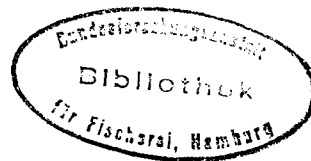This report not to be cited without
prior reference to the council

C.M.1993/B:4
Fish Capture Committee

Report of the Joint Session of the Fisheries Acoustics Science and Technology and the Fisheries Technology and Fish Behavior Working Groups

Gothenburg, Sweden, 20 April, 1993

INTERNATIONAL COUNCIL   FISH CAPTURE
FOR EXPLORATION OF   COMMITTEE
THE SEA

AGENDA

Joint session of the ICES
Fishing Technology and Fish Behaviour Working Group
and
Fisheries Acoustics Science and Technology Working Grpup
on

NEAR BOTTOM ASSESSMENT

Göteborg, Sweden   20 April 1993

Chair: William A. Karp, Alaska Fisheries
Science Center, Seattle, Washington, USA

14.00 hrs session opens

NEAR BOTTOM ASSESSMENT

R.B. Mitson
"The Dead Zone revisited"

O.R. Godö and R. Shengminh
"Can data from bottom trawl and acoustic surveys be
combined to one abundance estimate?"

OTHER TOPICS OF INTEREST TO BOTH WORKING GROUPS

G.P. Arnold
"The Lowestoft data storage tag"

15.30 hrs Session closes

Tea/coffee break 15.30-16.00 hrs

Report of the Joint Session of the Fisheries Acoustics Science and Technology (FAST) and the Fisheries Technology and Fish Behavior (FTFB) Working Groups, Gothenburg, Sweden, 20 April, 1993

1. Terms of reference

In accordance with C. Res.1992/2:10, a joint session of the FAST and FTFB working groups (Chair Dr.W.A.Karp) was convened in Gothenburg, Sweden, on 20 April, 1993 to:

a) consider the problems of near-bottom sampling in acoustic surveys and combined trawling/acoustic surveys:

b) consider the errors which may arise in near-bottom stock density estimates.

2. Opening of the meeting

The chair opened the meeting and made brief introductory comments.

3. Order of the day and appointment of rapporteur

The agenda was adopted and S. J. Walsh of the Northwest Atlantic Fisheries Centre, St.Johns, Newfoundland was appointed as rapporteur.

4. Presentation of Joint Session Topic Papers

4.1 Mitson, R.B. The dead zone revisited.

The question addressed was: " To what distance (height) above the seabed can fish echoes, individually, or collectively, be separated acoustically from the seabed and of what importance, if any, is this?" This paper was a continuation of work presented in an ICES CM paper in 1976. Since then the advent of color displays has allowed more investigation and updating of techniques to detect fish signals emanating from near the seabed and consequently more effort can now be made toward discrimination of fish and seabed rather than just detection.

The author emphasized the importance of short pulse lengths and narrow beam transducers for maximizing discrimination between targets and illustrated some qualitative comparisons of single fish detection and discrimination in midwater and hard to the bottom. He emphasized that bottom depth anomalies could confuse the interpretation of sounder displays of near seabed. The author emphasized the in the

1990's improved survey precision will be required and this might be achieved by re-examining the echo processes near the seabed boundary.

4.2   Godø, O.R. and R.Shengmin. Can data from bottom trawl and acoustic surveys be combined to one abundance estimate?

The paper was presented by O.R.Godø. Combined acoustic and bottom trawl surveys for cod and haddock have been carried out in the Barents Sea since 1981 but indices derived from each method are treated as independent measurements of stock abundance for tuning the VPA. Development of a rational strategy for combining the estimated bottom zone abundance from the bottom trawl survey with the estimated abundance in the pelagic zone from the acoustic survey is hampered by two problems: 1) not knowing the accuracy of the two methods; and, 2) not knowing the relationship between the two methods.

The author summarized several approaches which have been undertaken to address possible methods for combining the two sets of information. He emphasized that extensive knowledge of the dynamics of vertical distribution and migration are required. He reported on results of analyses of the 1991 and 1992 survey data in which the following aspects were considered: diurnal variation in bottom zone abundance; bottom depth influence; density dependent distribution; and areal differences. The data were analyzed using an ANOVA model which estimated a trawl index adjustment factor for each stratum in the bottom trawl survey; all indices were adjusted and compared with the VPA estimates. Comparisons of older age groups was encouraging, however, further work is required to establish sources and magnitude of variability.

5. Presentation of papers on other topics.

5.1 Arnold,G.P. The Lowestoft data storage tag.

In recent years consideration of the effect of migratory behavior on catch and long term management has become increasingly important. The author described the first use of transponding acoustic tags together with scanning sonar technology and explained how this approach allowed rapid acquisition of data on behavior of fish. He described work done at Lowestoft on North Sea plaice vertical movements with respect to tide and diel period. Similar tidal movements were also seen in eels, cod, sole and dogfish. Earlier acoustic tag studies were centered around tagging a single fish and following it, however, it was only possible to observe movements over short time intervals. Thus there was a need to develop a data storage tag which could collect and record measurements over long periods of time.

Dr Arnold discussed the design and development of the Lowestoft data storage tag, a miniaturized microprocessor-based device with substantial built-in data storage

capacity. Dummy tags, with similar dimensions to the production model, have already been tested and results indicate that predicted cumulative returns rates would be close to 45%. Prototype tags have been produced and the first production batch will be available later this year. The current version can measure time-scaled information on depth and temperature. Future versions may include sensors for measuring tilt angle, compass direction, heart beat rate, tail beat rate, and other parameters.