

Columbia Environmental Research Center

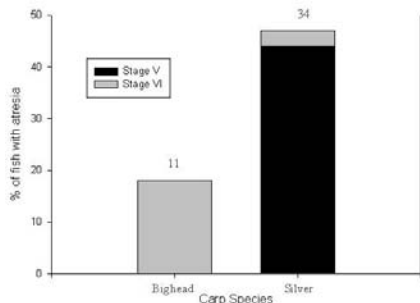
Publication Brief

# Reproductive Condition and Occurrence of Intersex in Bighead Carp and Silver Carp in the Missouri River

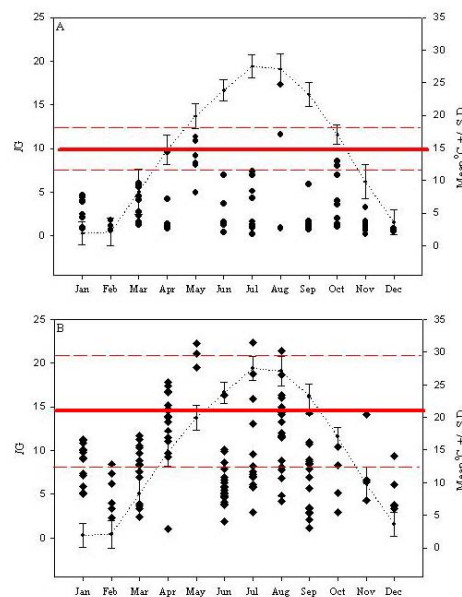
This publication describes the reproductive condition of the bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*Hypophthalmichthys molitrix*), much needed understanding about the reproductive biology of these exotic species in the Missouri River.

Results show that both species have a protracted spawning season and spawn multiple times during that period. Silver carp begin as early as late March when temperatures are about 14°C, while the bighead carp begin in early May. In addition, reproductive abnormalities such as intersex, atresia and sterility are documented.

Knowledge of the reproductive activity of these invasive carps will be useful to resource managers tasked with controlling these exotics, and in addition, the reproductive abnormalities observed can be used in evaluations of the Missouri River environmental condition relative to supporting healthy fish populations.

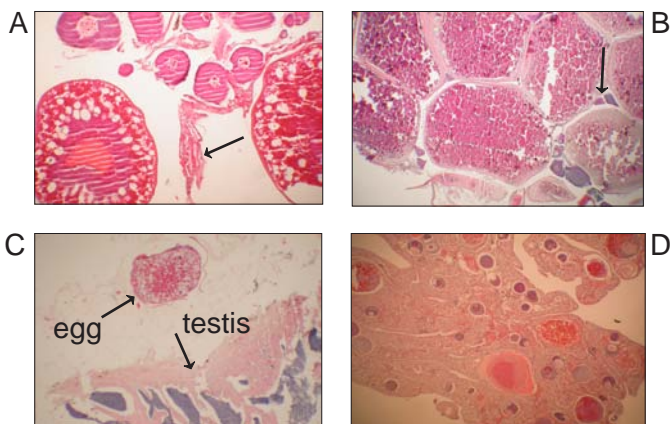


Percentage of bighead and silver carps from the Missouri River at reproductive stages V and VI with atretic follicles.



Monthly gonadosomatic index (GSI) values for female bighead (A) and silver (B) carps caught in the Missouri River during 2003, 2004 and 2005. Bold and dashed lines indicate the mean and S.D. (upper and lower) respectively of GSI of mature carps (stage V), as determined through histological analysis. The monthly mean temperature for the three years and the S.D. is also plotted.

A. Ovary of bighead carp caught in May in the Missouri River containing post-ovulatory follicle (see arrow). B. Ovary of silver carp caught in September in the Missouri River, showing many vitellogenic oocytes, some of which are in early stages of atresia (see arrow). C. Photomicrograph of ovotestis in silver carp from the Missouri River. D. Photomicrograph of ovary of sterile silver carp from the Missouri River.



**Key words:** bighead carp, silver carp, intersex, Missouri River, reproduction

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