

## **Project will examine genetic lineage of musky stocked in Wisconsin**

MADISON – Wisconsin fisheries scientists, hatchery staff and biologists are teaming up for a comprehensive examination of the state’s musky propagation practices, including using cutting-edge technology to tease out the genetic lineage of the state’s famed fighters.

The aim is to assure the fish Wisconsin produces for stocking stand the best chance of surviving and adapting to their receiving waters to improve [musky fishing](#) opportunities on lakes that currently require stocking to sustain a fishery. The effort is also expected to increase the cost efficiency of the stocking program.

“It’s exciting for the fisheries program to merge the latest science and forensic techniques and our day-in and day-out hatchery programs to bring the musky propagation program into the next century,” says Mike Staggs, who leads the Department of Natural Resources fisheries management and habitat protection program. “It’s a big step for us because we haven’t done this before on a hatchery system-wide scale.”

Wisconsin’s northern lakes and rivers are the natural home for muskellunge, but fish stocking has expanded its original range into the southern part of the state so that Wisconsin now has more than 700 lakes and 83 streams in 48 counties with musky populations. About 25 percent of Wisconsin’s muskellunge populations depend on some level of stocking.

In the past, DNR had an aggressive and comprehensive research program addressing musky genetics, harvest and stocking strategies, but budget and staffing cuts in more recent years put that program into a holding pattern, Staggs says.

The combination of new genetic analysis techniques and the recent hiring of a University of Wisconsin-Stevens Point researcher who’s an expert in such techniques provide a unique opportunity now for the state to evaluate aspects of the propagation program to assure it’s not only producing a lot of fish, but the best fish possible, Staggs says.

The effort involves three concurrent projects:

- DNR fisheries crews will improve the way they collect adult fish and eggs for stocking and obtain them only from waters with self-sustaining musky populations.
- University of Wisconsin fisheries professor Dr. Brian Sloss and his graduate students have already begun the process of conducting DNA tests of fish samples taken and archived over recent decades with the ultimate purpose of identifying whether there are distinct musky strains in the state and their geographic boundaries.
- DNR fisheries researchers will conduct a long-term study of the performance of fish stocked by Wisconsin hatcheries, with the goal of identifying the best populations to use as sources of eggs.

“We’re trying to improve upon an already good hatchery product by using sound genetic principles to improve the way we collect eggs and raise fish and stock them out,” says Tim Simonson, a DNR fish biologist who leads the department’s musky team.

Some anglers believe that DNR has been using slow-growing populations of musky as egg sources for its hatchery system and that, as a result, fewer than expected trophy musky are being caught by anglers. This comprehensive look at the propagation program should provide critical information needed to help answer questions about what effect, if any, past broodstock management and stocking practices have had on Wisconsin’s musky populations, Simonson says. It should allow the state to improve upon past successes with muskellunge propagation.

In terms of broodstock selection, Sloss says, “The idea is to put forward the healthiest, most genetically diverse fish possible.” Greater genetic diversity will give stocked fish a better chance of surviving and adapting to changing conditions such as climate, habitat and invasive species.

Already, Sloss has worked with DNR fish biologists and hatchery staff to examine the various steps in the production process and to recommend changes, starting this spring, that minimize artificial selection of fish, which can lead to uniform characteristics, such as growth rate, ultimate size attainment, spawning habitat preference, and timing of spawning activity.

For starters, production will shift to using waters with largely self-sustaining musky populations as egg sources to decrease the potentially adverse effects of inbreeding, and eggs will be collected from fish throughout the spawning run, not just during the early period of the run.

While DNR’s hatchery personnel make these changes, Sloss will be focusing on determining the existence of distinct genetic stocks and evaluating the geographic management zones DNR has tentatively picked based on earlier genetic work. Those interim management zones are the Lake Superior watershed, the Upper Mississippi watershed, Lower Mississippi watershed, Wisconsin River watershed and Green Bay/Lake Michigan watershed.

“We believe that distinct genetic stocks still exist in Wisconsin,” Simonson says. “With Brian’s work, we’re going to be able to assess this from a scientific perspective rather than by conjecture and speculation.”

Sloss’ work is expected to take several years, as will the evaluation of lakes within the final management zones to be used as egg sources. Final selection of appropriate brood stock lakes is expected to occur by 2015.

Starting this spring, side-by-side comparison studies will be conducted to see how DNR’s stocked fish survive and grow compared to stocked fish originating from Minnesota’s Leech Lake, which have worked well for Minnesota’s musky program. The fish will be stocked in seven lakes in the St. Croix River basin and in three southern Wisconsin lakes. Those three lakes are Lake Wissota in Chippewa County, Lake Monona in Dane County, and Lake Delavan straddling Adam and Juneau counties. No Minnesota fish will be stocked into the large native range of muskellunge in northern Wisconsin that remains isolated from exotic strains due to migration barriers such as the Lake Holcombe Dam on the Chippewa River.

As unique genetic strains of Wisconsin fish are delineated, future trials will include additional Wisconsin brood stock sources.

“These aren’t questions that can be answered overnight,” Staggs says. “It’s a long-term integration of science into our hatchery program, which will continue to evolve.”

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