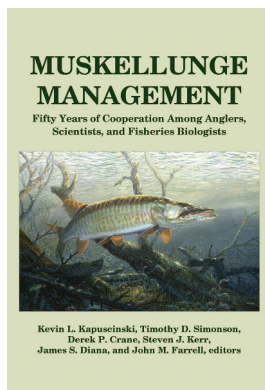


## ZOOLOGY

**Muskellunge Management: Fifty Years of Cooperation Among Anglers, Scientists, and Fisheries Biologists**

Edited by Kevin Kapuscinski, Timothy Simonson, Derek Crane, Steven Kerr, James Diana, and John Farrell. 2017. American Fisheries Society. 675 pages, 79.00 USD, Cloth.

Muskellunge (*Esox maskinongy*) is a freshwater apex predatory fish whose native range revolves around the Great Lakes region of North America. Because this species is long-lived and can grow to an exceptional size (approximately 160 cm), it has attracted continuing attention throughout recent history from an indigenous subsistence harvest, recreational anglers, and commercial netting operations. Inhabiting waters close to human population centres and the accompanying agricultural/industrial development, it has been impacted by water pollution, habitat degradation, and invasive species, as well as overfishing and harvesting.



In support, modern Muskellunge fisheries management encompasses all the administrative actions, procedures, and regulations developed and implemented, usually by a government agency, to restore, maintain, or enhance the biological and economic potential of the fish species in a body of water.

During the last 50 years, anglers in pursuit of Muskellunge have banded together to form muskie clubs specific to this species and promote public education, conservation, scientific research, fish data collection, and artificial propagation where necessary. In cooperation with the American Fisheries Society, academic researchers, fishery biologists, and clubs like Muskies Inc. and Muskies Canada, this textbook sized compendium of almost 700 pages reflects the proceedings of the Hugh Becker Memorial Muskie Symposium which was held in Minnesota during 2016. Containing many scientific papers, extended abstracts, and regional reports, *Muskellunge Management* demonstrates thematically 50 years of cooperation among anglers, scientists, and fisheries management concerns.

This book is primarily aimed at the fisheries management community across North America as well as scientists and researchers interested in this animal. Its state-of-the-art papers are organized into eight sections: 50 years of cooperative efforts, biology, habitat, population dynamics, genetics, population assessments, regional management approaches, and stocking and propagation. Essentially, these form a broad spectrum of papers on many aspects and issues related to Muskellunge.

As an example of the partnerships section, Muskies Canada, working with natural resource agencies, is seeking to ensure sustainable wild Muskellunge populations through habitat protection, restoration, and enhanced regulation. In contrast, in the United States, much more emphasis is placed on artificial propagation/stocking and also range extension across its continental geography. To support some of the Canadian objectives, muskie anglers are encouraged to enter angling information online, including waterbody location, data on fish captured, and amount of fishing effort. With this yearly data collection, large scale changes to fish size and abundance can be monitored by management agencies. For the curious, in 2018 within Ontario over 1400 captures were recorded by participants. On average it took about 16 hours of angling effort to record one capture of a Muskellunge.

In 1984 during a previous Muskellunge symposium, genetic research was identified as a priority future requirement. In this issue, a sizeable number of papers highlight the significant genetic diversity among native populations of this single species across its range. The genetic data appears to substantiate the reality of three distinct regional lineages derived from a single Mississippian glacial refugium population. Each lineage can be broken down to multiple subgroups impacted by local geography, spawning fidelity, proximity to each other, and habitat connectivity. For example, around the City of Ottawa, native Ottawa River Muskellunge above and below the city form different subgroups and the Muskellunge of the Rideau River tributary form a third genetic subgroup. The Chaudière and Rideau falls within the City contribute to these genetic differences. This can be compared to the Trent Severn system of the Kawartha lakes where the Muskellunge show little to no genetic substructure over a comparably more extensive geography.

Several papers detail the attempt to restore a self-supporting population of Muskellunge in Ontario's Lake

Simcoe. The species was essentially extirpated in the lake during the early part of the last century, mostly through commercial harvest and habitat loss. Over the last 14 years, millions of dollars, and multiple partners, more than 10 000 young-of-the-year Muskellunge have been stocked into Lake Simcoe. This project has wrapped up and now it is up to the animal. Biologists estimated that it will take another 15 years of monitoring to determine if this project will result in a successful restoration—a new self-sustaining population.

Interestingly enough, other articles call attention to an opposite ecological dilemma happening to the east. As the story goes, Muskellunge were introduced by Quebec provincial authorities, in efforts to increase sportfishing opportunity, to a headwater lake. Over time the Muskellunge emigrated and set up populations along the St. John River watershed throughout Maine and New Brunswick to points downstream of the City of Fredericton. Currently these fish are considered an invasive species subject to active efforts of elimination by government management agencies despite their increasing popularity as a sportfish.

For many decades the upper St. Lawrence River has long been considered mythical as harbouring some of the largest growing specimens of this animal on the continent. Despite many recent management efforts, researchers indicate it is suffering a continuing population decline triggered at least in part by fairly recent invasive species, such as the outbreak of viral hemorrhagic septicaemia causing adult die offs and staggering numbers of the Eurasian Round Goby which act as an egg predator limiting recruitment. Recommendations include management plans to enhance young-of-the-year recruitment with actions to restore high quality spawning and nursery habitat.

Within this substantial volume, much more subject matter touches on many issues, including non-lethal tissue sampling, weight estimates, tournament impacts, response to catch and release, nursery habitat, population assessment, regional management perspectives, and many others. Based on the partnership of an increasing number of concerned and dedicated non-profit muskie clubs, resource managers are forging biologically sound research and management efforts. The book *Muskellunge Management* provides a solid foundation for a potentially bright future.

HEDRIK WACHELKA

Muskies Canada Inc., Ottawa, ON, Canada