Tiny number of Asian carp could be big problem for the Great Lakes

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(Phys.org) —A tiny number of Asian carp could establish a population of the invasive fish in the Great Lakes, according to new research from the University of Waterloo.

Published this week in the *Biological Invasions* journal, research from Professor Kim Cuddington of the Faculty of Science at Waterloo indicates that the probability of Asian carp establishment soars with the introduction of 20 fish into the Great Lakes, under some conditions.

"Although established Asian carp populations including the Silver and Bighead carps are widely present in the Illinois and Mississippi Rivers, it's expected that it's only a matter of time before the population migrates through the many hydrological connections to the Great Lakes," said Professor Cuddington. "Lake Erie, in particular, provides a highly suitable habitat for the fish with very productive embayments for the fish to find food."

A mature Asian carp can grow up to 50 kg and consumes about 40 per cent of its body weight daily. A minimal length of 70 cm is considered a mature size, with much more substantial lengths being reported. In competition for food and space, the Asian carp has a significant size advantage over native fish species.

"This species will have a huge impact on the food web," says Professor Cuddington. "Not only is it a fast-growing fish physically, but the population itself grows very quickly. A female can lay well over a

million eggs a year, and with no known predators present in the Great Lakes, the Asian carp could dominate the waters and impact fisheries."

Professor Cuddington believes that we will not be able to stop the carp from entering the Great Lakes, and resources should focus on how to intercept new arrivals. If successful breeding occurs, biological control and trapping of vulnerable juveniles might prove the most successful strategy.

Individual fish have already been caught in two of the Great Lakes. The probability of Asian carp establishment changes dramatically if only 10 of the creatures are introduced. With 10 fish, the probability of a population of Asian carp is only 50 per cent, but with 20 fish, it jumps to 75 per cent, under some conditions.

Maturation rates for this invasive fish also play a significant role in positive population growth rates. According to Professor Cuddington, if the fish typically reach maturity within three years, then it will take about 20 years to reach to establish a moderate population, and between 40 and 50 years for that population to become very large. If cooler water slows down fish development time to five years, then the fish population might take more than a century to establish.

Asian carp were introduced to the United States in the 1970s as an agricultural fish used to combat algae in catfish ponds. They escaped into the Illinois River during the floods of the 1990s and later entered the Mississippi River. With recorded densities of 13 tonnes of fish per river mile in the Illinois River, the dangerous flying carp phenomena has schools of fish jump upwards of 10 feet sometimes injuring boaters. Anglers armed with crossbows take to the water to capture the large fish during sport fishing tournaments.

More information: link.springer.com/article/10.1 …

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