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## CATFISH - KING OF THE SEA.

by

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### ABSTRACT

During an acoustic tagging experiment on cod in the Barents Sea in March 1995 a hierarchy between different fish species was revealed, and the catfish (*Anarhichas sp.*) was observed to be dominant in relation to cod and haddock. When catfish are present at the fishing grounds, the dominant feeding behaviour of this species might reduce efficiency on other species. If longline catch data are used for stock assessment purposes, the catfish population might therefore be overestimated relative to other fish species.

### INTRODUCTION

The experiment described here was designed for *in situ* tagging of cod with acoustic tags for subsequent behavioural studies based on received acoustic signals. As a spin off, observations of species interaction and behaviour towards baits were obtained.

This paper describe behaviour of catfish towards baits as well as the interaction and competition between this species and cod and haddock for bait

### MATERIAL AND METHODS

An underwater TV-camera with radio contact to a TV monitor on board the vessel was used to observe feeding behaviour of fish towards baits (Fig. 1). The fish were offered three baits of which one contained an ultrasonic transmitter (50 kHz). The baits were continu-

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ously monitored (Fig. 1) and the observations of fish were taped on a VHS recorder for later detailed studies. The experiment was done at position N 72° 33' E 25° 51' during day time (1300-1630 local time). Bottom depth was 250 m.

When the bait with the acoustic tag was swallow by a fish, the depth and position could be continuously monitored when within reach of a positioning system. The system is composed of a triangle of hydrophones suspended from anchored buoys (see Godø 1995).

## RESULTS AND DISCUSSION

From the TV-camera had reached the bottom a continuous and increasing amount of fish was observed, indicating that the fish were attracted by the baits. According to bottom trawl catches in the area, the fish were mainly haddock (2/3 of the density) and cod (1/3). The fish moved uniformly back and forth in front of the baits. Most fish did not pay much attention, however, regularly a fish headed towards the rig and returned after inspection and sometimes tasting of the baits. After about 50 minutes of observations a big catfish (ca 70 cm) approached and remained close to the rig for about 15 minutes. The catfish showed three types of behaviour:

### *Chasing:*

The catfish showed aggressive behaviour towards the cod and haddock and at several instances directly chased other fish. At two occasions the catfish directly attacked cod approaching the baits. The cod and haddock showed clear fear reactions by fleeing the area.

### *Territory inspection:*

The catfish spent much of the time swimming around the baits and the rig, apparently marking a territory. It was out of view of the camera for short periods (10-30 sec.) and thus we have not a complete picture of its behaviour. The number of cod and haddock in the observation volume varied from 0 to 7, and was clearly dependent of the catfish behaviour. A moving and aggressive catfish scared other fish away from the baits.

### *Feeding:*

After 7, 8 and 11 minutes the catfish snatched the three baits off the rig in very determined movements and swallowed them.

After munching the last bait (the one with the acoustic transmitter), the hope of a successful study of cod behaviour evaporated from the mind of the watching scientists. As the catfish knew all about our experiment, it returned for a last time, opened its mouth in front of the camera in a big belch. After consuming the last bait, the catfish stayed within the rig area for one minute. Later, the acoustic positioning system showed a movement away from the rig. Based on data from the acoustic tag, the fish moved with altering course a distance of several hundred meters during the next hour. Later the same day and the following day, the catfish reappeared at the edge of the of the range of the buoy system.

These observation are interesting regarding the species composition in the long-line fisheries. Selectivity in longline is known to be dependent on numerous factors (Bjordal 1989). Species composition might be affected by competition for baits (see Engås and Løkkeborg 1994), but direct observation of the behavioural dynamics behind such competition is scarce. The presented observation is a clear example on how a dominant species may hinder target species hooking in long lining. When catfish are present at the fishing grounds, its dominant feeding behaviour might significantly reduce efficiency on other species. If longline catch data are used for stock assessment purposes (Hovgård and Riget 1992, Engås and Løkkeborg 1994), such competition may therefore cause an overestimation of the catfish population relative to other fish species.

#### ACKNOWLEDGEMENT

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## REFERENCES

- Bjordal, Å. 1989. Recent developments in longline fishing - catching performance and conservation aspects. Proceedings world symposium on fishing gear and fishing vessel design, St. John's, 1988, p. 19-24.
- Engås, A and Løkkeborg, S. 1994. Abundance estimation using bottom gillnet and longline. Pp. 134-165 in A. Fernø and S. Olsen (eds.): *Marine Fish Behaviour in capture and abundance estimation*. Fishing News Books. London.
- Godø, O.R. 1995. Transplantation-tagging-experiments in preliminary studies of migration of cod off Norway. ICES mar. Sci. Symp, (in press).
- Hovgård, H. and Riget, F.F. 1992. Comparison of long-line and trawl selectivity in cod surveys off West Greenland. *Fish. Res.* 13: 323-333.

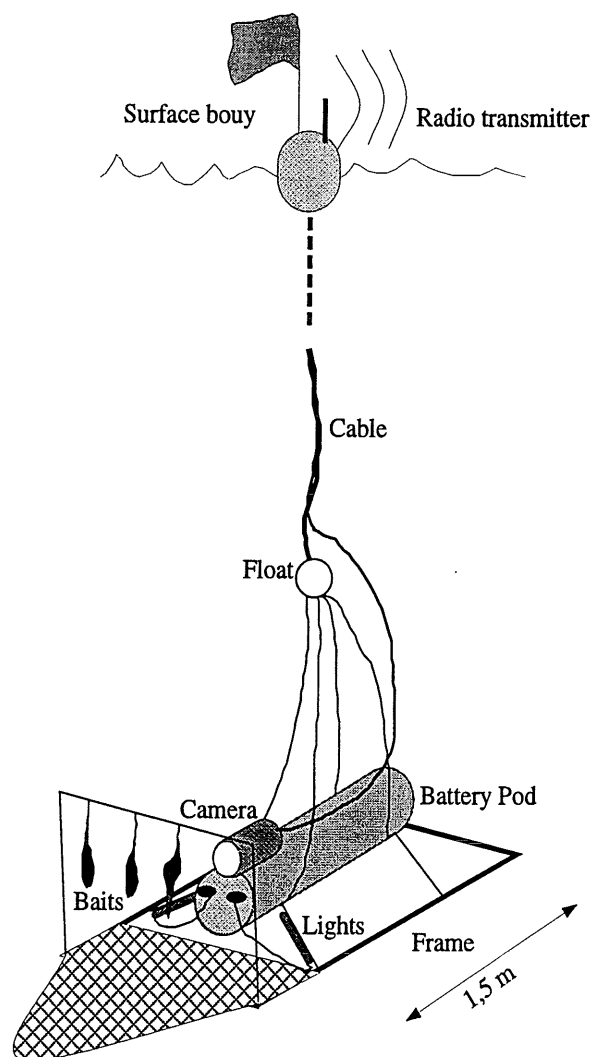


Fig. 1. The observation rig which continuously monitored the fish behaviour towards the baits.