AFS - New York Chapter Newsletter -- March 2001

Editor's Note

Spring is just around the corner and some important meetings and workshops are available to Chapter members. The Northeast Fish and Wildlife Conference will be held in Saratoga Springs, NY on April 22-25, 2001. An Otolith Workshop will be held in Syracuse on June 1-2, 2001. Plan to attend one or both of these events this spring. Remember to keep sending in any articles or information of interest to Chapter members.

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President's Corner

It doesn't look like spring yet (29" of snow this week at my house) but its signs are all around us. One sign is that nearly everyone, myself included, are busy preparing for the upcoming field season. My work on northern pike spawning gets us started early and the exact timing can be unpredictable. On a not so unrelated topic, our NYAFS Annual Meeting theme *"Large Scale Climate Variability Impacts Upon New York State Fisheries"*, for me, really drove home the reality of local impacts of global scale processes such as climate change. When I first heard of the potential meeting topic by Allen Peterson I was somewhat skeptical of how well it would play out at a local and regional scale in New York. Well my concerns were unjustified (other than the fact that current climate models are built by the Canadians and British because the US missed the deadline). I found the invited speakers did an excellent job at explaining what we do and do not know about climate change as well as its effects on biota at many scales. One thing I found enlightening was that the focus was not on the debate about the cause of global warming (CO2 emissions or entering a natural cycle), but dealt with the reality that temperatures are rising, and how is this going to affect our aquatic systems and fishes. I would like to thank all our excellent speakers, program chairs Allen Peterson and Dan Josephson, and the many volunteers who made the meeting a special one. I would also like to congratulate this year's award winners: Professional Achievement Award was given to Doug Carlson, Past-President to Don Stewart, Best Professional paper awarded to James Mckenna, Jr., Best Poster to Chris Mayer, and Best Student Paper to Steve Coglan. It was a pleasure to observe such high quality work and effort of all participants at the NYC Annual Meeting.

Moving on to future plans, we look forward to the upcoming NYC co-sponsored workshop being coordinated by Karin Limburg titled, *Analysis, Interpretation, and Applications of Fish Otoliths and Other Hard Parts: the State-of-the-Art*. Karin has assembled top scientists to instruct two full days of lectures and demonstrations at SUNY College of Environmental Science & Forestry on 1-2 June 2001. There is also a dinner trip out to the Cornell Biological Field Station as part of the workshop. I would encourage everyone to register ASAP for this exiting one-time event. Finally, I thank all the members for their support of the NYAFS! Have a safe and productive year.

Sincerely,

John M. Farrell
NYCAFS President

Chapter News

Annual Meeting Report - 2001

Greetings Everybody:

The 2001 annual meeting of the New York Chapter of the American Fisheries Society was held January 18-20 at the Owego Treadway Inn. The theme of the conference was "Large Scale Climate Variation Impacts to New York State Fisheries". Seventy registrants enjoyed some informative and hopefully eye-opening presentations and panel discussions on the topic by climate and fisheries professionals from around the Northeast. This was followed by the annual Chapter business meeting at which John Farrell was installed as President, taking over from Don Stewart. Dave Bryson was elected President-elect and will serve as President in 2002 (Thanks to all three gentlemen). The first day was capped by a fine steak and seafood banquet by the Treadway staff at which our Treasurer John Homa distinguished himself by eating everything on his plate. Four times.

The second day consisited of a full slate of contributed papers from both students and professionals. These presentations were judged and the following recognitions were made:

Best Professional Paper - James McKenna, USGS, "A Method to Predict Fish Assemblages From Environmental Variables".

Best Student Paper - Steven Coghlan and Neil Ringler, SUNY ESF, "Survival and Growth of Eyed Eggs and Fry of Atlantic Salmon Stocked in the Salmon River, New York: Implications for Restoration."

Best Poster - Nancy Tisch and Christine Mayer, Cornell University and Syracuse University, "*Echinogammarus ischnus*, the Next Exotic Threat?"

Congratulations to these professionals for their contributions. The Chapter will provide support for Best Paper authors to present their research at the Northeast Fish and Wildlife Conference in Saratoga Springs in April 2001.

The net cost of this conference to the Chapter was approximately $400. The Executive Committee is presently considering holding the 2002 annual Chapter meeting in January, 2002 in Canandaigua N.Y., with a theme of fisheries in large rivers. See you there!

Respectfully submitted,

Allen Peterson
Program Chairman

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Otolith Workshop

Dr. Karin Limburg from SUNY College of Environmental Science and Forestry has organized an excellent workshop entitled "Analysis, Interpretation, and Applications of Fish Otoliths and Other Hard Parts: the State-of-the-Art" to be held on June 1-2, 2001. This timely and informative workshop should be of great interest to anyone involved in understanding the age, growth, and life history of fishes. An impressive group of leading researchers will be presenting lectures and hands-on demonstrations. A complete description of the workshop is provided at the end of the newsletter.

Make plans to attend what promises to be an excellent workshop.

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Native People Fisheries Section

Dick McDonald Writes:

Jim Johnson of Tunsion Laboratory of Aquatic Science will be presenting a poster titled: "Survival and Growth of Atlantic Salmon Fry in Two Tributaries of the St. Lawrence River" at the next IAGLR meeting in conjunction with Jim Snyder and Shawn Martin of the St. Regis Mohawk Tribe (Environmental Division), and Betsy Trometer of the USFWS Lower Great Lakes Fishery Resources Office.

Dawn Dittman of Tunison Laboratory of Aquatic Science will be presenting a poster titled: "American Eel Assessment in the Lake Ontario/St. Lawrence River System" at the next IAGLR meeting in conjunction with Jim Snyder of the St. Regis Mohawk Tribe (Environmental Division) and Dave Arquette of the Akwesasne Task Force on the Environment, and Betsy Trometer of the USFWS Lower Great Lakes Fishery Resources Office.

Upcoming events

57th Northeast Fish and Wildlife Conference; April 22-25, 2001

Sheraton Saratoga Springs Hotel and Conference Center, Saratoga Springs, New York. Theme "Staying Connected"

Contact: Ed Woltmann; 518/457-9748; neinfo@gw.dec.state.ny.us

Visit this website for more information:

www.dec.state.ny.us/website/dfwmr/neconf/necmain.html

131st AFS Annual Meeting, August 19-23, 2001

Plaza Hotel and Convention Center, Pheonix, Arizona.

Contact: Betsy Fritz; 301/897-8616, ext. 212; bfritz@fisheries.org

Wanted

Nominations Sought:

The Professional Incentives Committee is soliciting nominations for the Chapter's "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

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6274 East Avon-Lima Road
Avon, New York 14414

Feature Article

By Brian Lantry, NY DEC Fisheries, Cape Vincent

The Current Status of Lake Trout Rehabilitation In Lake Ontario

The current era of lake trout restoration in Lake Ontario began in earnest in the early 1970's with stocking, but equally important - the beginning of sea lamprey control. The primary goals for the lake were to restore a self-sustaining population similar in abundance to the original population and to provide a useable annual surplus for a fishery. Early attempts to establish a reproductively mature population, however, were hampered by excessive mortality of immature fish. Subsequently, lamprey control was enhanced with treatments extending to Lakes Oneida (1984) and Erie (1986) and stocking emphasis was switched to better surviving Seneca strain lake trout. Results from mathematical projections for lake trout population growth indicated that even with these improvements there was a strong probability that the level of angler harvest occurring in the early 1980s would prevent the population from reaching the objective of 500,000 to 1,000,000 mature adults. In the fall of 1987, after considerable public outreach, the NYSDEC instituted a slot limit for lake trout which became effective during the 1988 fishing season. The goal of this regulation was to protect spawning aged adult fish by decreasing harvest mortality by at least 30%.

The recent high abundance of mature lake trout age-6 and older was reached in 1986 and maintained through 1998. While the high abundance of mature fish was reached by 1986, estimated egg production peaked later, about 1993. There were two general reasons why egg production lagged behind the abundance of mature fish. First the population present in the lake in 1986 needed time to age. Aging of the population is important because, in Lake Ontario, female lake trout do not generally spawn until they reach age-6 or 7. Additionally, the number of eggs produced increases with both size and age of the mature females. Second, beginning in 1984, a shift in the stocking mix of lake trout strains to include and eventually emphasize better surviving Seneca strain fish occurred and these fish needed time to mature. Detection of naturally spawned young fish from NYSDEC and US Geological Survey assessment catches began in 1993 coinciding with peak egg output. Also contributing to the production of those naturally spawned lake trout was a dramatic decline through the 1990's in the number of alewife. Alewife eat the small lake trout fry as they swim up and out from between the rocks where they began life as eggs and yolk-sac fry. Alewife also produce an enzyme that, when lake trout eat alewife, can cause depletion of a nutrient essential to the production of healthy eggs (thiamine or vitamin B1).

Naturally spawned lake trout have now been produced each year since 1993 and those fish have survived and been observed at older ages. The remaining members of the 1993 spawning most likely reached sexual maturity in the fall of 2000. If enough members of the annual groups of naturally spawned fish do survive through their own spawning, it is hoped and expected (from evidence in other lakes) that these fish will be more successful at producing offspring than hatchery fish. There are a number of reasons for this, many deriving from genetics, physiology and experience.

Genetics -- These naturally produced fish had successful parents that transferred their genetic information to them. If “Darwinian selection” or survival of the fittest is inheritable, as a tremendous amount of evidence indicates it is, then some of the traits that made the parents successful should appear in their offspring. Some of these traits include: ability to select good spawning habitat; spawning at the best time of the year; selection of the most fit mates; having diets that are diverse and include smaller proportions of alewives than other non-successful spawners; and enhanced predator avoidance.

Physiology -- In the scientific literature there is a growing body of evidence that natural fish perform better in many aspects of daily active life than hatchery fish. Some of these attributes include the ability to

endure sustained swimming for longer periods of time; faster recovery from exercise; and more efficient metabolism. There are many important advantages for reproduction from better physiology, notably the ability to defend spawning territories.

Experience -- Not all habitat in the lake is suitable for spawning. Also, within spawning habitats there are differences, such as gravel size and sediment quantity, that make some areas much better than others. Surviving young fish hatched from good habitat, have experience with the location of those "good" habitat areas and are expected to return to them as adults. This is a common trait in salmon and trout, exemplified in Pacific and Atlantic salmon migrations.

The current picture of Lake Ontario lake trout restoration, from the evidence gathered pertaining to the population over the last twenty years, is one of guarded optimism. The trends in the adult population and the consistent of production of eight naturally reproduced year-classes are reflective of a population that has benefitted from long term persistent and flexible management and the cooperation and patience of the anglers and public that have supported it. Restoration of a long-lived fish like lake trout, because they mature and spawn relatively late in life, requires a long term perspective. Results of management activities aimed at natural reproduction may not be fully observable for seven or more years and are often complicated by changes within the lake that can not be controlled and often can not be predicted. Also, complicating restoration in Lake Ontario, were exotic predator (sea lamprey) and prey species (alewife) which bring often unexpected problems, for example inhibition of thiamine uptake caused from eating alewives. An especially encouraging barometer for Lake Ontario came at a recent meeting of lake trout investigators from across the Great Lakes (Annual Lake Restoration Coordination Workshop in Ann Arbor, MI, Nov. 2000). At that meeting, biologists that were involved with restoration of the Lake Superior lake trout population indicated that just before natural reproduction really took off there, they were observing young naturally spawned fish at rates similar to those currently coming from Lake Ontario. The Lake Superior experience may then indicate that the consistent production of naturally spawned lake trout over the last eight years in Lake Ontario, which this past fall began to reach sexual maturity, could be setting the stage for a snowballing effect on natural reproduction.

Lake trout restoration has been and continues to be a viable goal throughout the Great Lakes. Naturally reproducing lake trout have been restored to Lake Superior and large adult stocks of hatchery origin fish occur in all of the other lakes. Rehabilitation efforts and investigations are ongoing throughout the basin. Lake Michigan management personnel have undertaken several years of experimental egg and fry stocking on known spawning shoals and placed a moratorium on fishing in a shoal complex in the northern end of the lake known as the Northern Refuge. Currently, there is a multi-agency effort underway there to examine adult recruitment from those experimental stockings and search for signs of natural reproduction. There is also good news for the lake trout restoration in the main body of Lake Huron. The lake trout population there had long suffered excessive lamprey predation from a population spawned in the St. Marys River. Control of the St. Marys River lamprey population had been impossible because of the size of the river and sheer volume of water moving through it. New control techniques employed in 1999 by the Great Lakes Fishery Commission, however, have had very encouraging results and promise to substantially enhance restoration efforts for Lake Huron. Also on the Canadian side of Lake Huron, two small stocks of native lake trout continue to persist. These stocks survived through the time period when most populations basin wide were extirpated. Restrictive fishing regulations for these stocks are currently allowing continued natural reproduction and overall increases in their abundance. Like the upper lakes, Lake Ontario lake trout restoration continues to be viable and now may be poised to produce fruit of the long rehabilitation process. While current management protocols are by no means sacred, in light of the considerable time and energy spent bringing this population to its' current status, great caution and informed decision making are certainly warranted.

Benchmarks of Lake Trout Restoration in Lake Ontario

1971	Sea lamprey treatment - Canada
1972	Sea lamprey treatment - US
1973	Stocking Begins
1978	Stocking Increases
1984	Begin stocking Seneca strain lake trout Enhanced Sea Lamprey treatment - Oneida Lake drainage
1986	Enhanced Sea Lamprey treatment - Lake Erie drainage Adult lake trout population peaks
1988	Slot limit regulation
1993	Egg production from mature female lake trout peaks Stocking cuts instituted
1994	Naturally reproduced lake trout from the 1993 and 1994 spawnings appear in survey catches
1995 - present	Continued catches of naturally spawned lake trout appear annually and older individuals from previous year-classes show up in assessment catches
2000	The lake trout from the 1993 naturally spawned group reach maturity
2001	The lake trout from the largest group of naturally spawned fish (1994) reach maturity
2001 - future	Search for second generation naturally reproduced lake trout

**** WORKSHOP ****

"ANALYSIS, INTERPRETATION, AND APPLICATIONS OF FISH OTOLITHS AND OTHER HARD PARTS: THE STATE-OF-THE-ART"

1-2 June 2001

Coordinator: Karin Limburg, SUNY College of Environmental Science & Forestry, Syracuse, NY 13210 (KLimburg@esf.edu)

Purpose: Vital statistics such as age, growth rate, and many life history events are now routinely gathered with information stored in the otoliths, scales, and bones of fishes. Although methods of age and growth determination have become a standard part of the fisheries professional's toolbox, data analysis and validation remain problematic. Environmental information, which can be extracted from microchemical studies of many of these structures, offers a new means of validation and also opens up exciting avenues of inquiry. New, high-resolution techniques, in combination with traditional methods, have revolutionized fisheries research. Elements and isotopes in otoliths can now be measured at fine enough spatial scales on otoliths so as to correspond to the time scales of interest (daily, seasonal, and annual) that can be determined with otoliths and other hard parts of fishes. Hypotheses about behavior, energetics, and food web relationships can now be tested. By running a transect through an otolith and measuring isotopes or elements (Fig. 1), we can learn about migration (by the ratio of strontium to calcium), thermal histories (from oxygen stable isotopes), and we can discriminate between stocks or sub-populations of fish species (via multiple elemental analysis). Dietary information can be inferred from carbon isotopic ratios in otoliths, and other ecologically useful stable isotopes (e.g. nitrogen), while not within the realm of analysis at the present time, are on the horizon.

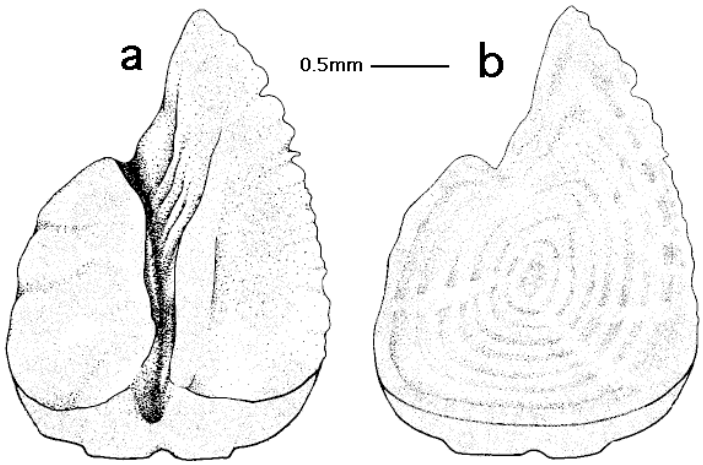

Fig. 1. Schematic of a sagittal otolith from a typical fish. The figure at left depicts the intact otolith, and a cross-section, showing the concentric growth increments, is shown on the right. By analyzing a transect from the core (innermost portion) out to an outer edge, valuable information on age, growth, and environment can be measured.

The NY-AFS is holding a workshop to train students and professionals in this exciting, rapidly developing branch of fisheries science. We are currently seeking official Continuing Education credit from the national AFS organization. This in and of itself will increase the appeal of the workshop to working professionals.

The format will be two full days of lectures and demonstrations, to be held at SUNY College of Environmental Science & Forestry, which has excellent facilities for such demonstrations. There will be a contributed poster session held at the end of the first day. Integrated into the workshop on the second day will be a trip to the Cornell Biological Field Station (ca. 25 minute drive), where there will be a tour of the facilities, more demonstrations, and dinner.

A special feature of this course will be the workshop's lecture roster, consisting of speakers who are leaders in the field. A permanent record of the lectures will be made, either as a set of lecture notes or (potentially) a methods book. The agenda will include both reviews of the literature, the current state of the art, and practical hands-on information.

The proposed set of workshop lectures includes (subject to revision):

Day 1:

1. Introduction & History – Limburg, SUNY-ESF

2. Structural analysis of otoliths (includes preparation, image analysis) –
   A. Microstructure - Ed Brothers, EBB Consultants
   B. Macrostructure – Steve Campana, Bedford Institute, & John Casselman, Lake Ontario Fisheries Station

3. Structural analysis of other hard parts – John Casselman

4. Otolith marking methods – John Farrell, SUNY-ESF, Ed Brothers

5. Otolith weight analysis – Mark Wuenschell, SUNY-ESF

6. Elemental analysis of otoliths – Simon Thorrold, Old Dominion University, David Secor, Univ. of Maryland, and K. Limburg

(Demonstrations/discussions/poster session in late afternoon)

Day 2:

7. Stable isotope analyses – William Patterson, Syracuse University

8. Radioisotopes, and combining microchemistry with other analyses – Steve Campana

9. Statistical analyses of structural and chemical data (e.g., for stock assessment) – Cynthia Jones, Old Dominion University

10. Ecological applications: K. Limburg, David Secor, and Don Stewart, SUNY-ESF

11. Futures in otolith research: a report by participants in an ESF graduate student seminar

Afternoon: departure for Cornell Biological Field Station
Tour of facilities
Dinner

End of Workshop

Expected significance: Otolith research is a rapidly advancing field, and the opportunity to bring in world-class leaders to share their knowledge with students, educators, and researchers interested in fisheries and fish ecology will provide a rare opportunity for much cross-fertilization between the attendees and these experts. We anticipate that, in addition to providing this introduction to the state-of-the-art, participants will come up with their own novel ideas and applications to fisheries problems of the Great Lakes, Hudson River, Long Island Sound, and far beyond. We intend to advertise the workshop broadly, to draw in participants from a wide range of interests and geographic locations.

For further information, contact Karin Limburg (KLimburg@esf.edu)