IOWA DEPARTMENT OF NATURAL RESOURCES

Sport Fish Restoration Research Findings

Distribution, population dynamics, and interspecific competition of Yellow Bass in Iowa's shallow natural lakes

Project Duration: 2017-2022

Location: Iowa's natural lake region (multiple counties)

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Distribution, population dynamics, and interspecific competition of Yellow Bass in Iowa's shallow natural lakes

Yellow Bass populations have expanded their range to include several northwest Iowa and southwest Minnesota natural lakes since the turn of the century, yet little is known regarding the mechanisms regulating their expansion, nor their impacts to native fish communities. In small impoundments, Yellow Bass overpopulate and stunt, causing cascading negative effects to the fishery. At Clear Lake, a natural lake where Yellow Bass were introduced in the 1920s, Yellow Bass populations widely fluctuate, but periods of overabundance have not caused significant declines in the fishery. It is largely unknown how natural lakes of varying physical and biological characteristics will respond to introduced populations of Yellow Bass. This research focused on identifying where Yellow Bass populations exist in natural lakes, the population characteristics of those populations, and the interactions among Yellow Bass and native fish communities.

Goals

- Determine the distribution of Yellow Bass in Iowa's shallow natural lakes.
- Evaluate population dynamics of Yellow Bass in infested natural lakes.
- Evaluate and identify interspecific diet interactions in lakes with Yellow Bass.
- Evaluate short and long-term changes in fish population size structure, density, and growth with varying Yellow Bass densities

Results

- New Yellow Bass populations existed in 2 of the 25 sampled natural lakes of unknown Yellow Bass status, and that as many as 21 natural lakes in Iowa have established populations of non-native Yellow Bass.
- We observed extreme variation in Yellow Bass recruitment, growth, condition, and mortality among, and within natural lakes sampled. The physical characteristics of the lake, such as lake size, lake depth, and habitat complexity, as well as fish community complexity and lake productivity may play a more important role in structuring Yellow Bass population characteristics than Yellow Bass density alone.
- The diets of 1,340 Yellow Bass collected from 8 natural lakes were evaluated and Yellow Bass consume mostly either benthic invertebrates and/or zooplankton throughout the open water season. Few dietary overlap relationships were observed with other fish species diets.
- Few significant differences among fisheries statistics between pre and post Yellow Bass introduction were observed and no consistent pattern of species prevalence or demise due solely to Yellow Bass introductions were detected at any natural lake evaluated.

Conclusions

In Iowa, we have observed a few scenarios that occur after Yellow Bass introductions. The most concerning is the ability for Yellow Bass to become extremely abundant and cause fishery declines. Yellow Bass expansion in Iowa and elsewhere will likely continue. This study provided valuable data on Yellow Bass diet composition and overlap with native species as well as the erratic nature of fishery trends. Yellow Bass inhabiting deep natural lakes with a diverse fishery are more resilient to negative fishery effects, whereas shallow lakes with low diversity may be more vulnerable. Fisheries managers must routinely evaluate Yellow Bass populations and continue education programs that inform anglers on the negative consequences Yellow Bass may have on natural lakes.