

Editor's Note

Welcome to the new millennium! Does it feel any different? I hope everyone had an enjoyable holiday. Thanks for your contributions over the last year. Please send me any information you have for the next issue!

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President's Corner

Well people, there's not a great diversity of news to report upon this winter. That is because virtually all of the Chapter's efforts have been going into one really huge project - the annual meeting. The amount of work that our members have been putting in has been pretty impressive. By now you have seen the registration and preliminary agenda. I encourage you all to attend this meeting - it promises to be a good one. It has evolved beyond a simple joint meeting to a regional conference which will include displays by commercial vendors. We also expect significant attendance from outside New York. Rumor has it that the foresters may drag the entire Ranger school out of the woods to attend. The Northeast Division of AFS has promised financial support if needed.

Of course it will be even better if you remember to submit abstracts for papers and posters. **Dan Josephson** promises to dance on a table in a skirt if we turn in more abstracts to him than the Foresters and Wildlifers (Dan - I'll bring the skirt!).

I extend my sincerest thanks to all the volunteers who have been working so hard on this meeting. I'd list you all but then this letter would be far too long!

Have a safe and Happy Christmas and New Year's and I'll see you all in Syracuse in January.

Allen Peterson
President

Chapter News

NY CHAPTER AFS Elections

At the upcoming NY CHAPTER AFS Annual Meeting in Syracuse new Executive Committee officers will be elected during the business meeting. **John Homa** has been nominated for Secretary-Treasurer; **Web Pearsall** and **John Farrell** have been nominated for President-Elect. Candidate biographies for President-Elect are printed below to help you to get to know them.

Biography of Webster Pearsall

Webster Pearsall is a Senior Fisheries Biologist with NYSDEC Region 8 in Avon NY. Web is responsible for the management of the fishery resources in Canandaigua Lake, and Wayne, Monroe, and Orleans counties, including the near-shore waters of Lake Ontario and some of its largest bays. In addition, Web manages the Finger Lakes Zebra Mussel Monitoring Program and co-ordinates NYSDEC's Aquatic Nuisance Species Program. Web is a native of central New York, but spent the last 11+ years working for the State of Maine Department of Environmental Protection, over nine of those years as an Aquatic Biologist. While in Maine, Web became a member of the Atlantic International Chapter (AI), while retaining membership in the New York State Chapter. During his time in Maine, Web constantly returned to participate in New York Chapter meetings each winter. Web returned permanently to New York State in 1998 to begin his career as a NYSDEC Fisheries Biologist. Web earned a BS in Forest Biology (Fisheries emphasis) from the State University of New York College of Environmental Science and Forestry (SUNY ESF) in 1982. He received his MS from SUNY Fredonia in 1989 while studying age, growth and resource partitioning between black and white crappie in Chautauqua Lake. While at ESF, Web was instrumental in resurrecting the ESF Chapter of AFS, and served as President. Since that time, Web has been actively involved in the New York and AI Chapters of AFS in a variety of roles including judging presentations and moderating sessions. Web is currently the Chair for the New York Chapter's Professional Incentive Committee. As NY Chapter president, Web would be particularly interested in pursuing ideas for increasing the Chapter's membership, and broadening membership participation in Chapter activities. Web loves spending time outdoors regardless of the season, and working around the new home he and his wife Heidi recently purchased in Manchester.

Biography of John Farrell

John Farrell is currently employed by SUNY-ESF, and is a Research Associate in the Department of Environmental and Forest Biology. John directs the Thousand Island Biological Station located on Governor's Island in the St.

Lawrence River, conducts research, teaches, and supports three graduate students. His research, a partnership between SUNY-ESF and NYSDEC, focuses on ecology of esocids in the Thousand Islands Region. John graduated from Cornell University in 1987 with a BS degree in Natural Resources, then completed a Master's in 1991 and a Ph.D. in 1998 in Fisheries at SUNY-ESF. He has also worked in the field of fisheries and aquatic ecology at Cornell Biological Field Station, Penn State Cooperative Fish and Wildlife Unit, and York University in Ontario. John has taught both Fisheries and Limnology to undergraduate and graduate students at SUNY-ESF, and has published in the *Transactions of the American Fisheries Society* and the *North American Journal of Fisheries Management*. He is currently President of Save The River Inc., an environmental organization of over 1,400 members dedicated to the conservation of the St. Lawrence River. For NY CHAPTER AFS, John has been a member for over 10 years and has contributed two talks at the Annual Meeting and sat in on a panel discussion last year. John has been the Chapter Newsletter Editor for three years, and recently was Program Chair and an instructor for the fall NY CHAPTER AFS Workshop on Aquatic Macrophyte Identification and Ecology. John is interested in building on NY CHAPTER AFS membership, student involvement, and high quality workshops to enhance professional training opportunities. His personal interests focus on the outdoors and all forms of fishing and hunting as well as skiing, hiking, wood boats, and whatever else his family and friends get him involved in!

Aquatic Macrophyte Workshop a Success!

Thanks to the assistance of many individuals, NY CHAPTER AFS hosted a very successful and well attended fall workshop, Aquatic Macrophyte Identification and Ecology. Held at the Tunison Laboratory, the workshop kicked off with very informative talks by **Bob Johnson** (Cornell University), **Don Leopold** and **John Farrell** (SUNY-ESF). Talks provided an excellent overview of plants associated with aquatic ecosystems in New York, the value of these macrophytes to fish species, and the effects of invasive species on our open waters and wetlands. The remainder of the morning was spent searching through tray after tray of aquatic macrophytes, learning to identify almost 40 species. Thanks to extremely helpful identification tips provided by **Bob Johnson**, **Alison Colby**, and **Jason Toner** (Cornell University) everyone got the chance to improve or begin on aquatic macrophyte identification skills. **Don Leopold** provided an excellent supplement to the indoor lab by taking groups to Tunison's marl pond to identify and discuss the natural history of many emergent wetland plants.

In the afternoon, we traveled to the Cornell Ponds, managed by **Bob Johnson**, to test our newly acquired plant identification skills. Many passed with flying colors, although some of us are, well...still have room for improvement! In summary thanks to the technical expertise of the instructors, and the enormous amount of information provided, everyone learned something, and many of us learned enough to keep our brains churning until these plants emerge again next spring! Special thanks go to **Jim Johnson** and the staff at the Tunison Laboratory, **Lynn Glase** (Ichthyological Associates) who organized food and drink for breaks and lunch, **Kim Farrell** (NRCS) and **Molly Connerton** (SUNY-ESF) who provided invaluable assistance with plant collecting, identification, and meeting preparation, and all others who volunteered their assistance.

New AFS Director of Publications

After a long search, I am happy to announce that **Victor Van Buren** has been offered and accepted the position of AFS Director of Publications and Communications, a key staff position that has been vacant since the retirement of **Bob Kendall**.

Victor, who will start on February 1, 2000, comes to AFS with a rich and long background in scientific publishing--both on the scientific society and the commercial world. Having worked with the American Association of Petroleum Geologists, Springer-Verlag, Elsevier, and, most recently, the American Geological Institute, Victor has extensive experience in the four critical areas of information dissemination: journals, books, magazine, and electronic and Web publishing. With his scientific background and business skills, he fits in well with both the Strategic Plan and my personal workplan on the Fisheries InfoBase.

Please join me in extending Victor a warm welcome. His present email is vbdkbooks@erols.com.

Budget

See attachment for budget information.

Upcoming events

NY State Tri-Society Meeting, January 27-29, 2000

"Strategies for Stewardship of New York's Natural Resources"

AFS - New York Chapter Newsletter -- January, 2000

Wyndham Syracuse
6301 Route 298, Carrier Circle
East Syracuse
Program Chair for NY Chapter AFS Dan Josephson (315)
369-6781; dcj3@cornell.edu
Registration Information call Diana Bryant (607) 255-2155

AIBS Annual Meeting, March 22-24, 2000

From 22 to 24 March next year, some of the country's most preeminent scientists will gather in Washington to review the major advances in organismal and integrative biology made during the last century and look ahead to future goals and challenges. The meeting is being cosponsored by the American Institute of Biological Sciences and the Smithsonian Institution. "Biology: Challenges for the New Millennium," which is also the 51st annual meeting of AIBS, will be held at the Smithsonian in Washington, DC. REGISTER EARLY--this extraordinary meeting is limited to 500 attendees!

Speakers at this unique millennial event include such notable scientists as:

Stephen J. Gould
Daniel H. Janzen
Gene E. Likens
Lynn Margulis
Gordon Orians
Ghilleen Prance
Marvalee Wake
Edward O. Wilson

Topics include Behavior, Biodiversity & Conservation, Development & Morphology, Ecosystems, Energetics, Environment, Evolution, Integration, Regulation, and Science & Society. Attendees and speakers will convene in breakout synthesis sessions following plenaries to discuss the presentation topics and prepare for the meeting's concluding roundtable event on Friday afternoon.

Other meeting features include a lecture by special guest Ernst Mayr, a workshop on the teaching of evolution (co-sponsored with the National Association of Biology Teachers), and a showing of the Smithsonian's new 3-D IMAX film on the Galapagos Islands. A limited number of poster submissions is also being accepted. Register online now and/or submit a poster abstract at <http://www.aibs.org/meeting2000/index.html>, where you may also obtain a detailed agenda for the meeting. For more information, contact AIBS Meetings Manager Marilynn Maury at 703/834-0812, ext. 203, or <mailto:mmaury@aibs.org>.

IAGLR 2000 43rd Annual International Conference, May 21- 26, 2000

Great Lakes, Great Rivers 2000 "A Vision For Tomorrow"

Cornwall, Ontario Canada

We are pleased to invite you to participate in the 43rd Annual Conference of the International Association of Great Lakes Research (IAGLR). The conference, hosted by the St. Lawrence River Institute of Environmental Sciences (SLRIES) in partnership with the University of Ottawa and the Mohawk Council of Akwesasne, will be held at the NavCanada Conference Center, Cornwall, Ontario, Canada from May 21 to 26th, 2000.

<http://www.NAVCANADA.CA/ncti/english/eindex.htm>
Dr. David Lean, Department of Biology, University of Ottawa is pleased to be the Conference Site Chair of IAGLR 2000 conference Great Lakes; Great Rivers 2000 - A vision for tomorrow. The conference is designed to integrate disciplines and to focus on the future health of Great Lakes and the St. Lawrence River Ecosystems for the next century.

ABSTRACTS ARE NOW BEING ACCEPTED!!!
ALL INFORMATION IS POSTED ON THE
NEW IAGLR WEBSITE:
<http://www.iaglr.org>

Contact: Christina Collard
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East Coast Trout Management and Culture Workshop III, June 6-8, 2000

Frostburg State University
Program Chairman- Larry Mohn
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Wanted

Nominations Sought

The Professional Incentives Committee is soliciting nominations for the Chapter Professional Achievement and Honorary Member awards. The Professional Achievement Award is presented to an individual who has provided exceptional value to the profession beyond Chapter duties. Honorary Membership is presented to long-standing Chapter members who have contributed significantly to the Chapter. Please give some thought to your coworkers or professional contacts as possible nominees. Send your nominations along with a short bio-sketch to Web Pearsall at wepearsa@gw.dec.state.ny.us or NYSDEC Region 8 Fisheries 6274 East Avon-Lima Road Avon, New York 14414

American Fisheries Society Holds Student Writing Contest

The American Fisheries Society (AFS) is holding its annual writing contest to recognize students who do an excellent job communicating the value of fisheries research to the general public. Undergraduate and graduate students are asked to submit a 500- to 700-word article explaining their own research or a research project in their lab or school. The article must be written in language understandable to the general public (i.e., journalistic style). Students may write about research that has been completed, is in progress, or is in the planning stages. Most important is that students write their articles in a manner that the general public can understand so people can appreciate why the research is important and how it could help society and the fisheries resource. The top three winners will be invited to the AFS annual meeting (at winners expense), where their articles will be prominently displayed at the poster session; they also will be given a plaque recognizing their achievements. The winning articles will be published in FISHERIES. Deadline for articles is January 15, 2000. Please mail five copies of the articles to Laura Hutchcroft, AFS; 5410 Grosvenor Lane, Suite 110; Bethesda, MD 20814. If you have any questions, please contact Hutchcroft at 301/897-8616, ext. 201.

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NY Chapter AFS Newsletter Editor

Seeking organized motivated person(s) to take over responsibilities as editor of the newsletter. Three publications a year are required. If you are interested please contact John Farrell (315) 470-6990; jmfarrel@mailbox.syr.edu

Recent Theses

Fish population dynamics: integration of bioenergetics and life-history processes.

by Ji X. He

Major Professor: Don Stewart

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This dissertation develops and combines models of bioenergetics, life-history dynamics and population dynamics. In the first chapter, I use an extensive data set to support an idea that growth patterns of body length are sufficient for predicting both age and size at first reproduction. Consequently, the relations between growth trajectories and each major life history trait (e.g., mortality, fecundity, age and size at first reproduction) can be quantified separately. In the second chapter, I analyze the case of lake trout fisheries in the Laurentian Great lakes, focusing on the relation between life-history dynamics and population dynamics. Life-history dynamics includes: 1) density-dependent body growth at two life stages, 2) the relation between body growth and age/size at first reproduction, 3) the relation between growth and natural mortality, and 4) fecundity as a nonlinear function of body size. Life-history dynamics can explain a mechanism that the balance between fishery yield and biomass growth is stable on the right side of a surplus production curve but not stable on the left side. Consequently, many incorrect implications of commonly used age-structured fish population models have been clarified. In the third chapter, I focus on processes of energy partitioning between growth and reproduction. Traditionally, growth patterns have been explained as: 1) consumption minus energy waste and cost, 2) assimilation minus respiration, 3) tissue synthesis minus tissue decomposition, and 4) tissue growth minus reproduction. All of those four interpretations have used the same Pütter-Bertalanffy

model. While those modeling interpretations each appear to be biologically reasonable, ambiguity remains when we try to understand the complete bioenergetic system of an organism. I developed a model that resolves that ambiguity by synthesizing in a new way the above relationships. My model emphasizes a control mechanism that endogenous energy flow plays a regulatory role. As a result, my model allows for simulating the process, rather than just the final result, of energy partitioning between body growth and reproduction. In the final chapter, I discuss the linkage between ontogeny of individual energy balance and trophic interchanges. I point out a forgotten control mechanism that, in the classic models for predator-prey interaction, consumption or assimilation rate equals its maximum value multiplied by the use efficiency of the key limiting factor of a given system. My model developed in the previous chapter is conceptually and mathematically consistent with those classic models. Particularly, my model is consistent with Henri's complete form of the Michaelis-Menten model for an open dynamic process. Energy budget regulation is more general than time budget regulation in an ecosystem context. I suggest that a better way to model food-web dynamics may be to start from ontogeny of energetic process and, then, evaluate second order impacts from environmental factors such as resource abundance.

Key words: age-structured fish population, food web, growth compensation, life-history dynamics, maturity depensation, open dynamic system, population dynamics, sustainable fishery, tissue turnover, Von Bertalanffy growth function.

Feature Article

Rainbow smelt in the Great Lakes; a successful invader

Susan L. Hardin

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Sue Hardin is a graduate of The Pennsylvania State University, and is currently a Graduate Student at the SUNY College of Environmental Science and Forestry. Her research focus is on northern pike in the St. Lawrence River. She completed the following paper as part of a course assignment.

Abstract: Rainbow smelt have successfully invaded the Laurentian Great Lakes region and are continuing to

rapidly increase their range in coldwater environments. They have a eurythermal life history, allowing them to occupy a variety niches, and have an omnivorous diet. Rainbow smelt have established themselves as an important predator, competitor, and prey species. As a result of their versatility, introduction of rainbow smelt has led to changes in the native fish community structure in many aquatic ecosystems.

General Physical and Taxonomic Description

The scientific name of the rainbow smelt, or American smelt, is *Osmerus mordax* within the family Osmeridae, which also includes eulachon of the west coast, pond smelt of the western Arctic and capelin which inhabits the east coast waters. The rainbow smelt is a slender silver fish with an olive to bottle green back, a long pointed head, a large mouth, a small adipose fin, and a deeply forked tail (Bigelow and Schroeder, 1953). Fresh from the water, its sides take on a purple, blue, or pink iridescent hue; characteristics that likely inspired the name, rainbow smelt. It is well documented that they also take on a peculiar 'cucumber' odor. The lower mandible of the fish extends slightly beyond the upper, and on the tip of the tongue are fang-like teeth. Rainbow smelt grow to a maximum length of 35 cm; however, few are more than 20 cm long. They weigh from 28 to 170 grams, with an average of 85 grams.

Distribution

Rainbow smelt is an indigenous species of glaciomarine origin in many freshwater lakes of Eastern North America (Evans and Loftus 1987). Originally an anadromous fish, they have been able to adapt to a strictly freshwater environment. Its native range in Eastern North America includes Atlantic drainages from Lake Melville, Newfoundland, to the Delaware River, Pennsylvania (USGS website). Invasion and colonization has resulted primarily through human introduction and by movement through interconnected waterways (Evans and Loftus 1987). Non-indigenous populations of the rainbow smelt are now widely distributed throughout the eastern and western North America, inhabiting coastal waters as well as inland freshwater lakes and rivers including all five Laurentian Great Lakes, many of the smaller lakes in the upper Great Lakes region in Canada and the United States, and the Mississippi, Ohio and Missouri rivers (USGS website). It is a successful invader in deep coldwater lakes and rivers and is rapidly expanding its range in northern and western North America.

Life History

In its native marine environment, the rainbow smelt is anadromous, spawning in freshwater and living the rest of its life in estuaries or off the coast. In lakes, rainbow smelt

have a eurythermal life history. They seek out gravelly areas for spawning and lay adhesive demersal eggs (Bigelow and Schroeder 1953). The young of the year (YOY) inhabit the warmer nearshore zones, with the age-1 class preferring cooler waters, while adults seek out cold-water habitats such as the hypolimnion. Adults display a diel behavior pattern of migration from the hypolimnion into the upper water column, frequently through the thermocline and into the epilimnion, during nighttime. Age-0 smelt exhibit an inverse diel migration from the epilimnion to the hypolimnion. Age-1 smelt are distributed at intermediate depths compared to adults and age-0 fish (Evans and Loftus 1987). This behavior allows them to occupy various niches throughout the lake while minimizing intraspecific interactions. Rainbow smelt are pelagic schooling omnivores, consuming both zooplankton and small fish. They have a reputation for being voracious predators, and at times large smelt may be almost totally piscivorous.

Impacts of smelt invasion

As a result of the spatial segregation throughout their life history, rainbow smelt interact with a wide range of predator and prey species. The introduction of rainbow smelt has not been detrimental to native fish communities in all cases, but many examples show significant negative effects (Hrabik et al. 1998). Predation and competition by rainbow smelt have negatively affected fish and zooplankton communities where rainbow smelt have successfully colonized. In some cases, the establishment of smelt has coincided with the disappearance of the largest zooplankton in the system, and its replacement by smaller species with a similar niche.

Hrabik et al. (1998) also found evidence of competition for food between introduced rainbow smelt and native yellow perch in a Sparkling Lake, Wisconsin. In addition, because of rainbow smelt predation on age-0 cisco, they replaced cisco as the dominant fish species in Crystal Lake, Wisconsin. The size of the prey consumed by smelt increases with their body size. In the Laurentian Great Lakes rainbow smelt compete with lake herring for food and prey upon young whitefish, thereby contributing at least in part, to the decline of these species (Evans and Loftus 1987).

Rainbow smelt are predators, but also serve as an important prey species for other fish. Increased growth rates in Atlantic salmon and lake trout have been reported following the introduction of smelt as a forage species. Walleye and northern pike also feed heavily on rainbow smelt. A recent study has documented that lake herring, is not only competing for food with rainbow smelt, but are also utilizing rainbow smelt as an important part of their diet (Hoff et al. 1997). Predation on smelt by so many

piscivores indicates that they can have a major influence in energy transfer in freshwater systems.

Since their introduction into the Laurentian Great Lakes in the early 1900's, the smelt fishery has established itself as an important year round fishery in the Great Lakes, both as a sports fish and as a commercial fishery. Commercially they are processed for animal feeds, and are imported and enjoyed by people in countries as far away as Japan.

Conclusion

Rainbow smelt occupy many niches, and in doing so play an important role in the restructuring of zooplankton and fish communities in the Laurentian Great Lakes. Many species are affected by the introduction of rainbow smelt, however, the degree to which they are affected varies between lakes. The ability of smelt to consume a wide range of prey, should make one cautious against the intentional introduction into a system as a management approach.

References

- Bigelow, H. B., and Schroeder W. C. 1953. Fishes of the Gulf of Maine. Fishery Bulletin of the Fish and Wildlife Service. 53: 135-139.
- Evans, D. O. and Loftus, D. H. 1987. Colonization of Inland Lakes in the Great Lakes Region by Rainbow Smelt, *Osmerus mordax*: Their Freshwater Niche and Effects on Indigenous Fishes. Can. J. Fish. Aquat. Sci. 44: 249-266.
- Hoff, M. H., Link J., and Haskell, C. 1997. Piscivory by Lake Superior lake herring (*Coregonus artedii*) on rainbow smelt (*Osmerus mordax*) in winter, 1993-1995. J. Great Lakes Res. 23: 210-212.
- Hrabik, T. R., Magnuson, J. J., and McLain, A. S. 1998. Predicting the effects of rainbow smelt on native fishes in small lakes: evidence from long-term research on two lakes. Can. J. Fish. Aquat. Sci. 55: 1364-1371.
- NCR website:
www.ncr.dfo.ca/communic/ss-marin/smelt/smelt.html
- USGS website:
nas.er.usgs.gov/fishes/accounts/osmerida/os_morda.html
- Wisconsin Sea Grant website:
www.seagrant.wisc.edu/Communications/Publications/Fish/rainbowsmelt.html

