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## 2004 Larval Fish Conference in Clemson, South Carolina

### Announcement and Call for Papers

The 28<sup>th</sup> Annual Larval Fish Conference will be held in Clemson, South Carolina, USA, from **Sunday, May 23 - Thursday, May 27**. Conference information and instructions for registration and abstract submission can be found at [www.LFC2004.org](http://www.LFC2004.org). Special symposium proposals will also be considered. The meeting will be held at the Outdoor Laboratory, a rustic camp in the woods on the shores of Lake Hartwell. The venue provides inexpensive on-site housing and meals that will be included in the registration fee. If you prefer more up-scale accommodations, they are available within a few minutes drive. Field trips are available both before and after the meeting. Check out the web site for additional details or contact Jeff Isely, the meeting organizer, at [info@lfc2004.org](mailto:info@lfc2004.org). §

### **ELHS Back Then**

**10 years ago:** Bylaws of the Early Life History Section under revision by President-Elect Jim Cowan, Jeff Govoni, and Darrel Snyder (July 1994).

**15 years ago:** 13<sup>th</sup> Annual Larval Fish Conference held in Merida, Mexico. Chaired by Karen Burns and hosted by Mote Marine Laboratory and Instituto Nacional de Pesca. (May 1989).

**20 years ago:** Doug Martin (Chesapeake Biological Laboratory) finishes term as Section President and Bob Hoyt (Western Kentucky University) takes over (September 1984).

**25 years ago:** Section unanimously authorized by the general membership during AFS annual meeting in West Yellowstone, Montana (September 1979).

### President's Message



This has been a busy year for the ELHS and the AFS. As you will read, books initiated at the meeting in Norway are nearing distribution (see page 9). The Larval Fish ID course (photo on page 5) has generated substantial discussion and may lead to additional courses and web material in the near future. We have become one of the largest sections in AFS, and have a true global membership. Our next president, Howard Browman, will surely target additional international activities.

As for the parent society, the Fisheries Conservation Foundation (FCF) recently advertised their first request for proposals (see page 10). Thirty-six pre-proposals were submitted and are being evaluated. The FCF provides assistance for outreach and education, capacity building, and continuation of projects associated with stocks and habitat in peril from invasions and contamination, as well as for resource policy development and

to develop leadership in the fisheries profession. Although the FCF does not fund basic research *per se*, it does fund the development of education material consistent with our Section history and mission. I will keep you posted on additional funding opportunities. The Executive Board and Management Committee of the Parent Society will meet in February. Please let me know if you have any issues you would like raised at the meeting.

In other Section news, we have made a number of administrative changes. We would like to thank Percival Powels for his dedicated service as *Stages* Editor. After almost 5 years, Perce is stepping down. Perce, the Section is extremely grateful for your efforts in procuring, digesting, assembling, and distributing the business and activities of the Section. This can often be a laborious and thankless process. At the same time we welcome and thank Lee Fuiman for stepping up to volunteer to serve as the new *Stages* Editor. Your service to the section over the

...continued on p. 4

*Deadline for material to be included in the next issue of **Stages**:*

**May 7, 2004**

## News from the Regions



### Northeast Region

**Motz Grothues**

*from: University of Rhode Island  
via Grace Klein-MacPhee*

Grace Klein-MacPhee was elected Secretary/Treasurer of the Southern New England Chapter of AFS and is moving up the ranks toward the presidency. She is currently President-Elect. She also received the Distinguished Naturalist Award from the Rhode Island Natural History Survey in 2002. Her current research projects are an ichthyoplankton survey in Narragansett Bay funded by the US Fish and Wildlife Service, working in conjunction with Rhode Island DEM Marine Fisheries with the goal of monitoring seasonal occurrence, species composition and possible changes that have occurred in the bay since earlier surveys in the 1970's and 1990. One of the interesting changes has been a range extension of the smallmouth flounder *Etropus microstomus* into Narragansett Bay. It has progressed from a rare stray to a significant contributor to the ichthyoplankton and the juveniles are also showing up in the salt ponds.

She is also working with Dr. Barbara Sullivan on effects of the ctenophore

*Mnemiopsis leidyi* on fish eggs and larvae. Information is being gathered from the ichthyoplankton collections, from a Sea Grant sponsored project and from an NSF-funded project which is looking at the abundance and seasonal distribution of the ctenophore. Co-Investigators on this project are Barbara Sullivan, Dian Gifford, and Jack Costello from Providence College. Grace has also been working with William K. Macy on the design of egg chambers for exposing winter flounder in the field to suspended solids from dredging. The Providence River ship channel is due to be dredged in the Spring of 2003 and this event will take 18 months to complete. Flounder eggs will be exposed at varying distances from the dredge plume in the incubation chambers and survival and hatchability monitored. The work will be done in conjunction with the Army Corps of Engineers and the U.S. EPA. Funding was obtained to develop the chambers from the Rhode Island Governor's Office.

A graduate student, Angela Allen, has been quantifying predation rates of *Mnemiopsis leidyi* on various fish eggs and larvae in the laboratory. Species of interest are black sea bass, bay anchovy, and tautog. She has also been examining gut contents of field collected ctenophores on shipboard because the ctenophores do not preserve well.

*...continued on p. 3*



### Northcentral Region

**Bruce Comyns**

*from: University of Michigan via  
Edward S. Rutherford*

The following information provided by Ed Rutherford describes research that both he and other scientists (including Dmitry Beletsky, Doran Mason, John Dettmers, John Janssen and others) are conducting on early life stages of fishes in the Great Lakes. Alewives (*Alosa pseudoharengus*) in Lake Michigan spawn in a variety of habitats, but the relative contributions of these different nursery habitats to the adult alewife population have not been evaluated. During the spring, summer, and fall of 2001 and 2002, age 0 alewives were sampled in near shore Lake Michigan and three drowned river mouths (Muskegon Lake, Manistee Lake, and Pigeon Lake). Physical and biotic habitat factors were characterized and related to habitat-specific hatch dates, growth rates and mortality rates, estimated from otolith increment patterns and temporal changes in densities at age. During 2001, Muskegon Lake was consistently warmer and contained greater densities of zooplankton prey relative to Lake Michigan. Alewives

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## Section Officers

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## Western Region

Dan Margulies

*from: Inter-American Tropical Tuna Commission via Dan Margulies*

Our own research program with ELH of tunas continues at the IATTC. We ended our joint project on yellowfin with the Japan Overseas Fishery Cooperation Foundation (OFCF) in 2001, but that program has continued as our main research focus. Our broodstock yellowfin continue to spawn in Panama, and it has allowed us to pursue a few interesting collaborations. Two years ago, I began some joint research with

*Northeast...continued from p. 2*

David Taylor, a graduate student of Jeremy Collie, has been looking at the effects of the sand shrimp *Crangon septimspinosa* on newly settled winter flounder larvae in the field and in the laboratory. Field studies have involved using the Ouchterlony double-diffusion immunoassay to examine the stomach contents of the *Crangon* and other possible invertebrate predators. He is looking at latitudinal variation in predation rates of *Crangon*, and the effects of temperature on predation strategies of *Crangon*. David won the *Saul B. Sailer Best Student Paper Award* twice for presentations on his research at the Southern New England Chapter AFS summer and winter meetings in 2002.

*from: University of New Brunswick via R. Allen Curry*

Presently, I have two new students working on early life history questions. Eric Chernoff (MSc) is examining the incubation period, timing of emergence, and first summer growth of brook trout (*Salvelinus fontinalis*) in search of differences between resident and anadromous progeny. His question is, are their differential growth rates between the forms that leads to anadromy? It is a combination of field observations and experimental stream channel work

Ellis Loew of Cornell University and Bill McFarland of Friday Harbor Lab, and we've been able to pursue some interesting stuff with spectral sensitivity of yellowfin. We are pursuing additional NSF support for the research. We've also been involved with the University of Miami on some joint work with billfish (attempts to hold live sailfish adults at the Achotines Lab — so far, no success — a very challenging undertaking!), as well as some larval yellowfin work with probiotics to improve survival. We've also had some recent discussions with Del Gatlin's lab at Texas A&M University concerning joint work on nutrition and biochemistry of larval/juvenile yellowfin. I remain interested in pursuing several other areas of yellowfin culture/behavior, including basic analysis of feeding tactics and swimming behavior (which we still haven't done) and mesocosm culture of juveniles. §

with trout from the Miramichi River, New Brunswick. Jennifer Shaw (MSc) is studying the growth of larval smelt (*Osmerus mordax*) in Lake Utopia, New Brunswick. Within the smelt complex of the lake, we have identified normal, giant, and dwarf forms separated by spawning period and streams and with some limited evidence of genetic differences among the ecotypes. Her question is similar to Eric's, is there a growth difference in the larval through first summer periods that is related to the separation of ecotypes.

I have a third project examining the stable isotope signature of newly emerged brook trout to determine their maternal parentage, i.e., either resident or anadromous. This is part of our ongoing studies of the actual contributions of anadromous individuals to populations.

### other region news

Bruce Collette has written sections on the Belontiidae, Hemiramphidae, and Scomberesocidae for Bill Richards' book on *Early Life History of Western Central North Atlantic Fishes*. The scomberesocid chapter (written with Dave Hardy) has been published as NOAA SEFSC Tech Memo-505. A section on Batrachoididae is in progress.



## Pacific Rim Region

Iain Suthers

*from: Australian Museum via Jeff Leis*

Australian Museum larval fish researchers in collaboration with other Australian workers are planning to produce a series of larval descriptions using the successful format of Neira, Miskiewicz and Trnski, 1998 (*Larvae of Temperate Australian Fishes*). These will cover Australian temperate species described since the book was published and will serve as a supplement to it. The idea is to produce them in PDF format, and post them on the Australian Museum website ([www.amonline.gov.au/fish](http://www.amonline.gov.au/fish)) for free downloading of individual files. The first of these should be posted on the website early in 2004.

Among the first will be the Eastern blue groper (Labridae, *Achoerodus viridis*), Australian bass (Percichthyidae, *Macquaria novemaculeata*), estuary perch (Percichthyidae, *Macquaria colonorum*) and Matsubara's velvetfish (Aploactinidae, *Matsubarichthys inusitatus*). All these will be based on papers in press or submitted. However, from here on, we plan to drop the normal journal publication and go direct to on line publication. Planned for this are two *Hime* spp. (Aulopidae), *Cepola australis* (Cepolidae) and some whiting spp. (Sillaginidae). All contributions will be peer reviewed. For further information, contact Jeff Leis ([jeffl@austmus.gov.au](mailto:jeffl@austmus.gov.au)) or Tom Trnski ([tomt@austmus.gov.au](mailto:tomt@austmus.gov.au)). §

All the completed sections are viewable online at [www4.cookman.edu/NOAA](http://www4.cookman.edu/NOAA)

Mike Fahay has also been writing for Bill Richard's book. Mike finished two sections for on larvae of western Central Atlantic fishes. The first covers *Steindachneria argentea* (Steindachneriidae) ontogeny. It will be published separately as a NOAA, SEFSC Tech Memo and available at the above website. The second, much larger, chapter (written with Jon Hare) covers

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*Northeast...continued from p. 3*

the order Ophidiiformes. It, too, will be published separately as a Tech Memo, and after review, will be accessible at the same website.

Mike is also well along on a revision of his earlier (1983) larval fish guide. The original covered the area from Scotian Shelf to Cape Hatteras, and included egg and/or larval descriptions of 290+ species. The revision will cover the western North Atlantic north of 35°N and west of 40°W (Arctic Canada, southern Greenland & Flemish Cap to Cape Hatteras) and will include ELH information on a projected 750+ species, including distribution of early stages. Descriptions are complete (in draft form) for about 350 species and mapping of collection locations (larvae) is underway. He is keeping a tally as he works through the orders: the ELH stages of approximately 70% of the fish fauna in this region are known. §

*Northcentral...continued from p. 2*

in Muskegon Lake had higher densities, emerged earlier and grew faster than in Lake Michigan. A physiologically-based model was used to estimate the ultimate recruitment success (survival through the winter) of alewife cohorts emerging in different habitats. Results of this model suggest that drowned-river mouths contribute a disproportionate (relative to volume) number of recruits to the adult population.

The carnivorous exotic zooplankton *Cercopagis pengoi* is established in Lake Michigan, and may impact growth, survival, and recruitment of important fishes including alewife. *Cercopagis* and larval alewife consume common zooplankton prey and thus, potential exists for competitive interactions among these groups. To quantify competitive interactions, in 2001-2002 zooplankton and larval fish were sampled in nearshore Lake Michigan and Muskegon Lake, a drowned river mouth lake connected to Lake Michigan. Zooplankton production rates, and both larval alewife biomass and growth rates, were highest in Muskegon Lake. Comparison of consumption and production rates suggests that predation by *Cercopagis* and larval alewife may have little impact on small-bodied zooplankton in the nearshore region of

*President...continued from p. 1*

years has been exemplary and we look forward to the future of *Stages*. Bob Hoyt has also stepped down as Section Historian. Jeff Govoni has agreed to serve as our new historian. Again, we thank Bob for his dedicated service and Jeff for taking over as caretaker of the Section's historic documents.

In other news, plans for the 28<sup>th</sup> Annual Larval Fish Conference are pro-

Lake Michigan and Muskegon Lake. Consumption rates of larval alewife exceeded that of *Cercopagis* in both habitats. Production by zooplankton prey in both habitats was sufficient to offset increases in predation pressure resulting from the establishment of *Cercopagis*.

Studies are also being conducted to assess potential effects of hydrodynamic lake circulation on transport, survival and potential recruitment of larval yellow perch and alewife in Lake Michigan. A 3D particle trajectory model, based on observed momentum and heat fluxes, is used to simulate transport of larvae. Virtual larvae are released in the nearshore rocky region of SW Lake Michigan that has abundant preferred substrate for yellow perch spawning. The hydrodynamic model was coupled with individual-based particle models of fish larvae to study variation in larval distributions, growth rates, and potential recruitment. Larval growth rates were simulated using a bioenergetics growth model with fixed consumption rates. Results indicate that lake circulation patterns are critical for understanding interannual variability in Great Lakes fish recruitment.

Another focus of research is to identify important spawning and nursery habitats for walleye, chinook salmon, steelhead trout, and potamodromous suckers to quantify survival during early life stages, and understand mechanisms driving recruitment variability for these species in the Great Lakes. Their approach is to link ongoing measurement of vital rates and abundances with simulation models to test hypotheses about recruitment mechanisms. For walleye, results of these studies will be integrated into walleye recruitment models developed by Dr. Michael

ceeding nicely. The first call for papers is the feature article in this issue of *Stages*.

I'm still hoping to hear from some of you willing to volunteer to assist with Section activities. Please contact me or any of the other officers if you have an idea or suggestion you would like to share.

See you in Clemson in May. §  
--- Jeff Isely

Jones of Michigan State University. For salmonids, results of field studies are being integrated into a salmonid individual based model developed by Jeff Tyler at Worcester Polytechnic University.

In March-April 2003, field experiments were conducted to estimate habitat-specific survival rates of walleye eggs in the Muskegon River. Fertilized eggs were placed into small chambers bored into Plexiglas incubators and covered with Nitex cloth, then were immersed in river water at sites with good, medium, and poor substrate conditions in each of three areas. In contrast to previous studies, walleye egg survival was relatively high, ranging from 60 to 85%, and did not vary among substrate types. These egg survival results agree with a recent laboratory study that found that walleye eggs are highly resistant to low water temperatures and to wide temperature fluctuations.

Finally, efforts are being made to identify and map critical habitats for key species. This has led to mapping historic spawning and nursery areas for Great Lakes fishes, and developing bioenergetics-based habitat-suitability maps for early life stages.

*from: University of Michigan via  
David J. Jude*

David Jude, who is involved with some of the research previously described, provided additional information about work that he and John Janssen are conducting. Efforts to document lake trout reproduction on the Sheyboogan reef and East reef in Lake Michigan are continuing. Much of this research involves innovative work with ROVs (including electroshocking). They have found lake trout eggs in stomachs of  
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*Participants of the Larval Fish Identification Course held 25-27 August 2003 in Santa Cruz, California. The course was organized by Art Kendall and attended by 23 students from around the world. Photo courtesy of Mike Fahay.*

## Conferences & Symposia

### *Northeast Ecology and Evolution Conference (NEEC)*

University of Connecticut, Storrs, **March 26-28, 2004**. The Ecology and Evolutionary Biology Department at the University of Connecticut will host the second Northeast Ecology and Evolution Conference (NEEC) this Spring. Entirely organized by graduate students, NEEC 2004 will feature talks and posters by grads, post-docs, and upper-level undergraduates from all fields of biology. The inaugural NEEC, hosted by Rutgers University in 2003, attracted participants from more than 40 institutions. The Saturday science program will be followed by a banquet featuring a Keynote Address by Dr. Michael Soule, Professor Emeritus in Environmental Studies, University of California, Santa Cruz. Dr. Soule is a founder of the Society of Conservation Biology and the Wildlands Project, and he is often referred to as "The Father of

Conservation Biology." Access will be provided during the conference to the University's recently-opened and state-of-the-art Systematic Research Collections facility, home to our herbarium as well as our vertebrate, invertebrate, and paleobotanical collections. NEEC 2004 represents a fantastic networking opportunity for the region's grads, as well as a chance to introduce the next generation of biologists to the research of their peers. Conference information, including registration materials and the call for papers, can be found at [www.eeb.uconn.edu/NEEC/](http://www.eeb.uconn.edu/NEEC/)

### *International Congress on the Biology of Fish*

The International Congress on the Biology of Fish, to be held in Manaus, Brazil, **August 1-6, 2004**, will include a Symposium on the Physiology of Fish Eggs and Larvae. We are soliciting papers for several sub-themes on different early life stages of fish. We are seeking papers in each section that discuss any aspect of egg/larval biology, including metabolism, respiration,

excretion, growth, development, nutrition, genetics, behavior, evolution, etc. In addition, papers are welcome that cover techniques for investigation into early life-stage physiology, including research and analysis methods, biotechnology and fish culture techniques.

The sub-themes will be:

1. Formation of eggs and sperm: processes and control in gametogenesis, variability in egg size related to parental size, gamete quality evaluation, broodstock management, sex control, genetic modification.
2. Fertilization: gamete collection, fertility analysis, cryopreservation, impacts of timing and conditions on egg viability, biochemistry of the fertilization process, changes in the fertile egg.
3. Embryonic development: rates of metabolism, developmental staging, survival patterns, optimizing incubator technology, managing natural conditions and constraints for incubation.
4. Metamorphosis: the transition from an egg to a free-moving and free-feeding form, hatching dynamics, sac-fry larvae, initiation of feeding, behavior, tissue (gut, muscle, neural) maturation.
5. Species summaries: we are also looking for overviews for a variety of species, in the form of summaries of the biological characteristics of the early life stages in the context of adaptation to the environment in which the animals are found.

We have published several symposia on related topics in the Fish Biology Congress series, accessible for free at: [www.fishbiologycongress.org](http://www.fishbiologycongress.org). Please contact me as soon as possible if you would like to participate in this Symposium. **The official deadline for title submission is March 1, 2004**, but I would appreciate hearing from you earlier than that if possible. Look at the Congress website at [www.fishbiologycongress.com.br](http://www.fishbiologycongress.com.br) for details about the location, costs, events etc.

Don MacKinlay, Chair, Fish Biology Congress, c/o Habitat & Enhancement  
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## People



### In Memoriam Eileen Setzler-Hamilton, 1943-2003

*Eileen passed away on 12 March 2003 after a struggle with cancer. Her passing has left a void at the Chesapeake Biological Laboratory (CBL) where she had held professional positions since 1975. She was a long-time member of the American Fisheries Society. At the time of her death, Eileen was Research As-*

*sociate Professor in the University of Maryland Center for Environmental Science (UMCES). Many of us in the AFS Early Life History Section remember Eileen from her many contributions to larval-stage biology of anadromous fishes, especially striped bass and white perch in the Chesapeake Bay. In recent years, Eileen's interests and contributions diversified as she led education and outreach activities and devoted much of her energy to fishery management and conservation activities in the Bay region.*

*Eileen was born in Ohio, but migrated to the coast to undertake graduate studies at the University of Delaware (M.S. 1969) and the University of Georgia (PhD 1977). Eileen's research interests were diverse. Her contributions to larval-stage ecology of striped bass are well known by many in the AFS-ELHS membership. Less known are her other substantive contributions to Chesapeake Bay ecology and fisheries management. In recent years her*

*research interests had broadened to include jellyfish ecology. Eileen's major and enduring contributions to understanding environmental factors and their effects on striped bass egg and larval survival in the Potomac River are still the primary source of historical knowledge on these factors in the Chesapeake region. Eileen was a valued advisor to management agencies where she contributed and shared her knowledge with the Potomac River Fisheries Commission, the Atlantic States Marine Fisheries Commission and local resource management institutions. At CBL, Eileen directed and coordinated its many educational and outreach activities, including University of Maryland programs on Collaboration for Teacher Preparation, Minorities in Life Sciences, and the CBL Environmental Education initiative.*

*In CBL and UMCES it was Eileen's contagious energy and enthusiasm that distinguished her and made her an excellent ambassador for science. She was uniquely effective in introducing students to the wonder and complexity of the Chesapeake and estuarine ecosystems. Recognizing her contributions and dedication, the Tidewater Chapter of AFS presented Eileen with its "Excellence in Education" Award in 2000. Eileen is sorely missed by her many friends and colleagues at CBL and in the Bay region. Her many contributions and her effervescent, optimistic outlook are legacies that distinguish her in our memories. A memorial fund has been established to honor Dr. Setzler-Hamilton and to develop a teacher/student outreach program named for her. Contributions can be sent to The University of Maryland Foundation, Inc., c/o Dr. Eileen Setzler-Hamilton Memorial Fund, Chesapeake Biological Laboratory, P.O. Box 38, Solomons, MD 20688.*

--- Edward D. Houde

### Dave Johnson Receives ASIH Gibbs Award

The 2003 winner of "The Robert H. Gibbs, Jr. Memorial Award for Excellence in Systematic Ichthyology" was G. David Johnson. The award was presented during the banquet of the annual meeting of the American Society of Ichthyologists and Herpetologists, in Manaus, Brazil, last June. Dave Johnson is curator in the Division of Fishes, National Museum of Natural History, Smithsonian Institution. The Gibbs Award is "given for an outstanding body of published work in systematic ichthyology" and consists of a plaque and cash sum. What makes this honor of special note to ELHS members is that in much of his work, Dave has used his extraordinarily detailed study of developmental changes

in larvae to reveal evolutionary relationships that were otherwise unclear. The award was presented by William Anderson, who recognized among Dave's many significant contributions to ichthyology that "he has described new species, studied functional morphology, and contributed to the of the ecology of larval fishes...his most significant contributions have been to comparative anatomy, ontogeny, phylogeny, and classification of fishes" (*Copeia* 2003:939). §

### Tom Simon Moves Up in Water Quality

Former ELHS Northcentral Regional Representative and Newsletter Editor, Tom Simon has become president of the AFS Water Quality Section. Congratulations Tom! §

## Bob Werner Retires



Another former president of ELHS has retired. Bob Werner retired in December 1998, so this is not exactly recent news, but *Stages* has not yet acknowledged the event. I've known Bob since about 1976, so I thought it appropriate that I do the story (with the help of some friends, of course).

Robert G. Werner has been a fixture of the Section since its inception. Bob served on the Provisional Executive Committee that was appointed to lead the Section through its organizational year (1979-1980). His service to the Section's governance continued through President-Elect (1986-1988) and President (1988-1990). He also served as an Associate Editor on the editorial board of the Section (1985-1988). Through this entire time, Section presidents counted on Bob's sage counsel and he always offered thoughtful insight during the Section's business and Executive Committee meetings.

Bob's work on larval fishes predates our Larval Fish Conferences by a long shot. His dissertation work at Indiana

University, under the supervision of Shelby Gerking, resulted in publications on the ecology and movements of bluegill larvae which appeared in *Transactions of the American Fisheries Society* (1967) and *American Midland Naturalist* (1969) and a chapter on methods for sampling fish larvae in Ricker's *Methods for Assessment of Fish Production in Fresh Waters* (1968). Clearly an authority, he also published a "state-of-the-art" paper and an annotated bibliography, both on larval fish taxonomy, for the proceedings of a freshwater larval fish workshop (Ann Arbor, 1976) that preceded the freshwater larval fish workshop we consider the first of the Annual Larval Fish Conferences.

Neil Ringler, of the State University of New York – College of Environmental Science and Forestry (SUNY-ESF), gives us the following insight on Bob from his home institution. Bob joined the faculty in 1966 as Assistant Professor of Aquatic Biology where he taught limnology and ichthyology for his entire career there. His research interests have been broad, including studies of fish migration, invertebrate drift, street salting, and bioenergetics. A tribute published in the *Great Lakes Research Consortium Report* (Spring 1999) states: "*his research has varied from sunfish, to suckers, to sturgeon, and rainbow trout to zebra mussels, plankton and aquatic insects.*" Within New York State, he conducted research in the Great Lakes, Adirondack Mountains, Oneida

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## In Memoriam Carroll R. Norden, 1920-2003

*Carroll R. Norden passed away on June 10, 2003. Elders of the Early Life History Section will recall Carroll's participation in some of the earliest Larval Fish Conferences, which dealt exclusively with freshwater species. He served in the third year-class of officers for the Section (1981-1982) as the Northcentral Regional Representative. The following details of Carroll's career are from the obituary published in Fisheries (December 2003), written by the Section's first Newsletter Editor, Fred Binkowski, and with his permission.*

*Carroll's research dealt with fishes of the Great Lakes Region. His dissertation at the University of Michigan (1958) was entitled "Comparative Osteology of Representative Salmonid Fishes, with Particular Reference to the Grayling (*Thymallus arcticus*) and its Phylogeny," which he prepared under the guidance of Reeve Bailey. He worked for the Michigan Department of Conservation and U.S. Fish and Wildlife Service before landing a faculty position at the University of Southern Louisiana. In 1963, he moved permanently to a faculty position at the University of Wisconsin - Milwaukee. He retired in 1988 and was granted emeritus status.*

*Carroll was active in the early development of the Wisconsin Sea Grant Program. His research in Wisconsin involved larval alewives, walleye, and yellow perch, as well as the native coregonines. At the University of Wisconsin,*



*1981-1982 ELHS officers at the 5<sup>th</sup> Annual Larval Fish Conference at Chesapeake Biological Laboratory, Solomons, Maryland. Carroll Norden, Northcentral Regional Representative is kneeling in the front row at the far right.*

*Carroll taught fishery biology, ichthyology, biology of marine fishes, tropical biology, comparative anatomy, and introductory biology. He advised approximately 25 master's students and several Ph.D. students and postdoctoral associates.*

*At the time of his death, Carroll was 83 years old.*

*Werner...continued from p. 7*

Lake, Finger Lakes, and the St. Lawrence River. His research extended well beyond the borders of New York. His sabbatical leaves took him to the Dunstaffnage Marine Laboratory (Oban, Scotland) to work with John Blaxter (1978), Buenos Aires, Argentina as a Fulbright Scholar (1988-1989), and NMFS Beaufort Laboratory (1996), all of which resulted in significant publications.

Featured among Bob's many professional honors are a Fulbright Scholarship, being elected Fellow of the American Institute of Fishery Research Biologists, and the AFS Professional Achievement Award.

The list of Bob's professional activities from 1968 to the present is impressive. It is clear that the Early Life History Section is not the only organization that will suffer if retirement ends his participation. He has been very active in AFS over the years, being President of the New York Chapter as well as our Section. He was elected to the council on Great Lakes Resource Managers and was Co-Director of the Great Lakes Research Consortium. He has been associate editor of the *Journal of Freshwater Ecology* and *Transactions of the American Fisheries Society*, and he served on many more professional panels and committees.

This record reflects a personality that could not possibly close the door one day and walk away. How true that is. In 1998, the year of his retirement, I invited Bob to help me produce a textbook to improve the training of young fishery scientists by explaining the unique contributions of early life stages. To my delight, he eagerly accepted the offer and during the course of our two-year effort I found his contribution to the book to be far greater than I could have imagined. His list of post-retirement projects, professional and otherwise, seems endless. After completing our book, he prepared a revision of his own book *Freshwater Fishes of New York*, originally published in 1980.

Everyone who knows him sees Bob as a wonderfully charming, thoughtful, and creative fellow. If you've attended many Larval Fish Conferences, you will have met his lovely,

dare I say vivacious, wife Jo. They're a terrific couple that are fun to be with...if you can keep up with them. Both avid bird watchers, Don Hoss tells the following story about an adventure at his home in North Carolina:

*"The singular incident of the painted bunting. During the year that Bob spent a half sabbatical at Beaufort, we had a few colleagues down for drinks prior to dinner. We knew that Bob was a bird watcher, so we told him that we frequently had painted buntings coming to our feeders. Since that was a species that he could not see in the North he was excited about the possibility of seeing it at our house. During Happy Hour, many of the guests were looking out the sun room windows for birds as they drank "Blaxters" (a.k.a. Manhattans). Of course that was the evening that the bird decided not to come. My wife, Carolyn, and I had anticipated that problem, however, and had arranged for my son, Patrick, to be ready with a dead painted bunting (one that had flown into a window and Carolyn had frozen to use in a painting) tied to a fishing pole with monofilament line. Just as it was getting dark and every one was grousing about not seeing the bird, I gave the signal to Pat and he dangled the frozen bunting over an Azalea bush in a way that the pole was hard to see. Bob saw the bird in the dusk and led a charge of drinking birders to the window. If we had been on a ferry boat it would have capsized. After a few seconds the always-composed Bob turned and calmly said, 'There seems to be something wrong with that bird - it keeps jumping up and down in the same place.' He now claims that he was never taken in, but we know that, just for a minute, we had that room full of earnest birders fooled."*

Bob is now Professor Emeritus at SUNY-ESF and maintains an office at the university, but I am willing to bet that much of his time is spent running or cross-country skiing (according to the season), fishing, and enjoying the idyllic setting of his lovely home with his wife, Jo, and their family. Bob, all of us wish you the very best and hope to continue seeing and hearing from you. §

--- Lee Fuiman

*Northcentral...continued from p. 4*

electroshocked sculpin during the fall, establishing that some spawning had occurred on the reefs. In addition, in spring 2003 Janssen collected a lake trout larva from the reef, and saw many other images on video he suspects were lake trout larvae that were not shocked but evaded a suction device. They have used this suction device successfully to collect eggs after moving rocks with the ROV. Janssen and Jude are also learning a considerable amount about the ecology of the reefs, which are more productive than surrounding areas.

Janssen and Jude are also involved in a study to identify risks to the Muskegon River ecosystem by examining

a wide range of driving factors (e.g., hydrology) and several important biological components (zooplankton, benthos, fish - larval, juvenile, and adult). They are delineating spawning and nursery areas in the Muskegon River Watershed for lake sturgeon, walleye, lake whitefish and yellow perch. Sampling to date has been conducted with anchored 0.5-m diameter nets in the river at six stations, and a 0.75-m net at two stations in Muskegon lake and both north and south of the mouth of Lake Michigan (to establish directional flow of larvae from the lake). They also set fry traps in the riprap along the channel to Lake Michigan and set sturgeon D nets at night to see if they could cap-

ture endangered lake sturgeon, which are known to spawn in the Muskegon River. Samples are still being sorted, but to date no lake sturgeon larvae have been found. A large number of chinook salmon fry and aquatic insects were found in the river, and lake whitefish were collected in fry traps deployed along the riprap in the channel leading to Lake Michigan establishing the region as an important spawning site for this species. Large numbers of larval walleye were collected in Muskegon Lake in May, and from previous samples it was determined that many larvae were also being transported out of Muskegon Lake and into Lake Michigan, where survival is expected to be low because

...continued on p. 9





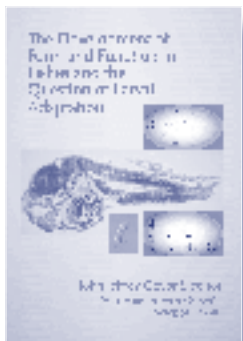
**Available now: *The Big Fish Bang. Proceedings of the 26th Annual Larval Fish Conference***

Edited by Howard I. Browman and Anne Berit Skiftesvik and published by the Institute of Marine Research, Bergen, Norway. ISBN 82-7461-059-8

Complimentary hard copies of the book were posted in early January 2004 to all conference delegates, reviewers of the manuscripts, and

400 other colleagues who have so far requested copies. Review copies were sent to all relevant journals and to the abstracting services. Note that the books were sent by surface post, with a 2-3 month expected delivery time. Approximately 50 free copies of the book remain to be distributed – so make your requests soon!

The book's content is available online at: [www.fishlarvae.com/book.asp?pg=52](http://www.fishlarvae.com/book.asp?pg=52) as PDF files of individual papers and may be distributed freely. §



**Available soon: *The Development of Form and Function in Fishes and the Question of Larval Adaptation***

This volume, edited by Jeff Govoni and appearing as American Fisheries Society Symposium 40, contains the proceedings of the "Symposium on the Morphological Development and Physiological Function in Fishes"

Held in Bergen, Norway 2002. It contains the following major reviews of form and function of organ systems in larval fishes:

- The Development of Form and Function in Fishes and the Question of Larval Adaptation* by John Jeffrey Govoni
- Functional Development of the Liver and Exocrine Pancreas in Teleost Fish* by Katja Hoehne-Reitan & Elin Kjørsvik
- The Development of the Swim Bladder: Structure and Performance* by Bernd Pelster
- Gas Exchange, Ionoregulation, and the Functional Development of the Teleost Gill* by Peter J. Rombough
- Mechanisms of Muscle Development and Responses to Temperature Change in Fish Larvae* by Ian A. Johnston and Thomas E. Hall
- Changing Structure and Function of the Ear and Lateral Line System of Fishes during Development* by Lee A. Fuiman, Dennis M. Higgs, & Kirsten R. Poling.
- Variation in the Development of the Fish Retina* by Barbara I. Evans & Howard I. Browman
- Allometric Growth in Fish Larvae: Timing and Function* by Jan W. M. Osse & Jos G. M. Van den Boogaart

The book will be announced on the AFS website ("Bookstore" link at [www.fisheries.org](http://www.fisheries.org)) in March or contact Jeff Govoni (Jeff.Govoni@noaa.gov) for more information. §



**Available soon in paperback: *Volume 2 The Larvae of Indo-Pacific Coastal Fishes***

J.M. Leis and B.M. Carson-Ewart

This second volume in the Fauna Malesiana Handbook series gives an extensive overview of larval development in 125 fish families, many of which are important from both ecological and fishery perspectives.

The families described are from the center of global marine biodiversity: the tropical Indo-Pacific, a region rich in coral reefs, as well as mangrove, estuarine, and coastal shelf habitats. This handbook covers fishes from all these habitats and not only documents their ontogeny, but also provides the means to identify their extraordinarily diverse larvae to the level of family.

As well as detailed descriptive text, the book offers a wealth of instructive and detailed illustrations (219 plates, each consisting of approximately 4 figures) and an illustration-based identification guide. The book focuses on the tropical regions of the Indo-Pacific, but many of the 125 families also occur in other tropical waters as well as in warmer temperate seas, so this handbook will also be of great value for workers in these regions.

- December 2003; xx+850 pages
- ISBN 90-04-13650-9
- List price: EUR 99 / US\$ 124

§

**Northcentral...continued from p. 8**

of low zooplankton densities. Janssen and Jude also collected yellow perch larvae in early spring in Muskegon Lake, establishing that some inland water bodies produce a cohort earlier than typically found in Lake Michigan.

Finally, Janssen and Jude report that results of a trawl survey showed

that survival of yellow perch juveniles was minimal in 2003 in Lake Michigan, contributing yet another poor year class to the Lake Michigan population. However, they note that some trawling data indicate that a more successful year class may have been formed in southern Lake Michigan, in Wisconsin and in Green Bay. §

[Editor's note: Bruce Comyns supplied much more information from the Northcentral Region than could fit in this issue. Look for the rest of the Northcentral Region news in the next issue of *Stages*.]

**REMINDER**

Deadline for sending materials to include in the next issue of *Stages*:

**May 7, 2004**

## Opportunities

### Funding Opportunity



The Fisheries Conservation Foundation seeks proposals for projects that are consistent with our mission to promote a better understanding of marine and freshwater fishery resources among users, the public, and decision-makers. Proposed projects should be submitted as pre-proposals by **April 30, 2004** to the following address:

Fisheries Conservation Foundation  
5410 Grosvenor Lane, Suite 110  
Bethesda, MD 20814-2199

Authors of pre-proposals that are determined to be worthy for further consideration will be asked to develop them into full proposals by June 30. Detailed instructions will be provided at the time of notification.

Pre-proposals for project funding may be targeted to address issues in any area, but priority consideration will be given to those that propose activities in one or more of the following three PROGRAMMATIC CATEGORIES:

- Public Outreach and Information
- Institutional/Organizational Capacity Building
- On-the-Ground Projects

and to those that focus on one or more of the following six CONCEPT AREAS:

- Stocks in Peril
- Vanishing Habitats
- Polluted Aquatic Ecosystems
- Exotic Invasions
- Shaping Resource Policies
- Enhancing Leadership in Fisheries

This program of funding is designed to support projects that will help the Fisheries Conservation Foundation accomplish its mission. In that regard, funding for primary research or to support agency-mandated initiatives or responsibilities is unlikely. For more information contact: John Epifanio by telephone at (217) 766-9559. §

### LFC 2004 Student Travel Grants

A total of \$1000 will be available for Student Travel Grants for the 2004 Larval Fish Conference. Individual award amounts will be based on need and will likely range from \$250-\$500. Grants are available to students in an undergraduate or graduate degree program who plan to present a paper at this meeting and are members or affiliate members of ELHS.

Send all student travel grant application materials to:

*Dr. Jeffrey A. Buckel*  
*Center for Marine Sciences and Technology*  
*North Carolina State University*  
*303 College Circle*  
*Morehead City, NC 28557*

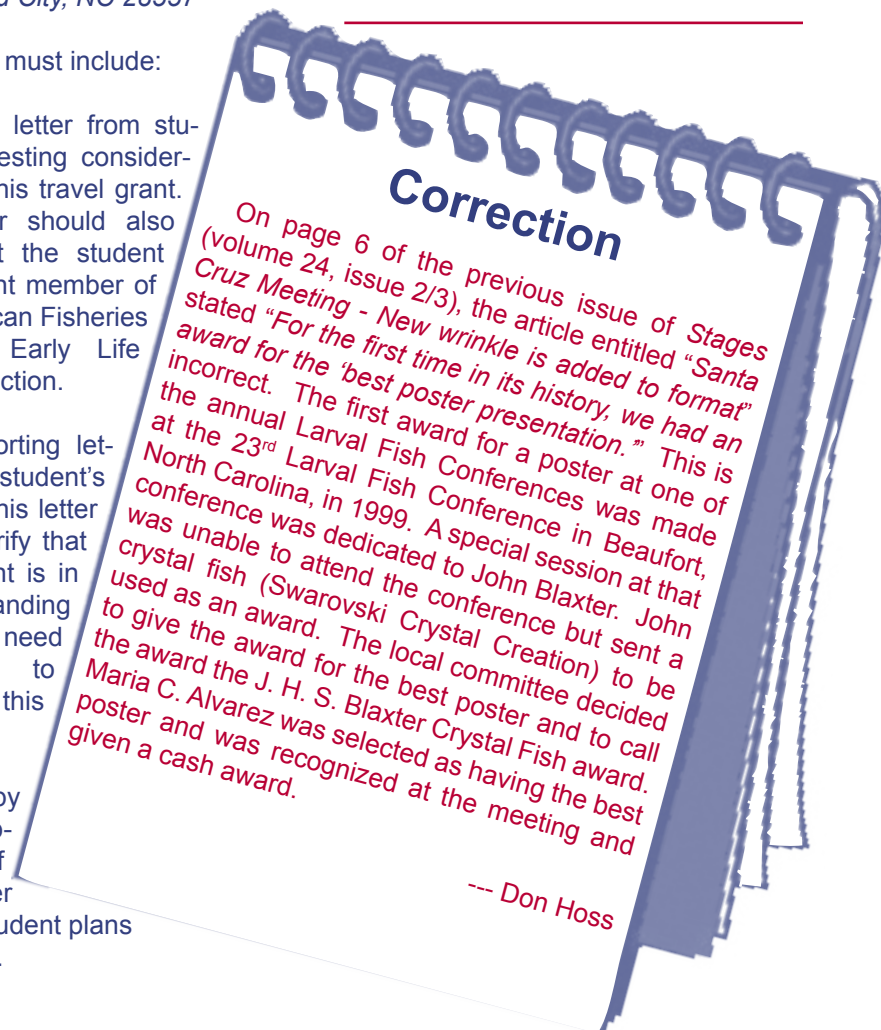
Applications must include:

1. Cover letter from student requesting consideration for this travel grant. This letter should also verify that the student is a current member of the American Fisheries Society's Early Life History Section.
2. Supporting letter from student's advisor. This letter should verify that the student is in good standing and is in need of funds to travel to this meeting.
3. A copy of the abstract of the paper that the student plans to present.

The final deadline for all these materials is 1 week after abstracts are due; however, early submission is encouraged. Applications must be received by regular mail, and if each item is sent separately, the last postmark will be used to date the 'completed' application. Selection for these grants should be completed within 2 weeks after the abstracts are due.

Students who receive these awards will be contacted soon thereafter to confirm their attendance at the meeting. Names of grant recipients will be reported in the ELHS newsletter, *Stages*.

Inquiries may be made by email: [jeffrey\\_buckel@ncsu.edu](mailto:jeffrey_buckel@ncsu.edu) §



## North Carolina Sea Grant Fellowship

North Carolina Sea Grant is accepting applications for a fellowship opportunity for students nearing completion of an advanced degree program in natural resources or marine sciences. The one-year Marine Fisheries Fellowship provides a \$26,000 stipend. It is open to graduate or post-graduate students who are enrolled in master's, doctoral or professional degree programs at southeastern universities and colleges (MD-TX).

The selected fellow will be placed in May 2004 with the North Carolina Division of Marine Fisheries (DMF). The fellow will analyze historical juvenile finfish monitoring data sets, with a focus on evaluating the monitoring programs. Recommendations from this research will help DMF determine if modifications in current fishery-independent surveys are required. A second goal is to interpret historic monitoring data for use in future fishery management plans.

Applications must be submitted no later than **February 20**. Send a personal and academic resume; a statement — no longer than two pages — giving reasons for applying and educational/career goals; a copy of undergraduate and graduate transcripts; and two letters of recommendation from professors with knowledge of applicant's academic performance. Travel for in-

terviews will be at the applicant's expense.

Mail application package to Jeffrey Buckel, Sea Grant Marine Fisheries Fellowship Program, Center for Marine Sciences and Technology, 303 College Circle, Morehead City, NC 28557.

For additional information about the fellowship, contact Buckel at 252/222-6341, [jeffrey\\_buckel@ncsu.edu](mailto:jeffrey_buckel@ncsu.edu) or Louis Daniel, NC Division of Marine Fisheries, 252/726-7021, [louis.daniel@ncmail.net](mailto:louis.daniel@ncmail.net). §

### *Conferences...continued from p. 5*

Branch, Fisheries & Oceans Canada, Suite 200 - 401 Burrard Street, Vancouver, BC V6C 3S4 CANADA; Phone: 604-666-3520; Fax: 604-666-0417 E-mail: [mackinlayd@pac.dfo-mpo.gc.ca](mailto:mackinlayd@pac.dfo-mpo.gc.ca)

### *7<sup>th</sup> Indo-Pacific Fish Conference*

The 7<sup>th</sup> Indo-Pacific Fish Conference will be held in Taipei, Taiwan in **May 2005**. Details are at [www.ipfc7.org](http://www.ipfc7.org).

The chief organizer, Dr. Kwang-Tsao Shao, would like to hear from anyone interested in convening a symposium at the conference. The following "core" sessions will be included: pelagic, deep-sea, chondrichthyan, larval, coastal, coral reef, and estuarine fishes; molecular evolution; phylogeography; aquarium fishes; reproductive mechanisms; MPAs; South China Sea; fish database; and conservation of freshwater fishes.

Dr. Shao hopes to receive some new titles, themes, or sessions which are important or are new trends in the field of ichthyological researches.

The reward for the Symposium Convenors is full or partial support of their travel expenses, depending on how many speakers (or presentations) they can invite and the budget situation. A waiver of the registration fee can also be considered. Please note that the deadline for receiving symposium proposals is **31 January 2004**. Contact Dr. Shao directly (see below) with your proposals.

Steve Swearer and Jeff Leis are planning to convene a session with the working title of "Dispersal and retention of larval shorefishes: Distribution, behaviour, sensory abilities and oceanography" (subject to final approval of the organizing committee). I invite your participation in this session. Contact Jeff Leis ([jeffl@mail.austmus.gov.au](mailto:jeffl@mail.austmus.gov.au)) directly about this.

Dr. Shao's contact details are: Kwang-Tsao Shao, Research Fellow; Laboratory of Fish Ecology & Evolution; Institute of Zoology, Academia Sinica; Nankang, 115 Taipei, Taiwan, Republic of China. Tel: 886+2+27899545, 27899556, 27887330 (Lab); Mobile Phone: 0932152991 or 886+932152991 (if abroad); Fax: 886+2+27883463 (Lab); E-mail: [zoskt@gate.sinica.edu.tw](mailto:zoskt@gate.sinica.edu.tw) §

## Editor's Ramblings



This year, 2004, marks the 25<sup>th</sup> anniversary of the Early Life History Section, as good a reason as any for a face-lift for its newsletter, *Stages*. Admittedly, this change is a bit of self-indulgence on my part, but I assure you it does not indicate that I have too much free time on my hands. I hope you find the newsletter appealing both aesthetically and professionally. I am eager to continue the tradition of keeping our members updated on activities, events, and publications related to the early life history of fishes. But, I also plan to use the newsletter to reflect on our Section's past, especially in this silver anniversary year. With 25 years behind us, many of our current members were not around in the early years. I am hoping you might find these reflections at least mildly interesting.

Perce Powles, who has been at the helm of this newsletter for the past few years, has stepped down, undoubtedly to enjoy life a little more. I know that all of you will join me in thanking him for taking charge of the newsletter from 1999 until 2003. As I take over from Perce, I will convey to you a message that he and all editors of *Stages*, back to our first editor Fred Binkowski, have expressed: *Stages* is one of the most important and valuable products of our organization and it relies on members for its content. We do have a terrific group of regional representatives to help gather information, but please don't wait for them to contact you. If you have something that may be of interest to your colleagues, or if you just want to brag about your work, please send it to your regional representative or to me so that we can get the word out. §

## Newsletter Production Team

**Stages** is published in February, June, and October each year. It is assembled by the Newsletter Editor with contributions from several Regional Representatives and other individuals. Please send any articles, announcements, or information of interest to Early Life History Section members or affiliates to your local Regional Representative or to the Editor.

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## Join ELHS

Membership in ELHS is open to all persons or organizations interested in furthering ELHS objectives, regardless of membership in the American Fisheries Society (AFS). If you are an AFS member, simply add ELHS membership when you pay your Society dues.

Affiliate membership is open to persons or organizations who are not members of AFS. Affiliate members are encouraged to participate in Section meetings, committee work, and other activities, but they cannot vote on official Section matters, run for or hold an elected office, or chair standing committees. All members receive **Stages**.

To become an affiliate member, mail your name, institutional affiliation (if appropriate), mailing address, telephone and fax numbers, e-mail address, and dues (US \$10 per year) for the current and/or upcoming year(s) to:

*Kathy Lang*  
Treasurer, AFS-Early Life History Section  
NMFS/NOAA  
166 Water Street  
Woods Hole, MA 02543-1097

Please specify the membership year(s) for which you are paying dues. Make checks or money orders payable to "AFS-ELHS."

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