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SCIENTIFIC COUNCIL MEETING - JUNE 1980

Preliminary Report of the Larval Herring Task Force

Woods Hole, USA, 28 April-1 May 1980

Chairman: M. D. Grosslein

Rapporteur: G. Bolz

Following a 1979 recommendation by the Environmental Subcommittee of STACRES, which was adopted by NAFO (NAFO Proc. 1979, p. 118) a larval herring task force met in Woods Hole, from 28 April to 1 May 1980, to review progress to date on analysis of the ICNAF larval herring data base. The Task Force was asked to evaluate the status of the data base and methods of analysis, to expedite the completion of processing and analysis of the time-series, and to consider possible recommendations for future work. Only a brief outline of the meeting is given here since a full report of the proceedings of the Task Force will be made on September 3-4, 1980 at the meeting of the NAFO Scientific Council.

Thirty-five scientists from four countries participated (attachment 1) and reviewed the status of biological and physical data relevant to the question of factors controlling year class success in sea herring primarily in the Georges Bank - Gulf of Maine region (list of topics discussed - attachment 2). Existing knowledge of the location and timing of spawning, and the distribution of larvae was summarized for all major stocks. Preliminary analyses of larval dispersal based on .505 mm mesh samples vs physical data on wind and water mass movements were presented for the ICNAF time-series 1971-1978 including results from the 1978 Patch Study. Also, preliminary estimates of larval growth, feeding and mortality, as well as larval production vs spawning stock estimates, were reviewed for the Georges Bank series. Progress in analysis of both physical and biological experiments during the 1978 Patch Study was also reviewed. Sources of bias and sampling variability among the various data sets were considered. Further

processing and analysis of the backlog of plankton samples and hydrographic data was discussed for all relevant biological and environmental data primarily for the period 1971-1978, in relation to various hypotheses about factors controlling year class success in sea herring. Specific data sets and analyses were identified which should get high priority and which should be reported on at the September meeting (attachment 3). Finally the value of possible physical and biological data reports or Atlases was considered.

Specific recommendations of the Task Force were as follows:

1. The Task Force should meet again on 3-4 September in St. John's, Newfoundland, to review further documentation and analysis of the larval herring time series, and to evaluate the data base with emphasis on factors affecting the recruitment process.
2. That an inventory be produced of the physical-chemical data taken during the ICNAF Larval Herring Cruises, 1971-1978, with plots showing the station positions where each variable was measured on each cruise, and including information on where and how to obtain the archived data. To accomplish the above, that all outstanding physical-chemical data and station positions for all biological observations from the 1971-1978 cruises be submitted to MEDS by all participating institutions before 1 July 1980.
3. An inventory of biological data and a bibliography should be prepared for the ICNAF larval herring cruises, 1971-1978.
4. A summary and critique be prepared of hypotheses on factors controlling recruitment in sea herring.
5. A series of papers on various aspects of herring recruitment be prepared for presentation at the Sept. 3-4 meeting (a tentative list is given in attachment #3).

NAFO Larval Herring Task Force, 28 April-1 May 1980

List of Participants

Canada

Anderson, J.

Dalley, E.

Day, L.

Gagnon, J.

Iles, D.

Keeley, R.

O'Boyle, R.

Trites, R.

Ware, D.

Poland

Grimm, S.

United Kingdom

Hill, H.

United States

Allen, A.

Fornshell, J.

Marak, R.

Anthony, V.

Goulet, J.

Pennington, M.

Bolz, G.

Graham, J.

Potter, D.

Busch, D.

Green, J.

Ridgway, G.

Chamberlin, W.

Grosslein, M.

Schlitz, R.

Cohen, R.

Ingham, M.

Sullivan, L.

Cooper, R.

Laurence, G.

Whitledge, T.

Dagg, M.

Lough, G.

Wright, R.

NAFO Larval Herring Task Force,

28 April-1 May 1980

Northeast Fisheries Center, Woods Hole, Massachusetts

Topics Covered at Workshop

1. Opening Session - 1000 (objectives and schedule, selection of rapporteur, adoption of agenda).
2. General overview larval herring program (Grosslein).
3. Herring spawning areas and timing vs. temperature; larval dispersal
 - Georges Bank (Lough, Grimm, Trites)
 - Gulf of Maine (Cooper, Graham)
 - Western Nova Scotia (Iles)
 - Gulf of St. Lawrence (Ware)Vertical Distribution of Larvae - Georges Bank (Lough).
4. Critiques of ICNAF sampling design - time x area coverage, sampling variability, extrusion and avoidance, Night/Day ratios, mesh sizes.
 - Georges Bank (Lough, Green, Pennington)
 - Nova Scotia (O'Boyle)
5. Sorting Protocols and Status basic Larval Herring Data Base
 - ICNAF series, Georges Bank & Gulf of Maine - .505 mm mesh (Lough)
 - Nova Scotia (Iles)
 - Polish Sorting Center - 0.333 mm mesh (Marak)
 - Comparison length frequencies - .333 vs. .505-mm samples (Bolz)
 - MARMAP Information System Data products (Goulet)
6. Distribution herring larvae on Georges Bank
 - Vertical distribution of larvae (Lough)
 - Larval dispersal (Lough)
7. Herring larvae vs. other zooplankton
 - Larval feeding vs. zooplankton (Cohen)
 - Composition and abundance total ichthyoplankton (Bolz)
8. Larval growth and mortality
 - Georges Bank (Lough, Pennington)
 - Gulf of Maine (Graham)
 - Nova Scotia (Iles)

9. Larval production vs. spawning stock and recruitment on
Georges Bank (Lough, Anthony)
10. Review Physical-Chemical Data Base from ICNAF 1971-1978 Time Series
 - Physical Oceanography (Wright)
 - Nutrients-chlorophyll-primary production (Busch)
 - Archived oceanographic data at MEDS (Gagnon)
 - Other sources oceanographic and meteorological data (Ingham)
 - Satellite observations (Chamberlin)
11. Georges Bank Patch Study
 - Physical oceanographic experiments (Trites, Schlitz)
 - Biological experiments (Lough, Whitledge, Dagg)
12. North Sea Plaice Patch Experiments (Hill)
13. Brief consideration hypotheses controlling herring year class success.
14. Processing, analysis, and publication of ICNAF data backlog
 - Inventories of physical and biological data series
 - Analyses and papers in progress
 - Additional analysis needed on available data
15. Future research on herring recruitment
 - Ongoing MARMAP series
 - Objectives and recommendations for next meeting of Task Force
in September.

Attachment #3

Preliminary List of Papers to be Prepared
for September meeting of Task Force

1. Review environmental and biological factors controlling recruitment of herring in Northwest Atlantic (Iles).
2. Evaluation of recruitment mechanisms in sea herring based on western Gulf of Maine studies of larvae (Graham).
3. Summary report on Georges Bank larval herring patch study (Lough, Trites, Wright).
4. Larval herring growth model for Georges Bank (Lough, Pennington).
5. Avoidance of bongo nets by herring larvae (Lough).
6. Spawning stock estimates from VPA for Georges Bank - Gulf of Maine stocks (Anthony).
7. Description of spawning areas and timing vs. temperature in Georges Bank region (Grimm).
8. Correlation of pre-recruit abundance with subsequent year class strengths (Sinclair).
9. Growth and mortality of herring larvae on Georges Bank (Lough, Bolz).
10. Feeding of herring larvae on Georges Bank (Cohen).
11. Vertical distribution of herring larvae on Georges Bank based on MOCNESS samples (Lough).
12. Invertebrate zooplankton distribution and abundance in ICNAF area based on 1971-1978 MARMAP surveys (Sherman).
13. Abundance and distribution of total ichthyoplankton on Georges Bank for ICNAF time series (Bolz).
14. Inventory of physical-chemical data for ICNAF larval herring cruises, 1971-1978 (Gagnon, Keeley, Wright, others).
15. Summary and critique of hypotheses on factors controlling year class success in sea herring (Grosslein, O'Boyle).
16. Inventory of biological data and bibliography for ICNAF larval herring cruises 1971-1978 (Lough, Bolz).
17. Inventory of larval herring data for Canadian surveys off western Nova Scotia (Iles).
18. Dispersal of herring larvae from spawning sites in the Georges Bank area (Lough, et al.).