

Capture Efficiency of Asian Carp in the La Grange Pool of the Illinois River Using Traditional Gear



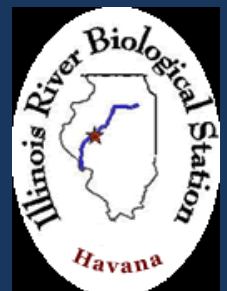
Greg G. Sass and John H. Chick

Illinois River and Great Rivers Biological Stations

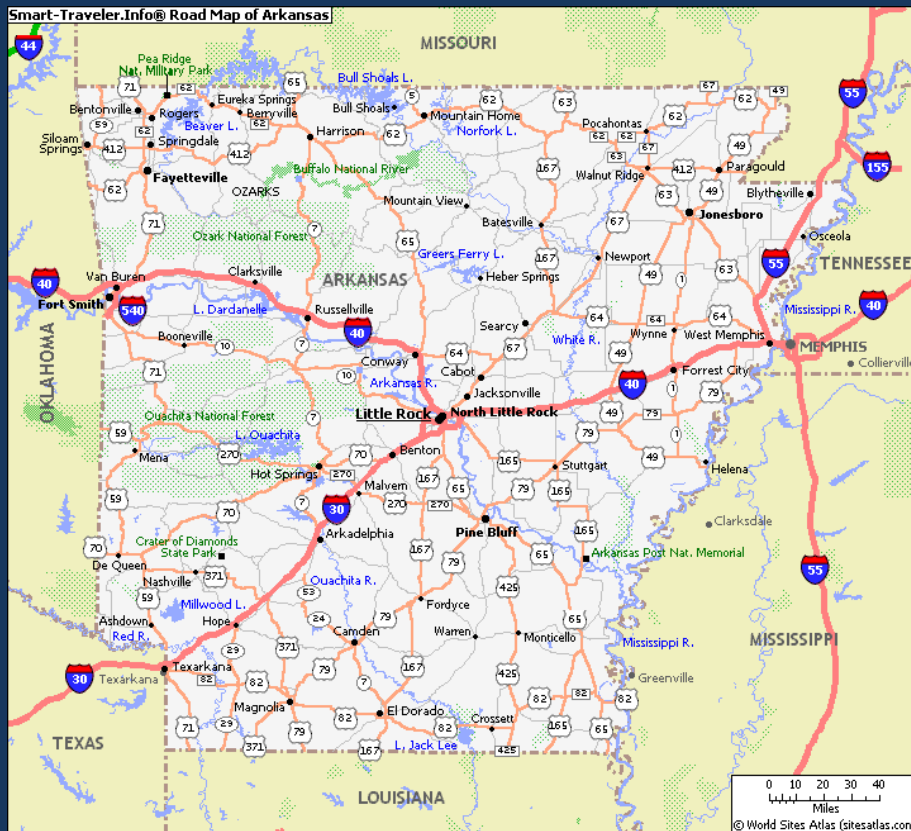
Illinois Natural History Survey

Institute of Natural Resource Sustainability

University of Illinois at Urbana-Champaign



Early Introductions and Spread of Asian Carps



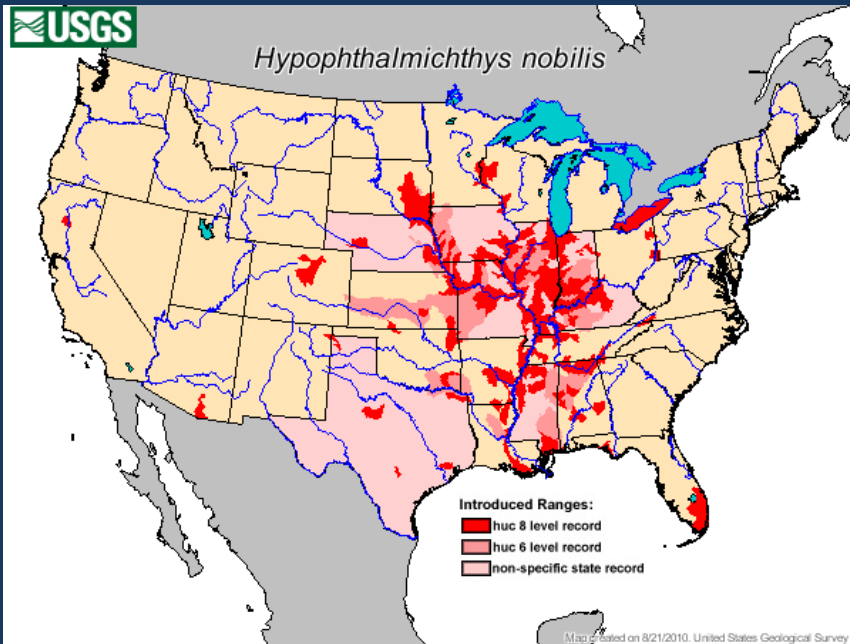
- Intentionally introduced in Arkansas to improve water quality in catfish aquaculture ponds in the early 1970's
- Escaped to MS River basin shortly thereafter due to flooding

Early Introductions and Spread of Asian Carps

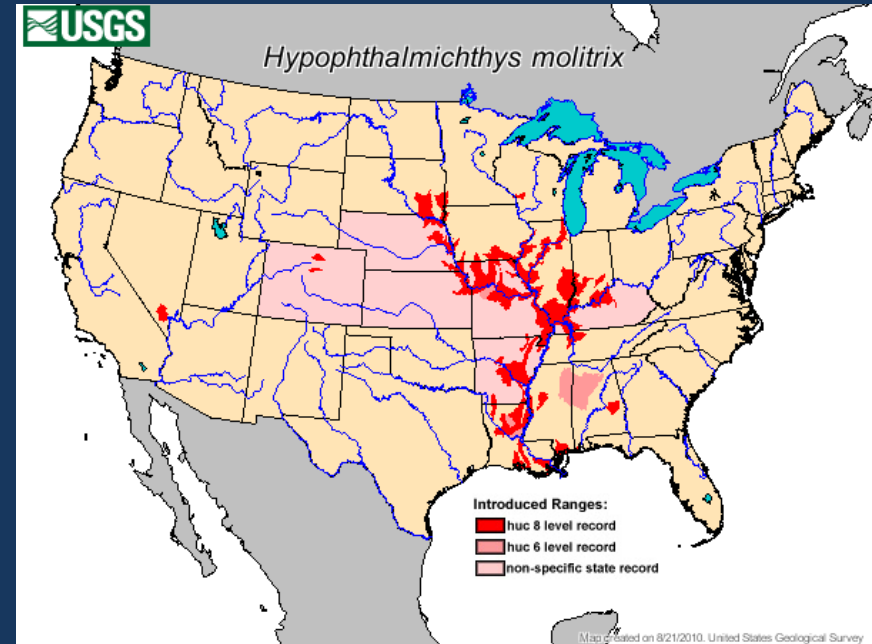


- Asian carps tested in polyculture to process swine manure and provide aquaculture product in early 1970's
- Sam Parr Biological Station, Kinmundy, IL (INHS)

Asian Carp Distribution



bighead carp
Hypophthalmichthys nobilis



silver carp
Hypophthalmichthys molitrix

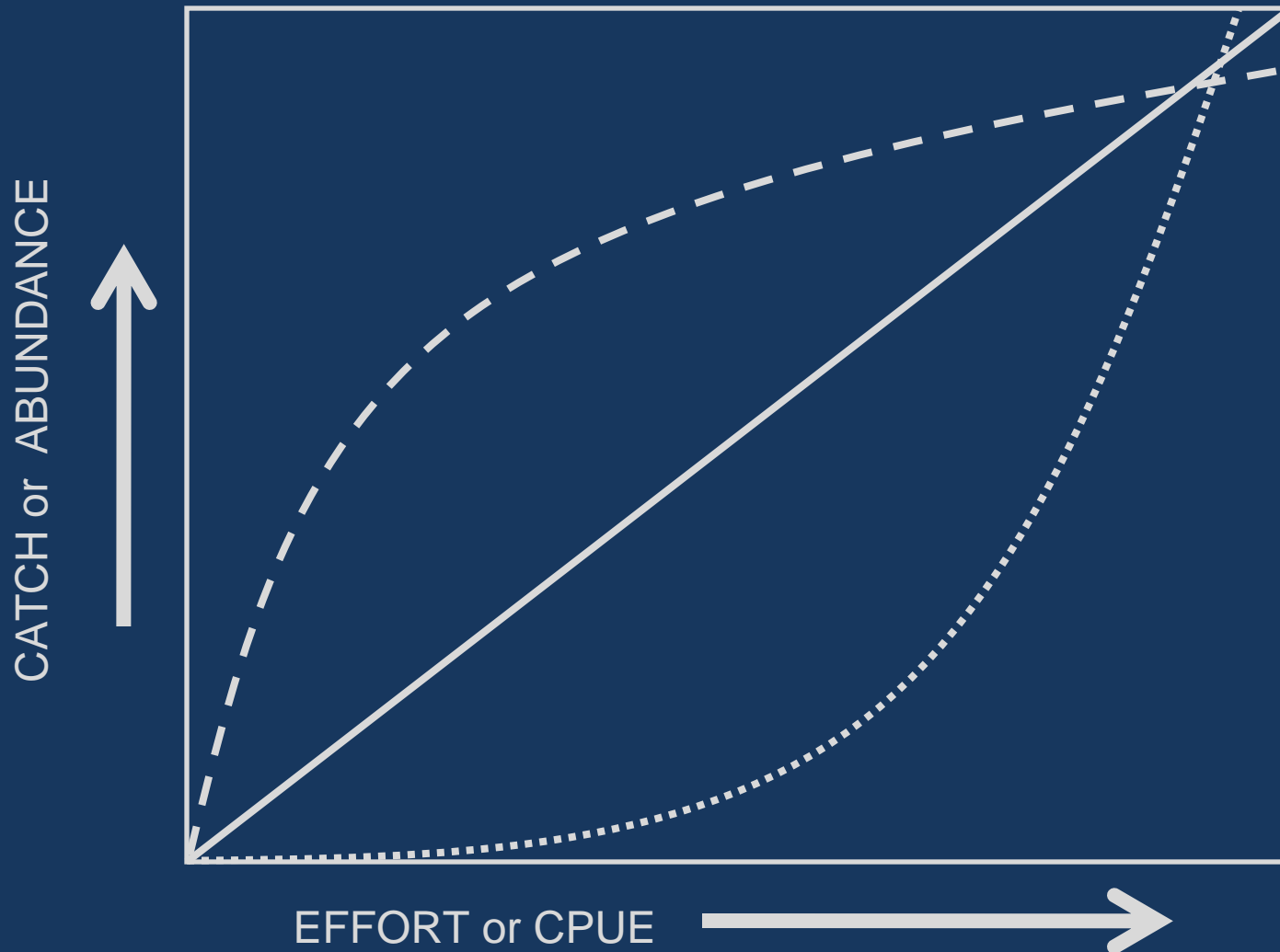


Long-term Fish Monitoring Programs on the La Grange Reach Illinois River



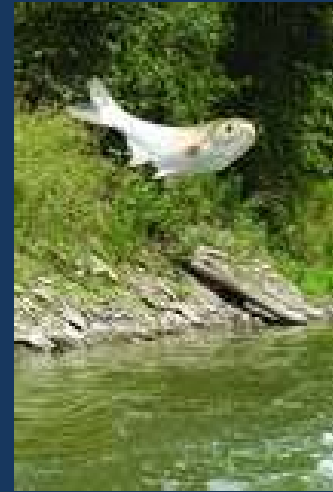
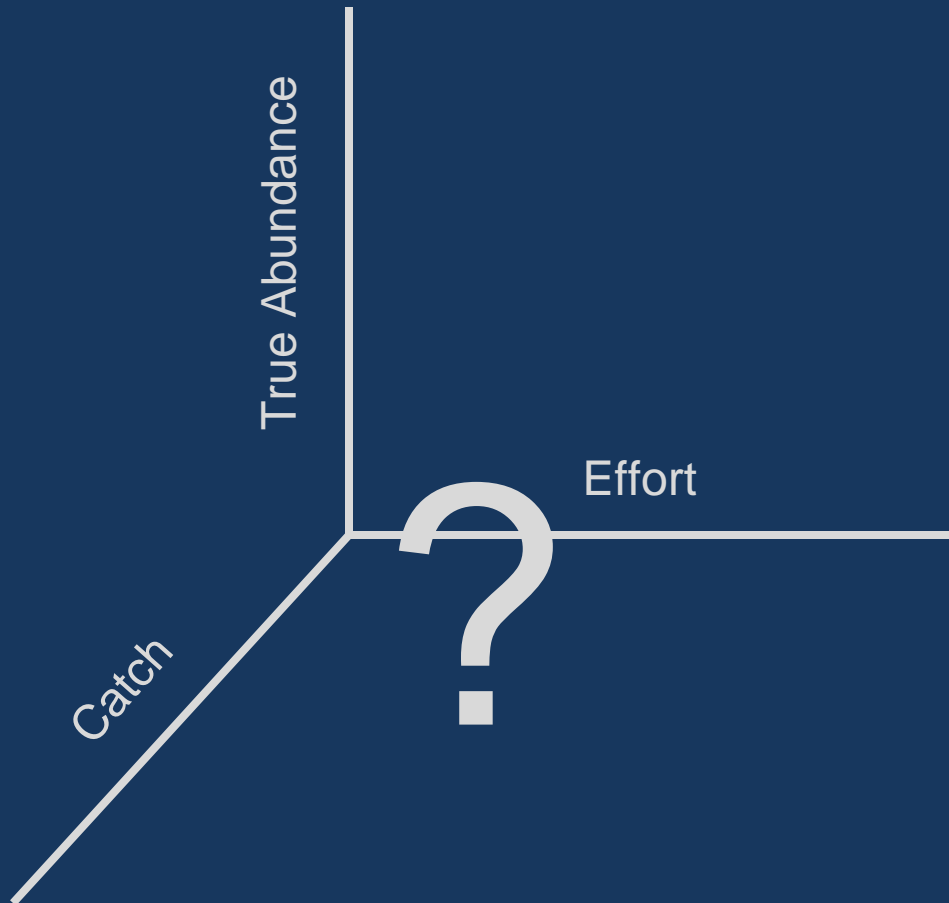
- Long-term Resource Monitoring Program (LTRMP), 1989-present
- Standardized fish community sampling using multiple traditional gears (pulsed-DC electrofishing, hoop netting, fyke netting, trawling)
- Long-term Illinois River Fish Population Monitoring Program (LTEF), 1957 – present
- Fixed site fish community sampling using AC electrofishing

Catch Per Unit of Effort



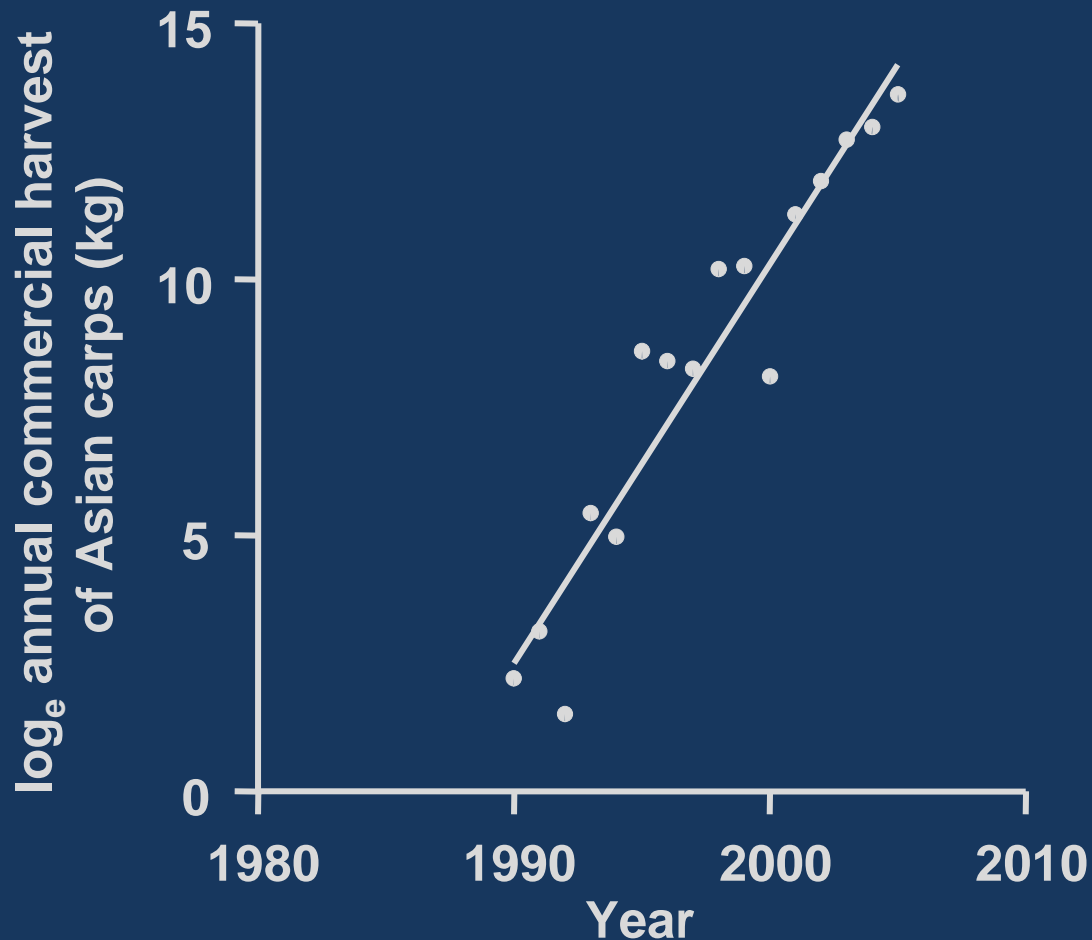
-Relationship may be fish species-specific and dependent upon habitat preferences, available gears, and elusivity of a particular fish species (e.g. jumping behavior of silver carp)

Capture Efficiency of Asian Carp?



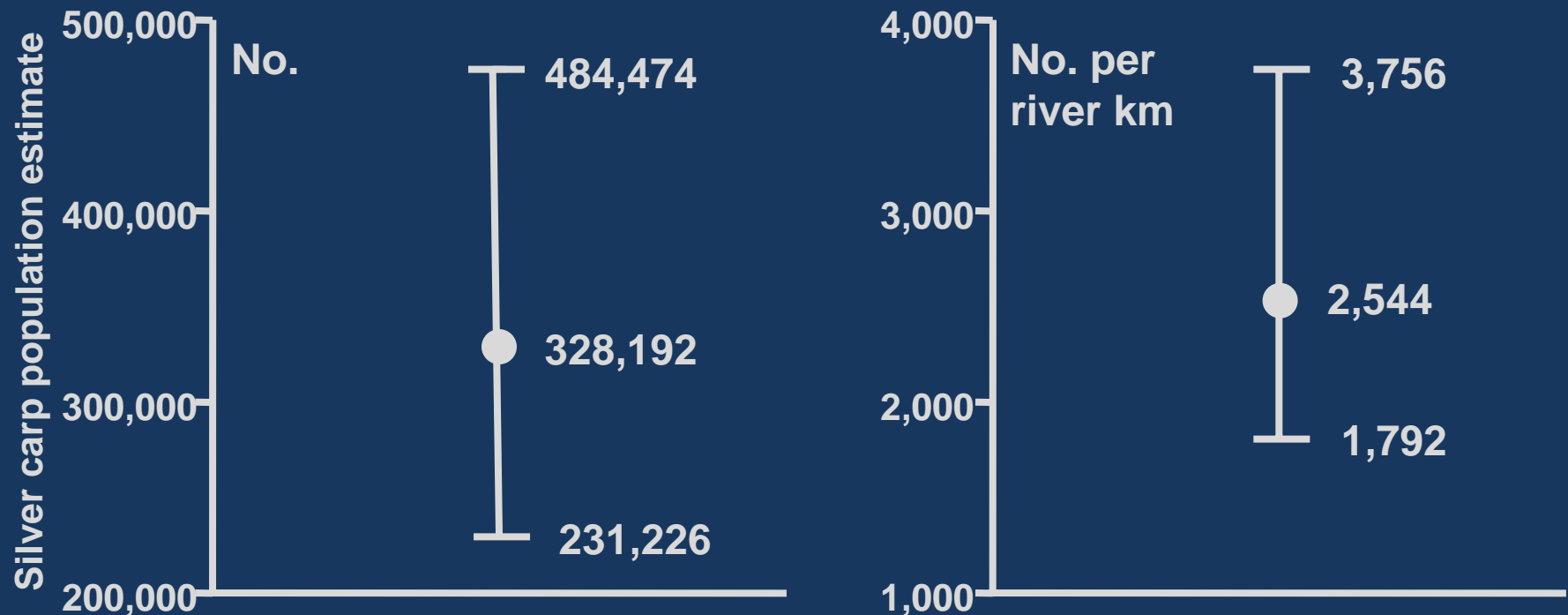


Asian Carp Commercial Landings – IL River



Rob Maher (IDNR) unproofed, draft quality data
Irons et al. (2007)

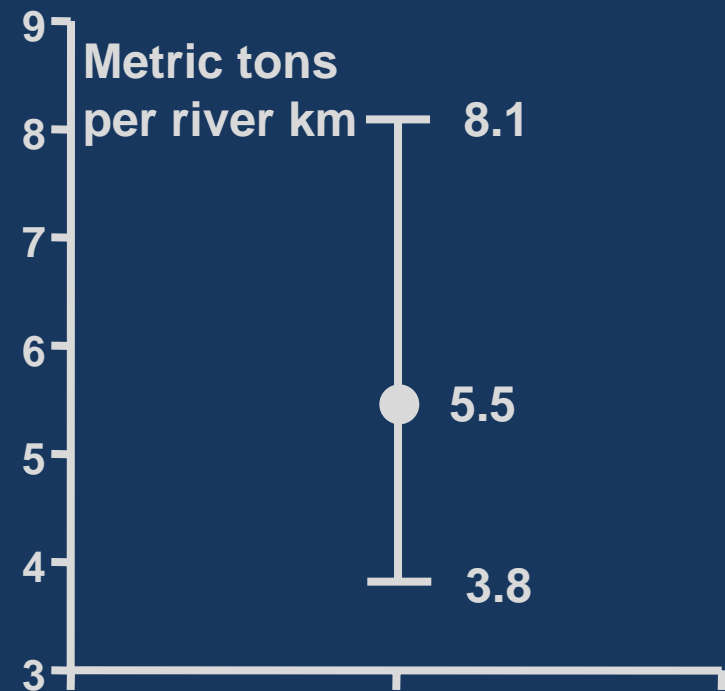
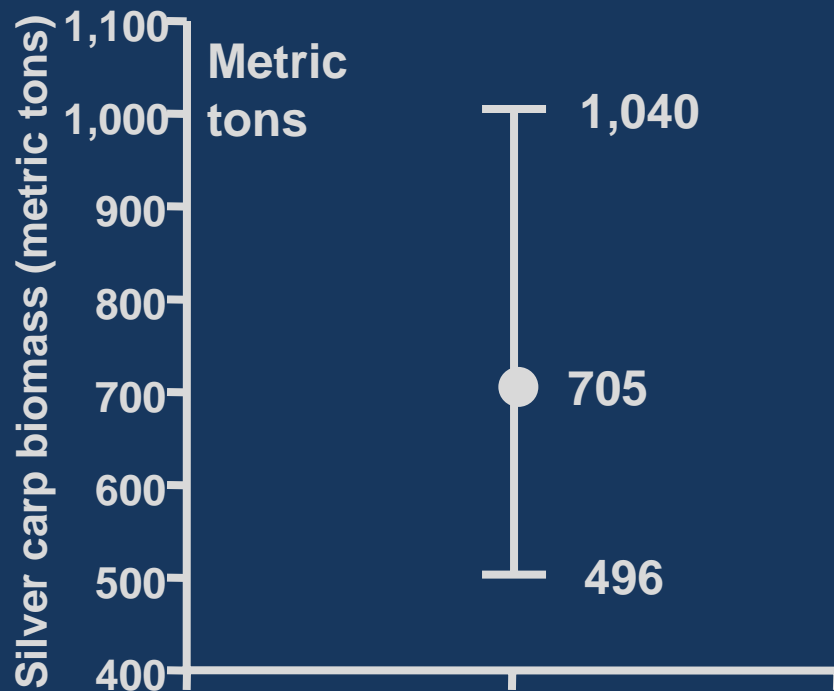
Silver Carp Population Estimate



La Grange Reach, Illinois River

Sass et al. 2010. A mark-recapture population estimate for invasive silver carp (*Hypophthalmichthys molitrix*) in the La Grange Reach, Illinois River. *Biological Invasions* 12:433-436.

Silver Carp Biomass Estimate

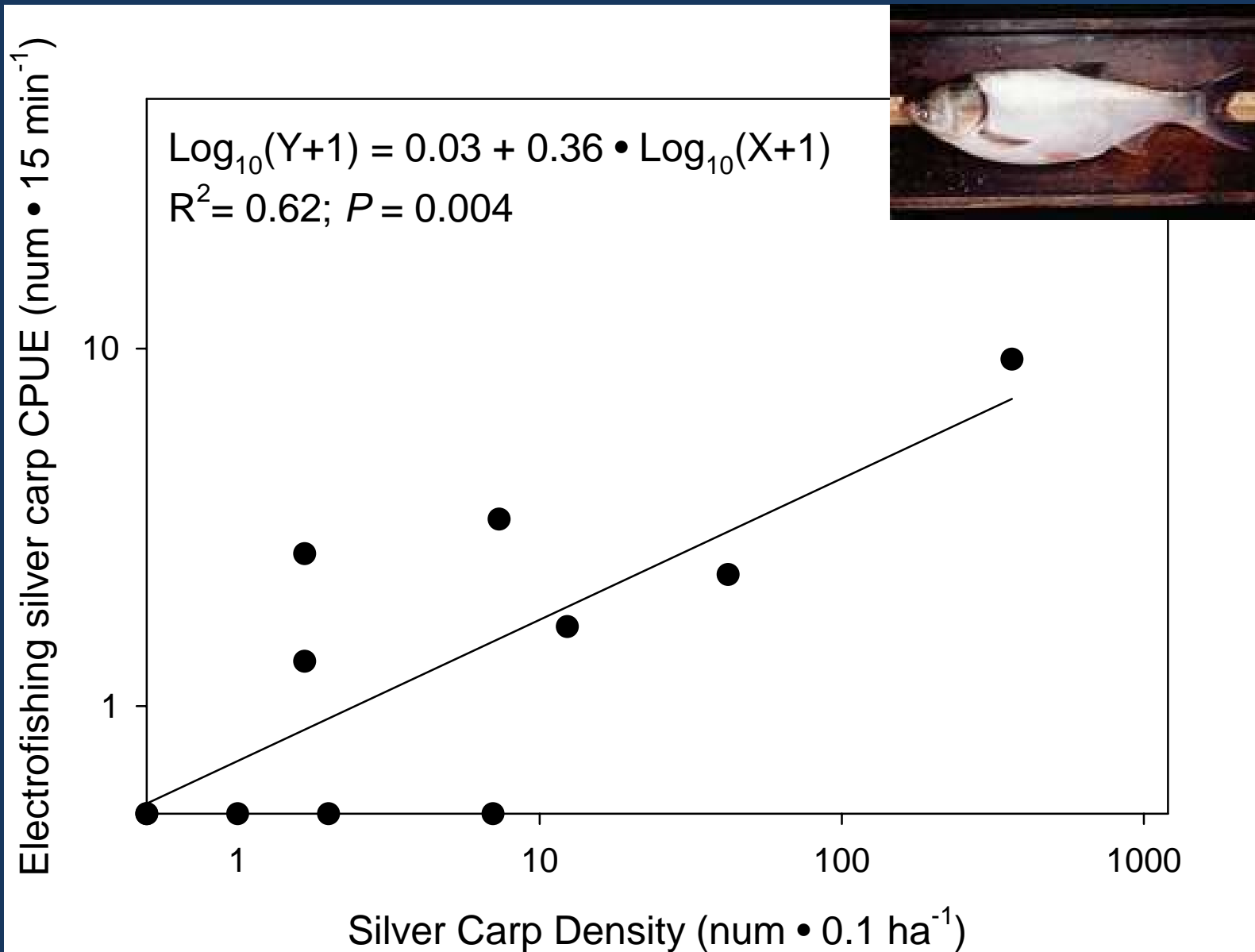


La Grange Reach, Illinois River

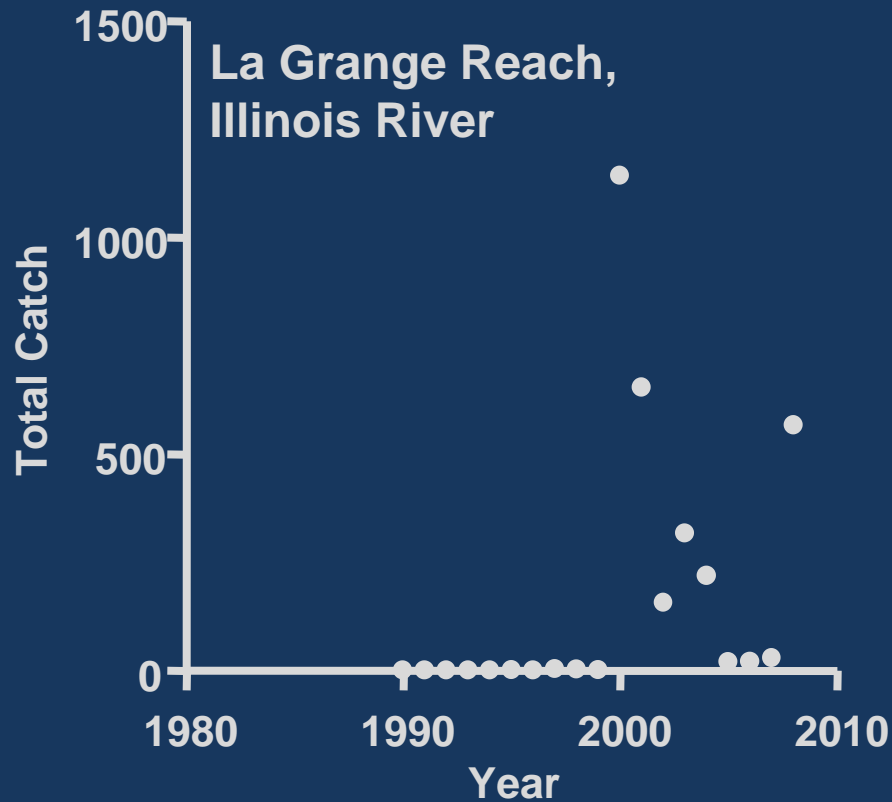
Sass et al. 2010. A mark-recapture population estimate for invasive silver carp (*Hypophthalmichthys molitrix*) in the La Grange Reach, Illinois River. *Biological Invasions* 12:433-436.



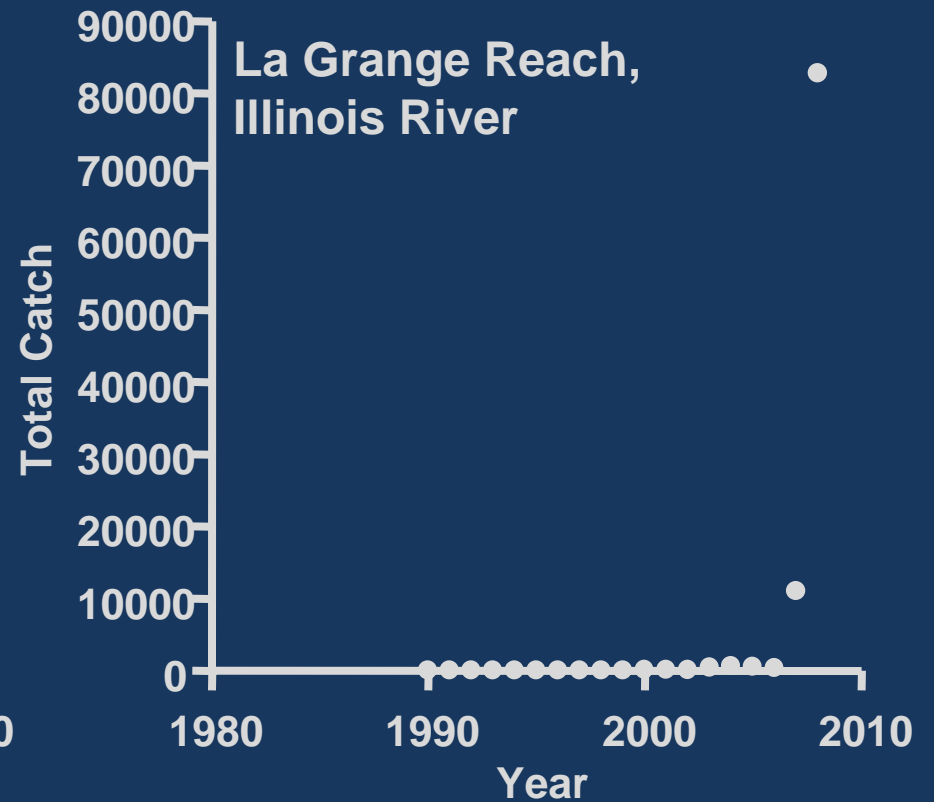
Electrofishing vs. Rotenone



LTRMP Asian Carp Collections (electrofishing, fyke and hoop netting)



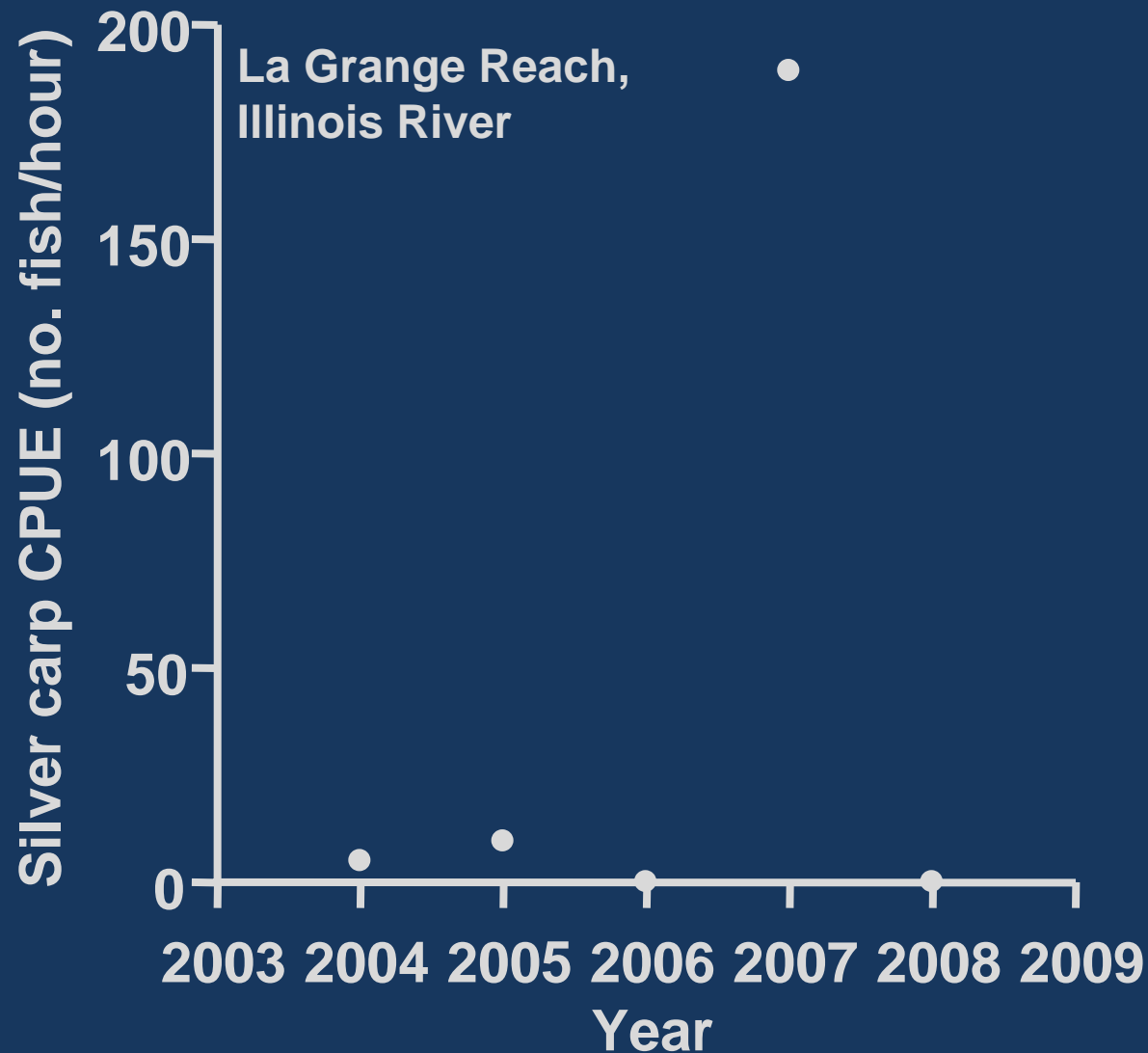
bighead carp



silver carp



LTEF Asian Carp Collections



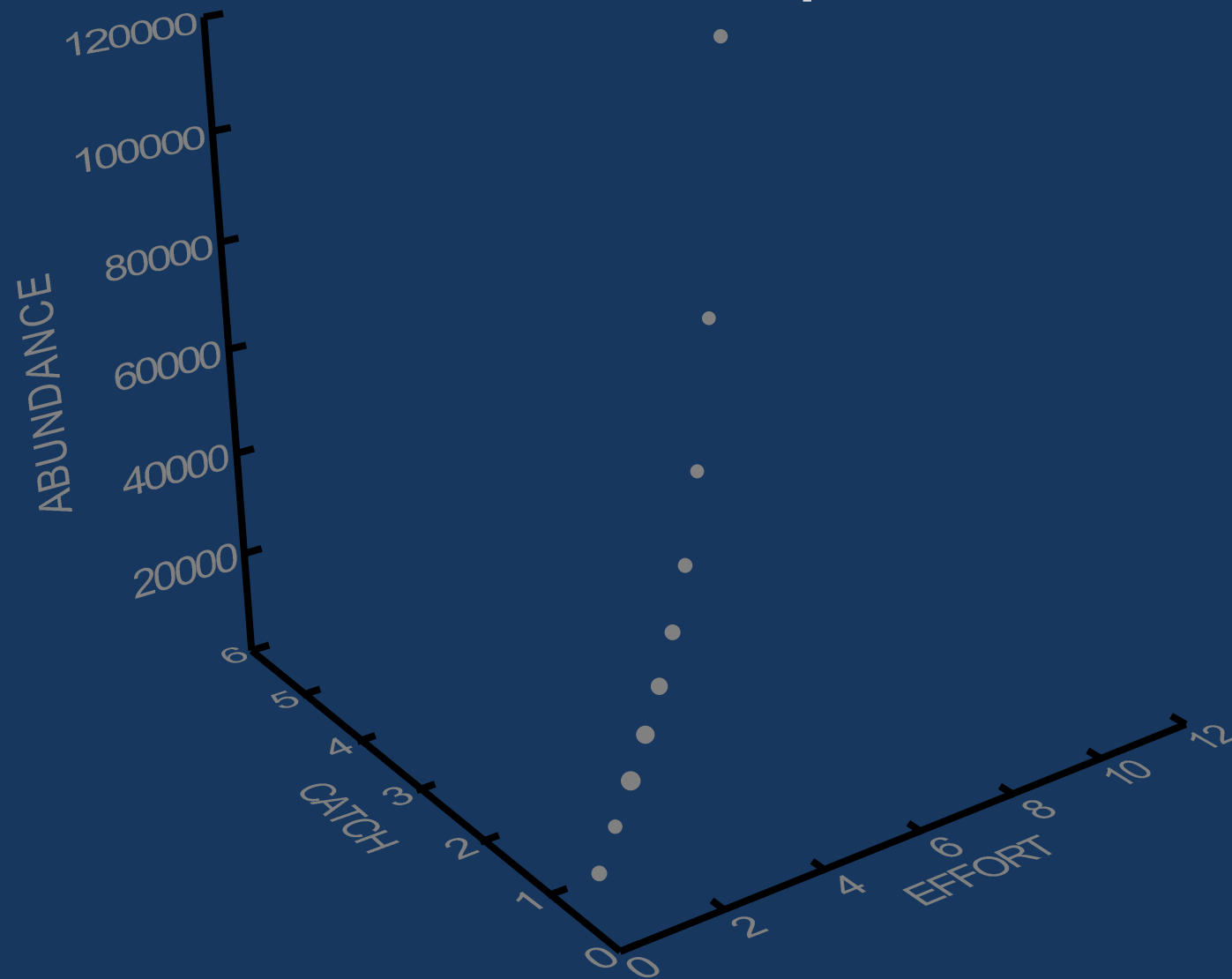
-bighead carp
CPUE = 0 from
2004-2008



Summary

- Capture efficiency of Asian carp using traditional gear is low, particularly for BHCP
- Capture efficiency has also remained low despite increases in Asian carp density over time (gear avoidance and fish-specific behavior)
- The relationship among catch, effort, and abundance needs to be established for early detection monitoring and to inform management responses

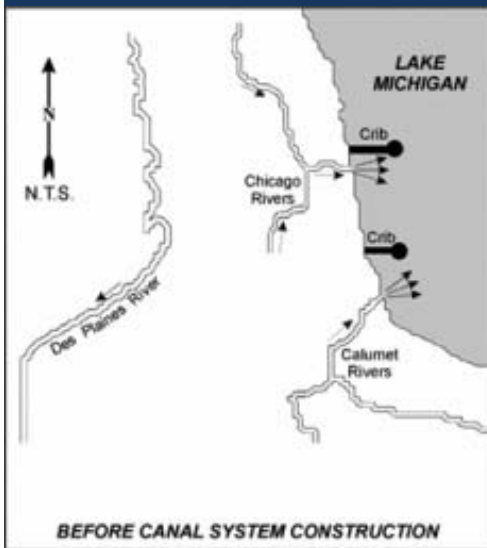
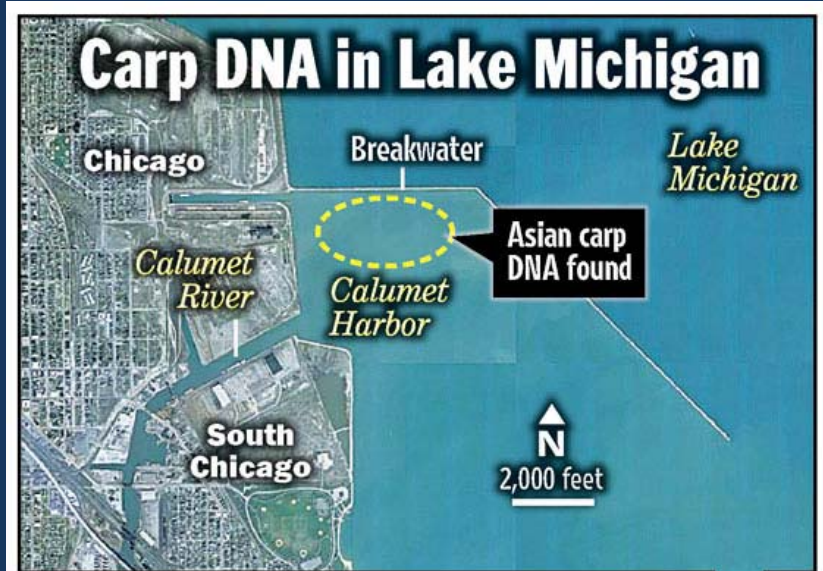
Theoretical Capture Efficiency of Asian Carp



Asian Carp and Lake Michigan

-Positive eDNA detections above electric barriers, January 2010

-June 24, 2010, first physical collection of a single bighead carp upstream of the electric barriers



Sources: Illinois Department of Natural Resources, Army Corps of Engineers Chicago District
Aerial photo courtesy of U.S. Geological Survey

MARTHA THIERRY/Detroit Free Press

Moving Forward

- New methods need to be developed such that a better correlation is established among effort, catch, and abundance for early detection monitoring and eradication efforts
- Environmental DNA?
- Large purse seines or lift nets?
- Hydroacoustics and/or side scan sonar?
- DIDSON sonar?

Acknowledgements

- Staff and technicians of the Illinois River Biological Station and Great Rivers Field Station
- The U.S. Army Corps of Engineers Long-term Resource Monitoring Program on the Upper Mississippi River System and Additional Program Elements
- The U.S. Geological Survey
- Federal Aid in Sportfish Restoration (USFWS)
- Illinois Department of Natural Resources
- Illinois Natural History Survey

Questions?

