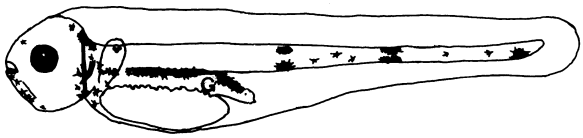
STAGES



Newsletter of the AFS Early Life History Section

Volume 19, Number 3 Jan. 1999

Inside this Issue

23rd Larval Fish Conference - April 6-10 at the NMFS/NOAA lab in Beaufort, NC to celebrate the 100th centenary of the Beaufort Lab. See page 12 for more details

AFS: Aug 29 - Sept 2 in Charlotte, North Carolina

Flatfish Ecology Symposium: Oct 18-23, Morehead City, NC

PRESIDENT'S MESSAGE

The "Mid-year" report on the state of the Early Life History Section has been submitted to the American Fisheries Society, and I am pleased to report that the "state of our organization is sound". This statement, as allegorical and facetious as it is, is nonetheless true. Our Treasurer, Newsletter Editor, and Web-Master, report that our membership is strong and efforts toward the recovery of the few derelict members that have fallen away, are underway. Our election of new officers will be complete in mid-March. Our Annual Larval Fish Conference, in Beaufort, North Carolina in early April, is impending, and we have proposals from prospective Conference hosts through the year 2002!

Apathy, a ubiquitous plague of all social organizations, has not spared ours. Much of the work of the maintenance and stewardship of our organization is left to a few. In accordance with our new Standing Rules, our Sessional, Standing, and *ad hoc* committees are in place and are with Chairs, but they must now be rounded out. Our Business Meetings, through which the business of our professional organization is conducted, are not well attended. I invite and encourage all of our members to participate in the next Business Meeting in Beaufort at our Twenty-third Annual Larval Fish Conference. The Officers of the Section need to know the attitudes of our members so that decisions will be made for the benefit of our entire organization.

Only through involvement can our organization, the Early Life History Section, move forward and grow. Only through participation can our members fully benefit.

Jeff Govoni, President

Masthead

NEWS FROM THE REGIONS

Northeast Region — Ben Letcher, S. O. Conte Anadromous Fish Research Center, 1 Migratory Way, P. O. Box 796, Turner Falls, MA 01376. (Phone: (413) 863-8995 ext 34, Email: bletcher@external.umass.edu).

Fisheries Oceanography Lab, Dalhousie University, Halifax, Nova Scotia, Canada

Research in Christopher Taggart's fisheries oceanography laboratory in the Oceanography Department at Dalhousie involves research formulated as testable hypotheses critical to making scientific predictions that have value in application. The field and laboratory research involves aspects of physical, biochemical, genetic and ecological influences on the early life history and recruitment in fish and on fish population structure and distribution. The research is conducted collaboratively with graduate students, research associates and research assistants, and in association with researchers at other academic and government institutions. Considerable effort is currently focused on quantifying the physical and biological processes responsible for the maintenance of discrete populations of fish on offshore marine banks. Thus, the efforts range from physical/biological coupling during the early life history stages of marine fish to population genetics viewed from an oceanographic perspective.

The focus of our GLOBEC-Canada field studies is Western Bank - a small, typical, low energy bank on the central Scotian Shelf located 150 km south of Halifax. Western Bank is also a major spawning area for a variety of groundfish and pelagic species. Here we are determining the relative roles of production and/or retention in the maintenance of high concentrations of larval fish, benthic invertebrate larvae and zooplankton on marine banks. Our work builds on the results from the OPEN (Ocean Production Enhancement Network) program in the early 1990's by examining the temporal and spatial scales of larval fish production and retention. Our work requires the incorporation of physical and biological oceanography into a coherent research program and involves researchers from a variety of institutions. We recently (Oct.-Nov. 1998) completed our final field season to meet the goals

(Continued on page 4)

Fourth International Symposium on Flatfish Ecology

Morehead City, NC, USA

18-23 October 1999

The symposium will consist of invited lectures, scientific papers (oral and poster), and workshops. All participants will be asked to develop their presentations to address the following question:

Given the state of knowledge, how can information on flatfish biology and ecology, related to the topics outlined below, be applied to understanding recruitment variation, population fluctuations and direct us to improved management approaches?

Topics and Keynote Speakers

- Hydrodynamics: E. Hill, University of Wales, UK
- Systematics and taxonomy: T. Munroe, National Museum of Natural History, USA
- Environmental influences on distribution: S. Sogard, Alaska Fisheries Science Center, USA
- Ecophysiology: Y. Yamashita, Tohoku National Fisheries Research Institute, Japan
- Recruimtent variability: M. Heath, Marine Laboratory, Scotland
- Managment: K. Frank, Canada

For more information on attendance contact:

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MEETING ANNOUNCEMENT

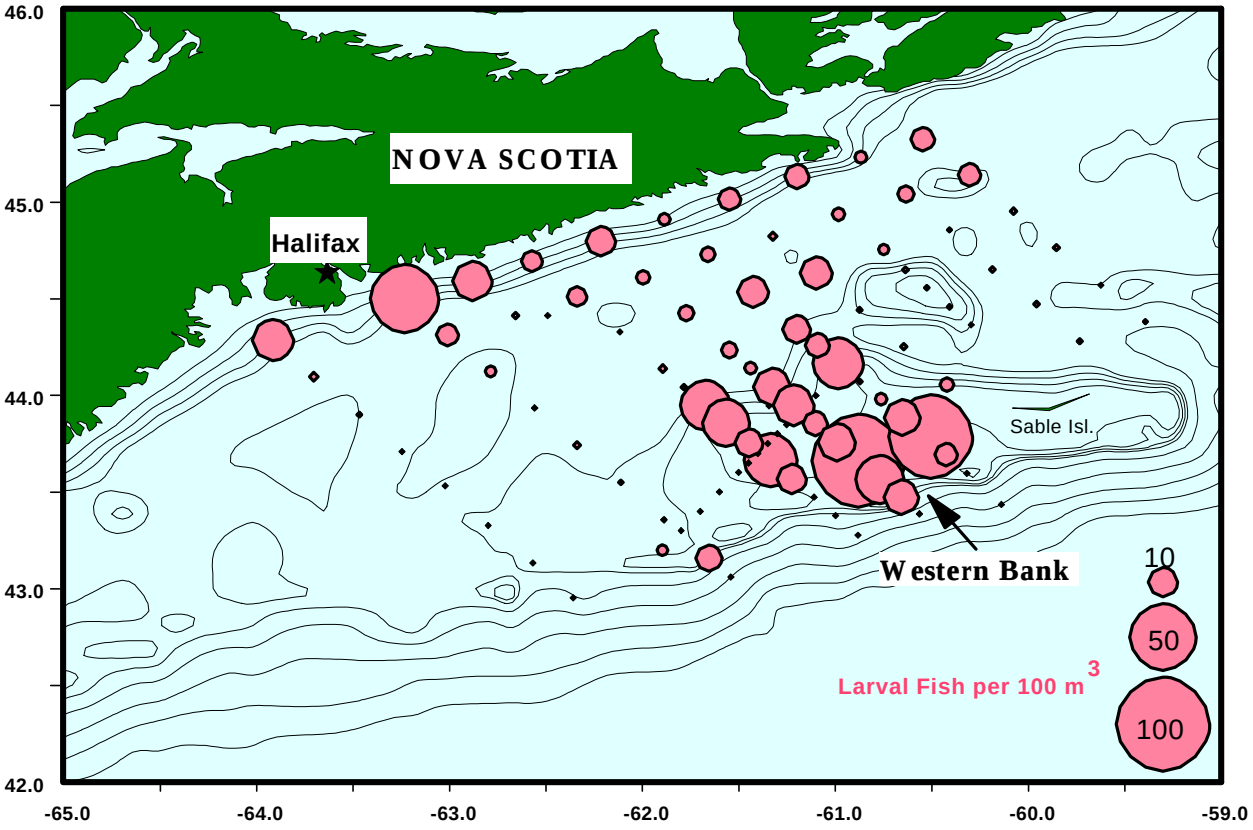
The First Biennial Meeting on the Biology of Tautog and Cunner is scheduled for November 30 and December 1, 1999. This meeting will be held at the Best Western Sovereign Hotel in Mystic, CT. Presentations will focus on the population biology, ecology, physiology, aquaculture, and fishery issues of tautog and cunner. We invite researchers with interests in any of these general topics to participate. This workshop is jointly sponsored by the Connecticut Department of Environmental Protection, Northeast Fisheries Science Center of the National Marine Fisheries Service, Northeast Utilities, and the University of Connecticut Department of Ecology and Evolutionary Biology. If you are interested in presenting a paper, a poster, or receiving more information about the workshop, please contact Anne Studholme at (732) 872-3001 or Anne.Studholme@noaa.gov to be put on the mailing list. Further details are posted at www.eeb.uconn.edu/tautog/announcement.html.

(Continued from page 2)

of the research programme and collaborated with other GLOBEC researchers from the fish ecology lab at Queen's University (see Stages 19(2), Sept. 1998) and in the Biology Department here at Dalhousie as well as physical oceanographers here at Dalhousie and at Memorial University. Rob Stephenson and Mike Power at the St. Andrews Biological Station have also made considerable collaborative contributions to our GLOBEC research.

The abundance distribution of larval fish (cod, hake, herring, capelin etc.) on the Scotian Shelf in Autumn reveals Western Bank as the only "hot source" except for the coastal concentrations of herring.

Christian Reiss is a GLOBEC-Canada post-doctoral fellow heading up much of the field research. He has been developing, in collaboration with the physical oceanographers, simple, tractable and field-ready circulation models that are used in near real-time to direct sampling in the field at the biologically appropriate temporal and spatial scales. The models are necessarily data assimilative and we have used the techniques to resolve flow fields while at sea so that we can adapt our sampling to the dynamic and advective environment, rather than using frozen field assumptions. We are now better able to interpret the biological data and have been able to show that larval size and abundance distributions can be most easily explained by spawning origin and density driven circulation. Several important aspects of the data have emerged from our preliminary analyses. Surface fronts seem to be unimportant in determining the spatial patterns of larval fish around Western Bank, especially during the summer when the wate column is highly stratified. Small scale spatial separation of life stages and species is consistent among years and appears related to the overall average drift of larvae around the bank. The consistency of pattern in species-specific size and abundance distributions is now leading us toward operational oceanography and we are preparing to make testable predictions of where larvae of a given species and size should be found through time.



Recruitment predictions should follow accordingly.

Jennifer Jeffrey, a graduate student in the lab, is using the Western Bank system to quantify relations between otolith (and thus larval) growth and variability in oceanographic conditions (initially focusing on temperature, water mass characteristics and wind mixing). Silver hake larvae and Western Bank represent an ideal model species and system for Jenn's research for several reasons. First, silver hake otoliths show well-defined daily increments that are ideal for estimating daily growth variation among individuals at a variety of scales. After all, silver hake was one of the species Pannella (1971) used to first demonstrate daily growth increments. Second, multiple cohorts of hake larvae persist in the Western Bank region for reasons that Christian Reiss (above) is determining. Finally, the oceanographic conditions on and around Western Bank are continuously varying and we have collected extensive data series (time and space) on those conditions. Previous studies addressing similar questions have provied mixed results, and at a variety of scales and perhaps the frequently applied method of temporally averaging individual growth variation is, in part, responsible. Thus, Jennifer is examining growth variability at a variety of scales; both among and within temporal cohorts of silver hake larvae and their entraining water masses. To date, Jennifer has found growth differences among larvae collected in September and November of 1997 consistent with seasonal variability in temperature. At smaller scales she has also found evidence of within cohort growth variability among water masses. The relationship between these growth differences and spatial variability in the oceanographic conditions is now being determined. So far, it appears that individual growth variability is high for larvae collected at a single location and time and there is evidence of accelerated growth in some individuals as early as 10 days post-hatch. The explanations for accelerated growth in these individuals, and its influence on future srvival, is fast becoming the focus of Jenn's research.

Arran McPherson, another graduate student in the lab, is using microsatellite variability to examine population structure of Atlantic herring in the Scotia-Fundy region and the role that oceanographic processes may play in explaining the structure, or lack thereof. Fisheries related genetic studies, until very recently, frequently failed to address oceanographic processes as genetic structuring agents. This prompted Arran to characterize the population structure of Atlantic herring in the region within an oceanographic (and therefore dynamic) framework. Working with Doug Cook in the Marine Gene Probe Laboratory (MGPL) here at Dalhousie, Arran is using 5 highly polymorphic microsatellite loci derived from Pacific herring (including one not previously used with Atlantic herring) as her major investigative tool. Microsatellites have been shown to reliably measure fine-scale population structure in several marine species, including cod where the lab has played a leading role in collaboration with MGPL over the ast 5 years. The novel coupling of oceanography and genetics has attracted research funding from the Pelagics Research Council, a fishing industry co-operative. To date, genetic samples from ripe and running fish have been collected from eleven spawning locations in the Scotia-Fundy region. In addition, larval herring samples have been collected from two very different oceanographic systems. One is offshore in the Western Bank region where there is clear evidence of population resurgence (from commercial extinction) and where circulation might be playing a role. The other is in the Nova Scotia coastal current where there are many putative spawning populations and where there is clear evidence of large scale advection. Arran's preliminary results provide evidence of population structure in the Scotia-Fundy region based on the analyses of 2 spawning groups within the same management unit. The evolving results are certain to provide insights on genetic structuring processes in Atlantic herring, related retentio and dispersal hypotheses, as well as the appropriate scale for population-based exploitation and management.

Erin Arnold is a Biology undergraduate in the lab working on her Honours thesis that is focused on testing the working hypothesis that crab

abundance in the Western Bank region has increased over the last two decades as a result of the concomitant decline in groundfish biomass. Commercial landings data for benthic invertebrates are consistent with this hypothesis but are difficult to quantify due to limited effort data. Thus Erin is using historical and new Brachyuran larval (zoea and megalopa) abundance data collected in the late 1970's and in the late 1990's as part of our GLOBEC-Canada research. Her analyses indicate an increase of approximately two orders of magnitude in larval crab concentration between the late 1970's and late 1990's when groundfish biomass and size structure decreased significantly. Wisely, Erin is assessing competing hypotheses. For example, the change in the abundance of crab larvae may be more easily explained by changes in the oceanographic environment. Her analyses of water column temperature and salinity data during the late 70's and late 90's are inconsistent with this hypothesis. The changes in abundance may alternatively be related to differential predation on the crab larvae by zooplanktivorous fish. However, over the last two decades herring and capelin (both planktivores) have increased significantly and this is inconsistent with the alternate hypothesis. Differences in sampling techniques and the spatial resolution of the data (bank-scale related bias) from the two periods are also being examined for their potential in explaining the observed change.

Shawn Pascoe, another Biology undergraduate in the lab has completed his Honours thesis, the core of which he is now preparing for publication. Working collaboratively with Mark Hanson at the Gulf Fisheries Centre, Shawn took advantage of the construction of the Confederation Bridge in the Northumberland Strait region of the Gulf of St. Lawrence to address some scallop fishery questions. During the period 1994-96 the construction resulted in a 5.6 km wide corridor that had reduced fishing activity. Using collections of the sea scallop shells from within and outside of the restricted corridor, Shawn was able to test several hypotheses related to the effects of fishing on a scallop population. His results show that the restricted fishing area had a significantly higher proportion of younger, smaller scallops relative to the normal fishing area (increased recruitment). Scallops from the normal fishing area for ages 5 to 7 showed higher growth during the three most recent years relative to those from the restricted fishing area (possibly a density dependent response). Shell damage was significantly higher in the normal fishing area (a direct fishing intensity response). Shell damage from parasitic *Polydora* was significantly higher in the normal fishing area (again related to fishing intensity). Shawn's study demonstrated that a reduction in fishing intensity on a sea scallop population over a period as short as three years can result in significant changes in the population and that the scallop resource might be more effectively managed using a rotational fishery.

Other collaborative efforts underway in the lab that have been recently completed, are ongoing, or are just getting underway include determining the genetic basis for population structure in Atlantic cod at a variety of scales (shelf-, bank-, and bay-scales) in the NW Atlantic, genetic analyses of oceanographically driven cod larvae exchange between Browns Bank and Georges Bank, the application of forensic genetics to shark by-catch problems, and a comprehensive review of the implications of physical, biological, economic, and socio-political changes for Canadian marine fisheries and options for the future.

For more information please contact:
Dr. C.T. Taggart
chris.taggart@dal.ca

or visit our Web site:
http://www.phys.ocean.dal.ca/~taggart/

Be a Part of A Success Story Contribute to STAGES

STAGES is recognized as one of the best newsletters within AFS. The regional reviews are the foundation of STAGES, bringing you updates on ELH research. If you have not submitted anything for STAGES, or have not talked to your regional rep, please contact them. They will be delighted to hear from you.

Location http://www.eos.ubc.ca/afs_early

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Welcome to the

EARLY LIFE HISTORY SECTION (ELHS)

Of the American Fisheries Society

Welcome to our new home page! The purpose of these pages is to provide a rapid means to disseminate information to ELHS members and anyone looking for information about the ELHS section. As such, these pages will complement Stages, our official newsletter

We are currently testing an online version of Stages. Follow the ELHS Newsletter link in the Directory on the left of the screen

Although still under construction, we hope you will find these pages informative in their present form. If you encounter any problem in viewing this page, please let me know (include the size and resolution of the monitor in your message).

Some of the items currently under consideration for inclusion in these pages are a searchable (and updateable) membership list, downloadable (pdf) versions of older issues of Stages, and an archive of larval fish images and drawings. If you have any comments on these or other elements of these pages, or if you have an ELHS web-page you would like to see linked under the "Other Links" section, please email me.

John Dower
ELHS Webmaster

Visit to new ELHS Homepage!!
The site contains full details of meetings, a membership directory and back issues of Stages!!!

Western Region. Dan Margulies, Inter-American Tropical Tuna Commission, Scripps Institute of Oceanography, 8604 La Jolla Shores Drive, La Jolla, CA 92037. (Phone: (619) 546-7120, Fax: (619) 546-7133, E-mail: dmargulies@iattc.ucsd.edu

Alaska Fisheries Science Center, NMFS

Researchers at the Alaska Fisheries Science Center are working on a Northeast Pacific GLOBEC project on ichthyoplankton abundance, distribution, and species associations of the Northeast Pacific and Bering Sea

Principal Investigators Ric Brodeur, Kevin Bailey, Miriam Doyle, Ann Matarese, and Susan Picquelle, along with several other FOCI researchers have begun a 3-year (1998-2000) retrospective analysis of ichthyoplankton data collected by the AFSC over the last 25 years. One of the products of this study will be an extensive atlas documenting the distribution of the 100 most abundant species in these collections. These collections will also examine in light of concurrent environmental conditions (e.g. ENSO, Regime Shifts), to provide a basis for understanding adaptations of spawning strategies and early life history patterns of the fish inhabiting the study areas.

Introduction

Ichthyoplankton surveys have been carried out in many large marine ecosystems as a way of generating fishery-independent stock assessment and as a result have played a key role in understanding how marine ecosystems function. It is hypothesized that spawning strategies among marine fish populations have evolved in synchrony with prevailing oceanographic conditions to give rise to persistent assemblages of fish larvae. Distinct assemblages of larvae have been recognized in diverse ecosystems and their occurrences reflect temporal and spatial patterns in the oceanographic environment.

The Fisheries Oceanography Coordinated Investigations (FOCI) research program has sought to understand processes leading to recruitment variability of commercially valuable fish and shellfish stocks of the North Pacific. To date, most of the effort has been concentrated on walleye pollock. Ancillary to the information gained on the early life history of walleye pollock, the FOCI database contains substantial information on the distribution and abundance patterns of eggs and larvae of other fish species which spawn in this region. This information can contribute significantly to an understanding of the biology and ecology of fish populations and the relationships between their life history strategies and the marine environment.

One of the goals of the Northeast Pacific GLOBEC program is to examine the effects of climate variability on plankton and fish populations and how these may respond to past and anticipated future climate change. Our effort in this regard will use over 10,000 plankton collections spanning 25 years (1971-1996) from the West Coast, Gulf of Alaska, and Bering Sea to examine geographic distributions and temporal trends in the dominant egg and larval components of the ichthyoplankton and how these relate to physical and biotic conditions during this period. The results will be interpreted with a view to understanding long term fluctuations in fish populations and adaptations of their early life history strategies to the environment.

Hypotheses and Research Questions

Several hypotheses that are being addressed by this research relate to the Northeast Pacific GLOBEC program goal of examining the effects of climate variability on fish populations:

Hypothesis 1. Spawning strategies among fish populations in the North Pacific have evolved in synchrony with the prevailing oceanographic conditions in the region to give rise to persistent ichthyoplankton associations.

Hypothesis 2. Occasional anomalous years in terms of climate and physical oceanography conditions cause major disruptions to fish spawning patterns and subsequent distribution and abundance of ichthyoplankton.

Hypothesis 3. Oceanographic regime shifts in the Northeast Pacific cause changes in spawning patterns among fish species and affect the occurrence and distribution of ichthyoplankton assemblages.

Hypothesis 4. The unusual occurrence or abundance of certain ichthyoplankton species in some years are manifestations of anomalous oceanographic conditions such as those that prevail during ENSO events.

Work in Progress

The objective for 1998 is to error-check and clean the database and begin to produce a comprehensive atlas of the distribution patterns of approximately 100 species that are important contributors to the ichthyoplankton assemblage. We are also analyzing the distributions of select taxa as indicators of ENSO-induced onshore transport.

Planned Work

1) identify dominant species and assemblages in the ichthyoplankton, describe their horizontal distribution patterns, and relate these to the oceanography of the study areas
2) examine temporal (intra- and interannual) variability in species composition, relative abundance, assemblage structure, and distribution patterns of spring ichthyoplankton
3) describe processes associated with onshore transport of fish eggs and larvae and develop cross-shelf exchange tracers composed of offshore ichthyoplankton assemblages
4) examine long-term trends in larval abundance and compare to available population trends of each species for each study area.

SECTION GOVERNANCE

Minutes of the Business Meeting – July 10, 1998, Ann Arbor, MI

1. The meeting was called to order at 5:55 pm.
2. Presidential announcements: President Jim Cowan announced that he would be passing the gavel to incoming president Jeff Govoni during the New Business portion of the meeting. Jim also noted that copies of the draft Standing Rules had been included with the registration packets given to participants at the 22nd Larval Fish Conference. He asked members to provide him with comments or corrections in the next few weeks so that the draft can be finalized and voted on by the ExCom.
3. Since only 10 voting members were present, a quorum was not achieved and the meeting proceeded for information and discussion purposes only.
4. Minutes of the previous meeting were distributed.
5. Sally Richardson Award Committee: Jeff Govoni noted that in the proposed new Standing Rules the committee has changed from an ad hoc committee to a Sessional committee. The committee is now responsible for running the award each year, so that that burden is removed from the local organizing committees. As incoming president, Jeff will need to appoint new members to the committee. Grace Klein-MacPhee volunteered to serve as a committee member. The endowment for the award is in good shape and we are almost able to fund the award each year just from the interest.
6. Treasurer's report: Kathy Lang reported that the ELHS general account had a balance of $23,559.33 (including $5,559.79 in escrow for future publications) and the Sally Richardson Fund a balance of $8,912.12, both as of June 1, 1998. Although her report listed $1,946.50 as "profit from 21st LFC" as income, that is not

really profit, but merely a repayment of the $3,000 advanced to the local committee for the 21st Larval Fish Conference.

7. Mail Ballot Committee: Jim Cowan announced that Scott Holt had stepped down as chair of this committee during the past year. Jim had solicited in our newsletter STAGES nominations for the offices of President-elect, Secretary-elect and the Regional Representatives, but had received no nominations. Jim and Dave Bengtson agreed to serve as members of this committee and will try to assemble a ballot as soon as possible. Simon Thorrold was nominated and agreed to run for Southeastern Regional Representative. Ben Letcher was nominated to continue as Northeastern Regional Representative.
8. Newsletter Committee: Tom Miller had submitted a written annual report, which is summarized as follows: 1) Tom has developed a new database of members, including both AFS-based members and affiliate members. It is a vast improvement over the old database, but still needs some work. We can now send out reminder notices to members who are tardy in dues payment and all members can be included in the membership directory on the web page. 2) Newsletters were published in June 1997, January 1998, and March 1998, and the May 1998 issue is in preparation. 3) Tom changed the printer and desktop publishing program after the May 1997 issue to improve quality and provided copies of last year's newsletters to the webmaster so that they could be put on line. 4) Tom will complete another year as newsletter editor and then ask the Section to find a new editor. Discussion followed presentation of Tom's report. Cynthia Jones remarked that Tom has done an outstanding job as editor and we should send him a letter of thanks. Jim Cowan noted that the proposed Standing Rules say that outgoing newsletter editors get a certificate of appreciation from the Section.
9. Old business: Bob Hoyt has about two dozen copies of the special volume printed by NOAA based on the 13th Larval Fish Conference and wondered if the Section could use them. Jeff Govoni suggested that they be donated as prizes for the Sally Richardson Fund raffle.
10. New business: Jeff Govoni took over the virtual gavel at this point in the meeting. Dave Secor is the incoming secretary, but was not able to be at the meeting. Jeff announced that the new Standing Rules require the incoming president to submit a two-year agenda at the Business Meeting. His agenda has two parts: 1) to provide stewardship of ELHS by implementing the new Standing Rules, and 2) to promote membership in the section (and he provided a series of suggestions toward the accomplishment of this goal). Jeff also announced that the Bylaws require the president to put forth an agenda for new projects. He envisions two new projects in his term. The first is to investigate the development of a Lifetime Achievement Award to be presented by the Section. After some discussion and suggestions, the general consensus was that the project should proceed and a committee should be formed to work out the details. Jim Cowan volunteered to serve on this committee. The second project is the publication of a bok by the Section. Lee Fuiman and Bob Werner will come up with a proposal and budget for a multi-authored book on fish early life history for use as a supplemental text in fishery science courses. Jim Rice suggested that a group of fishery educators be assembled to address the need for a text. The final order of new business was student travel grants. Jeff Govoni covered the brief history of these ad hoc awards and noted that the new Standing Rules establish a committee for them, with the ExCom deciding each year if sufficient funds are available to allow the award travel grants. It appears that the treasury is sufficient to support the awarding of two student travel grants for the 1999 Larval Fish Conference, but this will be voted on by the ExCom in an email ballot in the coming weeks. Rich McBride volunteered to serve as a member of this committee.
11. The meeting was adjourned at 7:20 pm.

Respectfully submitted,
David A. Bengtson, Secretary

Minutes of the Executive Committee Meeting – July 9, 1998, Ann Arbor, MI

1. The meeting was called to order at 5:10 pm by President Jim Cowan. It was determined that a quorum was not present, so the meeting proceeded for purposes of information and discussion only and it was agreed that no votes would be taken. Attendees were President Jim Cowan, President-elect Jeff Govoni, Secretary Dave Bengtson and Treasurer Kathy Lang, along with Publications Committee chair Lee Fuiman and Past President Bob Werner.
2. The main topic of discussion was the draft Standing Rules. A subcommittee had met at Dauphin Island, AL in February to develop these based on an original set of rules that had been drafted by Darrel Snyder some years previously. Copies of the draft Standing Rules were provided with the registration materials distributed at the 22nd Larval Fish Conference in Ann Arbor and Jim Cowan requested participants at the Conference to submit comments or corrections to him in the next few weeks. Discussion ensued to clarify some of the language in the draft Rules . In particular, it was noted that language should be included to a) require the Larval Fish Conference Committee to house the document that provides guidance to Conference hosts and to update it annually, and b) formalize the office and duties of the webmaster and to provide guidelines on what should be on the ELHS web site.
3. Publications Committee: Lee Fuiman said that he and Bob Werner will come up with a proposal to the ExCom by Sept. 1 for a volume on larval fish biology to be published by the Section.
4. Nominations Committee: Scott Holt has resigned as chair of this committee. Jim Cowan put out a call in STAGES for nominations for President-elect and Secretary-elect. There was no response, so Jim will start twisting arms.
5. Sally Richardson Award Committee: Jeff Govoni reviewed the status of the award and there was discussion about the amount of money in the bank account, which is nearly sufficient to fund the award each year out of the bank interest.
6. In response to a question, Jeff mentioned that nothing had been done about investigating the possibility of the Section developing a Lifetime Achievement Award. The subject will be brought up at the Business Meeting and, if there is sufficient support, Jeff will put on his two-year agenda as a new project during his presidential term the study of, and potential development of, such an award. It was agreed that development of a Section publication (see item 3 above) could become a second new project for Jeff's term. (The new Standing Rules require the incoming president to submit a two-year agenda for approval by the ExCom; because no votes could be taken, neither the two-year agenda nor the Standing Rules themselves were approved at this meeting.)
7. Treasurer's Report: Kathy Lang reported that last year's idea to open a Section bank account in a neutral location that would not change as treasurers change could not be implemented because one needs to physically enter the bank to open the account. She had therefore opened an account at a local bank in Massachusetts. She had investigated the costs in buying the necessary materials to handle credit card transactions and found that it was not cost-effective for the Section to handle credit cards. Foreign members who are affiliate members only will therefore have to continue to face currency transaction charges in paying dues. Suggestions were made that a) we could try to identify "country representatives" to collect dues from affiliate members within a country for forwarding *en bloc* to the Treasurer, and/or b) we could collect dues on a multiple-year basis from foreign affiliate members. Kathy reported that the ELHS general account has a balance of $23,559.33 and the Sally Richardson Award Account has a balance of $8,912.12 (both as of June 1, 1998).
8. The new Standing Rules authorize formation of a student travel grants committee to formalize what has been an ad hoc method of supporting student travel to recent Larval Fish Conferences. The Rules require the ExCom to decide

whether the treasury is sufficient to support the awarding of travel grants in any given year. Members of the ExCom present in Ann Arbor felt that we could afford to award two student travel grants for the next LFC, but the official vote on this will be by email ballot since no votes could be taken without a quorum.

9. Jeff Govoni announced that the 23rd Larval Fish Conference will be held in Beaufort, NC from April 9-14, 1999.
10. The meeting was adjourned at 6:45 pm.

Respectfully submitted,
David A. Bengtson, Secretary

PRELIMINARY SCHEDULE FOR LFC 99

Morning Session - Wednesday, April 7, 1999

0830 Introductory Remarks – D Hoss (Director of the Beaufort Laboratory) and J Govoni (President of the Early Life History Section)

0900 D Wolfe and D Hoss - Studies on Early Life History of Fishes at the Federal Fisheries Laboratory at Beaufort, NC

0920 L Fuiman and P Tytler - JHS Blaxter Session Organizers Remarks

0930 M Tanaka, S Kawai, Y Kurokawa and Y Takahashi - Metamorphosis and Digestive System in Teleost Fish

0950 R Werner and D Hoss - Consumption and Growth During Cross-Shelf Transport of the Early Life History Stages of Three Species of Estuarine-Dependent Fishes: A Bioenergetic Modeling Approach

1010 P Tytler - A Preliminary Investigation of the Development of Osmoregulation in the Larvae of Three Species of Texas Sciaenids (Red Drum, Speckled Sea Trout and Atlantic Croaker)

1100 R Batty and R Hoyt - Temperature Points the Way for Tidal Migration by Juvenile Plaice (Pleuronectes platessa)

1120 L Fuiman – Rapid Growth and Behavioral Profiecency of Individual Larvae: Are They Related?

1140 R Batty, M Yin, C Franklin and I Johnston - The Effects of Body and Size and Temperature on the Metabolic Rate and Energetic Cost of Swimming in Larval Herring (Clupea harengus L)

1200 K Bailey - Environmental Forcing and Biological Control of Recruitment in Walleye Pollock, Theragra chalcogramma, in the Western Gulf of Alaska: Shifting Gears in a Maturing Ecosystem

1220 H Browman, F Beland, J Cullen, R Davis, J Kouwenberg, J-F St-Pierre and R Vetter - Effect of Solar Ultraviolet Radiation (280-400 nm) on the Early Life History Stages of Atlantic Cod (Gadus Morhua)

Afternoon Session - Wednesday, April 7, 1999

1410 S Sogard - Growth Variability in Juvenile Sablefish (Anoplopoma fimbria): The Roles of Temperature and Social Interactions

1430 R Cowen, K Lwiza and S Sponaugle - Connectivity and Replishment of Reef Fish Populations

1450 E Houde, S Jung, S Leach and A Madden - Ontogenetic Migrations of Bay Anchovy in Chesapeake Bay

1510 S Thorrold - Geochemical Tracers in Otoliths: Natural Markers of Natal Locations of Weakfish (Cynoscion regalis)

1530 C Taggart, J Jeffrey, A McPherson and C Reiss - A Multi-Species Examination of Larval Populations in a Tracked Water Mass on the Scotian Shelf: Can Mixing Explain Most of the Variation in Larval Fish Loss Rates?

Poster Session – 16:00 Wednesday, April 7, 1999

J O'Neil, J Cowan and L Fuiman - Does Immersion in Alizarin Complexone Dihydrate Affect Behavior of Individual Red Drum Larvae?

S Hoskin, C Jones and S Thorrold - Growth History Comparison of Larval Cohorts of Micropogonias undulatus Recruiting to Oregon and Ocracoke Inlets

M Tzeng, J Hare, A Powell and D Lindquist - Ingress of Postlarval Snappers (principally Lutjanus griseus) Into the Newport River Estuary, North Carolina

S Weerts and D Cyrus - Preliminary Observations on Habitat Utilization by Post-larval Fishes in a Marine Dominated Estuary and Adjacent Harbour at Richards Bay, South Africa

G Ingram and J Lyczkowski-Shultz - Distribution and Abundance of the Triggerfishes (Balisitidae) in the Gulf of Mexico

H Walsh and D Peters - Abundance, Size, Age and Developmental Stage of Paralichthys dentatus Larvae at Shelf, Inlet and Estuarine Locations

A Skiftesvik and H Browman - Foraging Behaviour and

Prey Search Pattern of Atlantic Herring (Clupea harengus) Larvae: A Reassessment of the Cruise Searcher Characterization

D Snyder – Barbot - Larval Evidence for More Than One North American Species?

D Snyder - What Are Those Suckers? (Rio Grande Sucker Larvae and Early Juveniles: Morphological Description and Comparison with White Sucker)

A Kendall and J Orr - Definitely More Than You Want to Know About Sebastes

U Zika, T Granata and E Macpherson - RNA/DNA Ratios of Newly Settled Fish and Their Implication for Survival

R McBride, J Styer and R Hudson - Halfbeak, Hemiramphus spp, Fishing and Spawning Grounds in South Florida

H Patterson, R McBride and R Crabtree - Elemental Signatures of Red Drum (Sciaenops ocellatus) Otoliths from the Gulf of Mexico

X Chiappa-Carrara, L Sanvicente-Anorve, C Flores-Coto, A Monreal-Gomex and D Salas de Leon – Ichthyoplankton Distribution as an Indicator of Hydrodynamic Conditions of Two Lagoonal Systems in the Mexican Caribbean

C Flores-Coto, L Sanvicente-Anorve and Xavier Chiappa-Carrara - Temporal and Spatial Scales of Ichthyoplankton Distribution in the Southern Gulf of Mexico

C Flores-Coto, R Rivas-Vega and F Zavala-Garcia - Vertical Distribution of Larval Carangid Fish South Gulf of Mexico

R Chambers, D Witting, S Lewis, M Walsh and H Hamlin - Environmental Effects on Early Life History Attributes of Atlantic Tomcod (Microgadus tomcod) in the Hudson River Estuary

A Matarese, D Blood, S Picquelle and J Benson - An Analysis of the Abundance and Distribution Patterna of Ichthyoplankton From the Northeast Pacific Ocean and Bering Sea: A Preview of An Atlas Based on Research Conducted by the Alaska Fisheries Science Center (1971-1996)

A Hamilton and J Lyzlpwslo-Shultz - A Contribution to the Early Life History of Deep-sea Smelts (Family:

Bathyladidae) in the Gulf of Mexico with Comments on the Status of the Taxonomy of the Group

M Alvarez, R Perez, M Tanaka, T Seikai, S Kawai and Y Takahashi - Social Hierarchy Effect on the Physiology of Newly Metamorphosed Juveniles of Japanese Flounder

E Arnold, C Reiss and C Taggart - The Increase in Larval Crabs (zoea and megalopa) in Relation to the Decrease in Fish Biomass on and Around Western Bank Since 1977-78

P Powles and E Laban - Duration of Migration from the Sargasso Sea to the St Lawrence Estuary, and Rate of Riverine Ascent to the Cornwall (ON) Eel Ladder of Anguilla rostrata, Estimated from Otoliths

Morning Session - Thursday, April 8, 1999

0810 J Cowan and K Rose - Predicting Fish Population Dynamics: Life History Theory, Density-Dependence and Individual-Based Modeling

0830 S Dorsey and R Cowen - Coupling of egg production with recruitment: The destabilization effect of oceanographic processes in two tropical damselfish (Pomacentridae)

0850 R Allman and C Grimes - The Temporal and Spatial Dynamics of Spawning, Settlement and Growth of the Gray Snapper (Lutjanus griseus) Determined Using Otolith Microstructure

0910 S Barbeau, R Chambers, D Witting, K Able - Size-specific Predation on Juvenile Summer Flounder, Paralichthys dentatus, and the Duration of the Window of Vulnerability

0930 G Bath, S Thorrold and C Jones - Otolith Trace Metal Analysis of Lab-Reared Fish Using Isotope-Dilution ICP-MS

0950 L Settle - Langmuir Circulations and the Distribution of Zooplankton and Larval Fishes

1040 J Billerbeck and D Conover - Big Problems for Little Fishes: Energetic Conflicts in Atlantic Silversides

1100 T Lankford and D Conover - Evolution of Somatic Growth Rate in the Atlantic Silverside (Menidia menidia): Fitness Tradeoffs Between Feeding, Growth Rate and Predator Avoidance

1120 T Grothues, R Cowen, F Bignami, L Pietrafesa, G Weatherly and C Flagg – Flux of larval fishes around Cape Hatteras

1140 M Cieri and J McCleave - Discrepancies Between Larval and Juvenile Otoliths of the American Eel (Anguilla rostrata): Is There Something Fishy Going on at Metamorphosis?

1200 C Natunewicz and C Epifanio - Two-dimensional Scale of Larval Patches in a Buoyancy-driven Coastal Current

1220 R Gamble and D Lindquist - Distribution of Larval Fishes in Onslow Bay, North Carolina: A Comparison of Catches in Shelf Water and Gulf Stream Water

Afternoon Session - Thursday, April 8, 1999

1410 N Hirai, M Tagawa, T Kaneko, T Seikai and M Tanaka - Environmental Salinity Modifies the Gill Morphology in Juvenile Japanese Sea Bass, Lateolabrax japonicus: Changes in Distribution of

Branchial Chloride Cells

1430 F Hernandez, R Shaw, J Cope, J Ditty and T Farooqi - Rock Jetties as Suitable Habitat for Presettlement Larvae and Juvenile Reef Fish: Preliminary Results from Belle Pass, Louisiana

1450 Y Tanaka, J Burke, M Ueno, M Tanaka and D Hoss - Mechanisms of Inshore Migration of Larval Flounders Through Beaufort Inlet, North Carolina, USA

1510 F Scharf - Patterns in Abundance, Growth and Mortality of Juvenile Red Drum (Sciaenops ocellatus) Across Estuaries on the Texas Coast and Implications for Recruitment

1530 C Heyer and T Miller - The Effect of Maternal Condition on the Performance and Condition of Larval Yellow Perch (Perca flavescens)

1620 M Hibino, T Ohta, H Ueda and M Tanaka - Feeding Habits of Japanese Temperate Bass Larvae and Copepod Community in Relation to Freshwater Ingress, in the Chikugo River Estuary, Ariake Sea, Japan

1640 S Herzka, S Holt and J Holt - Evaluation of Stable Isotope Ratios as Indicators of Recent Settlement of Individual Red Drum Larvae (Sciaenops ocellatus) to Seagrass Nursery Habitat

1700 U Howson and T Targett - The Effects of Temperature and Salinity on Feeding, Growth and Survival of Juvenile Summer and Southern Flounder, with a Comparison of Salinity Preference

l720 J Hiroi, T Kaneko, T Seikai and M Tanaka - Developmental Sequence of Chloride Cells in the Body Skin and Gills of Japanese Flounder (Paralichthys olivaceus) Larvae

1740 D Nemerson and K Able - Seasonal Variation in the Diet of Juvenile Atlantic Croaker (Micropogonias undulatus) in Delaware Bay Salt Marsh Creeks

Morning Session - Friday, April 9, 1999

0810 S Holt and G Holt - Lateral Distribution of Fish and Shrimp Larvae Across the Aransas Pass Tidal Inlet

0830 T Hurst and D Conover - Evaluating Mechanisms of Winter Mortality in Young-of-the-year Hudson River Striped Bass

0850 J Jeffrey and C Taggart - Oceanographic Variability and Otolith Growth of Silver Hake (Merluccius bilinearis) Larvae from the Scotian Shelf

0910 D Jones – Distributional Ecology of Labrid and Scarid Larvae in the Straits of Florida

0930 W-S Gwak and M Tanaka - Assessment of Nutritional Condition of Japanese Flounder (Paralichthys olivaceus) Larvae and Juveniles with Special Emphasis on Metamorphosis and Settlement

0950 M Lara - Sensory Development of the Cephalic Lateral Line, Olfactory and Visual Systems of Settlement-stage Caribbeen Labroids

1050 E Schultz, T Lankford and D Conover - Evolution of Growth Strategies: Interpopulation Differences in Compensatory Growth of Juvenile Atlantic Silversides, Menidia menidia

1110 T Kaji, S Masuma, N Tezuka, M Oka, H Takeuchi, J Hirokawa and M Tanaka - Development Characteristics of Laboratory Reared Bluefin and Yellowfin Tuna Larvae and Early Juveniles

1130 T Tuckey - Recruitment and Retention of Larval and Juvenile Sciaenids in the Ogeechee River Estuary

1150 T Trnski - Swimming Behaviour of Settlement-stage Larvae Influences Dispersal and Initial Settlement-site Within an Eastern Australian Estuary

1210 J Shoji, T Maehara and M Tanaka - Unique Ecological Traits, Piscivory With Rapid Growth, in the Early Life Stages of Japanese Spanish Mackerel in Contrast to a Co-Habiting Species, Chub Mackerel

1220 S Lewis, R Chambers and D Witting - Analyzing Larval Survival and Detecting Critical Periods

Afternoon Session - Friday, April 9, 1999

1410 U Zika, T Granata and E MacPherson - The Influence of Oceanographic Parameters on Settlement of Littoral Fish

1430 AW Kendall - Specific Gravity and Vertical Distribution of Walleye Pollock Eggs

1450 M Smith and L Fuiman - The Role of Social Interaction in Growth Rate Variability of Red Drum Larvae

1510 J Selig and R Cowen - Distribution of Ichthyoplankton Along the North Shore of St Croix, USVI

1530 M Neuman and K Able - Quantification of Morphological Transitions During the Early Ontogeny of Windowpane, Scophthalmus aquosus

1620 E Niklitschek and D Secor - Bioenergetic Assessment of Potential Nursery Areas for Atlantic Sturgeon in the Chesapeake Bay

1640 A McPherson, D Cook and C Taggart - Population Structure in Atlantic Herring: A Test of the Retention Hypothesis?

1700 S Hagan and K Able - Effect of Marsh Vegetation on Use of the Marsh Surface by Mummichog, Fundulus heteroclitus

1720 J Rabe and J Brown - The Effects of Feeding Frequency on the Growth, Survival and Consumption of Yellowtail Flounder (Limanda ferruginea) larvae

1740 E Schultz, R Cowen, K Lwiza and A Gospodarek -

Explaining the Advection of Larval Bay Anchovy (Anchoa mitchilli): Larval Behavior and Estuarine Flow

Morning Session – Saturday, April 10, 1999

0810 A Bochdansky and W Leggett - Convergence of Routine Metabolism in Larval and Juvenile Fish

0830 J Buckel and K McKown - Field and Laboratory Examination of Competition Between Juvenile Striped Bass and Bluefish

0850 D Drass and J Lyczkowski-Shultz - New Information on Identification, Abundance and Occurrence of Lutjanid Larvae in the Gulf of Mexico

0910 J Duffy-Anderson and K Able - Effects of Pier Shading on Feeding and Growth of Juvenile Winter Flounder (Pseudopleuronectes americanus)

0930 P Rowe and K Able - Summer Nearshore Distribution of Larval and Pelagic Juvenile Bluefish (Pomatomus saltatrix) in Relation to Hydrography Along the Southern New Jersey Coast

0950 M Burger, J Govoni and J Hare - Biochemical Condition of Hake Larvae (Urophycis regia) From Discrete Depths

1040 C Grimes, G Fitzhugh, C Koenig and F Coleman - The Timing and Magnitude of Settlement of Gag, Mycteroperca microlepis, Along the West Florida Shelf

1100 B McClellan, C Jones and S Warlen - Age and Growth of Atlantic Croaker, Micropogonias undulatus, from the Newport River Estuary, North Carolina

1120 R Kimura, D Secor, E Houde and P Piccoli - Up-Estuary Dispersal of Young-of-the-year Bay Anchovy in the Chesapeake Bay - Inferences from Microprobe Analysis of Sr in Otoliths

1140 M Miller and K Able - Movements and Growth of Young-of-the-year Atlantic croaker, Micropogonias undulatus, in Delaware Bay: Comparisons Between Restored and Reference Marsh Tidal Creeks

1200 A Miskiewicz - The Ecology of Fish Larvae in Lake Macquarie - An Estuarine Lagoon on the East Coast of Australia

1220 K Bosley, D Witting, R Chambers and S Wainright - Ontogenetic Diet Shifts of Larval and Juvenile Fish: Estimating Turnover Rates with Stable Isotopes

Afternoon Session – Saturday, April 10, 1999

1410 O Rutten - Size and Age of Juvenile Gag, Mycteroperca microlepis, at Egress from New River Inlet, NC

1430 A Cook - Behavioral Resource Partitioning Among Juvenile Cottid Fishes

1450 S Szedlmayer - Artificial Habitats for Age-0 Red Snapper, Lutjanus campechanus

1510 J Brown, B Laurel, V Puvanendren and J Rabe - Observations on the Foraging Behaviour and Performance of Some Marine Fish Larvae

1530 P Groenkjaer, E Caldarone and W Leggett – A Comparison of the Nutritional Condition of Silver Hake (Merluccius bilinearis) Larvae Caught On and Off the Crest of Western Bank, Scotian Shelf

1620 D Witting and R Chambers - The Basis and utility of Meristic and morphological Variation in Winter Flounder, Pseudopleuronectes americanus

1640 C Reiss, G Panteleev, C Taggart, B de Young - Larval Fish on Low-energy Marine Banks: Is Drift or Retention Responsible for Observed Patterns

1700 R Perez, M Tagawa, N Hirai, T Seikai, M Tanaka and Y Takahashi - Ontogeny of Thyroid and Interrenal Systems in Japanese Sea Bass (Lateolabrax japonicus) Larvae and Juveniles

1720 C McDonough and R Larson - Changes in Lipid Reserves and Body Shape During the Pelagic-Benthic Transition in Juvenile Sebastes mystinus

1740 J Hare, J Quinlan, F Werner, B Blanton, J Govoni, R Forward, L Settle and D Hoss - Larval Transport During Winter in the SABRE Study Area: Results of a Coupled Vertical Larval Behavior-three-dimensional Circulation Model

Affiliate Members!

We have completed a project to update our database of full and affiliate members to make contacting section members more efficient. This list will allow us to contact voting members at election time and to send out reminder notices to affiliate members in a more timely and efficient manner. Until now, we have had a policy of sending out copies of Stages to all affiliate members in good standing as of December 1995. Now all affiliate members will be receiving dues reminder notices as their membership expires. We ask that you please submit your dues to Kathy Lang, the section treasurer. Kathy is continuing to find ways to ease payment for our foreign affiliates, until that time, checks and money orders only please. If we do not hear from you we will stop sending the newsletter!

DATES TO REMEMBER

April 6-10, 1999	22nd Annual Larval Fish Conference	Beaufort, NC
June 24-30, 1999	79th Annual Meeting of the American Society of Ichthyologists and Herpetologists	University Park, PA
August 29 - September 2, 1999	American Fisheries Society Meeting	Charlotte, NC
October. 18-23, 1999	4th International Symposium on Flatfish Ecology	Morehad City, NC
November 30 - December 1, 1999	First Biennial Meeting on the Biology of Tautog and Cunner	Mystic, CT

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