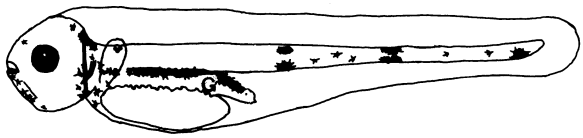
STAGES



Newsletter of the AFS Early Life History Section

Volume 19, Number 1 May 1998

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Abstract Deadlines:

AFS: Jan 15
to be held Aug 29 - Sept 2 in Charlotte, North Carolina

23rd Larval Fish Conference - Feb 1
to be held April 6- 10 at the NMFS/NOAA lab in Beaufort, NC to celebrate the 100th centenary of the Beaufort Lab

PRESIDENT'S MESSAGE

This edition of our newsletter marks the end of Jim Cowan's tenure as president of the section. Over the last two years Jim has worked tirelessly on behalf of the section. As he steps down Jim deserves our thanks and appreciation for a job well done.

The focus of Jim's efforts during his tenure has been on our section's governance. The committee structure within the section has been strengthened and solidified. You will see Jim's efforts reflected in the publication in this issue of Stages of the section's bye-laws, and of the minutes of both the Executive Committee and the Business Meeting at the Larval Fish Conference in Seattle. One of Jim's final action as president was to lead an effort to draft a new set of Standing Rules for the section. With these changes, we will have a solid foundation on which to build.

Jim's departure heralds the beginning of Jeff Govoni's tenure as president. Jeff's objectives are to:

1) Provide stewardship of the ELHS by implementing the recently written, and soon to be approved, Standing Rules (i.e., installing Sessional Committees, guiding their operation, etc.).

2). Promote membership by:

- Encouraging extant and prospective members to renew or initiate membership, this done through Presidential messages published in STAGES that define and project the purposes and objectives of the ELHS, and provide clear descriptions of the benefits of membership.
- Rostering former and lapsed members, especially Affiliate Members, sending inquiries as to the reason for lapse, and encouraging re-entry.
- Amend the ELHS Standing Rules such that applicants for, and

A Focus on Governance

Masthead

President:
Jim Cowan
Dept. of Marine Science
University of South Alabama
Mobile, AL 23388
(205) 861-7535
jcowan@jaguar1.usouthal.edu

President-Elect:
John Govoni
NOAA/NMFS
SE Fisheries Science Center
Beaufort, NC 28516
(919) 728-3595
jgovoni@hatteras.bea.nmfs.gov

Secretary:
David Bengtson
Department of Zoology, URI
Kingston, RI 02881
(401) 792-2372
bengtson@uriacc.uri.edu

Secretary-Elect:
Dave Secor
CBL / UMCES
Solomons, MD 20688
(410) 326-7229
secor@cbl.umces.edu

Treasurer:
Kathy Lang
NOAA/NMFS
166 Water Street
Woods Hole, MA 02543
(508) 495-2237
kathy.lang@noaa.gov

Editor:
Tom Miller
CBL / UMCES
Solomons, MD 20688
(410) 326-7276
miller@cbl.cees.edu

recipients of student travel grants are to be Student Members of the section (this is incentive ---if students are to benefit from the actions of the Section, they should at least be Members).

- Amend the ELHS Standing Rules such that recipients of the Sally Leonard Richardson award be granted one, two, or three year complimentary Affiliate Student Membership in the Section, with complimentary membership changing to Affiliate or Sectional Membership as add-on to AFS Societal Membership as appropriate (i.e., upon graduation), with the Section meeting the cost of Sectional Membership for the duration of the award tenure (this is incentive and also a way to augment the SLR Award).

It should be a great two years!

NEWS FROM THE REGIONS

Southern Region - Jon Hare, NOAA / NMFS, Beaufort Laboratory, 101 Pivers Island Road, Beaufort, NC 28516. (Phone: (919) 728-8732; Email: jhare@hatteras.bea.nmfs.gov).

Fish recruitment and habitat use in Florida Bay, Everglades National Park.

As part of NOAA's Florida Bay Project, a group of researchers from a variety of institutions are studying fish recruitment and habitat use in Florida Bay. The group is headed by Donald Hoss and Gordon Thayer at the NOAA National Marine Fisheries Service Beaufort Laboratory and includes: David Evans, William Hettler (retired), David Peters, and Allyn Powell (NOAA NMFS Beaufort Laboratory); David Camp, James Colvocoresses and Richard Matheson (Florida Department of Environmental Protection); Scott and Joan Holt (University of Texas at Port Aransas); Michael Robblee (US Geological Survey, Miami); Lawrence Rozas (NOAA NMFS Galveston Laboratory); and Robert Werner (State University of New York at Syracuse).

Florida Bay has undergone major environmental and habitat changes since the 1980's. This includes seagrass die-offs, algal blooms and increased turbidity. Within this perspective, a decadal

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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!!!

(Continued from page 2)

comparison of the distribution and abundance of larval, juvenile and small adult fishes, and seagrass habitat was undertaken. Investigators (Thayer, Powell and Hoss) have documented: (1) significant decreases in seagrass densities; (2) no changes in overall fish density; (3) a change in the fish community from one dominated by resident benthic species to one dominated by the pelagic planktivore, bay anchovy; and (4) an expansion of spotted seatrout spawning and nursery areas into the central interior area of Florida Bay. A manuscript dealing with this study has been submitted to Estuaries.

A management plan is presently underway in Florida Bay that will attempt to restore freshwater flow to the Bay to match historical flows. The working hypothesis is that the altered freshwater inflow will alter salinity patterns that will result in changes in fish assemblages and trophic structure. To address this general hypothesis, current research includes (1) monitoring the distribution and relative abundance of the juvenile and small adult fish (Thayer); (2) monitoring the spatial spawning habitat of spotted seatrout (Powell); (3) an otolith validation study for spotted seatrout (Powell, Holt and Holt); (4) examination of juvenile spotted seatrout otolith growth as a function of salinity and temperature using time-series analysis and as a function of location in the Bay (Powell and Colvocoresses); (5) determination of the metabolic rates of larval spotted seatrout as a function of salinity (Hettler); (6) development of an individual-based bioenergetics model for spotted seatrout (Hoss and Werner); (7) examination of the effect of salinity, location and other environmental factors on the growth rates of juvenile grunts, snappers and barracuda (Peters), (8) examination of the relationship between the densities of fish, densities of decapod crustaceans, and salinity and habitat gradients (Thayer, Rozas, Matheson, Robblee, and Camp); and (9) determination of the cause of elevated concentrations of mercury in certain forage and top predator species in eastern Florida Bay (Evans).

For more information please contact:

Allyn Powell
NOAA National Marine Fisheries Service
Beaufort Laboratory
101 Pivers Island Road
Beaufort, NC 28516
Email Allyn.Powell@noaa.gov

National Research Council Research Associateship Awarded

In February, Michael Burger arrived at the NOAA National Marine Fisheries Service Beaufort Laboratory to begin a National Research Council Post-Doc. His dissertation, entitled Temporal Variation in Larval Fish Condition Indices, examined the effect of atmospheric frontal passage on the relative condition of larval gulf menhaden. He found that the biochemical condition (RNA/DNA values, respiratory enzyme activity and protein content) rose during periods of increased southerly winds immediately proceeding the passage of an atmospheric cold front. The higher condition indices are proposed to be the result of increased wind generated turbulence and subsequent encounter rates. While in Beaufort, he will be examining the foraging behaviors of clupeid and sciaenid larvae and attempt to relate differences in species specific foraging success to natural variation in condition.

For more information please contact :

Mike Burger
NOAA National Marine Fisheries Service
The Beaufort Laboratory
101 Pivers Island Road
Beaufort, NC 28516
Email Mike.Burger@noaa.gov

Department of Biology and Institute for Coastal and Marine Resources, East Carolina University

Katherine Tull and Roger Rulifson have completed work on striped bass in Nova Scotia. The only, known self-sustaining population of striped bass, *Morone saxatilis*, in the Bay of Fundy spawns in the tidal bore-dominated Shubenacadie-Stewiacke watershed. Egg deposition and water quality were

monitored in the Stewiacke River downstream of the spawning grounds from 20 May to 15 June 1994. Replicate samples were taken every 1.5 h (16 times per day) cued to one hour after the tidal bore and 15 min after high slack tide. The tidal bore changed the river elevation 3.7 m and the salinity up to 20 ppt within one hour. Four major spawning peaks were observed: 2 June, 6-9 June, 13-14 June, and 20 June. The spawning period was approximately three weeks in duration and appears to be cued to the neap tide. The critical spawning temperature was 18°C and water temperatures fluctuated more with the tidal cycle than with season progression. Approximately 67% of the 20,318 eggs collected were <10 h old, and 9% were 30+ h old. Total estimated egg production for the Stewiacke River in 1994 was 61.5 million based on all eggs <10 h old caught in paired surface and paired bottom nets. Most eggs <10 h old were collected during ebbing tides when salinities were lowest. Striped bass egg density and bouyancy estimates indicated that youngest eggs were most buoyant (1 ppt at 17°C) and oldest eggs were least buoyant (9 ppt). This suggests that the eggs are retained in the estuary through hatching by the extreme salinity gradient of the tidal bore.

For more information please contact

Katherine A. Tull and Roger A. Rulifson
Department of Biology
East Carolina University
Greenville, NC 27858-4353 USA
email: RulifsonR@mail.ecu.edu

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

Culture of Pelagic Fishes at Monterey Bay Aquarium

Since November 1995, four species of schooling pelagic fishes, soupfin sharks, a *Mola mola*, and a green sea turtle have been maintained in the 1.3 million gallons Outer Bay Waters exhibit at the Monterey Bay Aquarium. Shortly after the opening of this new exhibit, in March 1996, the pacific bonito (*Sarda chiliensis*) and California barracuda (*Sphyraena argentea*) were observed to be performing courtship rituals and spawning on a regular basis. The other two species of schooling fishes, yellowfin tuna (*Thunnus albacares*) and skipjack tuna (*Katsuwonus pelamis*), have not been observed to be spawning. Based on culture work performed with yellowfin tuna by researches at the Inter-American Tropical Tuna Commission, Achotines Laboratory in Panama, we do not expect these fish to spawn due to the temperature being below the spawning threshold for these species.

We began to collect fertilized bonito and barracuda eggs from the exhibit during late September 1997 and commenced culture trials. To our knowledge, this is the first reported culture of both Pacific bonito and California barracuda, and this paper will outline the techniques used to culture the bonito and barracuda larvae.

Culture Systems

The larval culture systems used at the Monterey Bay Aquarium consist of black, conical bottomed, cylindrical larval rearing tanks. The water enters the tanks through a horizontal spray bar at the surface of the tanks and exits through a central standpipe that is covered with a pleated filter cartridge. Our main culture system consists of two larval rearing tanks, each holding a volume of 320 liters. These tanks are plumbed into a 300 liter reservoir, and the reservoir contains a fluidized sand bed filter and a 1500 watt immersion heater. Sea water is pumped out of the reservoir, through a 25

watt UV sterilizer, and then directly into the larval rearing tanks. Turbulence of the seawater is maintained via an airline placed at the bottom of each tank. The temperature of the system is maintained between 24°C and 26°C, and the lighting over the tanks is on a 12L:12D photoperiod controlled by a timer.

Juvenile bonito are stocked into a 4 meter diameter tank that is used for grow-out. Submersible pumps produce a strong circular current in this tank and the temperature is maintained at 22°C.

Culture Technique

A 2 meter plankton net that has mesh size of 800 microns is used to collect eggs from the Outer Bay Waters exhibit. The net is placed in the overflow box of the exhibit in the afternoon and then collected the next morning. The net samples only a small portion of the water leaving the exhibit, yet we are able to recover thousands of eggs at each sampling.

The eggs are stocked into the larval rearing tanks and the temperature is maintained between 24°C and 26°C. At this temperature, the eggs hatch in 30-36 hours as non-feeding yolk-sac larvae. Within thirty-six hours of hatching they develop pigmented eyes and begin to feed on RotiMac and AlgaMac (Aqua BioMarine)enriched rotifers and the pelagic harpacticoid copepod, *Euterpina actifrons*. During larval development, greenwater technique is employed in the culture tanks using a combination of live algae (*Nannochloropsis, Chaetoceros, and Isochrysis*) and a cryopreserved algal paste (Inland Seafarm Marine Microalgae Paste, Reed Maricultre Inc.).

By day four, *Artemia* nauplii that have been enriched with Super Selco (INVE Aquaculture) are offered and the majority of larvae are able to effectively feed on this larger food item. At eleven days post-hatch, Bonito yolk-sac larvae are added to the diet. The larvae undergo another major morphological change between day 12 and 16. At this point they are able to feed on small (10 mg) guppies and newly hatched gulf killifish (*Fundulus grandis*). The larvae will feed on increasingly larger guppies and killifish until they develop into juveniles.

The metamorphosis into juveniles takes

place between day 16 and 20, based on the temperature of the culture. When the larvae develop into juveniles, they are moved into the grow-out tank. At this point, the juveniles are fed chopped squid tentacles, gel diet, and a high protein, low-fat content pellet diet, similar to that used for mahimahi (*Coryphaena hippurus*) culture.

Discussion

While we have collected both bonito and barracuda eggs, we have focused our efforts on the culture of bonito. This has occurred for three reasons. First, the bonito and barracuda larvae develop at different rates and the bonito larvae prey on the same age barracuda larvae. Secondly, the number of bonito eggs that are collected per spawning event is much higher than the number of barracuda eggs. Thirdly, we are currently developing a juvenile pelagic fishes exhibit that will focus on bonito.

To date, we have reared 48 bonito through to the juvenile stage. We have kept a juvenile bonito for up to 117 days post-hatch, at which time the fish had a fork length of 22.4 cm and a mass of 152.5g. Barracuda larvae have been kept for 21 days post-hatch, and we will continue to work with this species in the future.

One of the most challenging problems that we have encountered with the culture of bonito is cannibalism. During the late larval stages, we have observed larvae swimming with other larvae of the same size in their mouths. Most of the mortalities that occur between day 12-20 post-hatch can be attributed to attacks by other larvae. We are currently testing the use of circular water currents and greenwater techniques in the larval rearing tanks to reduce cannibalism. These techniques have been used with some effectiveness in reducing cannibalism in the culture of other piscivorous fishes.

The development of a protocol for rearing various species of pelagic fishes continues to be a work in progress. We plan to at least raise the animals necessary for a juvenile pelagic fishes exhibit. As a future goal, applying our successes and failures may lead to stocking adult pelagic fishes in the Outer Bay Waters exhibit at the Monterey Bay Aquarium

For more information please contact:

David Cripe, Aquarist
(408)648-7941
dcripe@mbayaq.org

Tim Cooke, Aquarist
(408)648-7943
tcooke@mbayaq.org

Veronica Franklin, Aquarist
(408)648-7925
vfranklin@mbayaq.org

Monterey Bay Aquarium
886 Cannery Row
Monterey, CA 93940

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!

SECTION GOVERNANCE

BYLAWS OF THE EARLY LIFE HISTORY SECTION OF THE AMERICAN FISHERIES SOCIETY

Revised July 1994

Approved Spring 1995 by Section Members and August 1995
by American Fisheries Society Executive Committee

Section I. Name and Objectives.

A. The name of this sub-unit of the American Fisheries Society, hereafter referred to as the Society, is the Early Life History Section, hereafter referred to as the Section.

B. The objectives of the Section are to:
   1. provide for and maintain an association of persons with interests in fish embryos, larvae, and juveniles; and
   2. emphasize concerns for the early life history of fish in the pursuit of Society objectives as set forth in Article I of the Society's Constitution.

1 Section objectives shall be achieved in accord with Society Constitution, Bylaws, Rules, and Policies by:
   1. gathering, exchanging, and disseminating pertinent information, ideas, techniques, and materials through
      a. a regularly published newsletter distributed to members and affiliate members of the Section and members of the Society's Executive Committee,
      b. an annual conference and business meeting open to all interested persons, and
      c. special symposia, paper sessions, workshops, short courses, or other communication vehicles either independently or in association with events of the Society, other Society sub-units, or outside organizations;
   2. promoting coverage of the early life history of fishes and its importance in pertinent educational courses and curricula;
   3. encouraging the establishment, maintenance, and access to preserved collections of fish embryos, larvae, and juveniles; and
   4. identifying critical gaps in our knowledge of the early life history of fishes and facilitating efforts to fill those gaps.

Section II. Membership.

A. Voting membership in the Section is open to active members of the Society interested in furthering Section objectives and is established or renewed by calendar year upon payment of annual Section dues through the Society.

B. Affiliate membership in the Section is open to persons or organizations who are either affiliate members or non-members of the Society and interested in furthering Section objectives.

1. Affiliate membership is established or renewed by calendar year upon payment of annual Section dues through the Section Treasurer.
2. Affiliate members are encouraged to participate in Section meetings and activities but cannot vote on official Section matters, run for or hold an elected office, or chair standing committees.

Section III. Officers, Regional Representatives, and Executive Committee.

A. Elected officers of the Section are President, President-elect, Secretary, Secretary-elect, and Treasurer.
   1. The President-elect and Secretary-elect are elected by voting members at large for two-year terms in the elect office followed by two-year terms as President and Secretary, respectively, beginning at the business meeting associated with the annual Larval Fish Conference following election.
   2. The Treasurer is elected by voting members at large for a four-year term beginning at the business meeting associated with the annual Larval Fish Conference following election.

B. Appointed officers of the Section are Newsletter Editor and Historian.
   1. They are appointed by the President with approval of the Executive Committee.
   2. Terms of office are indefinite and end upon resignation or discharge by the Executive Committee.

C. Regional Representatives of the Section, one from each region represented by a Society Division, are elected by voting members within their respective regions for two-year terms beginning at the business meeting associated with the annual Larval Fish Conference following election.

D. Limitations, compensation, and contingencies.
   1. No Section member may hold simultaneously more than one elected office, appointed office, or representative position.
   2. There is no restriction on the number of terms, successive or otherwise, that an eligible member may be elected to an office sequence, the office of Treasurer, or a Regional Representative position.
   3. Officers and Representatives serve without salary or other material compensation from the Section; however, expenses may be paid from funds available to the Section when authorized by the Executive Committee.
   4. If new officers or representatives are not elected as scheduled, the previously elected officers and representatives maintain their positions until successors are elected for the remainder of those terms.
   5. If the President-elect, Secretary-elect, Treasurer or a Regional Representative cannot complete his or her term, the President offers the remainder of the term to the runner-up for that position in the preceding election; if the runner-up cannot be reached or declines the offer, the Executive Committee appoints a replacement for the remainder of the term.
   6. If the President or Secretary cannot complete his or her term, the position is filled by the person in the corresponding elect position for the remainder of that term as well as his or her own scheduled term; the then vacated elect position is filled as specified above, but the position is considered temporary and the person in the acting elect position does not assume the respective office of President or Secretary at the end of that elect position

term.

E. The Executive Committee of the Section is responsible for directing the affairs of the Section between annual or special Section meetings.
   1. Voting members of the Committee are the elected officials of the Section–President, President-elect, Secretary, Secretary-elect, and Treasurer; non-voting members of the Committee are the Regional Representatives, appointed officials–Newsletter Editor and Historian–all living Past-Presidents of the Section, and committee chairpersons.
   2. The Section President and Secretary serve respectively as Committee Chairperson and Secretary.
   3. Regular Executive Committee meetings of the Section are scheduled semi-annually in association with the Section's annual conference and the Society's annual meeting and are open to interested members.
   4. The Chairperson may call for special meetings of the Section Executive Committee whenever a majority of the voting members of the Committee can meet, or he or she may conduct Committee business by telephone, mail, or electronic means if appropriately documented and transmitted to the Secretary.
   5. Formal actions by the Executive Committee are decided by a majority consensus of the Committee's full voting membership; however, non-voting members may make, second, and discuss official motions.

Section IV. Duties of Officers and Regional Representatives.

A. The President:
   1. presides at business meetings of the Section and serves as Chairperson of the Section Executive Committee;
   2. appoints the Newsletter Editor and Historian with Executive Committee approval and committees except as provided for elsewhere in these Bylaws; and
   3. represents the Section on the Society Executive Committee and submits reports on Section activities at Society Executive Committee meetings.

B. The President-elect:
   1. assists the President in carrying out his or her duties and performs the duties of the President in the absence of the President;
   2. maintains and updates Section Bylaws and Rules, recommends Bylaws and Rules amendments to the Section Executive Committee and membership, submits approved Bylaw amendments to the Society Executive Committee for its consideration and approval, assures that Section Bylaws, Rules, and activities remain in accord with Society Constitution, Bylaws, Rules, and policies, and serves as Section consultant on these documents; and
   3. serves as chairperson of the Annual Conference Committee.

C. The Secretary:
   1. records the minutes of Section business and Executive Committee meetings, receives copies of written versions of committee, financial, and other official reports, which are then appended to the minutes, and reads or summarizes those minutes at the next Business or Executive Committee meeting;
   2. submits, within 30 days of the meeting, minutes of Section business meetings to the Ex-

ecutive Director of the Society and minutes of both Section business and Executive Committee meetings with appended reports to the rest of the Section Executive Committee including the Section Newsletter Editor for publication and the Historian for storage in the Section Archives;

3. receives dated copies or documentation of the substance and results of all official Section correspondence, actions, and business carried out by mail, telephone, or electronic means; appropriately transcribes, organizes, and summarizes that material; and submits the summary to the Newsletter Editor for publication and both the documentation and corresponding summary to the Historian for storage in the Section Archives; and
4. maintains, with or through the Section Treasurer and Society membership personnel, a current list of the voting and affiliate members with addresses and telephone numbers and, when requested, presents membership reports at Section business and Executive Committee meetings.

D. The Secretary-elect:
   1. assists the Secretary in carrying out his or her duties and performs the duties of the Secretary in the absence of the Secretary; and
   2. maintains, updates, and distributes the Section Handbook and Membership Directory.

E. The Treasurer:
   1. collects, manages, and disburses all Section funds with auditable accounts of checking, savings, receipts, and disbursements;
   2. pays or reimburses reasonable expenses associated with management of Section funds, preparation, production, and distribution of the Section Newsletter and Handbook and Membership Directory, and the President's representation of the Section in semiannual meetings of the Society's Executive Committee;
   3. pays or reimburses other expenses authorized by the Section Executive Committee or voting members of the Section;
   4. presents financial reports at Section business and Executive Committee meetings, and submits written copies of the reports to the President for review and the Secretary for appending to the minutes; and
   5. arranges for audits of financial records at intervals consistent with the policies of the Society.

F. The Newsletter Editor:
   1. produces the Section Newsletter at least three times each year as the primary means of general communication within the Section; and
   2. distributes the newsletter to all Section members and the Society Executive Committee.

G. The Historian:
   1. collects copies of all Section documents, newsletters, programs, publications, awards, publicity, and other items on Section activities of potential historical interest and organizes and maintains them in the Section Archives; and
   2. responds to reasonable requests for archived information.

H. The Regional Representatives:
   1. as ex officio members of the Section Executive Committee, represent the needs, interests, and concerns of Section members within their respective regions; and
   2. solicit and receive information on pertinent regional research, meetings, events, and con-

cerns and submit this information as regional reports to the Newsletter Editor prior to the submission deadline for each regularly scheduled issue of the Newsletter.

I. Additional duties for Section officers and representatives are specified in the Section Rules.

Section V. Annual Business Meeting and Conference.

A. The annual business meeting and conference of the Section is held at a time and place determined by the Section Executive Committee in consultation with the Time and Place Committee and general membership.
B. A quorum at a business meeting is 10% of the Section's voting membership.
C. Matters for vote at a business meeting are decided by a simple majority of participating voters.
D. The annual conference is organized and run by the volunteering local committee of the host institution and other sponsoring organizations on behalf of the Section.
    1. The local committee is chaired by a Section member and guided by the Section's Annual Conference Committee.
    2. The conference is a continuation of the formerly independent but strongly associated annual Larval Fish Conference.

Section VI. Mail Ballots.

A. Ballots are mailed to voting members of the Section for:
    1. election of officers and Regional Representative;
    2. approval of proposed amendments to these Bylaws; and
    3. other business deferred by the Executive Committee to the voting membership between annual business meetings.
B. Ballots are prepared under Executive Committee direction, mailed, received, tallied, and reported by the Nominations and Mail Ballot Committee.
C. Except for proposed amendments to the Bylaws, which require a two-thirds majority, matters for vote are decided by a simple majority of participating voters.
D. Tie votes are reballoted unless the Section Executive Committee finds reballoting to be impractical, in which case the Committee votes to break the tie.

Section VII. Committees.

A. The members and chairpersons of Section Committees are appointed and discharged by the President, except as otherwise provided in these Bylaws or Section Rules.
    1. Membership on a committee is indefinite, unless otherwise specified herein, in Section Rules, or by the President; however, periodic change is recommended to promote fresh ideas and involve more members in committee work.
    2. Affiliate members may serve on and vote within committees, but may not chair standing committees.
B. Committee chairpersons submit reports at annual business meetings and at other times upon request by the Section President.
C. Standing committees, aside from the Executive Committee.
    1. The Nominations and Mail Ballot Committee:
        a. consists only of voting members appointed by the President and approved by the Ex-

ecutive Committee;
   b. solicits nominations of candidates for office from the membership, nominates additional candidates as necessary for a full ballot, and verifies nominee eligibility and willingness to serve.
   c. prepares, mails, receives, and tallies all biennial election and irregular issue ballots and reports results to the Executive Committee, including the Newsletter Editor for publication and Historian for inclusion in the Archives with the tallied ballots.
2. The Time and Place Committee:
   a. consists of at least one Section member from each region represented by a Society Division; and
   b. solicits or generates competitive proposals for future sites of the annual conference and business meeting and offers recommendations for consideration by the Executive Committee.
3. The Annual Conference Committee:
   a. consists of chairpersons of local committees for immediate past, current, and future conferences, the Time and Place Committee, and pertinent sessional committees, and is chaired by the President-elect;
   b. counsels and coordinates with and among local committees for annual conferences; and
   c. prepares and updates guidelines and recommendations for future conference hosts and local committees.

D. Sessional, less permanent, committees, but not short-term ad-hoc committees, are specified in the Section Rules.

Section VIII. Dues and Fees.

A. The annual dues are determined by the Executive Committee based on expected expenditures.
B. Special fees may be levied by the Executive Committee to meet additional expenses.
C. All monies due the Section are paid in U.S. dollars or by check or money order for the same.

Section IX. Section Rules

A. The Rules of the Section provide protocols and procedures for implementing these Bylaws, define additional duties of officers or charges of committees, and establish sessional committees, but may not conflict with or supersede these Bylaws.
B. Amendments to Section Rules are:
   1. proposed by members at annual Section business or Executive Committee meetings or by letter to the Executive Committee; and
   2. implemented upon approval by a simple majority of the voting members of the Executive Committee or the Section membership participating in a mail ballot or annual business meeting.

Section X. Amendments to the Bylaws

A. Amendments to these Bylaws are:
   1. proposed and placed on a mail ballot by recommendation of the Section Executive Com-

mittee or a petition to the Section Executive Committee signed by at least 15 voting members of the Section;

2. approved by a two-thirds majority of Section members voting by mail ballot; and
3. implemented upon acceptance by the Society Executive Committee to assure conformity with the Constitution, Bylaws, Rules, and Policies of the Society, and receipt of written notice of Society approval by the Society Executive Director.

MEETING MINUTES

Minutes of the Executive Committee meeting, June 26, 1997, Seattle, WA

The meeting was called to order at 1:05 pm by President Jim Cowan. Art Kendall, host of the Larval Fish Conference (being held in conjunction with ASIH) was given the floor to summarize the status of the LFC. AFS-ELHS has a supplemental registration table set up in the registration area, where, among other things, one could purchase mugs, T-shirts, etc. A separate group photo for AFS-ELHS will be taken right after the main photo. The Sally Richardson Award raffle will be set up in Kane Hall, near the ELHS scientific sessions. There are about 90 oral presentations and 28 posters for the LFC, with no concurrent sessions and the posters all grouped together in the first poster session (with reception hosted by Research Nets, Inc.). Workshops will also be held on larval identification, image analysis and preservation of early life stages. Pre-registration for the LFC was 177 people. Jim Cowan (President ELHS) noted that he had authorized $3000 up-front money for the Seattle LFC and that the expectation was that the meeting would return at least $3000 to the treasury. Art pointed out that the local committee had worked very hard, but lots of compromises had to be made because of the joint meeting with ASIH. Jim thanked Art on behalf of the ExCom.

Jim Cowan announced that he wanted to set up a Standing Rules Committee to draft rules (above and beyond the Bylaws) by which the ELHS carries out its activities. The idea would be to have a small group draft the standing rules and then publish the draft in Stages. After much discussion of how to proceed, the motion was made and seconded to convene a small group of ELHS members to complete a draft of the standing rules and to authorize $2500 for their travel to Dauphin Island, AL (Univ. of South Alabama) to accomplish that. The motion carried.

Kathy Lang presented the treasurer's report. The balance in the AFS-ELHS general account as of June 1, 1997 was $23,338.75, of which $5102.04 was being held in escrow for future publications. The balance in the AFS-ELHS Sally Richardson Fund as of June 1, 1997 was $7,911.16. Kathy encountered some difficulties at her local bank in trying to set up multiple money market accounts when she took over the treasurer's job from Stan Warlen. She reported that she would set up three accounts: 1. A checking account for general usage with a $5000 minimum balance, 2. A money market account for the Richardson Fund, 3. A money market account for the remainder of the balance in the general account. It was agreed that the treasurer should set up an account anywhere in the U.S. to take advantage of the best rates and lowest fees and that the account should stay in one place even when a new treasurer takes office (it should be an FDIC-insured account).

The next issue was student travel awards:

whether and how we should make them permanent, how should the requests be judged, and how much should we award? Jeff Govoni reviewed the process by which this year's awards were made. He pointed out that there should be some official action taken on criteria for these awards, as nothing exists at present. Jim Cowan said that we should get the approval of the whole membership on this and Lee Fuiman suggested that we should present a formal plan to them. Jim Rice and Darrel Snyder had provided email input to Jeff on the subject of criteria. It was agreed that Jim Cowan would bring up the subject at the ELHS Business Meeting to get membership feedback.

Tom Miller summarized the status of STAGES. Three issues were produced last year. Outstanding issues are: 1. Need to have an accurate affiliate membership data base (Kathy will get that to Tom), 2. The "Perspectives" section is dying on the vine; recruiting of articles has not worked, 3. Attempts to publish STAGES on the web.

Jim Cowan brought up the fact that Jonathan Hare had tried to return his Richardson Award because he had discovered an error in the data on which his paper was based. The ExCom agreed to refuse to accept the return of the Award because the Award is based on many factors and because the error was an honest mistake and not an attempt at fraud.

We need to find a permanent site for the AFS-ELHS web page. John Dower would like to be webmaster. Darrel Snyder will handle it in the meantime. Darrel put the AFS-ELHS membership list on the web site, up-to-date as of Dec. 1996.

Jeff Govoni noted that we should have some kind of formal Lifetime Achievement Award. He will bring it up with the Awards Committee and also get feedback at the Business Meeting, then come up with some options. In discussion of the Richardson Award, it was pointed out that the recipient of the Award doesn't have to be an ELHS member and neither do the judges. The general consensus was that the policy should remain the same as it has been over the last several years.

Lee Fuiman reported for the Publications Committee. Lately, publications have gone through other channels. Lee suggested that the Section, instead of publishing meeting proceedings, might produce an occasional reference book or textbook for our profession. These might be aimed at the non-larval biologist, could contribute to fisheries biology, or be a supplemental text for a course, and might have chapters authored by specialists. The question is whether there is a need for this. Lee will pursue a proposal on doing a volume, including a budget and a "marketing survey".

At this point, the meeting was adjourned by general consensus.

Minutes of the Executive Committee meeting, June 29, 1997, Seattle, WA

1. The meeting was called to order at 3:25 pm by Section President Jim Cowan.

2. Jim extended thanks to Art Kendall and his local committee for the great job they did putting together the ELHS Conference on the Univ. of Wahington campus in conjunction with ASIH.

3. Treasurer's report: Kathy Lang reported that, as of 6/1/97, the AFS-ELHS general account had a balance of $23,338.75 (of which $5,102.04 is being held in escrow for future publications) and the Sally Richardson Fund had a balance of $7,911.16. She announced that the AFS-ELHS accounts will be transferred to a bank in a neutral location and remain there, so that the bank won't change each time a new treasurer is elected. The suggestion was made that we should sign up foreign affiliate members at each annual meeting when they have U.S. currency available, so they don't have to pay bank currency conversion charges. A motion to approve the treasurer's report was made, seconded, and approved.

4. Jim Cowan reported on items from the Executive Committee meeting. A) A small group will meet at Dauphin Island, AL (Univ. of South Alabama) to produce a draft document of AFS-ELHS standing rules. Members can review this document and the rules should be in place by the time of the next business meeting. B) John Dower has agreed to become the new AFS-ELHS webmaster and will try to find a site on a semi-permanent basis. Jim thanked Darrel Snyder for taking the web page to its present point.

5. Time and Place Committee: Ed Rutherford invited everyone to attend the next AFS-ELHS meeting at the Univ. of Michigan in 1998. Jim Cowan announced that future dates are: 1999 - Beaufort, NC (to celebrate the 100th birthday of the Beaufort Lab); 2000 - Mobile, AL. There followed much discussion about the need for more flexibility in the scheduling of the meeting, as these meeting often fall in the middle of some members' field seasons.

6. Student travel awards: There was unanimous support for the Section establishing a protocol for awarding student travel awards. Many suggestions were offered regarding the criteria that might be applied. Lee Fuiman suggested that the Awards Committee develop a protocol and put it on the web page, then have members vote on it via email.

7. STAGES: Tom Miller reported that three issues of STAGES had been produced in the past year. he encouraged everyone to contribute to the "Perspectives" section. Members should keep in touch with their regional representatives and provide with information to include in STAGES. He will try to get a handle on the affiliate membership, as some affiliates have not been receiving their issues.

8. New business: A) Darrel Snyder is still looking for information for the Bibliography. He has over 13,000 references now, but wants to keep it updated. B) The Brochure Committee is waiting for approval to do a new brochure. The suggestion was made that we should better spend the money on the web page.

9. A motion to disband the Brochure Committee was made, seconded, and approved. The meeting was adjourned at 4:40 pm.

Artwork by Bill Rugen

MEETING REVIEWS

Southeast Coastal Ocean Research (SECOR) *Crossing Disciplines, Crossing Boundaries*, Savannah, GA, April 7-10 - sponsored by South Carolina Sea Grant Consortium (prepared by Jon Hare)

Although not strictly a 'fish' meeting, there were many sessions and talks during SECOR that were pertinent to the members of the Early Life History Section. Sessions ranged from Eutrophication, and Biogeochemical Dynamics, to Inlets: Crossing Disciplines. It was in this last session that all of the talks were applicable to those interested in estuarine ingress by larvae, be they shrimp, crabs, or fish. The session largely highlighted a joint South Carolina-Georgia Sea Grant project studying the transport of white shrimp and blue crab larvae into southeastern estuaries which is being conducted by Jack Blanton, Julie Amft, Peter Verity (Skidaway Institute of Oceanography), Elizabeth Wenner, Charlie Barans, David Knott, Bruce Stender, (SC Marine Resources Research Institute), and Francisco Werner (UNC Chapel Hill).

The session opened, however, with an invited talk by Bill Boicourt (Horn Point Laboratory / University of Maryland Center for Environmental Science). He reviewed previous studies of larval ingress into Chesapeake Bay and concluded that although many mechanisms have been hypothesized, much of the data is qualitative. He then discussed some of the new work that he is involved in with the Land Margin Ecosystem Research in Chesapeake Bay. He indicated that multiple mechanisms affect larval ingress including some that have not previously received much attention: Stokes drift and hydraulic affects on flow. He also pointed out that most measurements are Eularian, yet larval ingress is inherently a Lagrangian process and that even the most complex models do not adequately reflect the complexity of estuarine flow fields.

Jack Blanton followed with an overview of the joint SC/GA work conducted at North Edisto Inlet, South Carolina in which researchers have contributed to defining the role of wind-generated and tidal-generated circulation in affecting the transport of larvae from the continental shelf through inlets using combined field experiments and 3-dimensional numerical modeling. Simulations, which were based on field conditions, indicated that larvae were drawn from the continental shelf into the inlet from a narrow zone parallel to the shoreline and extending only 5 km offshore. Downwelling favorable winds were optimum in their ability to concentrate larvae within the nearshore area but larvae entered the inlet during both upwelling and downwelling favorable winds.

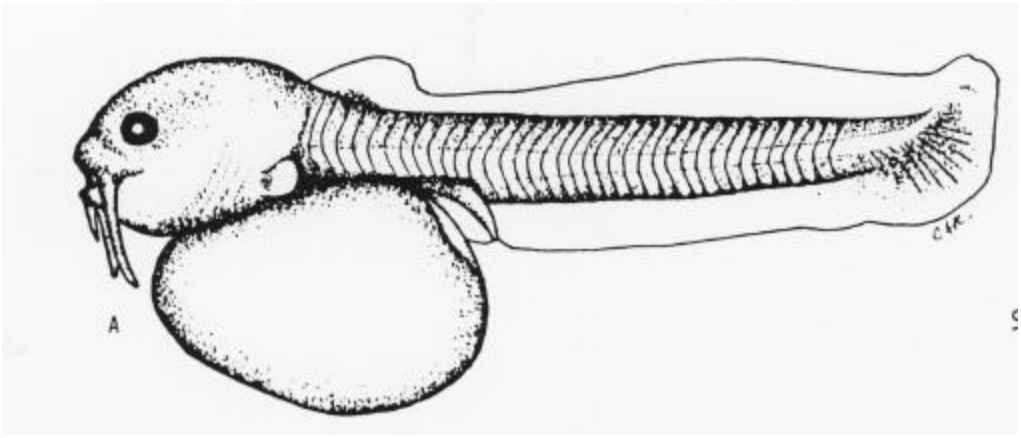
Peter Verity talked next on the control of primary production in the nearshore zone. Chl *a* in shelf waters was more or less homogenous and independent of wind and tidal regime. Within the estuary, however, chl *a* was positively correlated with the along-shore component of wind stress. The quick response observed indicated the cause to be resuspension of chl *a* rather than a population response to new nutrients. Tidal resuspension was also observed.

Bruce Stender then talked about the hydroacoustic work done as part of this project. At night, acoustic scatterers were uniformly abundant throughout the water column. During the daytime, there was remarkable vertical structure within the water column with small scatterers deepest, mid-sized scatterers intermediate (the size of shrimp postlarvae and crab megalopae) and large scatterers nearest the surface (the size of fish larvae or small pelagic fish). These three layers were maintained but rose higher toward the surface at maximum currents and nearest the bottom at slack water. Vertical distributions also changed drastically with the tidal resuspension of fine materials. Spatial and temporal variation were also evident, but interestingly, some of the temporal variation could be linked to the passage of small axial convergent fronts over the moored hydroacoustic equipment.

David Knott continued with a presentation on the ingress of blue crab megalopae into North Ediston Inlet. Daily plankton samples were compared with the wind record using vector-scalar analyses, and ingress was found to be greater under upwelling favorable winds (towards the NE) during the fall of 1993 and during downwelling favorable winds (towards the SW) during the fall of 1994. These results were consistent with numerical modeling of the transport of passive particles, which indicated that ingress may be enhanced by windstress from different directions, given different release conditions.

The session ended with a talk by Tom Wolcott (North Carolina State University), who with his colleague and wife Donna Wolcott, has developed a larval mimic, which is a drifter that can be programmed to replicate the vertical behavior of larval invertebrates or fish. In the Ogeechee River, Georgia, larval mimics were disproportionately associated with slicks and fronts. Trajectories revealed that stations which may appear to be oriented sequentially along an axis of an estuary may in fact sample different water masses due to small-scale physical processes. On incoming tides, few larval mimics entered side channels (where blue crab nursery habitats are) remaining predominately in the main axis of the estuary. He concluded that to understand larval ingress, larvae cannot be treated as passive particles.

For more information regarding this project, please contact Charles Barans, Marine Resources Research Institute, SCDNR, Charleston, SC 29422-2559; email: baransc@mrd.dnr.state.sc.us



Coming in the next edition of Stages

- Regional Reports
- Perspectives Essay on fisheries recruitment studies
- Meeting reviews
- Larval Fish Conference, Ann Arbor, MI
- Meeting Announcements

UPCOMING MEETINGS

Flatfish Biology Workshop

The National Marine Fisheries Service Northeast Fisheries Science Center is sponsoring a Flatfish Biology Workshop to be held December 1-2, 1998 at the Best Western Sovereign Hotel in Mystic, CT. The workshop is the sixth in a series that began in 1986 dealing with Northeastern Atlantic flatfishes. Individuals conducting research on various flatfishes may present their findings to others interested in gaining a better understanding of flatfish biology. Of particular emphasis this year will be research activities related to essential fish habitat for species covered under Fishery Management Plans, including the American plaice, Atlantic halibut, and the witch, yellowtail, summer, winter, and windowpane flounders. The symposium is divided into eight sessions over two days. More than 40 presentations will be delivered. Titles and authors of presentations are available at the Milford Laboratory home page at www.mi.nmfs.gov. Full details of the conference are also available at this site.

National Marine Fisheries Service's Milford Laboratory in Milford CT. Present research emphasizes aquaculture and habitat-related work. A well-integrated aquaculture program includes studies of the culture of fish and shell-fish to develop methods suitable for commercial use as well as for stock enhancement and restoration

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.

DATES TO REMEMBER

Dec 1-2, 1998	Flatfish Biology Workshop	Mystic, CT
Feb 1 - 5, 1999	American Society of Limnology and Oceanography Annual Meeting	Santa Fe, NM
April 6-10, 1999	22nd Annual Larval Fish Conferenc	Beufort, NC
June 24-30, 1999	79th Annual Meeting of the American Society of Ichthyologists and Herpetologists	Univeristy Park, PA
August 29 - Sept 2, 1999	American Fisheries Society Meeting	Charlotte, NC

AFS-ELHS
Chesapeake Biological Laboratory
University of Maryland Center for Environmental Science
P. O. Box 38
Solomons, MD 20688-0038

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