Lakes, Ponds and Reservoirs

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Population Dynamics of Common Carp in Lost Island Lake

Lost Island Lake is a 1,180 acre 18 foot deep glacial lake in northwest Iowa. The lake is connected to two large marsh complexes adding an additional 1,000 acres of aquatic habitat. The lake and associated wetlands have supported a wide range of recreational activity but have had a long history of poor water quality and degraded fish and wildlife habitat. The goal of Lost Island Lake Restoration Project is to restore water quality and ecological health to the lake and the wetlands in the watershed. The proposed management involves aggressively managing common carp using strategically placed fish barriers to prevent carp from reaching spawning areas, incentive-based commercial removal of carp from the lake, improving the fishery through stocking, water level management strategies, and targeted watershed improvements. This multi-faceted, holistic approach requires complex planning and engineering and design strategies performed by a number of active partners.

In an effort to assess and monitor the common carp population, the Fisheries Management and Research teams used mark and recapture techniques to estimate abundance and biomass of adult (≥ 17 inches) common carp. Each year since 2008, several thousand common carp were captured by a commercial fisherman and marked by removing a fin in the spring. A bottom trawl was used to recapture carp in August. In 2008, the population estimate for adult common carp in Lost Island Lake was 67,102 (54,258 – 91,817, 95% C.I.) or 156 lbs/acre. Biomass estimates of adult common carp in 2009 and 2010 increased substantially (261 – 301 lbs/acre) despite extensive commercial harvest of carp (429,386 lbs). This result was expected because common carp growth rates typically increase considerably as commercial harvest increases, thus replacing harvested individuals quickly. Also, common carp recruitment (successful reproduction) has not been limited. Fish barriers will be installed in 2011 to reduce or eliminate common carp recruitment. Mark-recapture population estimates for carp will be repeated during each year of the restoration project to track changes in biomass and recruitment. In addition, age and growth analysis is being conducted to assess any density dependent effects of associated with large scale removal efforts and to track recruitment patterns. Top-level predators such as walleye, northern pike, and largemouth bass have been stocked to control common carp recruitment; however, the success of these stocking are contingent upon completion of the fish barriers and water control structures.