

## **Revisit the Three Milestones Measures of Lake Trout Rehabilitation, Based on Status of Lake Trout Stock and Fisheries in the Main Basin of Lake Huron, 2011**

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### **Introduction**

One major fish-community objective for the main basin of Lake Huron is to restore a self-sustaining Lake Trout *Salvelinus namaycush* population (DesJardine et al. 1995; Bence and Mohr 2008). The rehabilitation process can be marked by three milestones (Ebener 1998). The first has been recently achieved and our measure is that the reestablished spawning stock has produced pervasive wild recruitment over more than ten consecutive years (Riley et al. 2007; He et al. 2012). In the near future wild adults may exceed 50% of the spawning biomass, which is our measure of the second milestone that the stock starts to be self-sustaining. In comparison with Lake Superior when that lake was experiencing a successful transition from a hatchery-stocked population to a wild fish population, the current spawning biomass in Lake Huron is still very low (Sitar and He 2006). If the abundance of top predators is below a minimum required level (Walters and Kitchell 2001), the prey-fish community always has a potential to reach the undesirable status that nonnative prey species either heavily feed on Lake Trout egg and fry or even lead to unbalanced nutritional status of adult Lake Trout and reproduction failures. Our measure of the third milestone of the rehabilitation process is to have sufficient and sustained top-down influence on the dynamically changing food web by Lake Trout, together with Walleye *Sander vitreus* and other top predators to stabilize and diversify the prey-fish community.

Toward those large goals for the main basin of Lake Huron, the purpose of this Lake Trout stock assessment is to provide essential measures of the primary Lake Trout management strategies and thereby inform management decisions. In the future these management decisions will include the following: (1) continuation or termination of Lake Trout stocking; (2) protection of spawning stock and wild recruitment through fishery regulation and the control of Sea Lamprey *Petromyzon marinus* abundance; and (3) fishing opportunity improvements for recreational anglers.