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Full scale trials with a collapsible fish trap design.

by

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INTRODUCTION

The new fish trap design used in this trial was developed in 1983, according to the following objectives: The trap should be easy to manufacture and easy to handle during the fishing operation. The latter objective required a design of low weight and with a low stacking volume. Further, Valdemarsen et.al., had found that the maximum catching efficiency for fish traps was obtained when the trap entrance was oriented down current. Another main objective of the new trap development was therefore to make a design that assured a down current orientation of the trap entrance.

The final prototype design is shown in figure 1. The trap has a top and a bottom frame with no vertical connections, so that it collapses in air, but obtains its full volume in water by buoyancy and gravity forces. Further, the design was made slightly buoyant and anchored to the bottom mainline with a weight and a bridle to obtain a down current orientation of the entrance. Total weight of the trap is 5 kgs.

Experimental fishing with this prototype trap design gave promising results for tusk (Brosme brosme).

In 1986 the idea was adopted by a gear manufacturing company, and a series of 500 traps was made in order to conduct full scale fishing trials. The overall objective of these trials was to clarify the possibilities of profitable catches with this type of gear.

MATERIALS AND METHODS

The trap was slightly different from the original prototype, being somewhat bigger, and non buoyant, (fig. 2). In addition the trial included traps with three different entrance designs: Horizontal - or vertical inner entrance opening, and one type with double entrance.

The trials were conducted on board a 109 feet longliner, with eight crewmembers. The deck layout is shown in figure 3.

The traps were originally set in fleets of one hundred with a trap spacing of 20 fathoms. Trials were also made with 40 fathoms trap spacing. The traps were attached to the mainline by a 1,85 m long branchline and a bridle attached to the bottom frame at the opposite end of the entrance.

The traps were baited with 0,5 kgs of either squid, herring or offalls/leftovers from mackerel filleting. The bait was put in special bait bags of webbing, mounted at the top panel of the trap. After introductory trials at different localities from August 24th to August 27th, full scale trials were conducted at Aktivneset (N62°40', E 03°35') from 27th to 30th of August 1987.

The fishing depth varied from 166 to 307 fathoms.

RESULTS

A total of 967 traps (new design, fig. 2) were hauled with a total catch of 2696 fish, mainly tusk. The individual catches ranged from 0 to 17 - with an average catch of 2.8 fish per trap. The average fish weight was 1,67 kgs (without head and guts) which gives an average catch of 4,7 kgs per trap.

With the experimental setup it was possible to haul 4-5 fleets a day, dependent on the fishing depth.

There were no differences in catch rates between traps with different entrance design. The average catch rates for traps with double, horizontal or vertical entrance were 3,0, 2,74 and 2,86 fish per trap.

Trap spacing of 20 fathoms gave an average catch of 2,5 fish per trap versus 3,35 fish per trap for 40 fathoms trap spacing, (34 % difference).

Catch rates versus soak time are given in figure 4. As shown in the figure there was no clear correlation between catch rate and soak time within the soak time range in this trial (6-24 hrs.).

A few traps of the original design (fig. 1) was used in the experiment. A total of 19 traps were hauled, giving a total catch of 78 fish, (4,1 fish per trap), which are 46 % higher catch rate than the new design.

DISCUSSION

These trials showed that the collapsible fish trap design might be an alternative fishing gear for tusk. Daily catches of 2-3 tons seems to be obtainable with a smaller crewnumber and a significantly lower bait consumption compared with a longline fishery for the same species.

The average catch rate was higher when the trap spacing was increased from 20 to 40 fathoms. However, this increased catch rate did not compensate for the reduced effort (number of traps hauled per day). An intermediate trap spacing is therefore suggested as optimal in this fishery.

REFERENCES

Valdemarsen, J.W., Fernø, A. and Johannessen, A. 1977. Studies on the behaviour of some gadoid species in relation to traps. Coun. Meet. it. Coun. Explor. Sea, 1977 (B:42): 1-9. (Mimeo.)

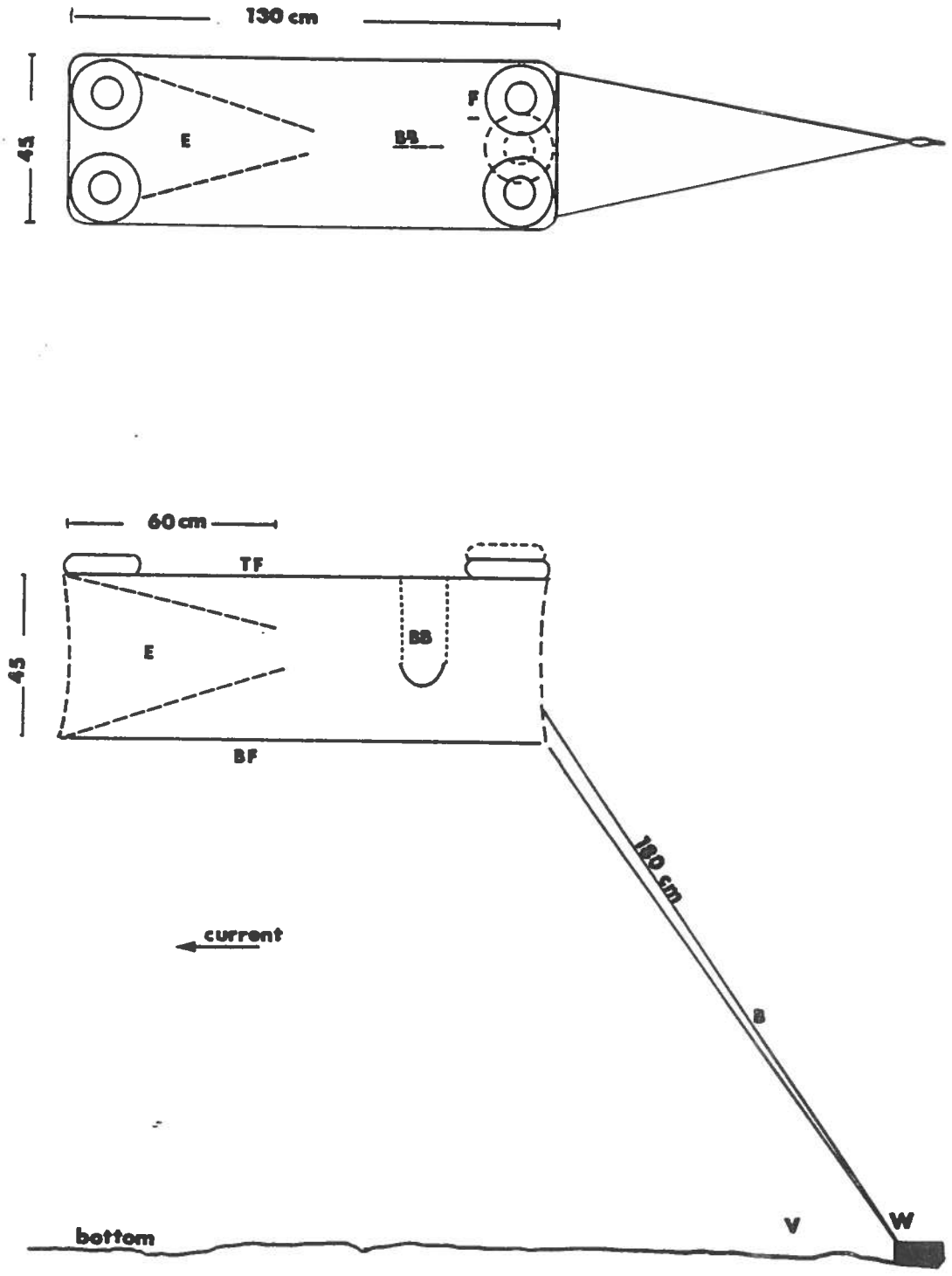


Figure 1. Collapsible fish trap, original prototype.
TF = top frame, BF = bottom frame, BB = bait bag,
E = entrance, F = float, B = bridle, W = weight (1.5 kgs)
Webbing = 55 mm (stretched mesh).

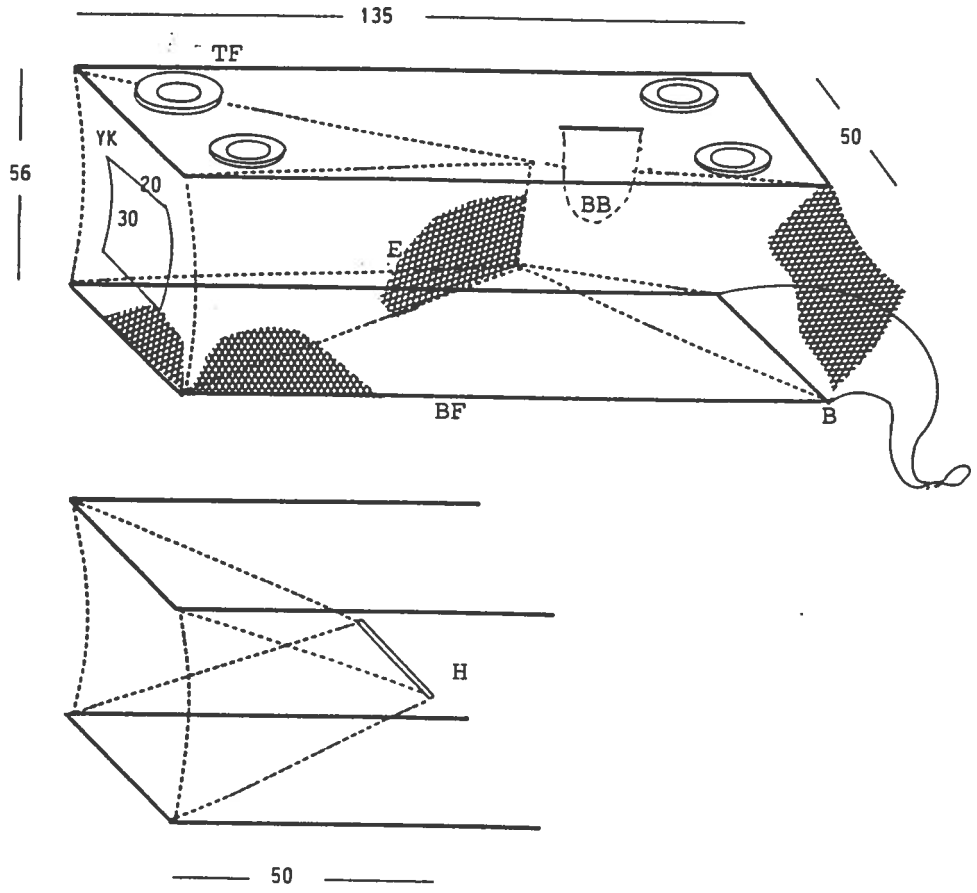


Figure 2. Collapsible fish trap, - new design (dimensions in cm).
TF = top frame (12 mm diameter, aluminium rod)
BF = bottom frame (12 mm, diameter, steel rod)
BB = bait bag, E = entrance, YK = outer entrance,
F = float, V = entrance with horizontal inner opening.

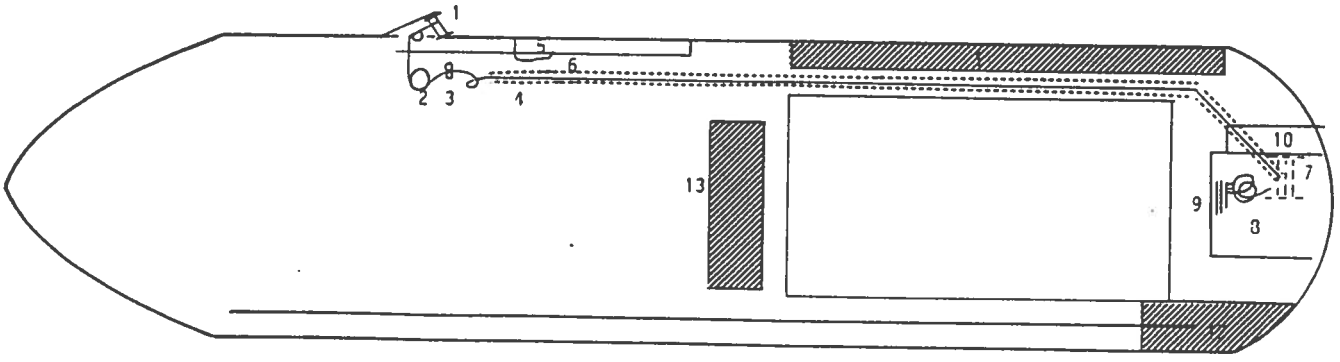


Figure 3. Deck arrangement at M/S "Smines" during the trap experiments, August 1987.
1 = rail roller, 2 = capstan, 3 = slack hauler, 4 = pipe (PVC) rope leader, 5 = fish bin, 6 = position for baiting, 7 = slack hauler, 8 = rope bin, 9 = bridle rack, 10 = platform for shooting
shaded areas = trap storage

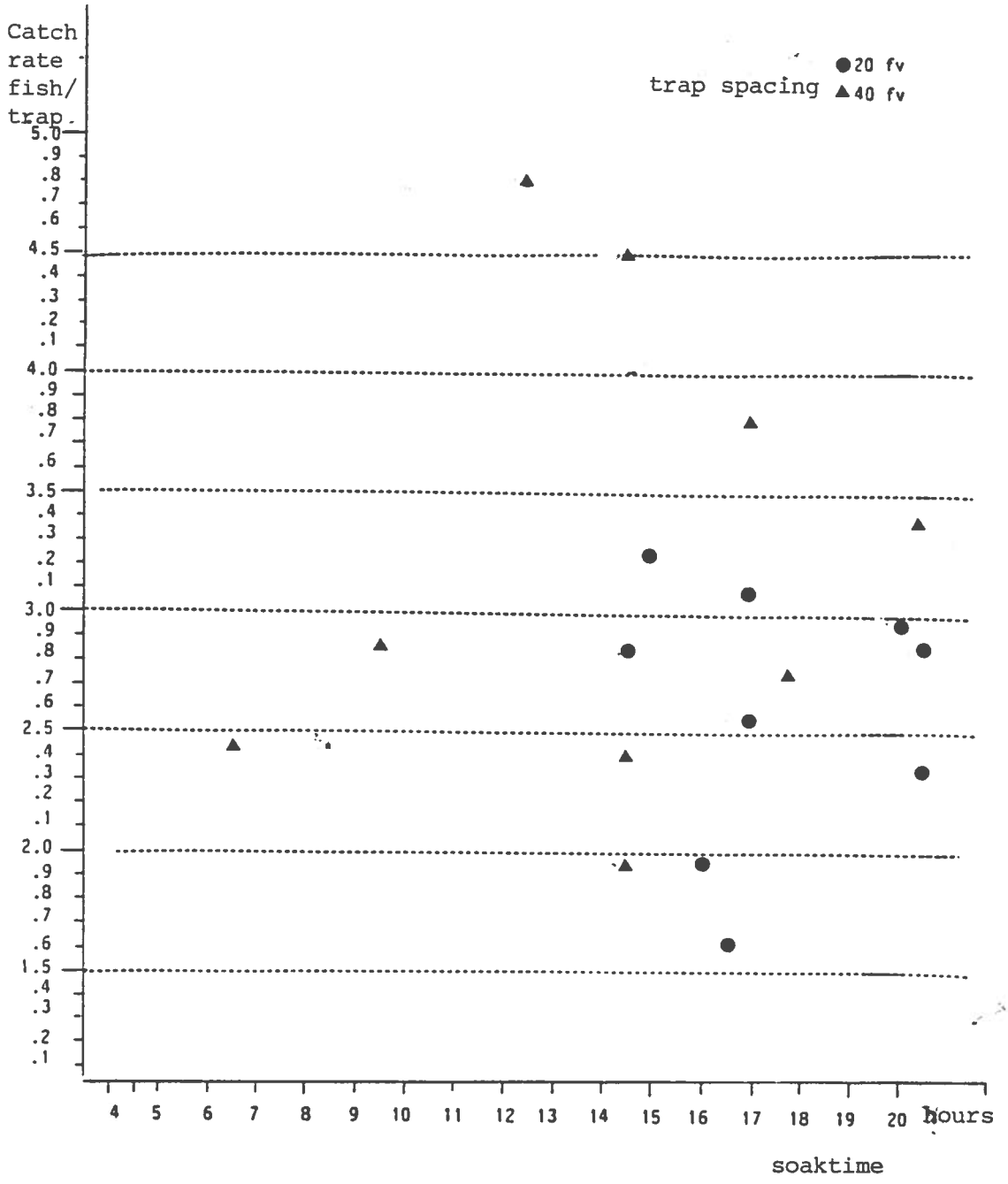
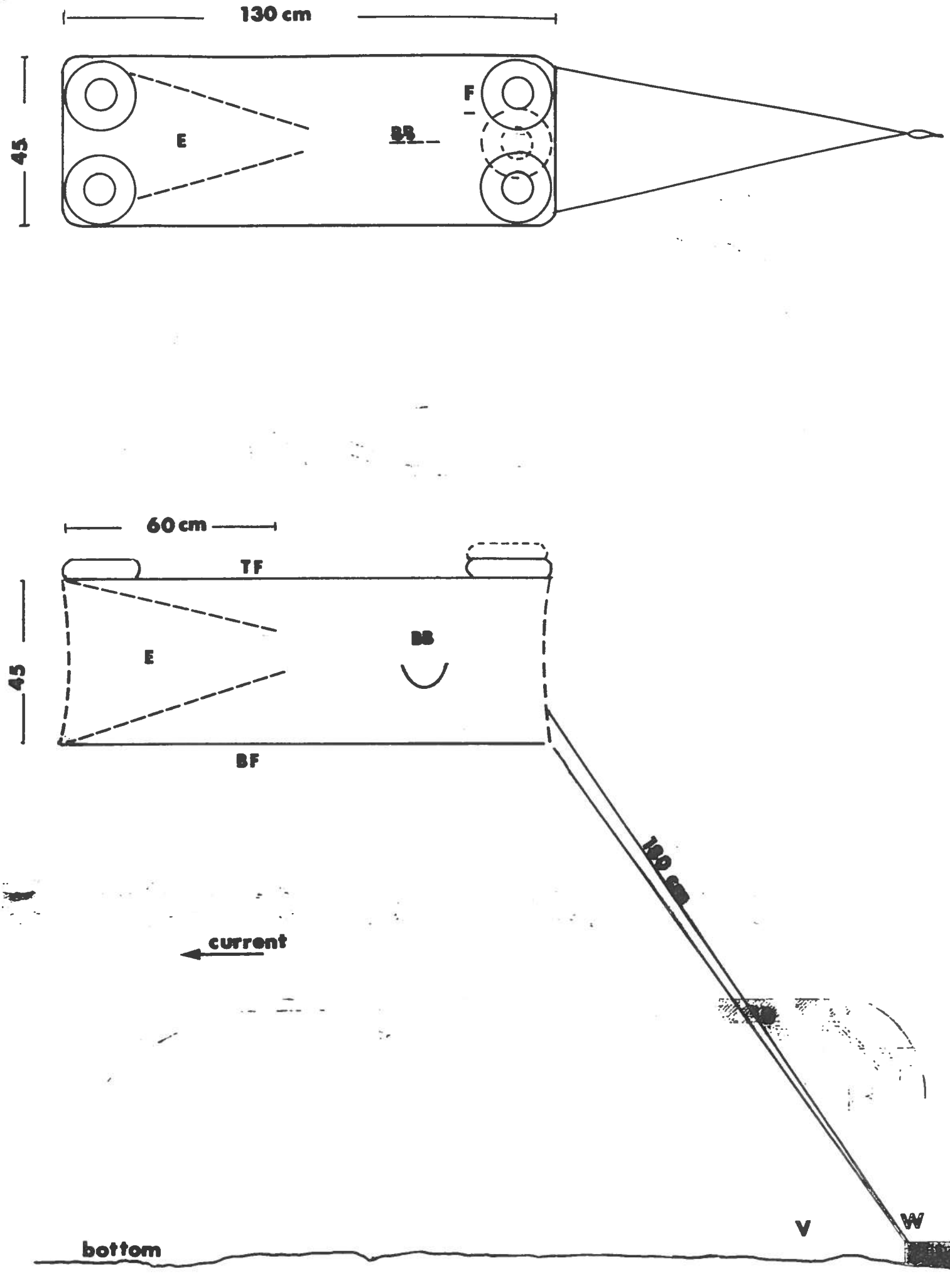


Figure 4. Catchrate related to soaktime


130 cm
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E
BB
F
60 cm
TF
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BB
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current
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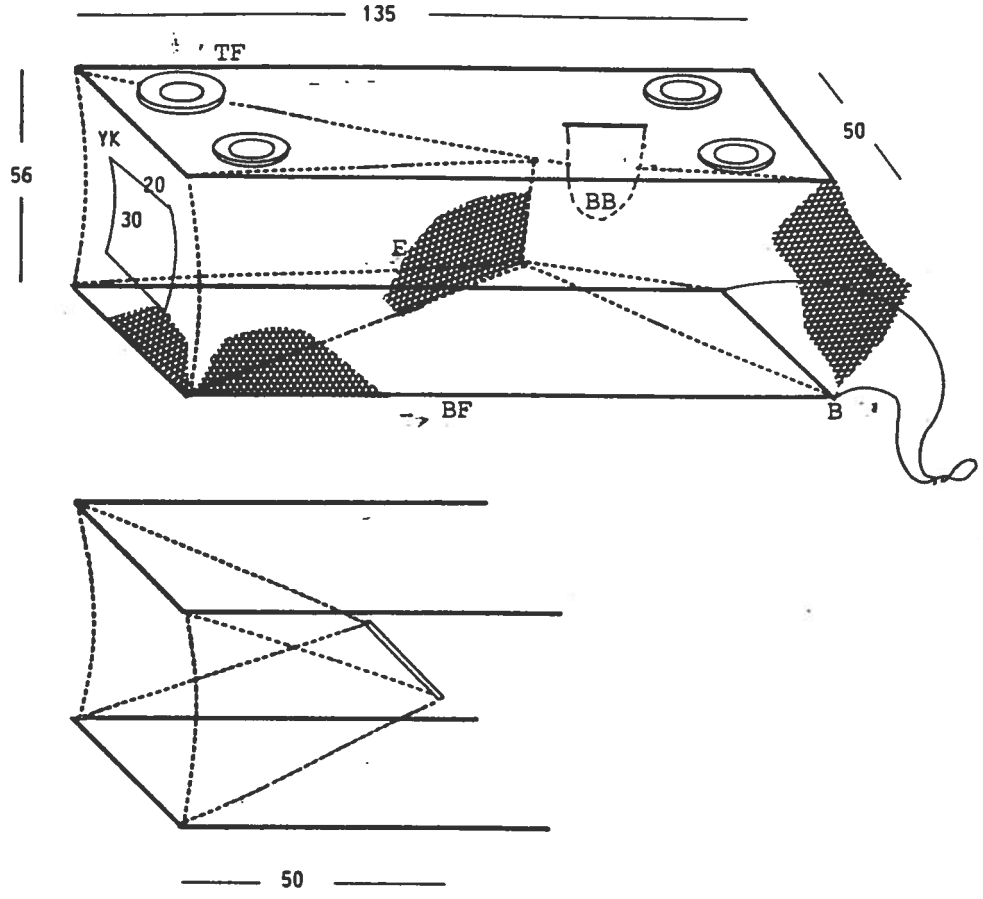
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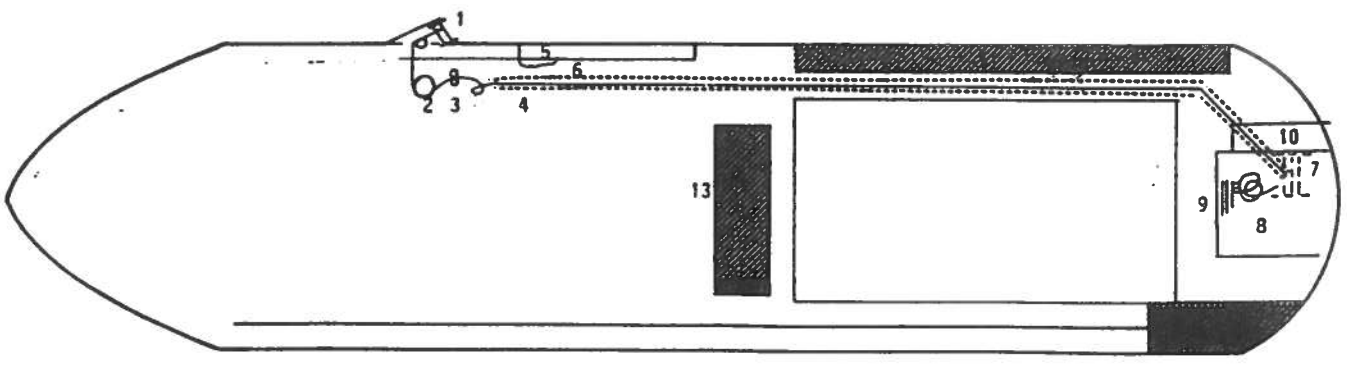
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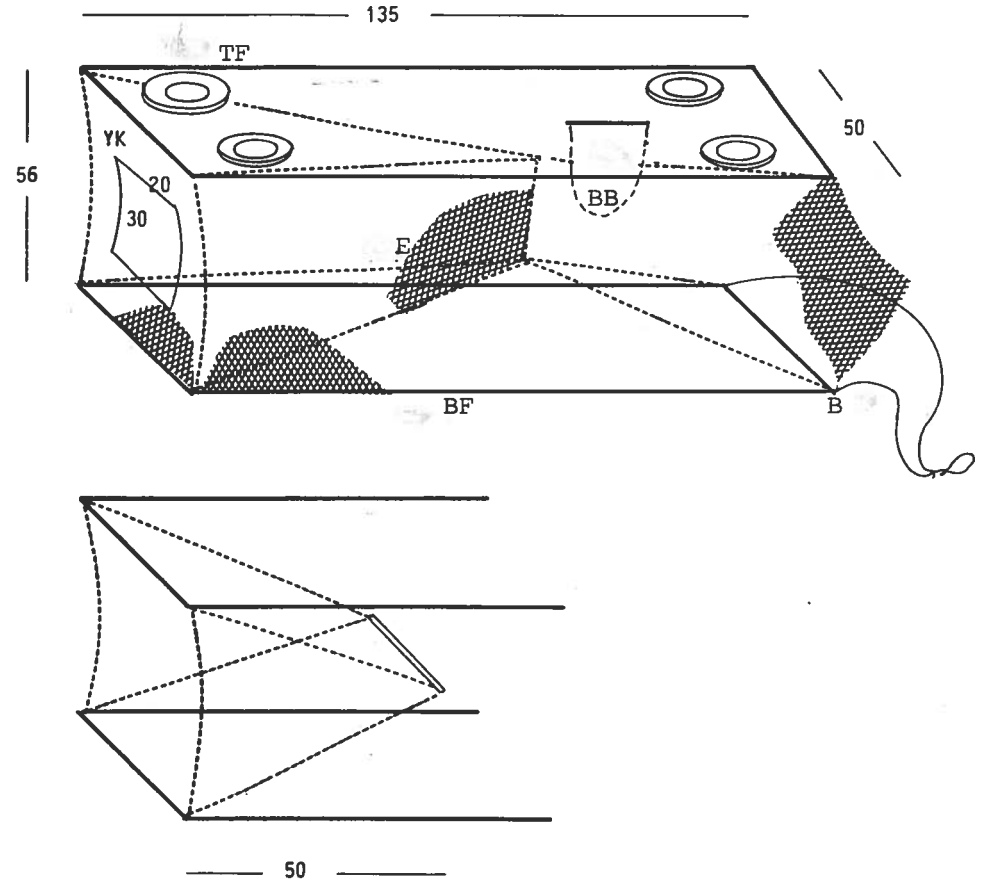
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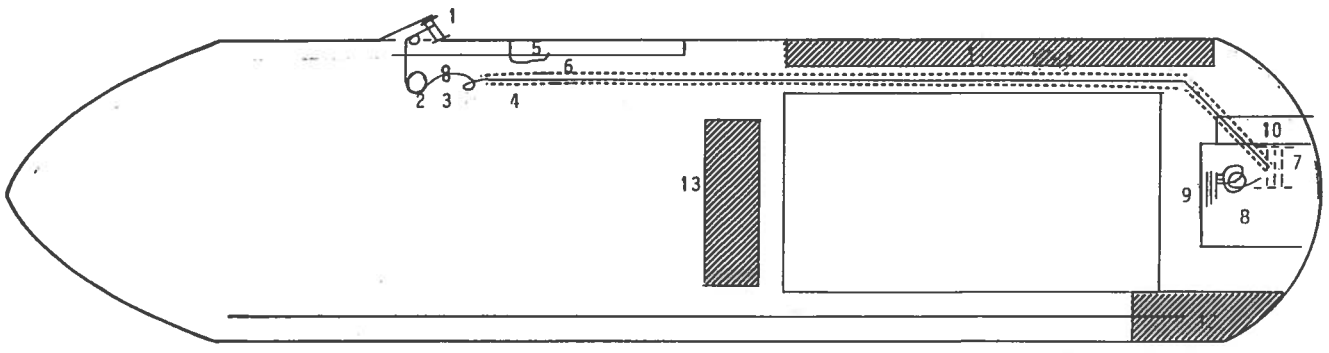
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