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Appendix to the United Kingdom Research Report

Progress Report on Trials of Top-side Chafers

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Barents Sea Cod

A number of tests of the effect on cod-end selectivity of top-side chafer have been carried out on recent cruises of the 'Ernest Holt' in the Barents Sea. The investigations are still in progress, but some provisional results have been obtained which it may be of value to place on record.

The tests have been carried out by the covered cod-end technique, the cod-end being fished alternately with and without a chafer. Some tests were made with a loose chafer according to the ICNAF specification, and some with a tight chafer as used commercially. The mesh size of the cod-ends (double manila, runnage about 40 yds/lb.) ranged between 105 mm and 110 mm, except for one cruise when it was 130 mm. The chafers were of the same kind of netting as the cod-end, but partly by design and partly by accident (shrinkage) their mesh size was sometimes less than that of the cod-end, sometimes the same and, in one instance decidedly larger.

Most of the results obtained so far have been on cod, but it is hoped that data for haddock will be obtained on tests later this year.

The results to date can be summarised as follows:-

- 1) Tests made with a cod-end of 105 mm fitted with a tight chafer having a mesh size of about 95 mm, showed that the selectivity for cod was markedly reduced by the chafer, the 50% length being decreased from about 40 cm to below 30 cm, that is, to a length substantially smaller than would be expected from even the smaller mesh of the chafer.
- 2) Tests in which the cod-end and chafers were of the same mesh sizes as above, (i.e. cod-end 105 mm and chafer mesh 95 mm) but in which the chafer was fitted according to the ICNAF specification, gave a reduced selectivity for cod, but this reduction was less severe than with tight chafers. The 50% length corresponded, in fact, to what would have been expected if the mesh size of the chafer had been the determining factor for selection.
- 3) Tests in which an ICNAF specification chafer was fitted to a cod-end of the same mesh size (110 mm) gave, as it happened, rather variable results, but on average the selectivity of the chafered cod-end was somewhat less than that of the unchafered cod-end.
- 4) Finally, some tests were made in which a chafer (ICNAF specification) of above 150 mm was fitted on alternate hauls to a cod-end of about 130 mm. The selection curves with and without the chafer were virtually identical.

It appears from these results that a tight chafer has a very severe effect on selectivity - as indeed would be expected. Whether it was coincidence that the selectivity of cod-ends fitted with an ICNAF chafer happened to coincide with what would be predicted from the chafer mesh size remains to be seen. If it is not, then it would seem that even with a loose chafer unattached at its lower end, the fish were escaping vertically through both the cod-end and the chafer meshes rather than through the open end of the chafer. This is in fact, what would be expected from the behaviour of fish observed by underwater television. The covers used in all these tests were of nylon shrimp netting and were made extra large to avoid interfering with the chafer. Nevertheless, it may still have been that the cover was having a masking effect, overlaying the chafer and forcing it to lie closer to the cod-end than it would normally. To test this requires the alternate haul technique instead of using covered cod-ends, and it is hoped to carry out such tests if opportunity permits.

Perhaps the most encouraging results were those obtained with the chafer having a substantially larger mesh size than the cod-end. Further work is planned, including the effect of variations in (i) shoal density and (ii) length composition, over a wider range of conditions than have been investigated hitherto and on other species than cod, to confirm whether the use of the large meshed chafer does indeed leave the selectivity of the cod-end unimpaired; and if so, to find what is the minimum difference between the mesh size of the cod-end and chafer that is needed to ensure this result.

#### Faroe Haddock

Similar trials to the above have also been made on haddock by F.R.S. 'Explorer' in the Faroe area.

These experiments were made with a loose chafer according to ICNAF specification with a mesh size (130 mm) substantially greater than that of the cod-end mesh (90 mm). The chafer was made of 3 strand manila twine, (runnage 112 yds/lb) while the cod-end was made of double, 4 strand manila twine (runnage 75 yds/lb). A loosely fitting topside cover made from "coulene" was used in the trials.

The results of these trials revealed a large chafer effect. While the selection factor for haddock in the hauls without a chafer averaged 3.1, in the hauls with a chafer it averaged only 2.6.

The results point therefore to a large masking effect of the chafer on haddock escapement. However, as in the Barents Sea experiments it is not possible to determine from the data the extent to which the apparent masking in these trials was a function of the cover. Further trials on haddock, using both the alternate haul and covered haul techniques are planned to test this possible effect.

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