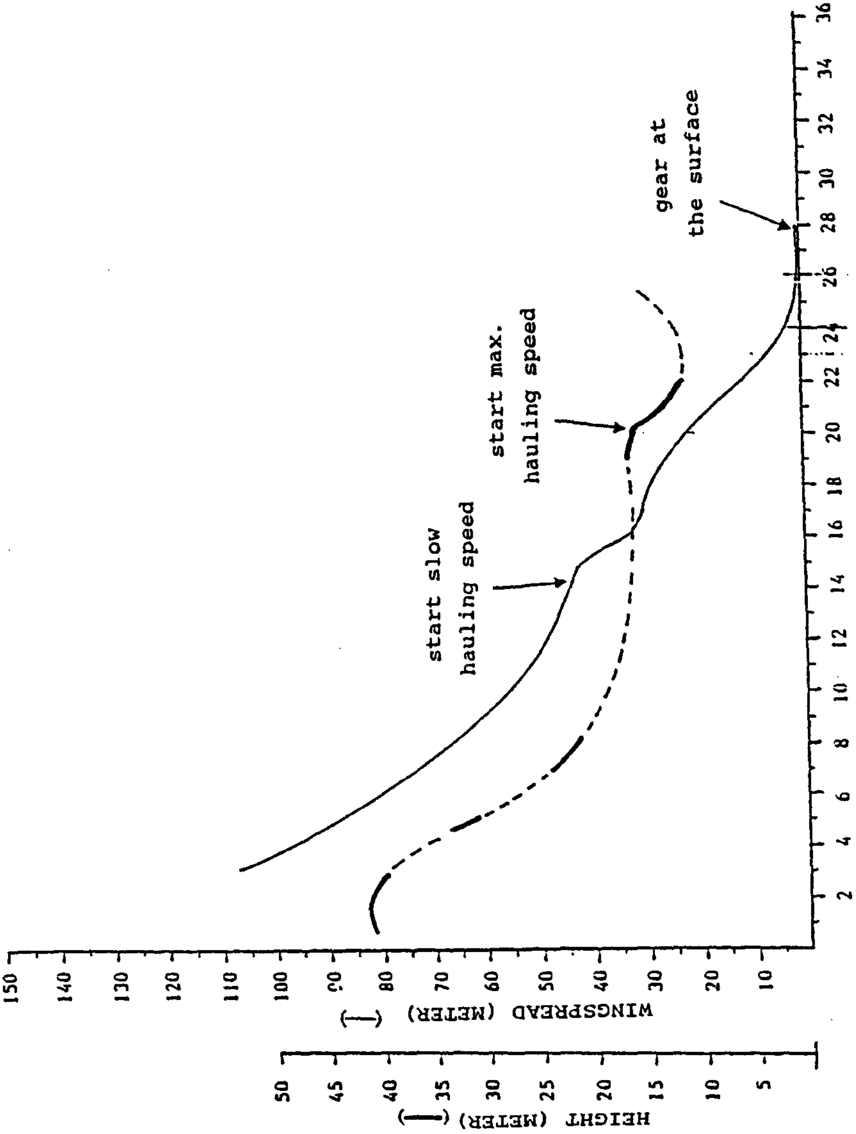

Figure 6: The "Refa" ropewing Danish seine.