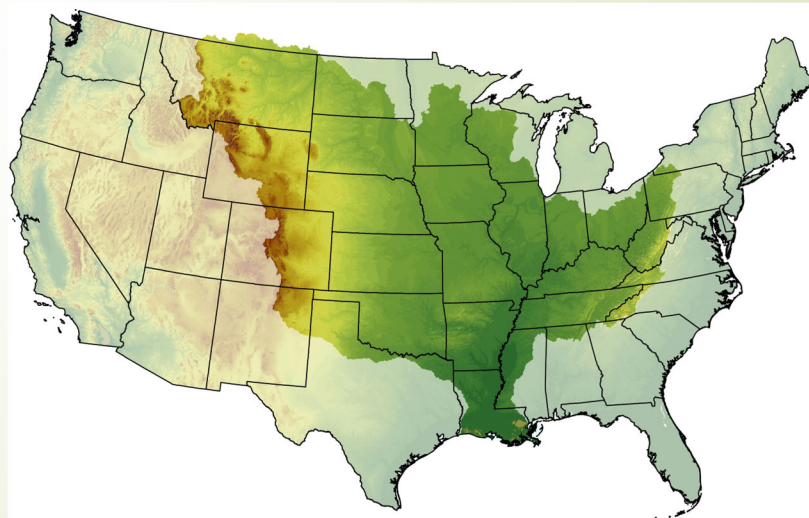




# Supporting Bighead, Black, Grass, and Silver Carp Management and Control in the Mississippi River Basin

Duane Chapman, U.S. Geological Survey  
Greg Conover, U.S. Fish and Wildlife Service





# Mississippi River Basin Panel Formation

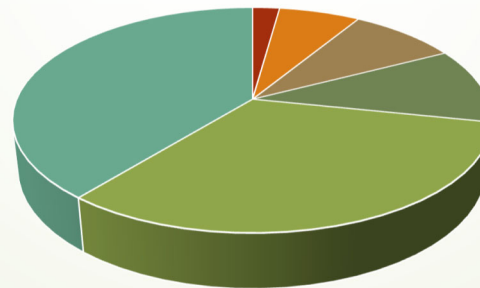
- Mississippi Interstate Cooperative Resource Association (MICRA) invited to host the MRBP in 2001
  - 28 states with fisheries management jurisdiction in the Mississippi River Basin
  - USFWS, USGS, BOR, TVA, and two tribal members
  - Coordinate interjurisdictional fisheries management
  - Aquatic Nuisance Species Committee
- MRBP organizational meeting July 2003
  - 40 attendees
  - Symposium on ANS problems and issues in the Mississippi River Basin
  - Field trip to St. Croix River
- MICRA coordination support





## “Most Troublesome” ANS in Mississippi River Basin

- 2003 survey of 28 MICRA member states
  - Present and creating problems in the state
  - Present and creating problems in the state, but not yet in MRB watershed
  - Not yet in state, but considered a major threat should it become established
- 46 total organisms identified



■ Mammals (1)	■ Microorganisms (3)
■ Crustaceans (4)	■ Mollusks (5)
■ Fish (15)	■ Plants (18)



## “Most Troublesome” ANS – 15 Fish (2003)

### ■ **Black Carp**

- 4 states: present and creating problems
- 4 states: not present but considered a major threat

### ■ **Bighead Carp**

- 12 states: present and creating problems
- 2 states: not present but considered a major threat

### ■ **Silver Carp**

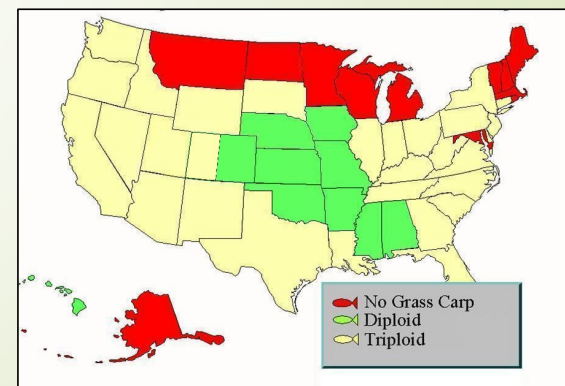
- 9 states: present and creating problems
- 2 states: not present but considered a major threat

### ■ **Common Carp**

- 15 states: present and creating problems

### ■ **Grass Carp**

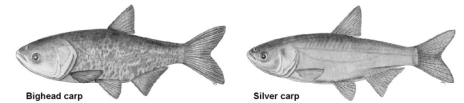
- 7 states: present and creating problems
- National Plan (2007) state regulations data
  - 10 diploid / 29 triploid / 12 prohibit





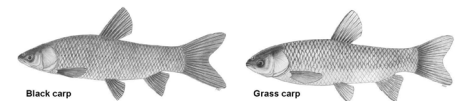
# Management and Control Plan for Bighead, Black, Grass, and Silver Carps

- 2002: USFWS requested to develop national plan
- 2004: Invasive Carp Working Group
  - Many MRBP members actively participated
- 2004: Initial Working Group meeting
- 2004: MRBP 3<sup>rd</sup> meeting held in conjunction with the Invasive Carp Working Group meeting
- 2007: National Plan approved for implementation
  - Common priority among many MRBP members
- MRBP unique role to support coordinated basin-wide implementation



## Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States

*Submitted to the Aquatic Nuisance Species Task Force  
Prepared by the Asian Carp Working Group  
October 2007*





# MRBP Contributions to ANS Task Force Strategic Plan Goals (Re: Invasive Carp)

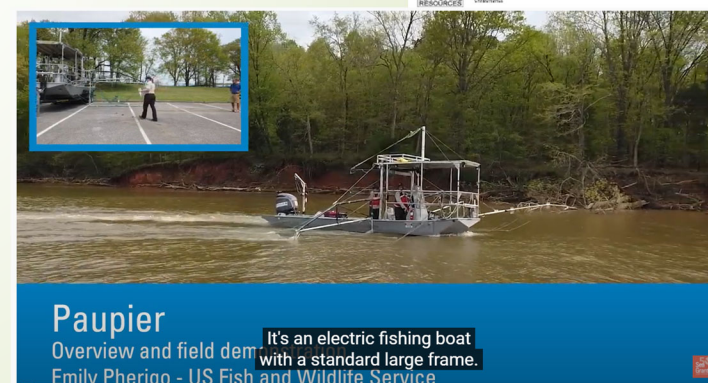
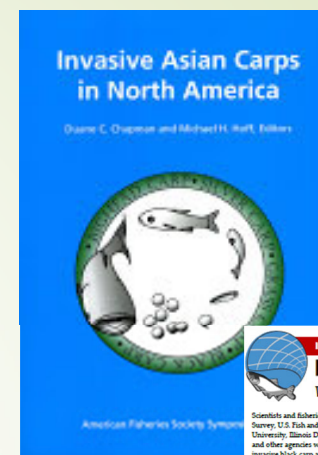
- Invasive carps are ONE priority of MRBP
  - Important but not all-consuming
  - MRBP carp work addressed all ANSTF goals
  - Invasive-carp-related work is also tied to the National Plan
  - Consistent, continual efforts
  - MRBP has been vital for agency coordination, information sharing





# Goal: Coordination

- International Asian Carp Symposium, and published proceedings
  - Idea for symposium originated in MRBP
  - MRBP provided more than half the funding for both symposium and proceedings
- Identification of participant needs and conception of ways forward
  - MRBP discussions helped start black carp research and attention
  - Invasive carp sampling methods workshop
  - Invasive carp in barge ballast water
  - eDNA for managers workshop





# Goal: Prevention

- Paylakes survey and presentations
- Life/Prayer Releases
- Carp Larvae in Tug/Barge Ballast Water
- Evaluation of USFWS Grass Carp Triploid Certification Program
  - MRBP RFP attempted
  - Led by MICRA, with MRBP support and evalation of report.
  - MRBP organized steering committee
- Helping ANS specialists to prioritize

## The use of grass carp (*Ctenopharyngodon idella*) in the United States:

Production, triploid certification, shipping, regulation, and stocking recommendations for reducing spread throughout the United States



Report to the U.S. Fish and Wildlife Service  
From the Mississippi Interstate Cooperative Resource Association

February 2015

Agreement #: F12AP00630



Management of Biological Invasions (2021) Volume 12 Article in press

Special Issue: Proceedings of the 21<sup>st</sup> International Conference on Aquatic Invasive Species  
Guest editors: Sarah Hickey, Marissa Johnson, Brenda Koenig and Linda Shree

CORRECTED PROOF

### Research Article

#### Qualitative interviews of practitioners of Buddhist life release rituals: residing in the United States: implications for reducing invasion risk

Tim Campbell<sup>1,2\*</sup>, Bret Shaw<sup>3,4</sup>, Evelyn Hammond<sup>5</sup>, Luye Bao<sup>6</sup>, Shiya Yang<sup>7</sup>, Peter Jurich<sup>8</sup> and Sara Fox<sup>9</sup>

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<sup>2</sup>University of Wisconsin Department of Extension Natural Resources Institute, 445 Henry Mall, Madison, WI 53706, USA

<sup>3</sup>University of Wisconsin Department of Life Sciences Communications, 1545 Observatory Drive, Madison, WI 53706, USA

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Shiyayang@uwis.edu (SY), peterjurich@gmail.com (PJ), gluc21@uwis.edu (GP)

<sup>\*</sup>Corresponding author

**Citation:** Campbell T, Shaw B, Hammond E, Bao L, Yang S, Jurich P, Fox S (2021) Qualitative interviews of practitioners of Buddhist life release rituals residing in the United States: implications for reducing

#### Abstract

The release of live organisms into the environment by Buddhists for religious reasons, known as "life release", is a less understood pathway of biological invasions. To better understand the activity as it is practiced in the United States, we conducted more than 400 Buddhist groups and interviewed 11 individuals during late 2018 and early 2019 to discuss the practice. The information obtained from this small sample included the nature of the ritual, their success in terms of impact and health, potential low-risk alternatives to the practice, and how to best engage with this community moving forward. Practitioner's motivations and understanding of the practice are similar to previously published work, though with a stronger emphasis on saving lives. Practitioners use release animals that they believe are likely to survive, not harmful to the local environment, and are easy to obtain, including waterbunnies, crickets, and minnows. Release events are often held in





# Goal: Early Detection and Rapid Response

- 2008 RR Tabletop Exercise funded by MRBP
  - Used snakehead for example but relevant to carps
  - Likely influenced 09 Invasive Carp workgroup RR Plan
  - Certainly influenced MRBP 2010 model plan
- 2010 Model Rapid Response Plan and fish addendum
  - One-stop shopping to get started responding
  - GLP regional response plan, probably others, were based on this product
- eDNA for Managers Workshop
  - What questions can be answered effectively (for carp and other ANS)
  - Best practices to achieve eDNA sampling goals
  - Ok, you've detected DNA – what does it mean?

## A Model Rapid Response Plan for Aquatic Invasive Species



Miss  
on A

## Rapid Response Protocols for Aquatic Invasive Fish



Mississippi River Basin Panel  
Aquatic Nuisance Species

September 2010





# Goal: Control and Restore

- Marketing Summit Financial Support and Participation
- Other support of Marketing Activities
  - Multiple Presentations by Entrepreneurs
    - Bait
    - Value added products
  - Flying Fish Great Dish video
    - How to deal with the bones in Invasive Carp filets

## Sampling/Harvest workshop

- Included Mass Harvest elements





## Goal: Research

- Providing ANS coordinators with assessments of available tools
  - Fluegg, CO<sub>2</sub> barriers,
- "Identifying Target Spawning Populations through Genomic Analysis for Directed Management" project underway
- Water Chemistry to support otolith microchemistry studies
  - Completed, data published in 2022
- Barge transport of carp larvae
- Survey of Paylake Operators and states with Paylakes
  - Reported out at MRBP meeting
- Life Release research and publications

### Final Report: "Survivability of Asian Carp in Barge Tanks in the Illinois River"

Distribution Statement A: Approved for public release; distribution is unlimited.

March 2012

### Water Transport during Normal Operations of Towboats and Barges in the Illinois River

Distribution Statement A: Approved for public release; distribution is unlimited.

January 2011



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<sup>1</sup>University of Wisconsin Sea Grant Institute, 1275 Willow Drive, Madison, WI 53706, USA

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\*Corresponding author

**Co-Editors' Note:** This study was submitted in relation to the 21<sup>st</sup> International Conference on Aquatic Invasive Species held in Montreal, Canada, October 27–31, 2019 (<http://www.icas.org/2019/program.html>). This conference has provided a venue for the exchange of information on various aspects of aquatic invasive species since its inception in 1990. The conference continues to provide an opportunity for dialog between academia, industry and environmental regulators.

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# Goal: Outreach and Education

- Production and sharing of outreach materials
  - Funding watch cards
  - Sharing of different state products
  - Flying Fish, Great Dish
- Education/communication with religious leaders associated with prayer releases
- Sampling/Harvest workshop





## Conclusions

- MRBP has been a catalyst for identifying and addressing needs
  - Some but not all work is completed directly by MRBP
  - Priorities identified by the panel are often addressed by federal or state agencies or MICRA or another entity, and the information then shared with MRBP members
  - Sometimes accomplished with MRBP coordination, sometimes with seed funding and some cases MRBP has contributed most funding
  - MRBP is an important mechanism for technology transfer and provision of needed information to MRBP members



## Conclusions

- MRBP continues to be a valuable forum for advancing coordination, collaboration, information, and information sharing on invasive carp management and control, and continues to set and advance priorities of the members
- Invasive carp are an example of one major ANS challenge in the Mississippi River Basin, and MRBP has provided many valuable contributions to carp management and control, both in the basin and nationally.
- There are other ANS priorities in the basin and MRBP is focused these broader ANS needs, not solely on invasive carps.