

Population Densities, Biomass, and Age-growth of Common Carp and Black Bullheads in Clear Lake

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Clear Lake is a shallow eutrophic lake with about 3,600 surface acres and is located in Cerro Gordo County, Iowa. Clear Lake has a maximum depth of 19 feet and has extensive muck flats and few rocky reefs. Due to poor water clarity, Clear Lake generally does not have stands of aquatic vegetation. Dense stands of giant bulrush are present, particularly along the northern shoreline. Water quality has substantially deteriorated in Clear Lake since the 1970s. In fact, phosphorus concentrations have nearly tripled and water clarity has decreased nearly 3-fold during this time period. In response to the deteriorating water quality, a diagnostic study was initiated to determine the causes of the decline and to recommend management guidelines to improve water quality in the lake. One conclusion from this investigation was that the impact of benthivorous fishes needs to be addressed to help ensure the successful renovation of Clear Lake.

Benthivorous fishes are known to deteriorate water quality in shallow, nutrient-rich lakes which may be attributed to their benthic feeding habits. This is especially true for common carp, which have been implicated in increasing phosphorus concentrations in lakes, increasing turbidity, and decreasing macrophyte abundance. Therefore, reducing the biomass of both common carp and black bullheads is being considered as a viable management option to help renovate Clear Lake. This investigation is being undertaken to provide baseline data for this biomanipulation experiment. Specifically, this investigation will determine population densities, biomass, and age-growth of common carp and black bullheads in Clear Lake.

Some recent work demonstrated the feasibility of obtaining viable biomass estimates of both common carp and black bullheads on Clear Lake. We estimated the biomass of common carp in Clear Lake to be about 111 lbs/ac in 1999 (95% C.I. 77-173) 316 lbs/ac in 2000 (95% C.I. 160-612), and 482 lbs in 2003 (95% C.I. 244-934). The biomass of black bullheads in Clear Lake was estimated to be nearly 300 lbs/ac in 1999 (95% C.I. 257-310), 119 lbs/ac in 2000 (95% C.I. 109-132), and 110 lbs in 2002 (95% C.I. 110-182).