



Contents lists available at ScienceDirect

Journal of Great Lakes Research

journal homepage: www.elsevier.com/locate/jglr

The flathead catfish invasion of the Great Lakes

Pam L. Fuller^{a,*}, Gary E. Whelan^b

^a U.S. Geological Survey, 7920 NW 71st Street, Gainesville, FL 32653, United States of America

^b Michigan Department of Natural Resources, Fisheries Division, P.O. Box 30446, Lansing, MI 48909, United States of America

ARTICLE INFO

Article history:

Received 30 November 2017

Accepted 19 June 2018

Available online xxx

Associate Editor: Anett Trebitz

Keywords:

Flathead catfish

Pylodictis olivaris

Great Lakes

Invasive

ABSTRACT

A detailed review of historical literature and museum data revealed that flathead catfish were not historically native in the Great Lakes Basin, with the possible exception of a relict population in Lake Erie. The species has invaded Lake Erie, Lake St. Clair, Lake Huron, nearly all drainages in Michigan, and the Fox/Wolf and Milwaukee drainages in Wisconsin. They have not been collected from Lake Superior yet, and the temperature suitability of that lake is questionable. Flathead catfish have been stocked sparingly in the Great Lakes and is not the mechanism responsible for their spread. A stocking in 1968 in Ohio may be one exception to this. Dispersal resulted from both natural range expansions and unauthorized introductions. The invasion is ongoing, with the species invading both from the east and the west to meet in northern Lake Michigan. Much of this invasion has likely taken place since the 1990s. This species has been documented to have significant impacts on native fishes in other areas where it has been introduced; therefore, educating the public not to release them into new waters is important. Frequent monitoring of rivers and lakes for the presence of this species would detect new populations early so that management actions could be utilized on new populations if desired.

© 2018 Published by Elsevier B.V. on behalf of International Association for Great Lakes Research.

Introduction

Flathead catfish *Pylodictis olivaris* are native to the central portion of the United States including the Mississippi, Missouri, Ohio, Tennessee, Arkansas, and Rio Grande river drainages. They are not native east of the Appalachians or west of the Rocky Mountains (Fuller et al., 1999; Page and Burr, 2011; U.S. Geological Survey (USGS) 2017a). Few of many historical publications record its presence in the Great Lakes. Osburn (1901), Dymond (1922), and Hubbs (1926) mentioned only a single record from McCormick (1892) for the Great Lakes (Lake Erie, Lorain County, Ohio). However, there are no specimens to support this record (Hubbs, 1926). Trautman (1957) cited the 1892 report in his early book, but Greene (1935) stated that Trautman believed the 1892 record was erroneous. A few publications such as Bailey and Smith (1981), Underhill (1986), and Bailey et al. (2004) list this species as native to Lake Michigan tributaries and to Lake Erie and its tributaries, although flathead catfish were not listed for the Great Lakes and connecting waters by Evermann (1902). Furthermore, none of the following Great Lakes publications list flathead catfish for the Great Lakes Basin: Cope (1864, 1865), Jordan (1877), Bollman (1890), Kirsch (1893), Eigenmann and Benson (1893), Hay (1894), Jordan and Evermann

(1896, 1898), Evermann (1902), Michael (1904), Forbes and Richardson (1920), and Greene (1935). The historical publications do list their presence in the Ohio and Mississippi Basins. More recently, the species is not listed as present in the Great Lakes Basin in Illinois or Indiana by Smith (1979), Simon and Stewart (1999), Simon and Moy (1999), and Simon (2011). There are no verified records for Lake Erie in Pennsylvania. Cooper (1983) mapped a historical record for Lake Erie in Pennsylvania but did not provide any specifics. Stauffer Jr. et al. (2016) apparently thought this record erroneous and did not map it in the updated version of the state fish book. The species has not been recorded in Lake Ontario (Carlson et al., 2016; Crossman and Van Meter, 1979; Evermann and Kendall, 1901; Underhill, 1986).

Because of this species' habitat preferences (i.e., deeper water and in holes or under debris), flathead catfish can be difficult to sample. Therefore, we examined historical literature to determine how it had been recorded within its native range. Forbes and Richardson (1920) listed this species from Illinois and gave a description of its native range, which did not include the Great Lakes or the state of Michigan. Evermann and Cox (1896) listed this species for the Missouri River Basin, as did Eigenmann and Benson (1893) for the Ohio River Basin in Indiana. Therefore, it seems reasonable that it would have appeared in early publications about Great Lakes drainages had it occurred there, because even early observers correctly listed it when present.

Our objectives in this paper are to: 1) determine if flathead catfish are native to the Great Lakes; 2) if not; what were the likely means of

* Corresponding author.

E-mail address: pfuller@usgs.gov (P.L. Fuller).

introduction, 3) determine when introduction likely occurred; and 4) provide the current distribution of this species in the Great Lakes.

Methods

Location data of flathead catfish occurrences were obtained from the Nonindigenous Aquatic Species (NAS) Database (Fuller and Nielson, 2015; U.S. Geological Survey (USGS) 2017a), the National Fish Habitat Partnership (2016), FishNet (<http://fishnet2.net>), VertNet (<http://vernet.org>), and the Global Biodiversity Information Facility (GBIF) (<http://gbif.org>). In addition, the following museums that are not members of GBIF were searched: American Museum of Natural History, Academy of Natural Sciences Philadelphia, New York State Museum Fish Collection, the Field Museum in Chicago, and the Cleveland Museum of Natural History. Numerous state and federal agency fisheries biologists were contacted to obtain knowledge and occurrence records.

Many reports came from the Michigan Master Anglers Database held by Michigan Department of Natural Resources (MDNR). We recognize there may be some errors due to untruthful reports from some anglers and that these only represent trophy-sized catches since 1973. The species may have been in these locations prior to entry in the Master Anglers Database. All available on-line management reports dating back to 1966 from MDNR (1966–2017) and Wisconsin Department of

Natural Resources (WDNR) (1966–2017) were reviewed for information on flathead catfish in the Great Lakes Basin. All flathead catfish reports from the MDNR's Fish Collection System were included.

Reports of charter boat catch from Michigan waters of the Great Lakes 1989–1999 were consulted (Rakoczy et al., 1989–1999), however, we found these only tracked salmonids, yellow perch *Perca flavescens*, and walleye *Sander vitreus*. U.S. Fish Commission Reports from 1886 to 1903 were reviewed for any stockings in the Great Lakes as was the Great Lakes Fish Stocking Database (Great Lakes Fishery Commission, 2015). The National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Environmental Research Laboratory and U.S. Geological Survey's Great Lakes Research Center were contacted for any Great Lakes flathead catfish data, and the NOAA database of Great Lakes commercial fishery landings was searched (NOAA, 2018). Fisheries dependent and independent data were also obtained from Michigan Department of Natural Resources, Ohio Environmental Protection Agency (OEPA), the Northeast Ohio Regional Sewer District, Ohio Department of Natural Resources (ODNR), Ohio State Museum of Biological Diversity, and Wisconsin Department of Natural Resources. We have compiled all occurrence data (including dates, locations, geographic coordinates, and data source) acquired from these sources into the U.S. Geological Survey's Nonindigenous Aquatic Species Database. They are also available as a data release from <https://doi.org/10.5066/F7V69HSC>.



Fig. 1. Flathead catfish distribution records in the Great Lakes Basin 1890–1969. Squares represent collections before 1949, circles represent collections 1950–1959, triangles represent collections 1960–1969. Flathead catfish may not still be present in all locations.

Download English Version:

<https://daneshyari.com/en/article/11010256>

Download Persian Version:

<https://daneshyari.com/article/11010256>

[Daneshyari.com](https://daneshyari.com)