



# ***Muskellunge Science and Management: Progress Through Partnerships***



**International Muskellunge  
Symposium August 14-15, 2014  
Ottawa, Canada**

# **Muskellunge Science and Management: Progress Through Partnerships**

**August 14-15, 2014  
Carleton University  
Ottawa, Ontario**

## **Organizing Committee**

Peter Levick, MCI (Chair)  
James Akers, MCI  
Steven J. Kerr, MNR (retired)  
Dr. Steven Cooke, Carleton University  
Dr. Jon Midwood, Carleton University

## **Moderator**

Steven J. Kerr

## Foreward

Welcome to the ***Muskellunge Science and Management: Progress Through Partnerships*** symposium! Whether known as a waterwolf or a noble beast, the muskellunge (*Esox masquinongy*) has captured the enthusiasm of many and enjoys an almost mythical reputation.

Over the years there have been several gatherings to share new science and management experiences with muskellunge. These have included a symposium on coolwater fishes held in St. Paul, Minnesota in 1978 (Kendall 1978), the International Muskellunge Symposium held in LaCrosse, Wisconsin in 1984 (AFS 1986), the “Managing Muskies in the 90s” workshop held in Kemptville, Ontario in 1995 (Kerr and Olver 1995), and, more recently, the E. J. Crossman muskellunge symposium held in Indianapolis, Indiana in 2005 (Diana and Margenau 2007).

This symposium has been organized with the goal of assembling anglers, researchers and managers to share new information and management approaches which have been developed over the past decade. Recognizing the long term cooperative approach to muskellunge management, the theme of this event is “progress through partnerships”.

We encourage your participation at this event. We have organized the verbal presentations under the general categories of biology, management and partnerships. There will be time for questions at the end of each presentation. We have also included three open panel discussions for you to voice your opinions on issues of the day. Finally, there will be ample opportunity for informal discussions at breaks and the evening social.

Steven J. Kerr  
August, 2014

### Literature Cited

- American Fisheries Society (AFS). 1986. Managing Muskies: A Treatise on the Biology and Propagation on Muskellunge in North America. Special Publication 15. American Fisheries Society. Bethesda, Maryland. 372 p.
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- Kerr, S. J. and C. H. Olver [eds.]. 1995. Managing Muskies in the 90s. Workshop Proceedings WP-007. Southern Region Science & Technology Transfer Unit. Ontario Ministry of Natural Resources, Kemptville, Ontario. 169 p.

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# **“Muskellunge Science and Management: Progress Through Partnerships”**

## **- Agenda -**

### August 14

8:00 - 8:45 – Registration

8:45 - 9:00 – Welcome and Opening Remarks (Steven Kerr)

9:00 – 9:20 – *An Introduction to Muskies Canada Inc.* (Chris Purdy)

9:20 – 9:40 - *An Introduction to Muskies Inc.* (Jay Zahn)

9:40 – 10:00 – *Partnerships Between MNR and MCI: An Historic Overview*  
(Steven Kerr and Ian Young)

10:00 – 10:30 – **Coffee Break**

10:30 – 11:00 – *Survival of St. Lawrence River Muskellunge Revisited: Can Today’s Nursery Habitat Support Adequate Recruitment to Fuel Population Recovery?* (John Farrell)

11:00 – 11:20 – *Distribution and Population Characteristics of Muskellunge in Georgian Bay and the North Channel of Lake Huron* (Arunas Liskauskas)

11:20 – 11:45 – *Unique Georgian Bay Muskellunge Nursery Habitat Features Allows for Successful Habitat Determination: Steps Towards a Spatially Explicit Muskellunge Nursery Habitat*  
(Jean-Paul Leblanc)

11:45 – 1:00 – **Lunch Break**

1:00 – 1:30 – *Perceived Threats to Ontario’s Muskellunge Fishery in the Future*  
(Panel Discussion chaired by Jon Midwood)

1:30 – 1:55 – *What Genetics Have Told Us About Muskellunge in Ontario* (Chris Wilson)

1:55 – 2:25 – *Using Genetic Information for Muskellunge Management in Minnesota*  
(Loren Miller)

2:25 – 2:45 – **Coffee Break**

2:45 – 3:15 – *My My, How Far We've Come: An Examination of the Impacts of Catch-and-Release Angling for Muskies* (Sean Landsman)

3:15 – 3:45 – *Ethics of Catch-and-Release Angling Practices*  
(Panel Discussion chaired by Steve Cooke)

3:45 – 5:15 – Poster Session and Social

6:00 - ?? – Ontario Chapter AFS Social - *Presentation on The New Fisheries Act.*

### August 15

8:30 – 9:00 – *Ontario's Approach to Muskellunge Management* (Dan Taillon)

9:00 – 9:30 - *Ontario's Muskellunge Regulations and Enforcement Issues* (Mark Robbins)

9:30 – 10:00– *Muskellunge Management in Wisconsin: Twenty Years of Progress*  
(Tim Simonson)

10:00 – 10:30 – **Coffee Break**

10:30 – 11:00 – *Future Directions for Muskellunge Conservation and Restoration*  
(Derek Crane and John Farrell)

11:00 – 11:45 – *Sustainability of Muskellunge Populations* (John Casselman)

11:45 – 1:00 – **Lunch Break**

1:00 – 1:20 – *An Overview of the Lake Simcoe Muskellunge Restoration Project*  
(Gabrielle Liddle)

1:20 – 1:40 – *The Jock River Muskellunge Embayment Project* (Jennifer Lamoureux)

1:40 – 2:00 – *The Ottawa Riverkeeper Riverwatch Program: Citizen Science and Volunteer Engagement* (Alexandra Brett)

2:00 – 2:45 – *Muskellunge Habitat Rehabilitation: Multi Perspective Case Study in Stakeholder Involvement in the Success of the Brewer Park Project*  
(Panel Discussion chaired by Peter Levic)

2:45 – 3:00 – *Closing Remarks* (Steven Kerr)

3:00 – 4:00 – Site Visit to Brewer Park (Peter Levick and Hedrik Wachelka)

4:00 – 5:00 – Electrofishing Demonstration Project on Rideau River (adjacent to Brewer Park)  
(Steven Cooke and Jon Midwood)

August 16

7:00 - ? - Guided muskellunge fishing trip on the Ottawa River (for those interested).

# Presentations

(listed in order of appearance)

## **An Introduction to Muskies Canada Inc.**

**Chris Purdy**, Muskies Canada Inc., P. O. Box 814, Station C, Kitchener, Ontario. N2G 4C5

**Abstract** - In 1978, a small group of anglers got together to address their concerns that muskellunge (*Esox masquinongy*) were becoming a forgotten part of the angling community and that the species was being overfished through the then prevalent attitude of catch and kill. Our founder, Bruce Park, got together with John Power (Toronto Star Outdoor writer) and Burt Meyers (Ontario Out of Doors writer) to create Muskies Canada Incorporated (MCI). Over the ensuing 36 years, MCI has sought to preserve, protect and enhance the muskellunge fishery, through research and education, as well as improved regulations to protect the species and ongoing work to create a now more prevalent culture of catch and release angling.

Partnerships have been the hallmark of all of our projects - primarily with the Ontario Ministry of Natural Resources (OMNR), but increasingly with a number of public and private organizations that have enabled the club to "punch above our weight." Though small in number, our members have achieved some remarkable results through projects such as the Lake Simcoe Muskellunge Restoration Project, Project Noble Beast, and our thirty year effort to gather angling data for the OMNR through the Angler Log Program.

Most, if not all, of the original goals of the organization have been achieved through regulatory changes that have seen dramatic improvements in the health of our naturally reproducing muskellunge fishery, but new challenges have evolved to spur our efforts to help look after the fishery - VHS, invasive species, habitat degradation - these and other changes continue to challenge our members to pursue our ongoing goals of research and education as we seek to preserve the opportunity to angle these "noble beasts" for the years to come.

Notes



## **An Introduction to Muskies Inc.**

**Jay Zahn**, Muskies Inc. 904 North Buchanan Street Green Bay, Wisconsin. 54303

**Abstract** - Muskies Inc. (MI) is the largest fishing and conservation non-profit organization in the world dedicated to the conservation of muskellunge (*Esox masquinongy*) and the enjoyment of musky fishing. It was formed in 1966 by Gil Hamm. Muskies Inc. works to conserve, protect and restore muskellunge fisheries in North America. Currently there are approximately 6,000 members in Muskies Inc. and 50 independent local chapters. MI funds research projects designed to improve muskellunge fisheries. The organization is committed to collecting information, maintaining records and disseminating muskellunge information. For example, our Lunge Log database has details on more than 340,000 muskellunge which have been angled and released over the years.

This presentation will outline how we differ in structure from other organizations, highlight our chapter accomplishments, showing how they work with their local DNR's and finish by showing how I feel Muskies Inc. is set up for the future and how Muskies Inc. and Muskies Canada need to work together to keep our sport moving forward.

Notes

## **Partnerships Between MNR and MCI: An Historical Overview**

**Steven J. Kerr**, Ontario Ministry of Natural Resources (retired), 264 Clonakilty Line, Ennismore,  
Ontario. K0L 1T0

and

**Ian Young**, Muskies Canada Inc., 24 Denver Crescent, Toronto, Ontario. M2J 1G6

**Abstract** - Muskies Canada Inc. (MCI) and the Ontario Ministry of Natural Resources (MNR) have enjoyed a long- standing cooperative relationship. Cooperative efforts have involved several areas including public education, research and data collection, restoration of muskellunge stocks and their habitat and the development of policy and regulations.

Public education efforts have included the preparation and distribution of several publications including effective techniques for catch-and-release angling and knowing the difference between northern pike (*Esox lucius*) and muskellunge (*Esox masquinongy*).

Members of MCI have been actively involved with MNR in policy development including the development of provincial standards for muskellunge size limit regulations and guidelines for competitive fishing events involving muskellunge.

Volunteer angler diary information collected and provided by members of both MCI and MI has served to provide a valuable long term data set which has been used to monitor the status of local fisheries and evaluate the effectiveness of muskellunge regulations.

By working cooperatively, it has been possible to realize successes that would have been difficult otherwise. We hope cooperative initiatives will continue in the future.

Notes

# **Survival of St. Lawrence River Muskellunge Revisited: Can Today's Nursery Habitat Support Adequate Recruitment to Fuel Population Recovery?**

**John Farrell**, College of Environmental Science and Forestry, State University of New York  
250 Illick Hall, 1 Forestry Drive. Syracuse, New York. 13210

**Abstract** - Management improvements led to a significant St. Lawrence River muskellunge (*Esox masquinongy*) population rebound peaking after the new millennium, but since that time invasive VHSV disease outbreak and potential nursery habitat factors have unfortunately reversed this trend. Long-term research sheds light on how differing regions have responded to the related widespread adult muskellunge mortalities observed from 2005-2008. Disease outbreaks, invasive species, prey community shifts, and habitat change are recently identified stresses that potentially affect muskellunge recruitment. Survival studies in the early 1990s conducted with experimental larval muskellunge releases in comparison to wild fish provide a useful baseline for population demographics in nursery habitats in the region. This approach is now being replicated to compare contemporary and historical population demographics to examine young-of-year (YOY) survival and effects of environmental change. VHSV status and changes in the virus itself are also being examined in addition to questions related to the YOY muskellunge habitat suitability. The future of natural recruitment in a changing environment will be explored and discussed using research results from a variety of past and ongoing studies as well as updates from long-term population and habitat monitoring.

## Notes

## **Distribution and Population Characteristics of Muskellunge in Georgian Bay and the North Channel, Lake Huron**

**Arunas Liskauskas**, Upper Great Lakes Management Unit, Ontario Ministry of Natural Resources and Forestry, 1450 7<sup>th</sup> Avenue East, Owen Sound, Ontario. N4K 2Z1

**Abstract** - The nearshore waters of eastern Georgian Bay and the North Channel of Lake Huron support the largest contiguous distribution of muskellunge (*Esox maquinongy*) populations in the Great Lakes. Prior to 1996 very little was known about the population characteristics of this species yet the area was perceived by ardent anglers as supporting a 'World Class' fishery. Since 1996, over 20 targeted muskellunge spawning surveys at eight different locations have been conducted in the area using live-capture trap-nets. Incidentally captured spawning muskellunge from additional spring live capture surveys have also contributed to the over 1,000 individuals that have been biologically sampled and affixed with external identification tags. Subsequent recaptures of more than 300 tagged fish have provided insights into fish movements and encounter rates in the recreational fishery. These muskellunge focused assessments have also resulted in collaborations with numerous government agencies and academic institutions which have all contributed to a greater understanding of muskellunge in this unique area of the Great Lakes.

### Notes

# **Unique Georgian Bay Muskellunge Nursery Habitat Features Allows for Successful Habitat Differentiation: Steps Towards a Spatially Explicit Muskellunge Nursery Habitat Suitability Index Model**

Jean-Paul LeBlanc, Department of Biology, McMaster University, 1280 Main Street West, Hamilton, Ontario. L8S 4L8

**Abstract** - In Ontario, muskellunge (*Esox masquinongy*) management strategies are predicated on self-sustaining populations to ensure high quality trophy fisheries. These strategies provide safeguards for breeding adults and their spawning habitats. In Georgian Bay, Lake Huron, suitable spawning habitat appears pervasive given the Bay's oligotrophic status. However, after more than a decade of sustained low water levels and increases in shoreline modification, coastal wetland nursery habitat structure has been altered, for which muskellunge young-of-the-year (YOY) are sensitive. Thus, despite the presence of suitable spawning habitat, muskellunge populations may fail if suitable nursery habitat is limited or absent. This hypothesis was supported in southeastern Georgian Bay, where suitable muskellunge spawning habitat failed to support YOY from a lack of suitable nursery habitat structure and altered fish community.

Unfortunately, very little information exists that can help managers identify suitable nursery habitat in Georgian Bay, which may be more limiting to recruitment than spawning habitat. To address this knowledge gap, a region in northern Georgian Bay was sampled for YOY muskellunge during 2012-13 to describe and quantify habitat parameters related to muskellunge nursery habitat in the absence of shoreline modification. Multivariate statistical techniques successfully differentiated muskellunge nursery sites from available habitat. Results suggested that suitable muskellunge nursery habitat in Georgian Bay encompassed a relatively narrow range of habitat parameters characterized by: steeper substrate slopes, greater densities and diversity of upper water column structuring submerged aquatic vegetation (SAV) and relatively low densities of low growing SAV. Muskellunge nursery habitat characteristics also promote a more diverse fish community and limited abundances of yellow perch (*Perca flavescens*) than sites absent of YOY muskellunge. These results are forming the basis of a spatially explicit muskellunge nursery Habitat Suitability Index (HSI) model for Georgian Bay. This HSI can be used in conjunction with current management strategies to provide a more holistic, complementary, approach to managing muskellunge populations by accounting for the life stage habitats limiting to recruitment.

## Notes

## **What Genetics Have Told Us About Muskellunge in Ontario**

**Chris Wilson**, Aquatic Research Section, Ontario Ministry of Natural Resources and Forestry,  
Trent University, Peterborough, Ontario. K9J 7B8

**Abstract** - Genetic information has provided valuable insights into the history, biology and behaviour of muskellunge (*Esox masquinongy*) populations, and is being used to inform practical management questions in Ontario and across the species range. All muskellunge alive today seem to be descended from a single Ice Age (Wisconsinan) ancestral source, although contemporary populations can exhibit substantial genetic differences at regional and local scales. Analysis of stock structure and gene flow in Ontario waters has shown that muskellunge populations in Georgian Bay are limited to local habitats, with very little straying and/or strong site fidelity. Populations in connected inland waters (Ottawa and Rideau Rivers and the Kawartha Lakes) show contrasting patterns of spatial structure: muskellunge in the upper and lower Ottawa River are recognizably distinct from each other and from those in the Rideau River, whereas muskellunge in the Kawartha Lakes show very little structure or spatial pattern. Given the elusive nature of muskellunge, obtaining samples for these analyses would not have been possible without substantial participation and cooperation from muskellunge anglers and clubs. The resultant genetic information is helping to inform management of muskellunge populations in Ontario by identifying and mapping stock structure and habitat use, as well as for assessing ongoing rehabilitation efforts in Lake Huron and Lake Simcoe.

### Notes

## **Using Genetic Information for Muskellunge Management in Minnesota**

**Loren Miller**, Department of Fisheries, Wildlife and Conservation Biology, Minnesota  
Department of Natural Resources, 135 Skok Hall, University of Minnesota,  
2003 Upper Buford Circle, St. Paul, Minnesota. 55108

**Abstract** - The Minnesota Department of Natural Resources has increasingly used genetic information to help manage one of the premier muskellunge (*Esox masquinongy*) fisheries in the U.S. The initial impetus to consider genetics was the poor growth of a strain being stocked statewide. A common-garden experiment demonstrated a likely genetic component to this poor growth and a new broodstock was developed. Genetic markers were able to track persisting ancestry from the poor-growing strain and demonstrate that its descendents were not attaining large sizes. In one lake, tagging and genetics were combined to target descendents for removal to determine if size structure could be improved. The study also showed that native genetics persist in several lakes despite years of stocking. Another study examined the current muskellunge stocking program. Reductions in genetic diversity compared with the source population indicated likely fragmentation and bottleneck effects in brood and stocked lakes. Genetic markers are also being used as part of mark-recapture estimates of population size. The ability to extract DNA from scales allowed anglers to participate in non-lethal collection of recapture samples. Population estimates and precision were similar for electrofishing and angler recaptures. Genetic tools and principles have provided benefits for muskellunge management.

### Notes

## **My My, How Far We've Come: An Examination of the Impacts of Catch-and-Release Angling for Muskies**

**Sean Landsman**, University of Prince Edward Island, 550 University Avenue,  
Charlottetown, Prince Edward Island. C1A 4P3

**Abstract** - Muskellunge (*Esox masquinongy*) angling has undergone enormous change since the mid-1900s when catch-and-kill reigned supreme. When the angling organizations of Muskies Canada, Inc. and Muskies, Inc. were founded in the late-1960s/early '70s, a paradigm shift occurred and the implementation of catch-and-release practices became increasingly prevalent. Changes to angling equipment, landing devices, angler knowledge (e.g., the impacts of air exposure and water temperature) and attitudes led to the development of today's handling methods. In 2009, a research project began to test the impact of current practices and compared them against a gentler alternative procedure. Over two years, 77 muskellunge up to 132 cm were angled and blood sampled to examine the physiological changes associated with the two angling treatments. A sub-sample of 30 fish were radio-tagged to determine the short-term behavioural impacts of the catch-and-release process and to determine survival rates. Little physiological change or short-term behavioural impacts were noted between treatments. All radio-tagged fish survived. The results indicate that today's handling practices greatly reduce the impacts associated with catch-and-release angling on muskellunge. Furthermore, our research illustrates how angling groups can effectively co-manage resources by ensuring as many fish stay within a population as possible and to ultimately improve the fisheries they use.

### Notes



## **Ontario's Approach to Muskellunge Management**

**Dan Taillon**, Fisheries Policy Section, Ontario Ministry of Natural Resources and Forestry, 300 Water Street, Peterborough, Ontario. K9J 8M5

**Abstract** – Muskellunge (*Esox masquinongy*) are present in more than 400 lakes and rivers in Ontario, representing an estimated 30% of naturally-reproducing muskellunge populations in North America. As such, the Ontario Ministry of Natural Resources and Forestry (OMNRF) play a key role in the conservation and management of this species. The current angling regulations for muskellunge are grounded in the research associated with the Cleithrum Project. The use of five standards for minimum size limits is based on growth potential of the populations, in concert with considerable changes to voluntary catch-and-release practices, have resulted in muskellunge populations that are thriving and providing world-class fisheries. This presentation will provide an overview of Ontario's muskellunge management with some discussion of current and future management challenges.

### Notes

## **Ontario Muskellunge Regulations and Enforcement Issues**

**Mark Robbins**, Enforcement Branch, Ontario Ministry of Natural Resources and Forestry, 300 Water Street, Peterborough, Ontario. K9J 8M5

**Abstract** - In most respects muskellunge (*Esox masquinongy*) fishing regulations in Ontario are very similar to those for other fish species, and yet the techniques of muskellunge angling and the objectives of the angler are often quite different from other targeted sport fish. This presentation will address some of the common questions and concerns raised by muskellunge anglers such as the restrictions on the use of live fish as bait, muskellunge limits for Conservation Fishing Licence holders, and the requirement to immediately release fish in excess of “catch and retain” limits and fish of prohibited size.

The presentation will also address a priority issue for OMNRF enforcement. In recent years conservation officers have found significant numbers of non-baitfish species such as yellow perch, sunfish, crayfish and bullheads in Ontario retail bait shops as well as exotic species such as goby, loach and aquarium species in angler bait buckets. The presence of non-baitfish species, in combination with the widespread and unlawful practice of “bait bucket dumping”, represents a significant threat to Ontario’s aquatic biodiversity. The OMNRF enforcement program is taking active steps to influence a change in angler behaviour and in commercial bait industry practices.

Notes

## **Muskellunge Management in Wisconsin: 20 years of Progress**

**Tim Simonson**, Bureau of Fisheries Management, Wisconsin Department of Natural Resources, P.O. Box 7921, Madison, Wisconsin. 53707

**Abstract** – The muskellunge (*Esox masquinongy*) sustains an important recreational and tribal fishery in Wisconsin, with over 700 waters containing the species. Musky waters are classified according to their population and fishery characteristics as either “trophy” (18%), “action” (28%), “intermediate” (34%), or “minor” (20%) fisheries. Growth potential of muskellunge in Wisconsin varies by water, but is generally comparable to Ontario populations. In the early 1990’s, the fishery exhibited signs of growth-overfishing. While most musky anglers desired large (45-50”+) fish, the average length of harvested muskellunge was 38”. Efforts were initiated to: 1) better meet our information needs for management, 2) take better advantage of the biological potential of the species, and 3) better meet angler expectations for the fishery. Since that time, we’ve made advances in the identification and protection of naturally reproducing populations; developed more water-specific management actions aimed at maximizing the potential of individual fisheries; greatly expanded our sampling efforts on musky waters; and more fully engaged our partners. As a result, we have a much clearer picture of our muskellunge fisheries today. We still have work to do, but, by all accounts, our fisheries are closer to meeting their biological potential and are better meeting angler expectations, due in large part to the cooperation and active involvement of avid musky anglers.

### Notes

## **Future Directions for Muskellunge Conservation and Restoration**

**Derek P. Crane**, Lake Superior State University, 7808 119<sup>th</sup> Lane North. Champlin,  
Minnesota. 55316

and

**John M. Farrell**, College of Environmental Science and Forestry, State University of New York  
250 Illick Hall, 1 Forestry Drive. Syracuse, New York. 13210

**Abstract** - Conservation and restoration of native muskellunge (*Esox masquinongy*) populations should be the top priority of muskellunge focused researchers, managers, and angler groups. Although the distribution of muskellunge has been expanded and maintained through stocking many native populations have been extirpated or exist at depleted levels. Overharvest and habitat degradation are two historical sources of muskellunge population losses. Muskellunge angler groups, working with researchers and resource managers, have been successful at addressing overharvest thorough conservation minded initiatives such as catch-and-release angling and increased size limits. Angler diaries and creel surveys indicate that current release rates are often  $\geq 99\%$ , and most states and provinces have adopted length limits that protect the majority of mature muskellunge within a given population. Although continued overexploitation of muskellunge has been halted the legacies of past overharvest and habitat degradation remain. Targeted muskellunge conservation and restoration will be essential for maintaining self-sustaining populations and restoring extirpated or depleted populations. In order to maximize the use of resources scientifically based habitat and population conservation and restoration priorities should be developed across the muskellunge's native range. Successful conservation and restoration projects will integrate knowledge across multiple disciplines, such as genetics when reintroductions are necessary and limnology, hydrology, and aquatic botany when restoring habitat. Given the past successes of angler groups at addressing issues related to exploitation of muskellunge they could be a powerful resource for pushing new conservation and restoration initiatives that focus on current threats to the sustainability of native muskellunge populations.

Notes

## **Sustainability of Muskellunge Populations**

**John Casselman**, Department of Biology, Queens University, 2406 Biosciences Complex, 116 Barrie Street, Kingston, Ontario. K7L 3J9

**Jonah L. Withers**, Department of Forestry and Natural Resources, Purdue University, West Lafayette, Indiana. 47907

and

**Thomas J. Howson**, Trent University, Peterborough, Ontario K9J 7B8

**Abstract** - Sustainability of trophy muskellunge (*Esox masquinongy*) populations and fisheries was examined by using long-term catch data from Muskies Inc. and Muskies Canada, along with 35 years of muskellunge data and cleithra (2,430) submitted to The Cleithrum Project. Muskellunge catch has increased substantially, but harvest has been greatly reduced because of increased size limits, in Ontario set on a biological basis using growth potential and voluntary catch-and-release promoted by organized muskellunge anglers. Science transfer has been fundamental in encouraging interaction between anglers and fisheries professionals, promoting communications, awareness, and improved management, assessment, and research. The Cleithrum Project exemplifies this interaction, and although fewer samples have been submitted in recent years, they indicate a significant increase in total length and weight of trophy samples; this pivotal change occurred in the mid-1990s (mean size—1979–1994, TL=105.9 cm, TW=9.01 kg; 1995–2013, 119.0 cm, 11.74 kg). Cleithrum Project age data were used to estimate total annual mortality rate of muskellunge, using observed annual maximum age for the 35-year period. Total annual mortality rate ranged from 15 to 24%, corresponding to predicted maximum age of 26 to 16 years. Up to the mid-1990s, mortality rate increased, but since then, there has been a substantial decrease. Although angling pressure has increased in recent years, size and longevity of angled trophy muskellunge have increased substantially, suggesting increasing population reproductive capacity. Considering mortality rate and exploitation, to ensure that trophy muskellunge and fisheries are sustainable, fish younger than 15 should not be harvested ( $A=25\%$ , where  $F=M$ ). Management for large size can have ephemeral results because large, older fish are increasingly sensitive to all forms of stress (e.g., VHS mortalities). However, if muskellunge populations are managed for high reproductive capacity (protecting fish to an old age and large size), they will be more reproductively resilient, producing larger year classes and better sustaining trophy populations and fisheries.

### Notes

## **An Overview of the Lake Simcoe Muskellunge Restoration Project**

**Gabrielle Liddle**, Ontario Ministry of Natural Resources and Forestry, 50 Bloomington Road,  
Aurora, Ontario. L4G 0L8

**Abstract** - The muskellunge (*Esox masquinongy*) is native to Lake Simcoe, Ontario, and supported a commercial fishery and sport fishery in the late 1800's and early 1900's, respectively. After significant overharvest, habitat loss and ecological change, the Lake Simcoe population of muskellunge was significantly reduced by the 1930's. The sport fishery in both Lake Simcoe and Lake Couchiching was closed in 2005. Feasibility and habitat inventory studies determined that restoration of the Lake Simcoe muskellunge population is a realistic management objective. The goal of the Lake Simcoe Muskellunge Restoration Project is to restore a self-sustaining muskellunge population to Lake Simcoe through a long-term restoration project including habitat enhancement and stocking efforts. Proposed 2014 works are nearshore, targeting critical spawning/nursery areas and will benefit the nearshore fish communities, with additional benefits to water quality. Many challenges are identified, including choosing enhancement sites, future habitat protection, logistical concerns considering Lake Simcoe is a large inland lake, biological risk, and defining program success. However, these challenges can be addressed with support from the strong partnerships and significant funding commitments that have guided this long-term restoration project to date.

Notes

## **The Jock River Muskellunge Embayment Project**

**Jennifer Lamoureux**, Rideau Valley Conservation Authority, 3889 Rideau Valley Drive,  
Manotick, Ontario. K4M 1A5

**Abstract** - The Rideau Valley Conservation Authority (RVCA) in partnership with Fisheries and Oceans, Shell Fuelling Change Program, Muskies Canada - Ottawa Chapter, National Defence Fish and Game Club, Community Foundation of Ottawa, Fendock and the Ottawa Flyfishers Society are constructing a fish habitat embayment at the Richmond Conservation Area in October 2014. The project involves converting an existing grassed park area in the Richmond Conservation Area in the Village of Richmond to a small wetland embayment along the shoreline of the Jock River. The purpose of the Jock River Fish Habitat Embayment Creation Project is to create 1000 m<sup>2</sup> of new spawning, nursery, rearing, and feeding habitat for the 40 species of fish that reside in the Jock River. The Jock River in Richmond has been experiencing increased recent development activity. Opportunities to continue to improve aquatic and terrestrial habitats along the Jock River and its tributaries will have a positive effect on water quality and watershed health. The Rideau Valley Conservation Authority has identified a portion of the Jock River as a suitable site for a fish habitat creation project. Spawning and nursery habitat is of particular importance when addressing fisheries recovery, as many fish are dependent upon specific habitat conditions during this crucial time period. It is our goal to create suitable spawning and nursery habitat along the Jock River, while helping to improve shoreline stability, riparian habitat, water quality and improve access to the Jock River for recreational purposes.

### Notes

# Poster Session

## Anadromous pike in the Baltic Sea

**Olaf Engstedt**, Projektledare Royfisk Kalmar – Östergötland, Svergies Sportfiske-och Fiskevardsförbund. Svartviksslingan, Bromma. 28/16739

**Abstract** - The northern pike (*Esox lucius*) is a major predator and top-down regulator in the Baltic Sea. Since the beginning of the nineties many populations seem to have decreased and in some areas of the Baltic Sea the recruitment of young-of-year has shown to be severely damaged. It has long been known that the Baltic Sea pike population exists in two sympatric forms. One form migrates upstream for spawning in fresh water habitats, such as creeks, lakes and marshes and the other spawns in shallow inlets in the Baltic Sea where the salinity ranges between 1 practical salinity unit (PSU) in the north and about 8 in the south.

During the last decades, the spawning habitats for both of these forms have developed in a negative way. In some parts of the Swedish coastal areas as much as 90 % of the freshwater areas have disappeared, mainly through drainage and straightening of watercourses for agricultural purposes. In the sea, recruitment habitats decrease due to exploitation and human activities that may disturb spawning or early life stages. But the perhaps largest single factor negatively affecting recruitment of pike in the sea is eutrophication. Substrates are overgrown with filamentous algae and shallow bays are covered with dense *Phragmites* belts decreasing the habitats suitable for spawning. Further, a predator on egg and fish larvae, the three-spined stickleback (*Gasterosteus aculeatus*) has increased in abundance. Other impacts on the ecosystem consists of over fishing and elevated concentrations of pollutants. Despite numerous efforts there has, so far, not been possible to pinpoint the actual cause or causes for the decline of pike. As many of the above mentioned environmental problems are widely spread and takes decades to overcome, if at all possible, the most effective short term way to increase pike production was assumed to be restoring of freshwater habitats.

In order to get a clue on the freshwater systems impact on the coastal pike population Sr:Ca ratio was studied in otoliths. We found that pike of natal freshwater origin accounted for as much as 45 percent of the total coastal pike population in the region. The majority of the pike had emigrated out of freshwater at a length below 6 cm. These results indicate that freshwater recruitment is successful, contrasting the vast areas available for spawning in the sea. A conclusion is that restoration measures in freshwater systems are highly motivated as they are easily carried out and have an instant significant effect on the pike population in the Baltic Sea.

Further, in three streams running out in the Baltic Sea, more than a thousand pike were marked by pit-tags to study spawning migration. About 30-40 % returned to the same river the subsequent year. Most of the pike used the lower parts of the stream for spawning. The homing



of pike to a watercourse indicate that freshwater pike in the Baltic Sea consists of specific populations and this is crucial information when taking decisions on fish restoration measures.

Three wetlands adjacent to streams were restored for pike production. The most successful restoration involved minimal digging, with flooded grasslands providing optimal conditions for spawning. The first spawning season after restoration increased the pike production one hundredfold.

In conclusion, anadromous pike are numerous in the Baltic Sea. To compensate for the decline in pike populations in the sea, “pike-factories” created along the coastline is probably the most justifiable option.

### Notes

## **Pike factories – Swedish Anglers Association**

**Henrick Schreiber**, AquaBiota Water Research, Löjtnantsgatan 25, SE-115 50 Stockholm, Sweden.

**Abstract** - Predatory fish such as northern pike (*Esox lucius*) and perch (*Perca fluviatilis*) that inhabit the Baltic Sea could either be born in brackish or fresh water. Recent studies show that the proportion of freshwater born pike in the ocean is as much as 45 % even though the possible freshwater spawning area is only a fraction of the brackish. That result has increased the understanding of the importance of freshwater systems as spawning habitats for the Baltic Sea pike.

In Sweden, as well as many other countries, large areas of wetlands have been drained with the aim to gain more land to produce crops. Since the beginning of the 19<sup>th</sup> century no less than 3 million hectares of wetlands have been drained, and in some parts up to 90 % of the wetlands are vanished. Thereby important habitats for fish, birds, frogs and insects as well as effective nutrient traps are gone. Thus there are numerous reasons to restore these systems. And as the recruitment of pike in brackish water, for unknown reasons, has decreased significantly the last 20 years, the need for actions cannot be denied.

For several years the Swedish Anglers Association (SAA) worked in full scale along the Swedish east coast reconstructing freshwater spawning habitats and constructing new marshes. The constructed marshes are usually situated on pasture where cattle are allowed to graze part of the year in order to create a suitable spawning habitat consisting of short straws and tufts. The water level and the outflow is controlled by a dam during spring so the adult pike can migrate up and down before and after spawning. In the middle of June the water is continuously discharged which forces the around 6 cm young-of-year pike out. Some of these constructions have had a tremendous result, raising the fry production from close to zero to approximately one hundred thousand. This was the basis for the designation "pike factories".

Pike factories not only produce fish, they also decrease the eutrophication in the Baltic Sea. The wetlands trap nutrients and prevent it from reaching the sea. Secondly, the massive increase of pike reduces the symptoms of eutrophication near the coast through a "top down" effect. Simplified, the predatory fish eat fish such as roach and herring, the herring eats zooplankton that in their turn feed upon phytoplankton. Hence dense populations of predatory fish such as the pike, will reduce the amount of phytoplankton.

SAA have six full-time employees working with the "Back to Big Fish" project. At the moment, SAA is working on around thirty restoration projects in different stages of completion, whereas

10 have been completed. Since the recruitment problems are not limited to Sweden, but are obvious in all of the countries around the Baltic Sea, SAA aims to forward the experiences from the successful fish conservation projects to the neighboring countries.

## Notes

## **Muskellunge Movement in Georgian Bay: Spawning Site Fidelity and Habitat Selection**

**Dan Weller**, Department of Biology, McMaster University, 1280 Main Street West, Hamilton, Ontario. L8S 4L8

**Abstract** - Georgian Bay, Lake Huron, presently supports a world class, naturally reproducing muskellunge (*Esox masquinongy*) fishery; however, a suite of unprecedented changes to historic musky habitat has raised concerns regarding the sustainability of some sub-populations. Fifteen years of sustained low water levels, anthropogenic modifications of shoreline, and the establishment of invasive species like the round goby (*Neogobius melanostomus*) have all been implicated as potential stressors affecting muskellunge populations. To investigate the impacts of these stressors, we initiated a radio-telemetry study to track movements of adult muskellunge to identify spawning and nursery habitat and to elucidate their criteria for habitat selection. In partnership with the Ontario Ministry of Natural Resources and Forestry and the Georgian Bay Musky Association, we began tagging and tracking in 2012 in Severn Sound (SS; southern Georgian Bay) and Beaverstone Bay (BV; northern Georgian Bay). In total, 24 muskellunge have been tagged in SS and 12 in BV. Adult muskellunge exhibited high spawning site fidelity between years. In SS, 6 of 7 adults tagged in 2012 returned to the same spawning grounds in both 2013 and 2014, and 13 of 14 adults tagged in 2013 were re-located near their original capture location the following season. Post-spawning movement patterns indicate that adults tended to follow edges (steep drops in the bathymetry) in the lake basin, and this may reflect their ambush feeding behaviour or their requirement for cooler temperatures. Confirmation of their spawning-site fidelity has serious implications for the long-term viability of the SS sub-population, given that the breeding habitat has been compromised by the recent declines in water level and increased human activity.

### Notes

## Use of Bubbles and Strobe Lights to Deter Muskellunge Dam Escapement

**Heather A. Stewart**, Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana-Champaign, 1102 South Goodwin Avenue, Mail Code 047, Urbana, Illinois. 61801.

and

**Max H. Wolter** and **David H. Wahl**, Illinois Natural History Survey, Kaskaskia Biological Station, 1235 County Road 1000N, Sullivan, Illinois. 61951.

**Abstract** - Upwards of 25% of the adult muskellunge (*Esox masquinongy*) population have been observed leaving reservoirs in the midwestern United States by moving over dams. This dam escape is of concern to managers and anglers alike. Barriers and guidance systems have been used to control movement of fishes, however success of such barriers appears to be species-dependent. We examined the potential use of a simple, relatively low-powered and low-cost bubble curtain, strobe light, and bubble curtain with strobe light barriers to decrease the amount of escaping reservoir muskellunge. Experimental trials were conducted in a simulated spillway with 15 replicates of each treatment type. Juvenile muskellunge had greater tendency to escape during daytime trials ( $P < 0.01$ ), and the three barrier combinations used did not reduce rates of escape. Overall study results indicate that light and bubble barriers are not an effective solution to reduce spillway escapes by Muskellunge.

### Notes

## **First Occurrence of Chain Pickerel in Ontario: Possible Range Expansion from the New York Waters of Eastern Lake Ontario**

**Jim Hoyle** and **Colin Lake**, Lake Ontario Management Unit, Ontario Ministry of Natural Resources, Glenora Fisheries Station. Picton, Ontario.

**Abstract** - In this poster, we describe observations of chain pickerel (*Esox niger*) in Ontario waters. During the period 2008-2011, sixteen individuals were confirmed and sampled. In 2011 we reported these observations in the scientific literature (Canadian Field-Naturalist 125(1): 16–21). These fish represent the first chain pickerel collected in Ontario and the first on the northwestern side of the St. Lawrence River in Canada. Since publication, more observations have been made. We present these new observations up to the spring of 2014. We hypothesize that the appearance of Chain Pickerel in the Ontario waters of eastern Lake Ontario and the upper St. Lawrence River signalled an expansion of this species' range from New York state waters. Time will tell if this expansion is permanent; despite the regular capture of mature fish, no obvious signs of recruitment have been observed.

### Notes

## **The Brewer Pond Radio Tracking Project**

**Karsten Pankhurst, J. D. Midwood and S. J. Cooke**, Fish Ecology and Conservation Physiology Laboratory, Department of Biology and Institute of Environmental Science. Carleton University. 1125 Colonel By Drive, Ottawa, Ontario. K1S 5B6

and

**Hedrik Wachelka**, Muskies Canada Inc. 2201 Riverside Drive, Ottawa, Ontario. K1A 8K9

**Abstract** - The portion of the Rideau River that flows through Ottawa, Ontario supports a recreational fishery for muskellunge (*Esox masquinongy*). These muskellunge are a globally unique population due to their successful propagation within a large urban centre. There is also a healthy northern pike (*Esox lucius*) population. To ensure the persistence of these esocid populations and the fisheries they support it is important to maintain existing spawning and nursery habitat and, where possible, remediate historical habitat. Brewer Pond was created by reclaiming land from the floodplain of the Rideau River. It became a popular recreational swimming destination in the 1960's, but was closed due to water quality concerns in 1970's. Currently, the pond is an important feature in this popular residential park. With support from a variety of stakeholders, there is collectively interest in reconnecting the pond to the Rideau River and naturalizing it to provide fish habitat. Construction is slated to break ground in late-summer 2014. Using radio tracking, our primary goal was to evaluate the use of the proposed backwater area at Brewers Pond by adult esocids for foraging, spawning, and nursery habitat. In addition, we will attempt to identify other key spawning, nursery, foraging and over-wintering habitats along this stretch of river. In the summer and fall of 2013, 20 adult muskellunge and 20 adult northern pike were captured and radio-tagged in the region around Brewer Park Pond. These individuals have been tracked on a bi-monthly basis (including during the winter), with daily tracking during the spawning period. Preliminary results suggest that there is considerable activity by both species in the Brewer Park Pond area. In addition, key aggregation areas during the winter and during the spawning period have been identified. Results from this study will provide an important pre-construction baseline and allow us to determine the effectiveness of habitat restoration activities once complete.

### Notes

## **Crime Stoppers (Ontario) - A community organization protecting natural resources values**

**Mark Robbins**, Provincial Enforcement Specialist, Enforcement Brand, Ontario Ministry of Natural Resources and Forestry, 300 Water Street, Peterborough, Ontario. K9J 8M5

**Abstract** - The Crime Stoppers program is an internationally successful initiative that encourages members of the public to anonymously provide law enforcement agencies with information about criminal activity. Caller anonymity is the cornerstone of the Crime Stoppers model.

Natural resources offences are often called “victimless crimes” because individuals seldom feel a sense of ownership or feel direct loss when fish or wildlife fall prey to illegal acts. Additionally natural resources crime often happens on lakes and streams and in the fields, forests and the backwoods where there are few witnesses and often little evidence of the illegal act. These realities make every piece of information shared by the public important to a Conservation Officer; no tip is too small or insignificant to have value in an investigation.

Luckily the majority of Ontario’s fishing and hunting public is willing to play an active role in reporting natural resources violations. The Ministry of Natural Resources and Forestry toll-free violation reporting line receives in excess of 6,000 phone calls every year; many of these calls are the first step in successful investigations and prosecutions.

However, for some, openly sharing information creates concern. Some are reluctant to call because they feel they are too closely connected to those involved in the illegal activity. For others there is no motivation to call because they may not understand the issue or support the reason for the law. This is where Crime Stoppers plays a significant role in the Ministry of Natural Resources law enforcement program.

Known and respected across North America and around the world Crime Stoppers guarantees anonymity to all callers and offers cash rewards for valuable information. For some this eliminates the fear of reprisal. For others it motivates them to call because they may profit from sharing information. Either way we all win because valuable law enforcement information is conveyed.

The posters in this presentation cover a variety of different threats to Ontario’s natural resources. Many of the posters directly recognize the community organizations that have taken a stand to protect our natural resources and outdoors activities.

If you have information about natural resources abuse please call our violation reporting line at 1-877-847-7667, or call Crime Stoppers anonymously at 1-800-222-8477.

### Notes





# Speaker Biographies

(listed alphabetically)

**Casselman, John** - John Casselman is an adjunct professor, Biology Department, Queen's University, Kingston, Ontario, and former senior scientist who supervised fisheries research on Lake Ontario for the Ontario Ministry of Natural Resources. He is a fisheries ecologist and environmental physiologist who has numerous publications in the primary literature (158), reports, and book chapters. He has conducted extensive research on climate change, fish, and fisheries around the world, such as by invitation in the Canadian Arctic, Ethiopia, and Tibet, as well as the Laurentide Great Lakes Basin. He has worked, studied, and published on muskellunge populations and fisheries since the 1960s. He was an originator of the muskellunge Cleithrum Project in the late 1970s. He is a member of Muskie's Canada Hall of Fame and, in 2008, he received the prestigious American Fisheries Society Award of Excellence.

**Crane, Derek** - Derek Crane is currently a research associate at Lake Superior State University. Prior to his current position he was a post-doctoral associate and Ph.D. student at State University of New York-ESF. He investigated muskellunge spawning in the upper Niagara River as part of his dissertation research and participated in several muskellunge studies in the Thousand Islands region of St. Lawrence River and the Niagara River while completing his graduate work. His current muskellunge research projects include investigations of egg incubation habitat and age-0 habitat use.

**Engstedt, Olaf** - Olaf's doctoral thesis focused on northern pike in the Baltic Sea specifically with regard to homing behaviour and habitat restoration. Olaf now works at the Swedish Anglers Association (Sportfiskarna) with numerous coastal habitat restoration projects along the Swedish Baltic Sea coastline.

**Farrell, John** - John Farrell is an Associate Professor of Fisheries and Aquatic Sciences at the State University of New York (SUNY) College of Environmental Science and Forestry in Syracuse, New York. He is also the Director of the Thousand Islands Biological Station in Clayton, New York. Not surprisingly, muskellunge is one of John's favorite fish.

**Kerr, Steven** – Steve retired from the Ontario Ministry of Natural Resources in 2012 after a career as a fisheries biologist of almost 36 years. During his career he worked in a number of Ontario locations most recently as a senior fisheries biologist in the policy division. He has working experience on Lake Superior, Lake Huron, Lake Erie, and Lake Ontario as well as inland waters of Ontario. Over the years he received extensive training in many aspects of fisheries management and was designated as a Certified Fisheries Scientist by the American Fisheries Society. In 2010 he was elected into Muskies Canada's Hall of Fame. Steve has authored or coauthored more than 200 technical reports and scientific papers. He currently works as a consultant in the private sector.

**Lake, Colin** - Colin has worked in natural resource management, specifically fisheries and fish habitat management, for approximately 20 years. His employment background includes positions in the private sector in British Columbia (Pacific coast and central interior), Fisheries and Oceans Canada (Northwest Territories), and the Ontario Ministry of Natural Resources (two inland fisheries assessment units, several districts throughout north-eastern Ontario, and the Lake Ontario Management Unit). Colin has been with the Lake Ontario Management Unit for approximately nine years in various positions. His current role is Lead Planning Biologist.

**Lamoureux, Jennifer** - Jennifer Lamoureux is the Rideau Valley Conservation Authority's (RVCA) Aquatic and Fish Habitat Biologist. For the past 14 years she has provided a range of professional biological services and advice to support the programs and activities of the RVCA and its partners. The Conservation Authorities vision for the future is a healthy watershed. She supports this vision by providing technical review/input in support of the RVCA programs in regulations, planning and development review, watershed monitoring and reporting, restoration and stewardship and watershed management planning. She has provided review and design advice on a large number of aquatic restoration and habitat enhancement projects within the Rideau Valley watershed. Jennifer has built strong relationships with a large number of non-governmental organizations, the Department of Fisheries and Oceans, Ontario Ministry of Natural Resources, Conservation Authorities and municipality staff by collaborating on a number of initiatives. Jennifer manages the Conservation Authorities aquatic monitoring programs and has provided technical input and advice from an aquatic ecology perspective for over 1600 development projects in the Rideau Valley Watershed.

**Landsman, Sean** – Sean's passion for muskies has consumed the better part of the last thirteen years and has worked its way into both his science interests and free-time hobbies. He graduated from Carleton University in 2011, having been a member of Dr. Steven Cooke's lab. During his time at Carleton, Sean worked closely with Muskies Canada to examine the impact of

catch-and-release angling on *Esox masquinongy*. His research demonstrated how species-specific anglers could collectively create handling practices that maximize survival of caught-and-released fish. These efforts effectively enable co-management of the resource alongside State and Provincial fisheries biologists. He is currently pursuing a Ph.D. at the University of Prince Edward Island and serves as the Assistant Editor of Muskies Inc.'s magazine MUSKIE.

**LeBlanc, Jean-Paul** – John-Paul is currently a Ph.D. candidate at McMaster University in Hamilton. His Masters thesis examined selective silvicultural practices in Algonquin Provincial Park and how current harvest rotation schedules may not be sufficient to sustain an old growth forest specialist bird species. His Ph.D. work examines habitat associations of muskellunge nursery habitat in Georgian Bay to develop definitions of Georgian Bay specific suitable nursery habitat. Additionally, this research examines how sustained low water levels and shoreline modification may adversely affect the quality of muskellunge coastal wetland spawning and nursery habitat. Both avenue of research examines aspects of species recruitment, through multivariate statistical analyses of habitat parameters. The goals of his research have been to provide managers with best available information to help mitigate disproportionate habitat degradation of habitats with high recruitment potential.

**Liddle, Gabrielle** – Gabrielle is a Lake Simcoe Biologist with the Ontario Ministry of Natural Resources and Forestry, Aurora District. She led a successful 2014 Muskellunge egg collection from Gloucester Pool to be stocked into Lake Simcoe. She is currently leading the Lake Simcoe habitat enhancement component of the Lake Simcoe Muskellunge Restoration Project. Since 2006, she has worked in numerous positions with the Ontario Ministry of Natural Resources, with Fisheries Research and Fisheries Monitoring Sections at Harkness Laboratory for Fisheries Research and the Lake Simcoe Fisheries Assessment Unit, respectively. Gabrielle has a strong interest in Muskellunge restoration techniques and angler surveys. She wrote two publications for the Lake Simcoe Fisheries Assessment Unit on the State and Trend of Lake Simcoe's recreational fishery, and has also been a part of many other Lake Simcoe and Lake Opeongo-based publications.

**Liskauskas, Arunas** – Arunas Liskauskas is a management biologist with the Ontario Ministry of Natural Resources and Forestry, Upper Great Lakes Management Unit, Lake Huron Office. He has been with the unit since 1993 and has worked on various projects focused on nearshore fish community dynamics in Georgian Bay and the North Channel of Lake Huron. He was the lead author in the development of Environmental Objectives for Lake Huron and is involved with

outreach activities with a variety of stakeholder groups including the Fisheries Management Zone Council for Georgian Bay and the North Channel. He has an Honours BSc. in Fisheries Science and a MSc. in Fish Genetics, both from the University of Guelph.

**Miller, Loren** – Loren Miller is a research scientist with the Minnesota Department of Natural Resources (MNDNR) and also an adjunct Association Professor at the University of Minnesota. He received his M. Sc. and Ph.D. from the University of Minnesota with an emphasis on fisheries genetics. He served as a research associated at the University of Minnesota for twelve years and four years as a research scientist at the MNDNR with the genetics laboratory housed at the University of Minnesota.

**Pankhurst, Karsten** - Karsten is entering his 5th and final year at Carleton University with a major in environmental science. From a young age he has been passionate about Muskellunge and Northern Pike fishing. He considers himself an expert Northern Pike angler but realizes he has not quite mastered the art of Muskellunge fishing. Karsten has studied Muskellunge behaviour for over a decade for angling purposes and out of personal interest. It wasn't until this past year that he began studying Muskellunge as part of his education at Carleton University. As part of a group research project he helped provided input into the proposed Brewer Park Pond rehabilitation plan, which involved summarized preliminary data into a lengthy report. He was given the opportunity to continue working on the project for his undergraduate thesis. In addition to his studies at Carleton University he has joined the Ottawa Chapter of Muskies Canada. His goal is to pursue a master's program studying the behaviour of Muskellunge and Northern Pike. He currently work as a fisheries assistant for the city of Ottawa and in the future I hope to be working in a fishery related career.

**Purdy, Chris** – Chris started fishing for muskies in the mid 1990's and first joined Muskies Canada Inc. in 2002. He became involved in the National Executive as the National Research Director in 2005-06 and served as National President in 2007-08. After a three year break, he filled in as the interim National Web Director in 2012 and he is currently finishing his second two year term as President. Chris describes himself as a musky anger of very limited abilities, a much more reliable "netman."

**Robbins, Mark** – Mark Robbins is a Provincial Enforcement Specialist with the Ontario Ministry of Natural Resources Enforcement Branch. He is responsible for providing enforcement training

to field Conservation Officers, and advice to other Ministry staff and to the public, on subjects related to the sport and commercial fishery as well as aquaculture and aquatic invasive species. Mark is also the Ontario co-chair of the Law Enforcement Committee of the Great Lakes Fisheries Commission as well as the Ministry of Natural Resources enforcement representative to the Ontario Association of Crime Stoppers.

**Schreiber, Henri** - Henrik is attending the symposium in terms of the leader for the EU-project "Learning best practice on habitat restoration and fisheries management evaluation strategies from an exchange to the North-American Laurentian Great Lakes area". The project is a part of the program GAP2, Connecting Science, Stakeholders and Policy (<http://gap2.eu>). Henrik is employed as an aquatic ecologist at the institute AquaBiota Water Research dealing with various issues regarding fish and aquatic environmental issues. He has previously worked with water environment policy and management issues at both regional and national agencies in Sweden and before that as a research assistant at two national fisheries research institutes.

**Simonson, Tim** – Tim Simonson has been a Fisheries Biologist and Muskellunge Program Coordinator with the Wisconsin Department of Natural Resources (WDNR), Bureau of Fisheries Management for over 20 years. He also spent 7 years as a Research Scientist with both the University of Wisconsin – Superior and the WDNR. He received a B.S. in Biology (Fisheries Emphasis) from University of Wisconsin-Superior and a M.S. in Fisheries and Wildlife Sciences from Virginia Tech. Tim is a Life Member of the American Fisheries Society and is a Certified Fisheries Professional. In 2005 and 2006, he served as Chair of the Esocid Technical Committee of the North Central Division, American Fisheries Society. Tim has published 23 peer-reviewed articles; 20 technical and administrative reports; and has authored over 50 technical presentations.

**Stewart, Heather** – Heather was born and raised in the U.S. midwest. She became interested in science, specifically ecology and conservation, at a young age. She earned her B.Sc. at Michigan State University in Zoology with a concentration in Marine Biology after studying at Galapagos Academic Institute for the Arts and Sciences. Following graduation her interests shifted to freshwater fisheries. Heather began working at the Illinois Natural History Survey and the University of Illinois Urbana-Champaign where she was involved with several diverse projects before attending graduate school. She earned my M.Sc. at Mississippi State University in Wildlife, Fisheries, and Aquaculture and currently is working for Oregon State University in the Department of Fisheries and Wildlife. Her research interests are physiology, aquatic ecology, behavioral ecology, and conservation.

**Taillon, Dan** - Dan Taillon has been an Aquatic Ecologist with Fisheries Policy Section of the Ontario Ministry of Natural Resources (MNR) for four years. Currently, he serves as the recreational fisheries policy lead as well as the provincial liaison with the executive of Muskies Canada Inc. Prior to this, Dan was a Management Biologist with Peterborough District (MNR) and was the lead for the development of the Fisheries Management Plan for Fisheries Management Zone 17. Dan also has experience supporting the Southern Region Walleye Regulation review and with the Lake Erie Management Unit and Fort Frances District offices within OMNR. Dan has an M.Sc. and B.Sc. (Hons.) from Trent University.

**Weller, Dan** – Dan’s current research focuses on the development and application of GIS-based tools to identify and evaluate critical fish habitat. His graduate work has focused on muskellunge in Georgian Bay, Lake Huron and the impacts of sustained low water levels on the quantity and quality of spawning and nursery habitat. His goal is to use geospatial modelling and analysis, informed by intensive field sampling, to help guide management and restoration activities.

**Wilson, Chris** - Chris Wilson is a research scientist with the Ontario Ministry of Natural Resources, and runs the province's Aquatic Biodiversity and Conservation research unit, including the Fisheries Genetics lab at Trent University. His research mainly focuses on the genetic structure and diversity of exploited and endangered aquatic species, and using this information to help inform their sustainable management.

**Zahn, Jay** – Jay Zahn retired in 2005 after working for 31 years at a Green Bay paper mill. He then managed a Green Bay Yacht Club for 5 years from 2008 till 2013. During that time he became a partner in Tyrant Tackle specializing in musky lures. In 2012 he opened a bait tackle shop in Green Bay featuring custom color musky and walleye baits. Having fished muskies all my adult life led him to join Muskies Inc. (MI). In 2005 he started the Titledown chapter of MI locally in Green Bay. He served as President for 5 years and also worked with the National arm of Muskies Inc. He served as the Vice President of Communications and was elected to be the President of Muskies Inc. in 2011.

# Carleton University Campus Map

## Symposium Location

AT – Azrieli Theatre rm. 102

## Lunch & Coffee Breaks

UC – University Centre

## Residences

CO – Residence Commons  
(check-in & breakfast)

FR – Frontenac House

LE – Leeds House

LX – Lennox & Addington House

PH – Prescott House

## Poster Session

TT – Carleton Technology &  
Training Centre rm. 4440Q

★ Parking

