YELLOW PERCH IN THE GREAT LAKES: CURRENT STATUS AND FUTURE RESEARCH NEEDS
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Yellow perch (Perca flavescens) and European perch (P. fluviatilis) are an important fishery resource in many parts of the world, both as a food source and as a source of cultural heritage. Globally, declines in yellow and European perch populations have been observed over the past two decades. Declines in perch abundance have been reported in the Baltic (Sweden), the Chesapeake Bay region (US), Lake Erie (US/Canada), Lake St. Clair (Canada), Lake Constance (Germany/Switzerland), Lake Huron (US/Canada), Lake Michigan (US/Canada), and Oneida Lake (US). While percid populations have declined in many areas of the World during similar time periods, their specific causes have varied and in many cases remain undetermined.

In the Baltic, declines in European perch, as well as other species, have been attributed to recruitment failure, though the mechanism or mechanisms responsible for the recent recruitment failures remain unknown. In the Chesapeake Bay region, increased residential and commercial development of several tributary basins and increased coverage by impervious surface is thought to be responsible for decreases in suitable yellow perch habitat.

In Lake Erie, yellow perch populations declined during a period of poor recruitment during the late-1980s through the mid-1990s, but have since rebounded through sound management practices. The causes of the decline of Lake Erie’s perch population are not precisely known, but drastic changes to the lake ecosystem through the introduction of invasive species are thought to have played a major role. The decline of yellow perch in Lake St. Clair has been directly attributed to overfishing. In Lake Constance, the decline of European perch has been attributed to reoligotrophication of the lake, which has favored increased growth but not reproduction. The causes behind the collapse of the yellow perch populations in Lakes Huron and Michigan remain undetermined, but many hypotheses have been put forward. Likely causes of the yellow perch declines in Lake Michigan include increased predation by alewife, offshore transport away from nursery areas, decreased quantity and quality of zooplankton, shifts in the characteristics of the spawning stock, and changes in the ecosystem due to the introduction of invasive species. Recent declines of yellow perch in Oneida Lake have been attributed to increased cormorant predation, which is now a concern in many systems where cormorant populations are booming.

While there is great variation in the causes, or hypothesized causes, for the recently observed declines in yellow and European perch, there are some commonly recurring suspects. With the exception of those systems that can attribute perch population declines to increased predation on adults, there appears to be a common theme of increased mortality during the first summer from the onset of first feeding to the stage of late summer fingerlings. This increased mortality in early-life may be related to increases in water clarity through the introduction of zebra mussels (Dreissena polymorpha) and lake reoligotrophication. It has been suggested that reoligotrophication results in decreases in the nutritional quality and species richness of the plankton food web. These changes in the plankton community may result in a shift from pelagic to benthic producing systems and may impact perch development during early-life stages. However, as has been seen in Lake Michigan, the suspected causes for perch declines in one portion of the lake do not appear to be the causes for declines in other portions of the lake.

While much has been learned in many of these systems, much still remains unknown. For example, it is still unclear how many abiotic factors affect recruitment success and yellow and European perch stock-recruitment relationships. Additionally, in many systems little is currently known about the long-term changes in production. There is a need to investigate how the introduction of invasive species and changes in the phosphorous loading and trophic structure of these systems have impacted the quality and quantity of the plankton community. While perch in many of these systems may not be starving, they may not be getting all of the nutrition essential to ensure proper development and successful recruitment. The decline of perch in these systems is not likely attributable to any one cause, but rather to a synergy of many factors. As has become apparent in many current fisheries issues, researchers and managers need to examine the ecosystem as a whole in order to understand and dissect such synergies.

As is the case with all resource management, information about the recent declines of yellow and European perch does not exist in a vacuum. In many cases, the collapse of these populations has prompted tremendous public outcry. While much research has been conducted on these declines and much has been learned, this information often does not get disseminated to the public. There is an increased need for effective and frequent communication with the stakeholders of these resources. A proactive approach to open communication helps to insure public trust in researchers and managers, and may even make tough management decisions easier to accept. This is an essential need if researchers and managers are going to stave off unrealistic management requests by stakeholders.