



NEWSLETTER FALL/WINTER 2000

Fourth International Congress on the Biology of Fish a Great Success.

by Don MacKinlay

The Fourth International Congress on the Biology of Fish was held July 23-27, 2000, at the University of Aberdeen, Scotland, U.K. This was the fourth in a series of conferences sponsored by the Physiology Section of the American Fisheries Society that covered a wide range of topics in fish biology. Over 200 papers were presented in 12 Symposia by people from over 30 countries. Visit the web site www.fishbiologycongress.org where all of the papers from this, and all previous Congresses, are available free as .pdf files.

Students paper monetary award winners were: K.N.T. Tsui, Sarah Crabbe, Veronique Theriault, Neil Ruane, Christiana Barzaghi and Andrea Maria Pinto Delimaire. Other students also won books. Session organizers selected the winners and Academic Press and AFS Books donated the books.

Dave Randall presented Dominic Houlihan of the University of Aberdeen with the Award of Excellence in Fish Physiology, as the highest achievement award of the Physiology Section to honor a lifetime of contributions to a number of areas of fish biology.

Congress Chair Don MacKinlay inducted the 5 charter members (Bruce Barton, Steve McCormick, Dave Randall, Joe Cech and Dal Val) into the Congressional Legion of Honor, in appreciation for the outstanding level of support they have given the Fish Biology Congresses over the years.

The next International Congress on the Biology of Fish will be held at the University of British Columbia, Vancouver, Canada, from July 21-26, 2002. Anyone interested in organizing a Symposium for the Congress should contact Don MacKinlay

Travel Grants to Students and Post-docs Allowed 18 to Attend the Fourth International Congress on the Biology of Fish

by Stephen D. McCormick

Aberdeen is a long way from Kansas, and one of our concerns in organizing the meeting in Scotland was that it would be too expensive for many students and post-doctoral fellows to attend. So one of the tasks

that I took on during my term as President of the Physiology Section was to procure funding for travel grants to the Fourth International Congress on the Biology of Fish. Due to the generosity of the U.S. Department of Agriculture and the U.S. Geological Survey, the Section obtained \$15,000 devoted specifically to help students and post-docs attend the meeting.

We were able to help all 18 people from North America who applied (see list and picture next page), and gave travel grants of between \$500 and \$800 (US). I know that these students and post-docs contributed greatly to the meeting, and I greatly appreciate the thanks that I received from many of the recipients. . In official terms, we received \$10,000 from the NRI Competitive Grants Program of the US Department of Agriculture (award 00-01986) and \$5,000 from the Biological Resources Division of the US Geological Survey. Special thanks to Deb Hammernik (USDA) and Denny Fenn (USGS) who were instrumental in getting us these funds.



The names and affiliations of the travel award recipients (not all are picture):

Nicholas Bernier, University of Alberta; Dawna Brand, University of Victoria; Colin Brauner, McMaster University; Ted Castro-Santos, University of Massachusetts; Steven Cooke, University of Illinois; David Courtemanche, University of New Brunswick; Mark Fast,,University of Prince Edward Island; Heather Faust, Portland State University; Sarah Foster, Dalhousie University; Natasha Frick, University of Guelph; Andrew Hendry, University of Massachusetts; Shana Katzman, University of California, Davis; Wendy McFarlane, McMaster University; Eric Mellina, University of British Columbia; Toba Niazi, Towson University; Ryan Pelis, University of Massachusetts; Holly Shiels, Simon Fraser University; Jacques Zarate, University of Rhode Island

131st American Fisheries Society Annual Meeting to be held in Phoenix, Arizona

by Colleen Caldwell

Just a reminder to everyone of the 131st American Fisheries Society Annual Meeting to be held in Phoenix, Arizona, from August 19-23, 2001, at the Crowne Plaza Hotel. The meeting's theme is "2001: A Fisheries Odyssey-The Journey of Science, Management, and Education Continues".

The theme of the meeting will address the future fates of our aquatic resources as our odyssey continues into the first full year of the new millennium. Nearly all fisheries across North America are faced with

threats to population sustainability. We wonder whether certain fish populations will survive, and in what state. Can fisheries science help us rescue some of our native fish populations, or is it too late? In many ways, scientists, managers, educators, and politicians are presently unprepared to deal with some of the most inexorable problems facing us, such as human population growth and global climate change.

Among many other symposia and technical sessions, the 2001 Annual Meeting will explore some of these extremely complex issues in a special symposium: Can the Journey of Science and Education Lead to Fisheries Sustainability in North America? Sponsored by the Western Division of AFS and the Sustainable Fisheries Foundation, this symposium will explore some of the most challenging sustainability issues and hopefully provide solutions, or at least opinions, about where fisheries professionals should be heading. This multi-day session will address human population growth, landscape urbanization, the effects of broad landscape changes on fisheries, the biological, social, and economic impacts of overharvest, and new paradigms for management that account for ecosystem-wide effects. Invited experts will recommend solutions that, in addition to improving fisheries science and management, will help move fisheries management to a new level of involvement with other sectors in society that often dramatically influence the relative success of fish populations, their habitats, and the fisheries they support.

For more information about the meeting contact: Colleen Caldwell, Chair, 2001 AFS Program (505) 646-8126 ccaldwel@nmsu.edu or Visit the AFS Annual Meeting Website at (<http://www.fisheries.org/aznm/annual2001/default.htm>)



Report From 2000 AFS Annual Meeting In St. Louis

by Bruce Barton

I attended the Parent Society's 2000 Annual Meeting with the intent of representing outgoing Section President George Iwama. Due to a late rescheduling, I was unable to attend the Governing Board Meeting but did provide AFS President Christine Moffitt with George's Annual Report for the record. However, I did attend the new Board of Governor's meeting to represent the Section and incoming President Michael Redding. At the meeting, incoming AFS President Carl Burger outlined his goals and plans for his term of office. One area considered important was to increase AFS's international visibility, an area in which the Section has been in the forefront with the continuing Congresses. Ken Beal, current

AFS President-Elect, attended the Aberdeen Congress on behalf of the Parent Society, and remarked to me how much he enjoyed it.

On behalf of the Section, I chaired the Physiology Section general meeting, which was scheduled in the morning on Tuesday, August 22. Predictably, the meeting only drew about a half-dozen people, represented by members, students, and non-members. Ron Eisler, a USGS research scientist who is presently on secondment with AFS, attended the meeting for awhile on behalf of Gus Rassam, AFS's new Executive Director. Although attendance was low, a lively discussion centered on increasing Section membership and presence within AFS generally. In particular, it is apparent that the Section should encourage membership in the Parent Society so that, at the least, it can have a vote and, thus, participate actively on AFS's governing board.

I also moderated a combined Fish Culture and Health Contributed Papers session, which included the physiology papers, on the afternoon of Wednesday, August 23. Eight papers were presented to a receptive audience of approximately 25-25 people. I have agreed to moderate the Physiology Contributed Papers session at the 2001 AFS Meeting in Phoenix. Colleen Caldwell is one of the Program Chairs for that meeting.

Other items of interest from the meeting. Ira Adelman was elected as Second Vice-President of AFS. As Section members probably know, Ira is a fish physiologist and currently Head of the Department of Fisheries and Wildlife at the University of Minnesota. Also, fish physiologist and Section member Carl Schreck, Leader of the Cooperative Fishery Research Unit at Oregon State University, received the Fisheries Education Section's Annual Fisheries Educator of the Year Award.

Swimming performance and exhaustive stress in Pacific lampreys (*Lampetra tridentata*): implications for upstream migrations past dams

by: Matthew G. Mesa
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Pacific lamprey populations in the Columbia River Basin are believed to be in decline. One factor, among several, potentially limiting lamprey production is the amount of energy they expend negotiating upstream passage facilities at dams. Recent research using radio-telemetry suggests that Pacific lampreys have difficulty negotiating the fishways at Bonneville Dam. Our research is designed to examine the energy use of lampreys as they negotiate fishways and identify specific areas of difficult passage. In preparation for this field work, we conducted a series of laboratory studies over the last two years to provide information on the swimming performance, physiology, and metabolic costs of exhaustive stress in Pacific lampreys. Using swim tunnel respirometers, we estimated the critical swimming speed (U_{crit}) at 12°C of radio-tagged and untagged fish to be 81 cm/s and 86 cm/s, respectively. Radio-tagged and untagged lampreys showed severe, but short lived, physiological responses to exhaustive exercise, including decreases in plasma pH and muscle glycogen levels and increases in hematocrit, plasma lactate, and muscle lactate concentrations. These physiological responses tended to be more severe in untagged animals. Mean active rates of oxygen consumption of fish at 10, 15, and 20°C ranged from 200-300 mg/kg/h at 15 cm/s (spontaneous activity) to 1000-1200 mg/kg/h at speeds approaching U_{crit} . Finally, we have documented electromyogram activity from the swimming musculature of lampreys at rest, during active swimming, and at burst-type speeds using a new, smaller, surgically implanted radio transmitter. Electromyogram output was positively related to swim speed and was maximal during times of severe exertion. Collectively, our results provide a solid foundation towards estimating the metabolic costs of fish ascending the fishway at Bonneville Dam and should help identify areas of particularly difficult passage. This information, in conjunction with the results of other studies, should help solve the apparent lamprey passage problems at Bonneville Dam.



Nelson Goes South

by J. M. Redding

Section President-Elect Jay Nelson has an exciting spring semester planned. With grant support from NSF, he will be traveling to Brazil to study the topic of gut microclimate in neotropical armored catfish (Loricariidae). This work is being done in collaboration with Professor Tadeu Rantin of the Department of Biological Sciences, Federal University of São Carlos, Brazil. This collaborative effort was hatched at previous International Congresses in San Francisco and Towson and finalized in Aberdeen. It is an outstanding example of the kind of productive interaction that can occur at such meetings and of the international spirit that exists within our Section. The following is a summary of the project as provided by Jay.

The Neotropical catfish family Loricariidae is a vertebrate success story about which we know little. With over 600 described species, and many additional undescribed, this family evolved entirely after the Cretaceous separation of South America from Africa and accounts for between 1 and 2% of all current vertebrate diversity. Unlike other speciose fish families, which usually exploit multiple trophic niches, virtually all loricariids are herbivorous and eat near the bottom of the food chain. Field collections and laboratory experiments suggest that some loricariid catfishes are even utilizing wood in their diet. This is the first and only documentation of wood eating (xylophagy) in the more than 25,000 species of bony fish. These observations alone justify undertaking more detailed studies of the nutritional physiology of loricariids. However, all cellulolytic organisms thus far cultured from loricariids are either aerobic or facultatively anaerobic, and, all loricariids that have been tested can breathe air as well as water. Thus, it is possible that loricariids are the only vertebrates to be digesting cellulose under aerobic conditions. Unfortunately, nothing is currently known about the gut environment of loricariids. PI Nelson has been working on the mechanism of recalcitrant carbon bond degradation in small loricariids without the benefit of knowing the *in vivo* conditions under which it occurs. Collaborator Rantin has extensively studied the physiology of hypoxia tolerance in tropical fishes and has the only lab presently doing invasive physiology on large loricariids. Together, they propose to use large loricariids with surgically implanted catheters to test the null hypothesis that the lumen of the loricariid gastrointestinal tract is anaerobic as in other vertebrates. Nelson and Rantin will be investigating the environment of the gastrointestinal tract and the blood draining it in either fed or starved animals which are breathing either water-only or both water and air.

Sounds like international fish physiology at its best to me. Good luck, Jay.

Physiology Section Business

Report of Secretary/Treasurer

Gail Dethloff

Savings Account:

Beginning Balance (1/1/00)	\$ 5,698.70
Deposits AFS Dues	\$ 285.00
Interest Y-T-D	\$ 153.97
Ending balance (11/19/00)	\$ 6,137.67

Checking Account:

Beginning Balance (1/1/00)	\$ 4,475.31
Deposits Proceed Sales	\$ 205.00
AFS Dues	\$ 375.00
USDA Congress Travel Award	\$10,000.00
USGS Congress Travel Award	\$ 5,000.00
Checks Reimbursements (postage, travel, Congress)	\$ 1,234.09
AFS (Plaques, webpage hosting)	\$ 200.00
Travel Awards (International Congress)	\$14,005.00
Presentation Awards (International Congress)	\$ 600.00
Bank Charges New Checks	\$ 14.75
Ending Balance (11/19/00)	\$ 4,001.47

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New Voting Method for Election of Section Officers

One major reason for the rise of internationalism in our profession is our ability to communicate rapidly with each other via electronic media. In keeping with this trend, the Section Executive Committee has decided to try an electronic balloting procedure for the election of the new Vice President. We hope that you will appreciate the ease of voting this way and that you will vote in greater numbers than in the past. **Please read the following carefully.**

This newsletter is being mailed to all Section members, both regular AFS and affiliated members (non-AFS members). AFS rules allow voting for Section officers only by individuals who are current regular AFS members.

Thus, **for regular AFS members ONLY:**

1. Select your choice for the 2000-2001 Vice-President, either Chris Kennedy or Dal Val.
2. Cast your vote by sending an email with your name and the message KENNEDY or VAL to Section President Michael Redding (mredding@tntech.edu) and Section Secretary, Gail Dethloff (gail_dethloff@usgs.gov). Be sure to include your name so that we may compare it with our AFS master list.
3. Our deadline is January 17, 2001.

We will independently tally and compare the results. In the event of a tie vote we will decide the result with a coin flip.

2000-2001 Candidates for Section VicePresident

Christopher J. Kennedy is a professor in the Department of Biological Sciences at Simon Fraser University where he teaches and performs research in the broad areas of aquatic toxicology, environmental physiology and fish biology. He obtained his Ph.D. at Simon Fraser working on the development of pharmacological models to describe the movements of contaminants in fish. As a postdoctoral researcher at the University of Miami Rosensteel School of Marine and Atmospheric Sciences, he examined the effects of temperature on the fate of chemical carcinogens in benthic fish species.

Since starting at Simon Fraser in 1991, his basic research has been geared towards understanding how environmental and biological factors affect the natural physiological processes of chemical detoxification and elimination. Two of his larger projects in this area relate to differences between the sensitivities of marine versus freshwater fishes to toxicants, and changing sensitivities of salmon during the smoltification process.

The other half of his research is in more applied areas. One of his projects is to determine the probable causes and mechanisms of Pacific herring population declines in Prince William Sound, Alaska, by providing information on the health and fitness of herring following exposure to stressors such as oil and disease. This project also attempts to identify biomonitoring tools which can be used to monitor the health of wild fish populations and the effects of various fisheries management practices on fish health. Another

of his more applied projects deals with the development of water quality criteria for pollutants such as the antiseptics chemicals DDAC and IPBC which are used by the lumber industry.

Dr. Kennedy believes that information on functional fish biology is indispensable to protect and manage the world's fish populations in order to maintain sustainable fish stocks and biodiversity and to minimize the effects of natural and anthropogenic stressors. He strongly believes in the AFS mandate to protect and promote the well-being of living aquatic resources and considers this nomination for Section Vice President an opportunity to participate in the fulfillment of that mandate.

Professor Adalberto (Dal) Val writes the following:

I am a comparative physiologist with a strong interest in tropical fish and their adaptations to extreme environments. My lab is in the middle of the Amazon, at Manaus, Brazil, where we work on the adaptations fish developed to maintain their homeostasis under extreme environmental and physiological conditions such as hypoxia/anoxia, low pH, high hydrogen sulfide, long migration endurance, and growth in hypoxia and anoxia. Environmental degradation is becoming a big issue even in the Amazon Basin and so a substantial part of the lab is engaged in projects investigating the effects of contaminants on the aquatic environment and on the physiology of fish. Our lab is always open to national and international scientific cooperation.

In attending for the first time our meeting in San Francisco in 1996, I had the chance to meet with many new colleagues, to attend several fantastic talks and learned that this community of scientists would be in a special position to make important contributions to our field. This was confirmed in our subsequent meetings. Another strong point of the AFS is its growing international membership bringing colleagues from many countries to the meetings, who contribute through their interactions for the rapid dissemination of new concepts. I am honored to be nominated to run for the position of Vice President of the AFS-Physiology Section. My contributions to this Section would be to help maintain its endeavor of getting people together, especially those from outside of North America, and to bring truly new scientific information to our meetings. The Section should also continue to be the forum for postgraduate students presentations, both native and non-native English speaking students. I would look forward to serving the AFS-Physiology Section as a foreign ambassador.

President's Message

The spirit of internationalism is on the rise in most professions. At this year's Annual Meeting of the American Fisheries Society, President Carl Burger stated his intention to raise the international visibility of the AFS. Nowhere is that spirit more apparent than in our own Physiology Section. This year our Section sponsored its fourth meeting, the International Congress on the Biology of Fishes in Aberdeen, Scotland, following three previous meetings in Canada and the United States, all of which have drawn a decidedly international crowd. We've selected Vancouver, Canada as the site for the next Congress in 2002, and there is serious consideration being given to Brazil as the location for the Congress in 2004. The five distinguished recipients of the Section's Award of Excellence, William Hoar (Canada), Dave Randall (Canada), Howard Bern (United States), Tetsuya Hirano (Japan), and Dominic Houlihan (Scotland) are recognized not only for their notable work on home ground but also for their extensive international collaborations that have yielded rich scientific rewards. Five inductees into the Congressional Legion of Honor this year, Bruce Barton, Joe Cech, Steve McCormick, Dave Randall, and Dal Val are likewise notable for their world reach. I could keep going, but you already know many within our Section for whom the word "international" means more than a visit to their local Starbucks Coffee shop.

Many of us in the Section regard internationalism as a geopolitical imperative, given that our fisheries resources often transcend national boundaries. Thus, if for no other reason, we must come together as world neighbors for our common good. From another vantage this international spirit adds immeasurably to our opportunities for personal and professional development. My postdoctoral experience at the Laboratoire de Physiologie at the Musuem d'Histoire Naturelle in Paris, France still stands as one of the highpoints of my professional life, and my scientific visit to China is still reaping personal benefits. As you will read, Section President-Elect Jay Nelson will soon depart for an extended scientific, and no doubt cultural, adventure in Brazil. I imagine that many of you have similar stories to tell of personal and professional enrichment via international collaborations. I encourage you to share those experiences with your students and other associates. Pass the word. We live in one big global village. Let's share it and protect it together, and while we are doing that, let's have some fun.

Michael Redding –

Section President

JOIN AFS AND BECOME A VOTING MEMBER OF THE PHYSIOLOGY SECTION

Please visit the AFS website (www.fisheries.org) click "membership" from the menu and join online. Or contact

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