

## STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-8

Study No.: 230495

Title: Assessment of lake trout populations in Michigan waters of Lake Superior

Period Covered: October 1, 2006 to September 30, 2007

**Study Objectives:** (1) To determine relative abundance, length and age composition, sex, maturity, sea lamprey wounding, growth, and mortality for lean and siscowet lake trout in Michigan's Lake Superior lake trout management areas. (2) To periodically determine relative abundance, diet, and demographic variables (age, growth, etc.) of lake trout forms, other predator fish, and forage fish at various depth strata in Lake Superior. (3) To calculate total allowable catch (TAC) for lake trout in Michigan's Lake Superior management areas.

**Summary:** During this performance period, fall, spring, and summer lake trout surveys were conducted. Lean and siscowet lake trout were collected May, June, August, and September 2007 as the first part of a 2-year lake trout reproductive study. Survey data were entered in the lake trout database and stomachs and age structures will be processed in the winter months of 2007-08. Data from this study were used to estimate lake trout harvest quotas for 1836 Treaty waters in management units MI-5, MI-6, and MI-7. Various manuscripts based on data or expertise from this study were submitted for publication or published during this performance period.

**Findings:** Jobs 1, 2, and 4 through 9 were scheduled for 2006-07, and progress is reported below.

**Job 1. Title: Conduct spring lean lake trout survey.**—During spring of 2007, 41 stations in five lake trout management units were sampled. The Chippewa/Ottawa Resource Authority sampled eight of those stations in MI-7. Age structures and stomachs, collected from a subset of the lake trout and other predator fish, will be processed during the winter months of 2007.

**Job 2. Title: Conduct pre-recruit lean lake trout survey.**—During summer of 2007, 17 sampling stations in lake trout management units MI-4, MI-5, MI-6, and MI-7 were fished. Due to budget constraints, 11 stations west of the Keweenaw Peninsula in lake trout management units MI-2 and MI-3 were not sampled in 2007.

**Job 4. Title: Conduct lean lake trout spawning survey and tag lean lake trout.**—During the fall of 2006, three spawning reefs near Marquette in MI-5 were sampled weekly from 10 October through 13 November. During this survey, 1,054 lean lake trout were marked with anchor tags. Tag-return data will be analyzed and used to determine fish movements, growth, and spawning site fidelity.

**Job 5. Title: Analyze Survey Data.**—Survey data from the previous performance period have been processed, analyzed, and integrated into various models.

**Job 6. Title: Analyze diet data.**—Diet data from stomachs collected in the previous year's sampling were processed during the 2006-07 study period. Stomach samples collected from 2006-07 netting will be processed during the winter months of 2007-08.

**Job 7. Title: Model lean lake trout populations.**—As required by the 2000 Consent Decree of the 1836 Treaty of Washington, lean lake trout total allowable harvest limits were estimated for the 2007 fishing season for MI-5, MI-6, and MI-7.

**Job 8. Title: Assess lake trout morphotypes.**—Based on a cooperative study with researchers from the University of Wisconsin at Milwaukee, U.S. Fish and Wildlife Service, and National Marine Fisheries Service, Marquette Fisheries Research Station personnel collected siscowets and lean lake trout during May, June, August, and September 2007. The study design called for samples to be collected monthly in the Marquette area during the open water season, and three times per year on the west side of the Keweenaw. The only sampling that was missed during this performance period was the July sampling in the Marquette area. Tissue samples will be processed during the winter months of 2007-2008 to determine maturity schedules of the two lake trout forms in different areas of the lake.

**Job 9. Title: Write reports.**—This progress report was written as scheduled. Stock assessment reports for 2007 Lake Superior lake trout total allowable catch limits for 1836 Treaty waters were written and are currently under review. During this performance period, the following manuscripts were published:

Janssen, J., J. E. Marsden, C. R. Bronte, D. J. Jude, S. P. Sitar, and F. W. Goetz. 2007. Challenges to deep-water reproduction by lake trout: pertinence to restoration in Lake Michigan. *Journal of Great Lakes Research* 33 (supplement 1):59–74.

Linton, B. C., M. J. Hansen, S. T. Schram, and S. P. Sitar. 2007. Dynamics of a recovering lake trout population in eastern Wisconsin waters of Lake Superior, 1980–2001. *North American Journal of Fisheries Management* 27:940–954.

Ray, B. A., T. R. Hrabik, M. P. Ebener, O. T. Gorman, D. R. Schreiner, S. T. Schram, S. P. Sitar, W. P. Mattes, and C. R. Bronte. 2007. Diet and prey selection by Lake Superior lake trout during spring, 1986-2001. *Journal of Great Lakes Research* 33:104-113.

Schreiner, D. R., S. T. Schram, S. Sitar, and M. Petzold. 2007. Non-indigenous species. Pages 77-84 *in* M. P. Ebener, editor. The state of Lake Superior in 2000. Great Lakes Fishery Commission Special Publication 07-02.

Sitar, S. P., C. R. Bronte, M. P. Ebener, W. P. Mattes, M. Petzold, S. T. Schram, and D. R. Schreiner. 2007. Lake trout. Pages 49-61 *in* M. P. Ebener, editor. The state of Lake Superior in 2000. Great Lakes Fishery Commission Special Publication 07-02.

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