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ELHS Newsletter
AFS

STAGES

President's Report

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Dates to remember

Ethology and Evolutionary Ecology of Fishes:
May 20-24, Athens, GA

4th International Larval Biology Meeting: June
24-28, Santa Cruz, CA

24th Annual Larval Fish Conference:
Gulf State Park, AL

I have spoken, and written, about apathy in our organization before; I will now write on this again.

Within any organization, most of the work of maintaining the function of the organization falls on the hands of a few, this largely owing to the scarcity of people willing to contribute.

Tom Miller, dedicated to the function of our organization and not in the least apathetic, has served the Early Life History Section since 1995, with a most demanding task: Editor of our newsletter *STAGES*. Inasmuch as communication among people of like scientific interest is the principal function of the Section, this is no mean task. Tom has served well. He has steadfastly produced the quarterly issues; he has consistently laid-out an attractive, interesting, and informative journal. Tom is to be commended by our entire organization for his fine work. He has my gratitude. I thank as well the Regional Representatives who provided Tom with material for inclusion in the Issues of *STAGES*.

Dr. Percival Powles has accepted the appointment as the new Editor of the Section. Perce's contri-

butions to the function of the Section are not new. Perce was an early functionary, serving as Secretary/Treasurer-Elect from 1982 to 1983, and as Secretary from 1983 to 1984. Commendably, he has agreed to serve again, this time in his professional retirement. No apathy here.

The terms of the Regional Representatives expired and I encountered considerable difficulty in finding people willing to accept nomination, with the exception of one, Dan Margulies, who agreed to accept nomination for a second term. No apathy here, either. Even so, only one willing nominee per post could be identified. As a consequence, the new Regional Representatives, identified in this issue of *STAGES*, were appointed, not elected. I ask that all of our members cooperate with their Regional Representative by providing information on research activities, developing plans for forthcoming meetings, conferences and symposia of interest, visitation by international colleagues, etc., to their Regional Representative.

The 1997 Early Life History Section Webpage, another medium of communication, was erected by Darrel

President's Message Continued

Snyder, the first President of the Section. Since then the Webpage has been maintained by John Dower. John's contribution to the section came during a period of great personal tragedy, yet the Webpage not only subsisted, it improved immensely during his tenure. The Section should commend John for his fine work; he has my gratitude.

Jim Rice has agreed to accept the appointment as the next Web-Master of the Section. Jim brings with him considerable skill and no apathy in regard to the successful function of the organization. He should be commended forthrightly for his willingness to serve.

I encourage all members of the Early Life History Section, to attend the next Business Meeting, at the 24th Annual Larval Fish Conference in Gulf Shores, Alabama, in November 2000, to meet and talk with the functionaries of the Section, and to participate fully in the success of a most worthwhile organization.

Jeff Govoni

Congratulations

Dr. Jonathan A. Hare received the 1997, F. Thompson Award of the American Institute of Fishery Research Biologists. The award was issued in recognition of his recent article published in the journal *Ecology* and entitled "Size, growth, development, and survival of the planktonic larvae of *Pomatomus saltatrix*", which documents the influence of larval growth rate on survival rate. Jon is a former Regional Representative for the Early Life History Section and Research Fishery Biologist and Team Leader of the Fisheries Oceanography and Ecology Team at the National Ocean Service's Center for Coastal Fisheries and Habitat Research at Beaufort.



Darrel Snyder (left) receiving congratulations for his award from Bob Muth (See below)

Darrel conceived of, and led the efforts to establish our ELH Section, and served as our first President in 1980-81! He also helped found the Larval Fish Lab at Fort Collins, Colorado State University. Bob Muth, who presented the award, is a former Director of that Lab, and a long-time member of ELHS, serving as both Regional Rep and Secretary. The award was presented to Darrel in recognition of his research on larval taxonomy, habitat studies, especially larval nurseries, reproduction, and larval transport. The Award of Appreciation was presented to Darrel E. Snyder by Robert T. Muth at Upper Colorado River Basin Researchers' Meeting, Moab, Utah, 25 January 2000.

“Here and there in early life history research”
North America, Europe, Australia, and elsewhere

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First of all, I wish to thank Tom Miller, Jeff Govoni, and many others for their best wishes in receiving the torch of editor. It is going to take me time to catch up to the expertise of Tom, but already he has helped me to get started during a visit to his lab in the Solomons. He has since helped me by editing this first issue. Ron Bradley, NOAA, Beaufort, helped me to get started on the software. Thanks, Ron.. And thanks to the new and old regional reps for copy! Please keep the reports coming, though, or it becomes hard to get out the issues on a regular basis.

I thank you all in advance for your cooperation and help in this endeavour.

I thought it might be interesting to start an international section here, but not an ambitious one. It would be comprised of small notes of one or two paragraphs describing some new work or novel discoveries in the early life history field. I will start with one of my own. At our CCFR (Canadian Fishery Research) meetings this year in Fredericton, N. B. I was struck by one fascinating study on lake trout. John Gunn (OMNR) and his team found that if he covered ideal lake trout spawning habitat with sheets of plastic, the pairs moved on, and spawned in the next best place. They were quite unaware that they were supposed to chose the precisely-defined set of criteria which we have more or less imposed on them for years! Every year more sites were covered up, and every year we had an increase in the stock! Until of course roads were built into the lake!! From **John Burke NOAA, Beaufort Lab (March 8)** “Our summer flounder broodstock spawned volitionally this morning!! Eggs were at the 2 cell stage and continue to develop nicely. We have collected 200,000 eggs so far. Although we have been tank spawning these fish for the past two years this is the first time the broodstock has spawned without hormone induction and to our knowledge represents a first for summer flounder culture. Generally strip-spawning is the norm.” **Al Curry, at UNB, Fredericton, NB,** is assessing date of hatch and summer growth, to overwinter survival in slimy sculpins. He is also attempting to determine the contribution of sea run forms of brook trout to alevin production (numbers emerged from gravel) using stable isotopes to look for marine signatures.

OurNext Meeting ... 24th Annual LFC - Gulf Shores, AL

24th Annual Larval Fish Conference: Global Climatic Change, Essential Fisheries Habitat, and Early Life History Stages

The 24th Annual Larval Fish Conference will be held in Gulf Shores, AL on 5-10 November 2000. The conference program will begin with a 1-day theme session (organized by R.F. Shaw, Louisiana State University, 225-388-6734) designed to critically review, evaluate and focus the evolving hypotheses from previous Global Climatic Change (GCC) research as they pertain to impacts on coastal Essential Fisheries Habitat (EFH), followed by a 1-2 day "working group meeting" for those interested. A second 1-day theme session (organized by J.H. Cowan, Jr. 334-861-7535 and D. DeVries 334-844-9322, University of South Alabama and Auburn University, respectively) will be devoted specifically to GCC, EFH and fish early life history stages, and will focus on habitat-related recruitment bottlenecks and other issues related to the interaction between habitat and factors that limit population size. Theme session 1 and 2, and working group results will be published in a reviewed and edited book or special issue journal. Timely turnaround of said publication (within one year) will be aided by pre-distributed briefing documents and invited symposium speakers arriving with disciplinary "white papers" and manuscripts in hand. The symposium and its proceedings will provide a forum for consensus, and a single source of information detailing the potential problem, its likely impacts, and methods to investigate, identify and mediate these impacts. Finally, a third 1-day theme session (organized by J. Shardo, USA, 334-460-7523) will be devoted to fish embryology and larval development. The remainder of the conference will be comprised of contributed papers, with many of these expected to address conference topics.

A website describing conference location, facilities, and registration procedures will appear shortly, linked to the ELHS website (www.eos.ubc.ca/afs_early/), with additional links to the Dauphin Island Sea Lab (www.disl.org/main.html/), the USA Department of Marine Sciences (www.southalabama.edu/marine_sciences/index.html) and the LSU Coastal Fisheries Institute (<http://chaos.cceer.lsu.edu/>, look under Research Units, then go to Coastal Fisheries Institute). The first call for papers and early registration will occur in April; abstracts for contributed papers will be due by 1 September, 2000. The conference will be held in a self-contained, 144-room conference center located at Gulf State Park, on the northern Gulf of Mexico's "emerald coast" in Gulf Shores, AL. Room rates will be \$39/night. Room registration will be made directly with the conference center once the website is activated. The conference center can be reached by flying either into Pensacola, FL or Mobile, AL and is about a 1-hour drive from each. The weather in early November usually is in the low to mid-70s, with cool nights in the low 50s. Surf temperatures also are usually in the low 70s; fishing, scuba diving, golf and tennis are located nearby.

For more information, feel free to phone or e-mail Jim Cowan at 334-861-7535 or jcowan@jaguar1.usouthal.edu. See you in Gulf Shores.!

Regional Research News

Western

Daniel Margulies

Submitted by Churchill Grimes, Director, NOAA, NMFS Santa Cruz/Tiburon Lab (church@tib.nmfs.gov)

Investigator: **Steve Ralston**

Larval Sebastes Survey

The Groundfish Analysis Branch at the Santa Cruz/Tiburon Laboratory (SWFSC, NMFS) recently completed an ichthyoplankton survey aboard the NOAA R/VMcArthur. This particular survey was designed to estimate the total abundance of preflexion rockfish larvae (*Sebastes sp.*), including especially chilipepper (*S. goodei*), as part of a stock assessment of total spawning biomass. The cruise was conducted from January 22-February 3, 2000 and sampled central Californian waters from Point Reyes south to Morro Bay (lat. 38o00'-35o25'N) and out 100 km from shore. Ninety samples were collected with a bongo net that was deployed using standard CalCOFI protocols. There are plans to have the rockfish larvae sorted and a subsample of chilipepper aged in order to evaluate the total mortality rate and daily larval production rate.

Preliminary indications are that very few rockfish larvae were encountered between Santa Cruz and Piedras Blancas (lat. 37o00'-35o40'N). Distributional patterns of the ichthyoplankton will ultimately be interpreted in light of results from ADCP and CTD transects that were also conducted during the cruise.

Physiological Ecology of Juvenile Chinook Salmon in the San Francisco Estuary and Coastal Gulf of the Farallones

Investigator: **Bruce McFarlane**

Chinook salmon (*Oncorhynchus tshawytscha*) populations from California's Central Valley are in jeopardy. The winter and spring runs

are listed under the Endangered Species Act and the fall and late-fall runs are candidates for listing. To determine the effects of estuary passage on emigrating juvenile chinook salmon, a multi-year study was started in 1995 to assess growth and development through the San Francisco Estuary, a highly-modified and urbanized estuary. Juvenile salmon were obtained during May and June at locations spanning the estuary, from the confluence of the Sacramento and San Joaquin Rivers to the exit at the Golden Gate, and after ocean entry in the Gulf of the Farallones.

Analyses of data from 1995 to 1999 indicated that juvenile chinook salmon demonstrated little estuarine dependency but derived substantial benefit from coastal waters. Young salmon emigrated through the estuary in about 30 to 40 days at a rate of 1.5 - 2.5 km/d. While in the estuary they grew little in length or weight) and condition (K-factor) declined progressively. Despite declining condition, however, energy stores were maintained through the estuary. After entry into the coastal Gulf of the Farallones, juveniles grew rapidly and condition improved markedly. Growth appeared to be a consequence of increased feeding and utilization of energy reserves. The results of the study suggest that Central Valley chinook salmon populations have evolved an ecological strategy of little reliance on estuarine habitats and expedited ocean entry, to benefit from the biologically productive central California coastal marine environment, which is driven by upwelling and advective circulation.

Since juvenile salmon biology is poorly known in the ocean, the next phase of the study will focus on their ecology in coastal habitats from Monterey Bay to Pt. Reyes on the central California coast. Abundance, distribution, growth, development, and trophic relationships of immature salmon will be investigated in a study design addressing mesoscale spatial coverage and prominent oceanographic features, including estuarine discharge, upwelling centers, coastal jets, and eddies. Salmon data will be related to physical and biological environmental variables shortly after ocean entry and at later times to determine their influences on distribution, development, and survival.

North Central Region

Bruce Comyns

Aquatic Ecology Laboratory

Department of Evolution, Ecology, and Organismal Biology

The Ohio State University

David Culver made two trips to Wuhan, Hubei Province, People's Republic of China in the last year, trying to adapt the techniques he developed for inorganic fertilization of walleye, saugeye, and yellow perch juvenile raising ponds to Chinese conditions. His approach involves measuring ammonia, nitrate, and phosphate each week and restoring the hatchery ponds to 30 ug PO₄-P/L and 600 ug inorganic N (nitrate+ammonia)/L (N:P=20) using phosphoric acid and ammonium nitrate diluted and sprayed on the ponds.

The Chinese traditional method involves adding 260 ug PO₄-P/L as calcium superphosphate (hard to get into solution) and urea (1157 ug N/L) (N:P= 4.5:1) to each pond, irrespective of the concentration in the pond. These traditional Chinese ponds developed huge algal blooms, requiring artificial aeration and copper sulfate treatment, whereas the phosphoric acid ponds did not. Not very many fish farmers in China would be interested in measuring nutrients, but if the optimal fertilization could be determined, both the cost of fertilizer and the degree of pollution of surface waters would both decrease considerably

To better understand factors that drive recruitment variability of yellow perch *Perca flavescens*, in western and central Lake Erie, Stuart Ludsin has been exploring age-0 yellow perch diet selection, growth, and survival. By combining weekly field estimates of abiotic (e.g., temperature, turbidity, precipitation) and biotic (e.g., phytoplankton and zooplankton biomass, potential competitor and predator abundances/consumption) conditions with diet and otolith analyses, Stuart is seeking to identify 1) the life stage (e.g., egg, larval, juvenile) at which recruitment is set. 2) whether survival is age- and/or size-dependent, and 3) how recruitment

mechanisms vary both spatially and temporally.

As David Culver summarized in the Sept. 1998 issue of *Stages*, populations of yellow perch declined drastically in the Great Lakes during the 1990's, and in response both management agencies and academic institutions have focused on determining causes of this decline. Other scientists in the northcentral region trying to explain this recent recruitment failure include David Clapp, John Dettmers, David Jude and Scott McNaught who have been sampling early life stages of yellow perch in Lake Michigan. They are part of a larger group, including Tom Miller at Maryland and Jim Rice at NC State, sampling the Lake Michigan population. A yellow perch Update will be included in a future issue of *Stages*.

Finally, David "Bo" Bunnell, who is pursuing his Doctorate under Roy Stein is attempting to understand mechanisms underlying recruitment of white crappie in Ohio reservoirs. He is exploring whether the larval stage is a critical period for white crappie recruitment, and is collecting larvae to quantify abundance, growth rates, diets, and the zooplankton (prey) community. Bo is sampling 8 reservoirs that span the productivity gradient and is set to begin the final year of this 3-year sampling project.

School of Natural Resources Ohio State University

Travis J. Hartman, a masters student of Konrad Dabrowski, will be stocking 3 hatchery ponds with the larvae of triploid hybrid saugeye (female walleye X male sauger), and comparing the growth and diets of the triploids with diploids raised in similar ponds. Ohio currently stocks over 12 million diploid saugeye fingerlings, and it is possible for fish stocked in waters of the Ohio River drainage to escape into the Ohio River and backcross with native walleye and sauger. Triploid saugeye are sterile and their use would eliminate any potential for backcrossing with native parental stocks. The thesis research of Travis will determine if triploids "perform" as well as diploids and are a viable option for Ohio stocking programs.

Department of Fisheries and Wildlife, U. of Missouri at Columbia

During the past 5-10 years Rob Hayward has been involved in estimating the energetic status and density dependence of larval gizzard shad, and evaluating environmental factors that affect survival and growth of larval crappie (using otoliths to place fish into weekly cohorts).

**Department of Animal Ecology
Iowa State University**

Bob Summerfelt is currently involved in one larval fish project with his Doctoral student, Todd Phillips, who is studying various topics related to the toxicity of chlorpyrifos, an organophosphorus insecticide, to larval walleye.

Joe Morris and his students have studied out-of-season spawning of *Lepomis* producing both pure bluegills and hybrids. This work involved raising larvae and fry until they could accept commercial diets. During the past 4 years, Joe and his students have also worked on larval walleye culture in culture ponds, research that involved both zooplankton population dynamics and fry food habits

Institute for Fisheries Research, School of Natural Resources and Environment, U. of Michigan

Ed Rutherford and his students have recently been quantifying anadromous fish production and recruitment in Lake Michigan and Lake Huron tributaries. Many of these tributaries are dammed, and have abnormally high summer temperatures with little daily fluctuation. Ed is using lab experiments to measure growth and survival response of juvenile rainbow trout (steelhead) to varying fluctuations in daily temperature and prey density, and is identifying habitat factors influencing juvenile salmonid production in Great Lakes tributaries. Ed is also working with Jeff Tyler at Worcester Polytechnic Institute, to build Individual-Based-Models for predicting future salmonid productions and recruitments given proposed changes (fish passage,

dam removal) in river management. Simon Thorold (Old Dominion U), John Christensen (U Michigan) and Ed, are using trace element and stable

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The smoking gun—a 12 mm, 10 d old larval swordfish, with a larval flying fish in its gut

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