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## ADDENDUM

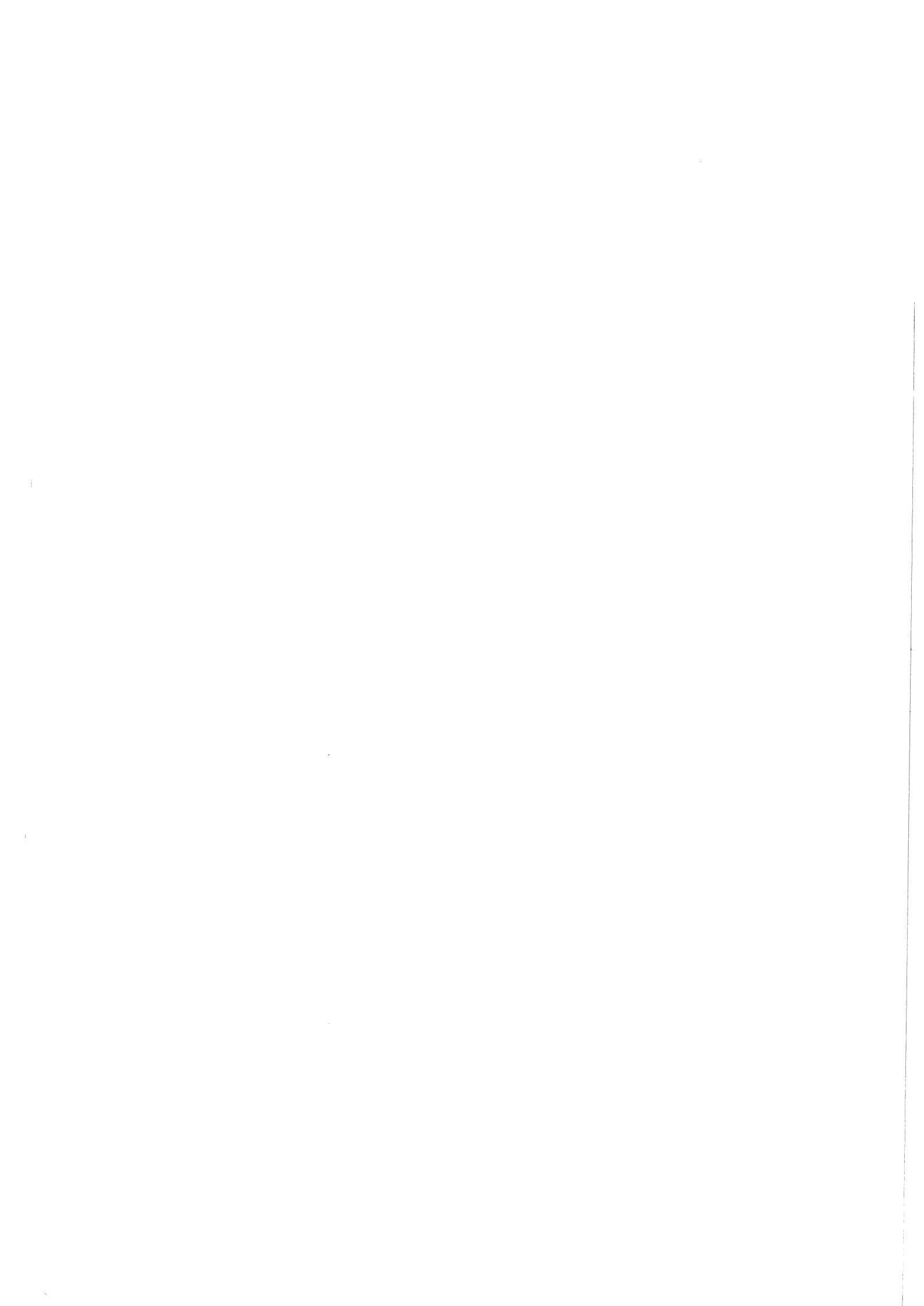
TO C.M.1994/L:12

REPORT OF THE RECRUITMENT PROCESSES WORKING GROUP

APPENDIX 7

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## APPENDIX 7

An addition to the Report of the Recruitment Processes Working Group CM 1994/L:12, dated 24 August 1994.

Report from a subgroup of the Recruitment Processes Working Group

Prospects for a Workshop on the relationship between otolith growth and body growth in fish larvae

S.Campana (Canada), T.Linkowski (Poland) and H.Mosegaard (Sweden)

### Summary

A subgroup of the main WG comprising S. Campana (Canada), T. Linkowski (Poland) and H. Mosegaard (Sweden) worked by correspondence through the summer of 1994 and evaluated the consistency of the relationship between otolith length, weight and area. As a result of their deliberations the subgroup recommends that a Workshop on otolith growth be held in 1996.

### Recommendation

The subgroup recommends that a workshop entitled "Towards an Otolith Growth Model" (Convenor: S. Campana) should be held in Canada in June 1996, immediately prior to the next RPWG meeting.

The terms of reference for the Workshop should be to:

- i Statistically test a range of conceptual models of otolith growth by analysis of assembled data on cod and herring.
- ii Identify conceptual limits to further progress.
- iii Determine the characteristics of an experimental programme designed to overcome the conceptual limitations to progress.

### Detailed subgroup report

The first concern of the subgroup was to assess the problems associated with the use of otolith length as a measure of otolith growth, rather than weight or area. It was concluded that otolith weight was likely to be a more useful measure of otolith growth than was otolith length. However, based on a review of both the literature and unpublished data, it was agreed that the relationship between otolith weight, area and length was sufficiently tight that the latter could be used as a proxy for the former in juvenile and adult fish. There were insufficient data to reach a conclusion for larval fish.

There was general agreement that further progress in modelling otolith growth is possible and desirable. It may be that this progress is possible with existing data. More likely however, additional contrast will be required in the data together with new experiments. Several suggestions were made concerning new experiments or analyses prior to any workshop. However, the planning of any new experiments/analyses will be sufficiently difficult that this should form part of the workshop.

A workshop should be devoted to the conceptual basis and design of a model of otolith growth, with statistical model-fitting used to test among various conceptualizations. The expected product would probably not include the development of a working otolith growth model, but rather would specifically outline what is needed in order to reach that objective. Naturally, reaching such an objective would require a thorough review of the literature as well as a highly-contrasted data set, both of which would have to be available in a standardized format prior to the workshop.

In many ways, the above objective is similar to that discussed at the RPWG meeting in Lysekil. Where it differs is in terms of the product: more than one conceptual model should be tabled and evaluated. Furthermore it is suspected that the exercise will quickly reach the limits of conceptual knowledge, and will demonstrate that the necessary experiments to understand otolith growth have never been done. Those experiments could then be designed as part of the workshop, and implementation considered. Although these products fall short of the originally-proposed working otolith growth model, either of these products would be a real step forward: this would not be a trivial exercise. At the end of the workshop, the group would also be in a much better position to schedule the development of a working growth model.

Defining the conceptual basis of otolith growth will require more expertise than is currently available in the RPWG. In addition to interested RPWG members, we suggest that workshop invitations be extended to, at a minimum, a statistician, a physiologist and a specialist in biomineralization.

It is proposed that the workshop be held in Canada over a 3-4 day period immediately prior to the next RPWG meeting in June 1996. Additional expenses for all workshop/RPWG attendees would then be minimal, and much less than those associated with a 1995 workshop date. While it is premature to specify a workshop site now, there are several resort sites within driving range of Halifax which could be used to host the workshop and yet leave participants in relaxed surroundings different from that of the ensuing RPWG meeting.

## **Conclusions**

In conclusion, the subgroup recommends that a workshop entitled "Towards an Otolith Growth Model" (Convenor: S. Campana) should be held in Canada in June 1996, immediately prior to the next RPWG meeting.

The terms of reference for the Workshop should be to:

- i Statistically test a range of conceptual models of otolith growth by analysis of assembled data on cod and herring.
- ii Identify conceptual limits to further progress.

- iii Determine the characteristics of an experimental programme designed to overcome the conceptual limitations to progress.

The workshop will work towards the definition of the conceptual basis of otolith growth, and use existing data to initiate the design of a predictive mathematical model.

The sub-group agreed to coordinate the advance preparations for the workshop, including the following:

- a) data for both cod and herring from a minimum of 5 different geographic regions, spanning a broad range of environmental conditions, with the list of variables to include larval length, larval weight (if possible), age in days, otolith diameter, otolith radius, otolith weight (if possible), increment width time series, temperature at capture, and temperature time series associated with the increment width sequence (if possible). The data are to be drawn as much as possible from RPWG members, and are to be provided in a standardized format in an ASCII file
- b) a thorough review of the literature associated with the mechanisms of otolith growth
- c) identification of specialists not already represented in the RPWG who could contribute to progress in the workshop, such as statisticians, physiologists and experts in biomineralization