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Aquatic Nuisance Species Coordinator

Kansas Department of Wildlife and Parks

Nov 17, 2022

Aquatic Nuisance Species (ANS) background

- **What are ANS (or AIS)**
  - Federal definition: nonindigenous species that threaten the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters
  - More simply: Non-native species that threaten the water resources of Kansas
  - **"Biological Pollution"**
- **Federal Legislation that guides ANS/AIS activities**
  - Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
  - National Invasive Species Act of 1996
- **Kansas ANS plan approved by governor in 2005**
  - ANS Coordinator position created in 2007
- ANS were recently added to the State Water Plan

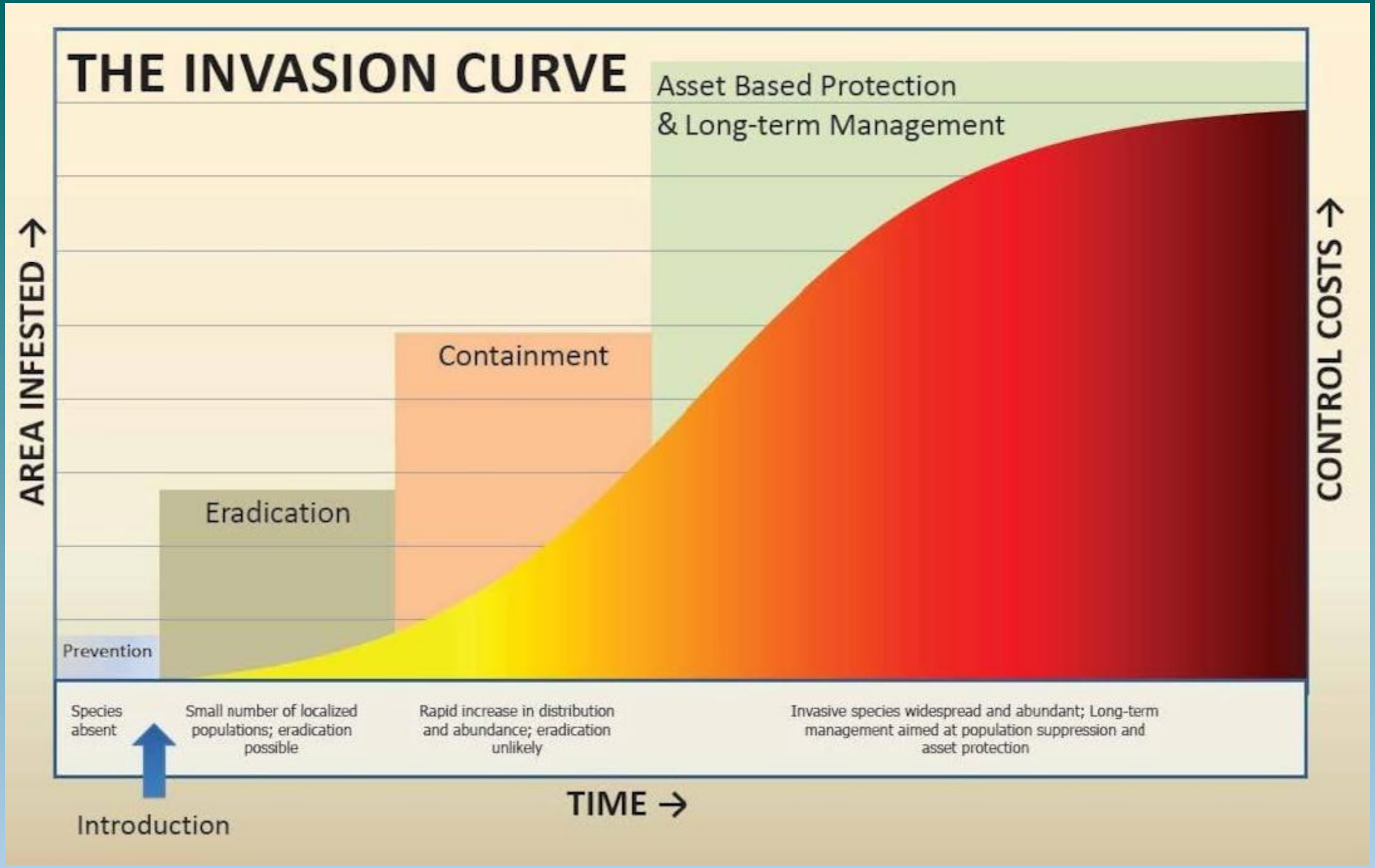
Ecological, Economic, Recreational, and Quality of Life Impacts

- Disrupt balance of ecosystems
  - Invasive species don't have to cope with the predators or diseases from their native range
- Declines in native species
  - 50+% of threatened or endangered species are directly impacted by invasive species
- Loss of habitat
  - Decreased sportfish and wildlife populations – decreased fishing/hunting opportunity
- Decreased recreation at waterbodies
  - Reduce usable acres of water
  - Clog boat motors
  - No longer able to swim

Impacts to People

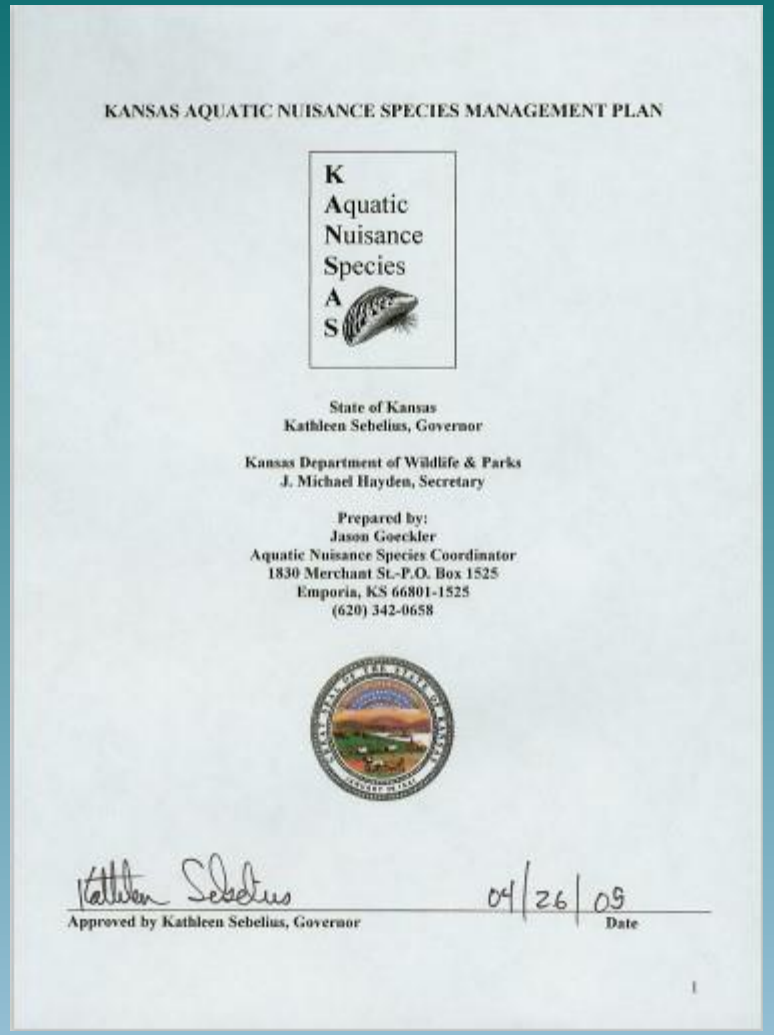
Pathways - How do ANS Spread?

- ANYONE or ANYTHING moving water, mud, animals or vegetation between waterbodies is at risk of spreading ANS
- *Some* examples:
  - Boats/trailers
  - Bait buckets
  - Ballast water in large ships
  - Interbasin transfers
  - Fire suppression equipment
  - Ceremonial releases
  - Agency/University activities
  - Construction equipment
  - Irrigation systems
  - Pet releases
  - Seaplanes
  - Raw water line repair equipment
  - Intentional stockings


THE INVASION CURVE
Asset Based Protection
& Long-term Management
Containment
Eradication
Prevention
AREA INFESTED →
CONTROL COSTS →
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and asset protection
Introduction
TIME →

ANS Program

- **ANS Program Goals:**
  - To **prevent new introductions** of ANS to Kansas
  - To **prevent dispersal** of established populations of ANS into uninfested waters of Kansas
  - To **eradicate or control** to minimize the adverse ecological, economic, social, and public health effects of ANS in an environmentally sound manner
  - To **educate** all aquatic users of ANS risks and how to reduce the harmful impacts
  - To **support research** on ANS in Kansas, and develop systems to disseminate information



KANSAS AQUATIC NUISANCE SPECIES MANAGEMENT PLAN

K
Aquatic
Nuisance
Species
A
S

State of Kansas
Kathleen Sebelius, Governor

Kansas Department of Wildlife & Parks
J. Michael Hayden, Secretary

Prepared by:
Jason Goeckler
Aquatic Nuisance Species Coordinator
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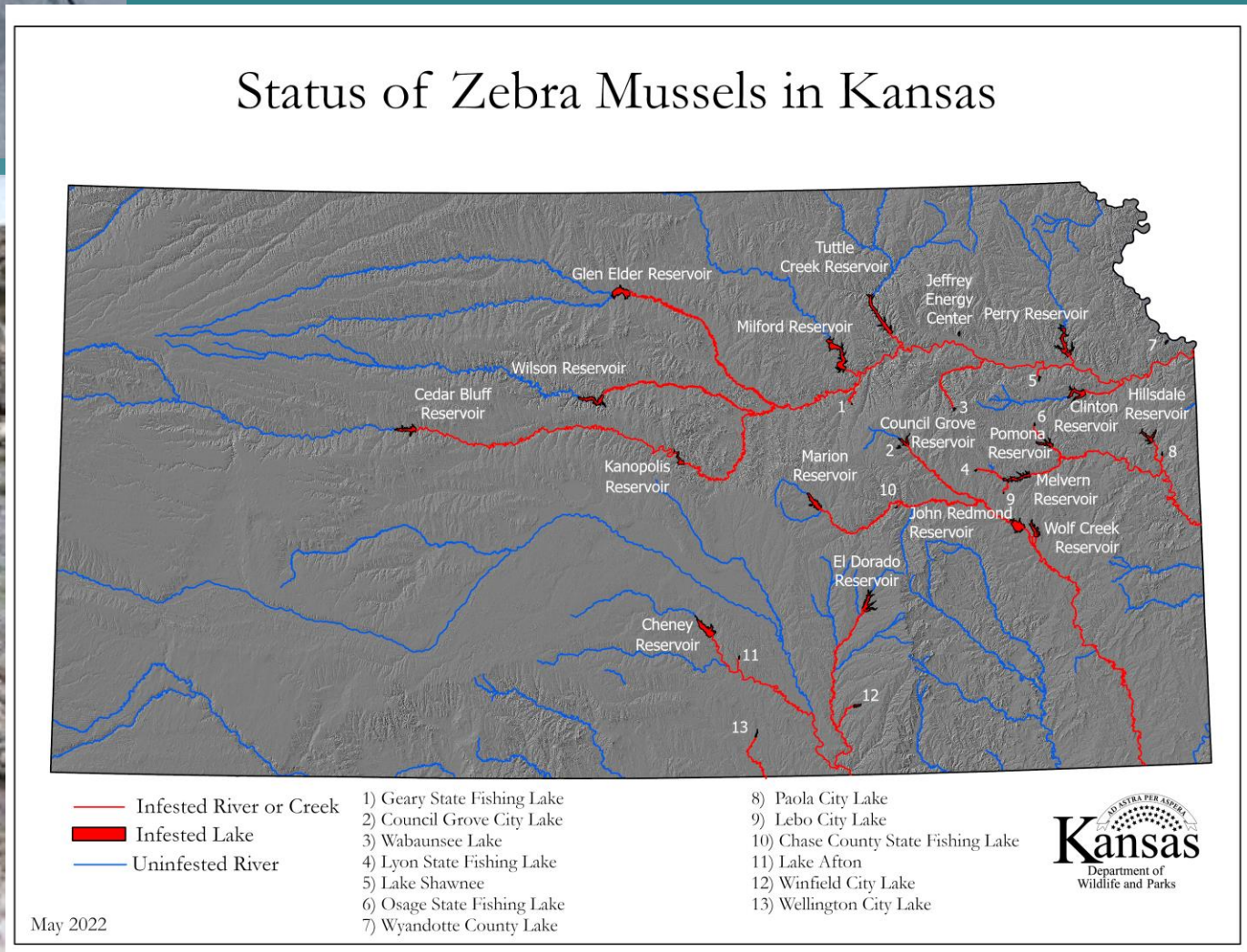
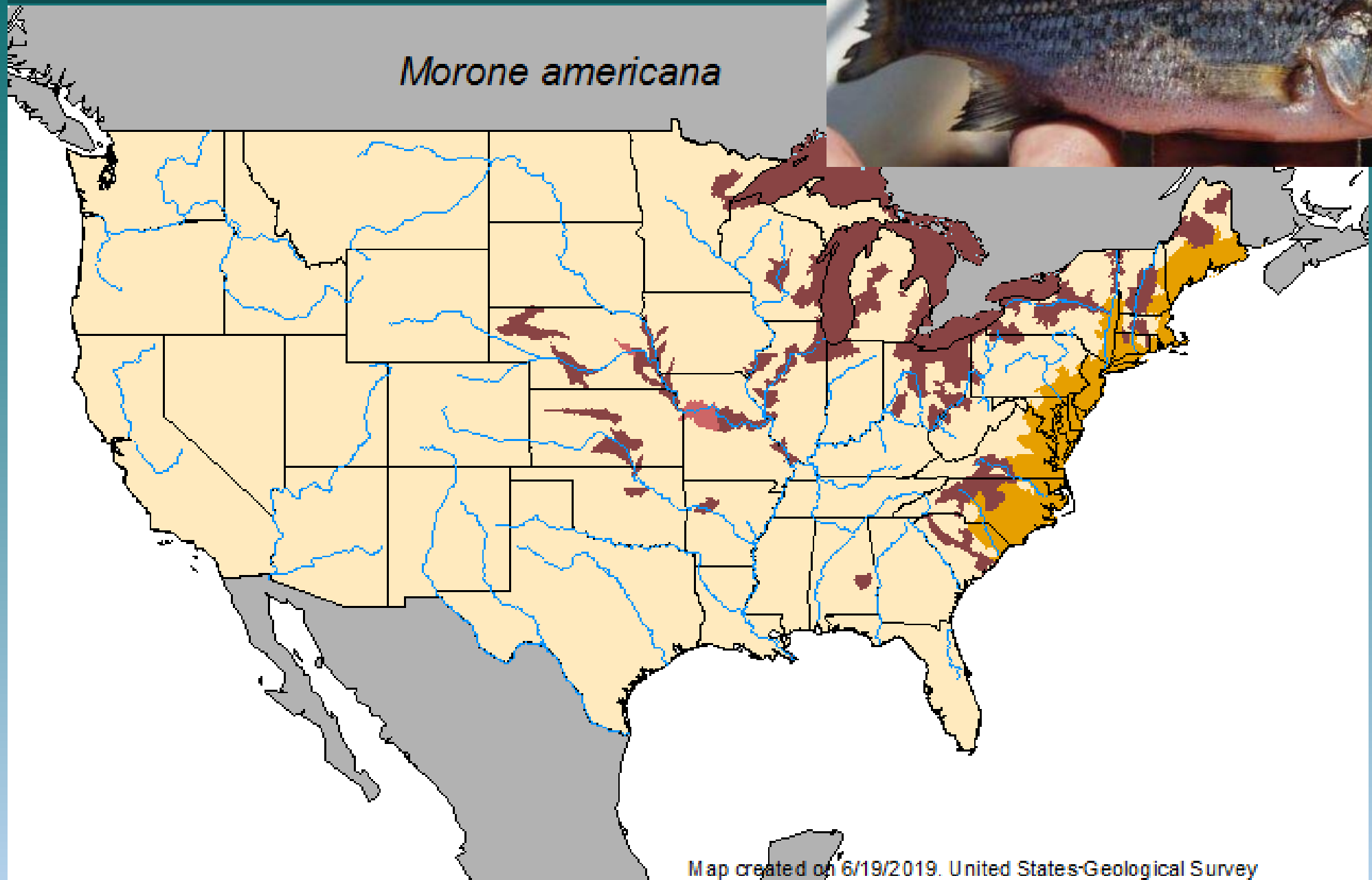
Kathleen Sebelius
Approved by Kathleen Sebelius, Governor

04/26/09
Date

Zebra Mussel

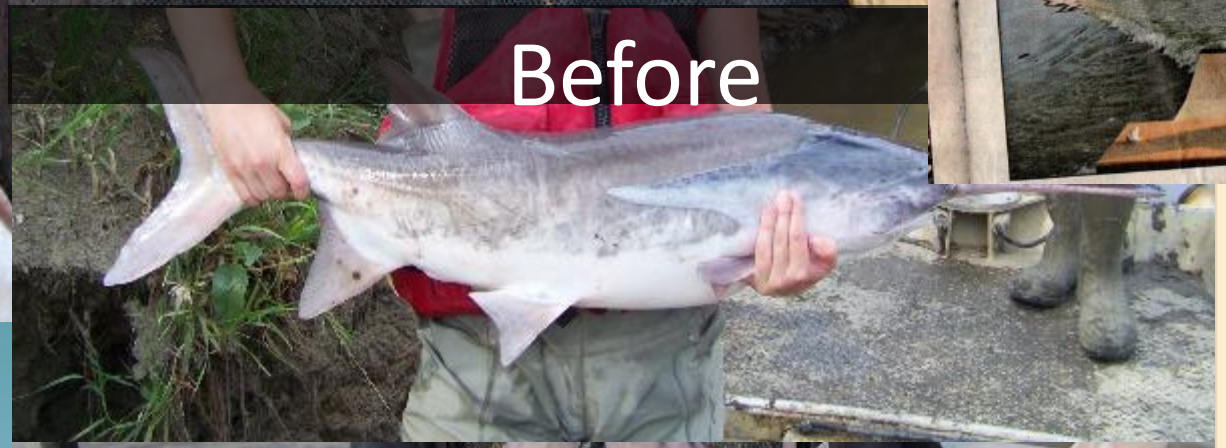


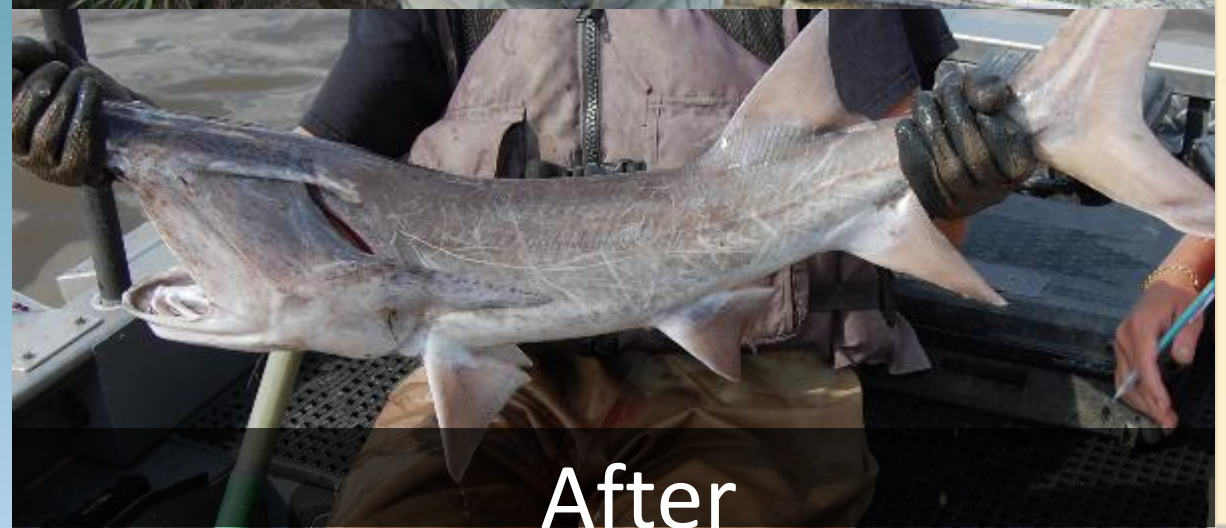
White Perch


Morone americana
Map created on 6/19/2019. United States Geological Survey

Invasive (Asian) Carp

Before





After

Silver Carp

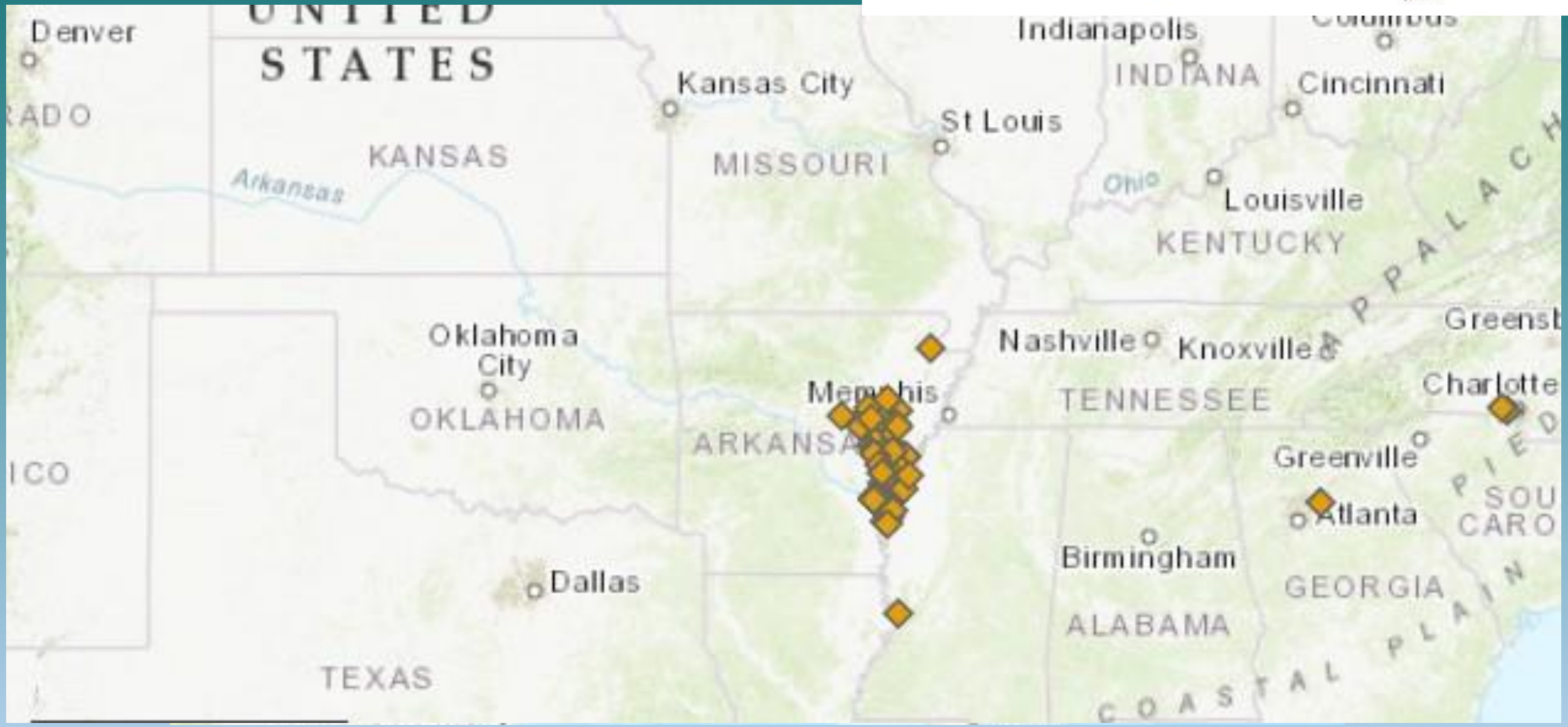
Hypophthalmichthys molitrix

Map created on 3/3/2018. United States Geological Survey

Black Carp

© Leo G. Nico

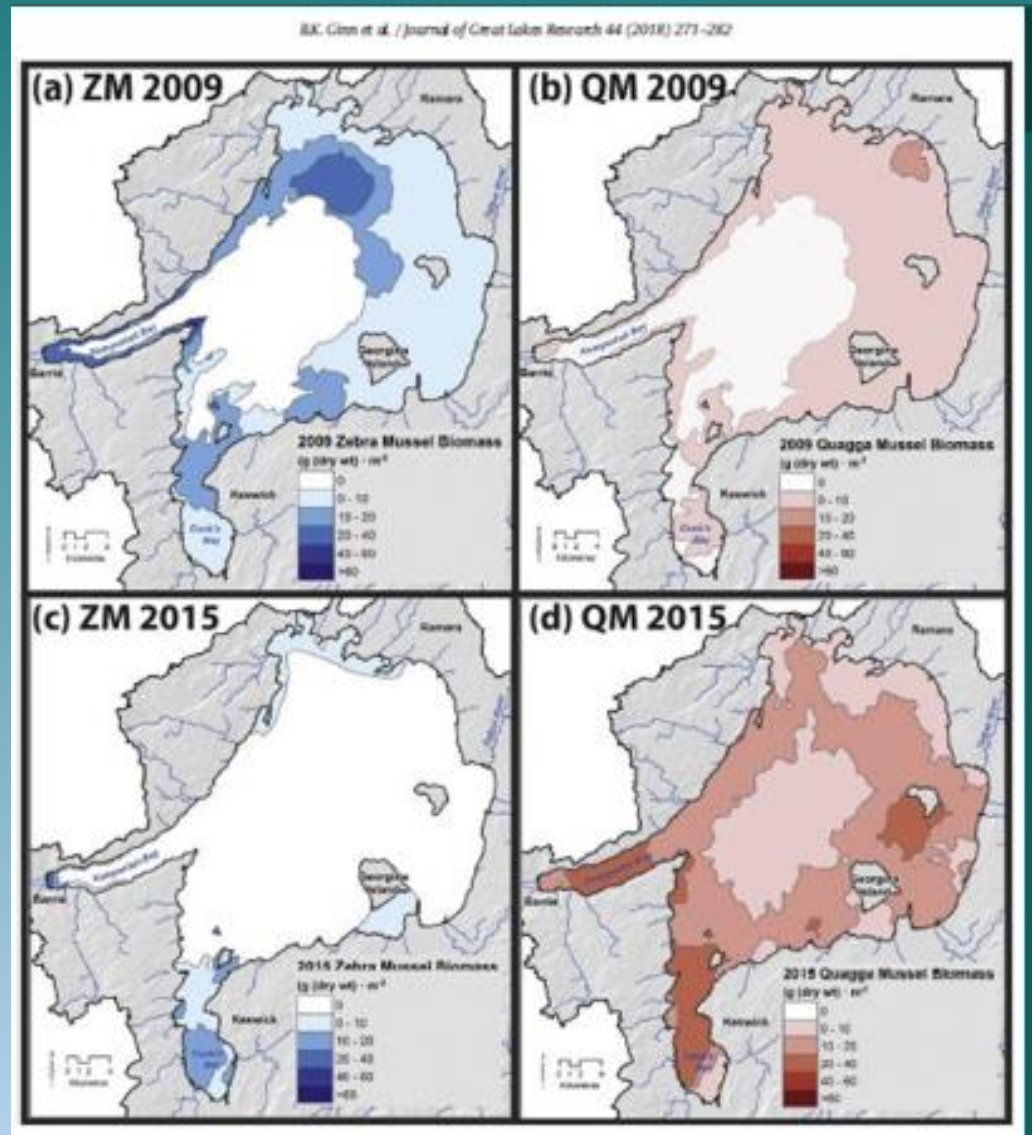
Northern Snakehead



Rusty Crayfish

- **Found in McPherson State Fishing Lake – July 2021**
- **First detection in Kansas**
- **Found during crayfish research project to develop a protocol for statewide crayfish sampling in lakes**

Quagga Mussel - Amistad Reservoir, Texas



Quagga Mussel

These surveys showed a large shift in Dreissenid dominance from zebra mussels (84.3% of the dreissenid population) in 2009 to quagga mussels (88.5% of population) in 2015. **Of particular note, was the expansion of quagga mussels onto the mud/silt substrates of the profundal zone, previously not available to zebra mussels.**

Quantifying a shift in benthic dominance from zebra (Dreissena polymorpha) to quagga (Dreissena rostriformis bugensis) mussels in a large, inland lake. Journal of Great Lakes Research · January 2018

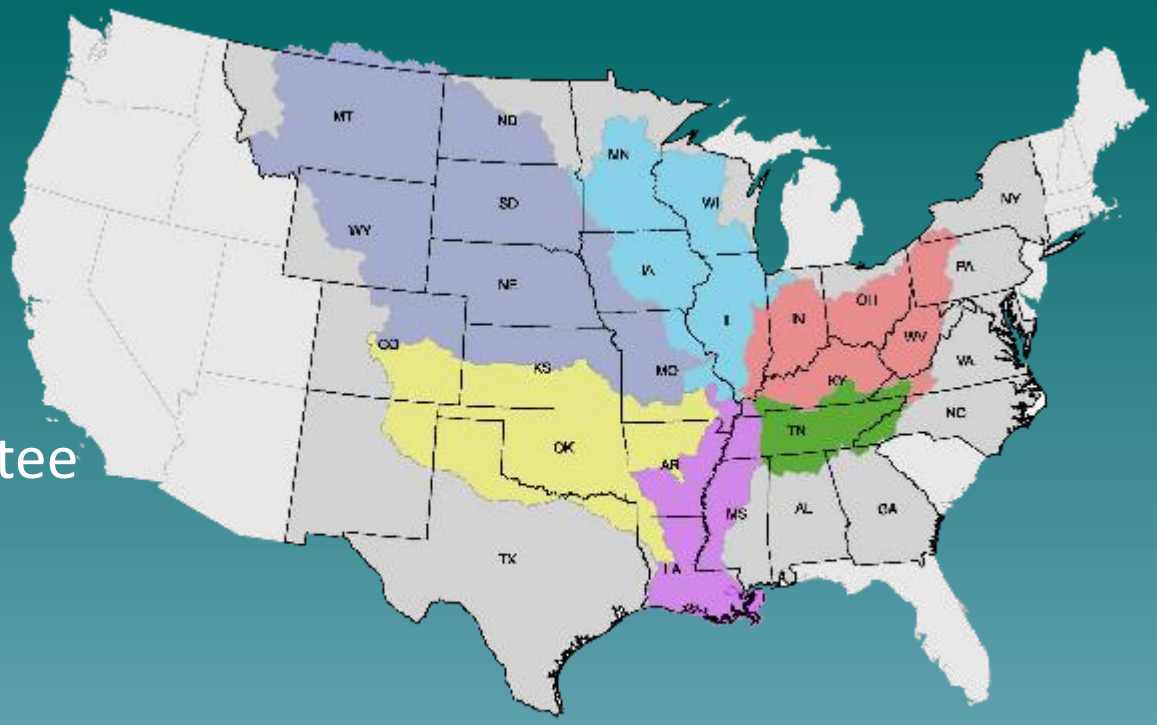
Zebra Mussels in Moss Balls 2021

- **250 locations visited/contacted in Kansas within 3 weeks to remove product**
- **Larger issue of organisms in trade**
  - **Now states finding unknown crayfish species in pet stores**
  - **National priority**
- **We continue to participate in *Don't Let it Loose* campaign to address this issue, but more needs done**

Monitoring, detection, and prevention

- Zebra mussel monitoring at 110 lakes
- Fish health sampling at state and private fish hatcheries
- Baitshop inspections at ~200 baitshops statewide
- eDNA sampling for invasive carp in Upper Kansas River
- Assess the risk of invasive carp spread in MO River basin via live bait trade
- Crayfish sampling development
- Respond to public reports for ANS of all types
- ANS information provided to all registered boat owners
- Continued partnership with pet shops through “Don’t Let it Loose” program

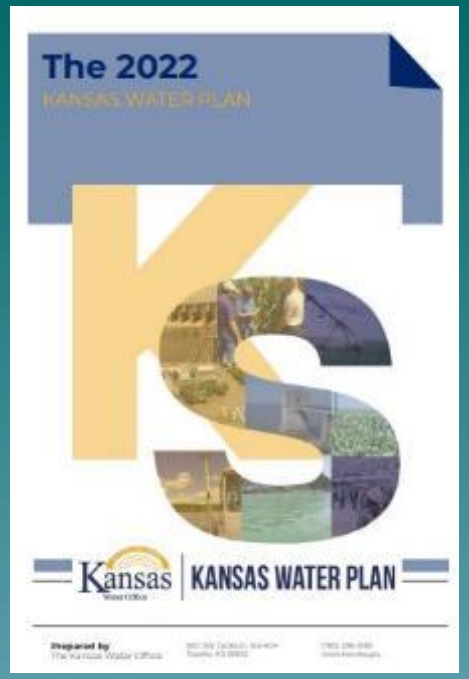
Coordination



- Mississippi River Basin Panel on ANS
- Western Regional Panel on ANS
- MO River Basin Invasive Carp Technical Committee
- Arkansas-Red-White Invasive Carp Partnership
- Western Invasive Species Council
- Western Invasive Species Coordinating Effort
- Association of Fish and Wildlife Agencies, Invasive Species Committee
- Western Association of Fish and Wildlife Agencies, ANA Working Group
- Kansas Dept. of Ag., Cooperative Agricultural Pest Survey
- KDWP ANS Committee
- Kansas Invasive Species Council
- Invasive Carp Advisory Council of Mississippi Interstate Cooperative Resource Association
- North American Invasive Species Management Association

Funding successes and opportunities

- State Water Plan funds received for the first time in 2022
- U.S. Fish and Wildlife Service *Invasive Carp Grant Program* continues to receive support nationally
- U.S. Fish and Wildlife Service *Quagga-Zebra Mussel Action Plan Grant Program* increased in amounts and scope
- U.S. Army Corps of Engineers has received direction and funds to create a cost share program for watercraft inspection and decontamination programs in many river basins of the western US (including Kansas)
- Bureau of Reclamation is increasing ANS funding through *Safeguarding the West* grants
- Infrastructure Bill directs $100 million to Department of Interior to pass to states for invasive species work
- Recovering America's Wildlife Act continues to make progress and could provide $18 million to Kansas Wildlife and Parks for the conservation of America's wildlife, fisheries and habitats, some of which could be directed to ANS efforts

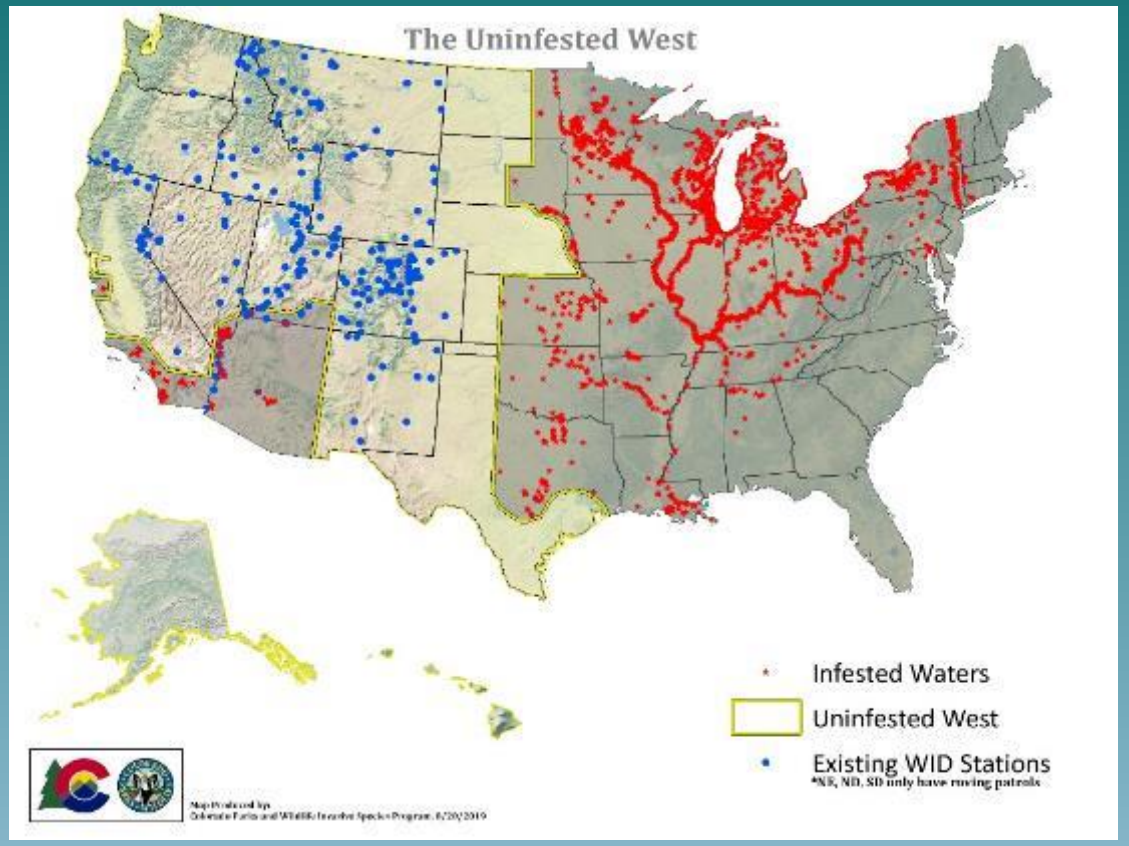


ANS program reorganized and positions added

- Reconfigured an existing split ANS-fish research position to full-time ANS Biologist to lead watercraft inspection and decontamination program implementation, aquatic vegetation management, and to increase Kansas' representation and collaboration in interstate working groups
- Added Carp Biologist position to lead invasive carp removal, monitoring, research, outreach, etc.
- Added Carp Technician position to assist invasive carp projects
- Added additional ANS biologist position to address organisms-in-trade issues, raise ANS awareness through increased and improved education and outreach, implement white perch management, etc.
- All new positions started in September 2022

WID (watercraft inspection and decontamination) update

- Contracting with conservation organization to place inspectors at zebra mussel free NW Kansas reservoirs
- Initiating discussions with other potential partners to implement additional WID locations across the state
- Eligible for USACE cost share program upon completion of “letter report”
- Future efforts
  - Partnerships
  - Clarify authorities and locations of inspections
  - Mandatory inspection



Crayfish Research Project

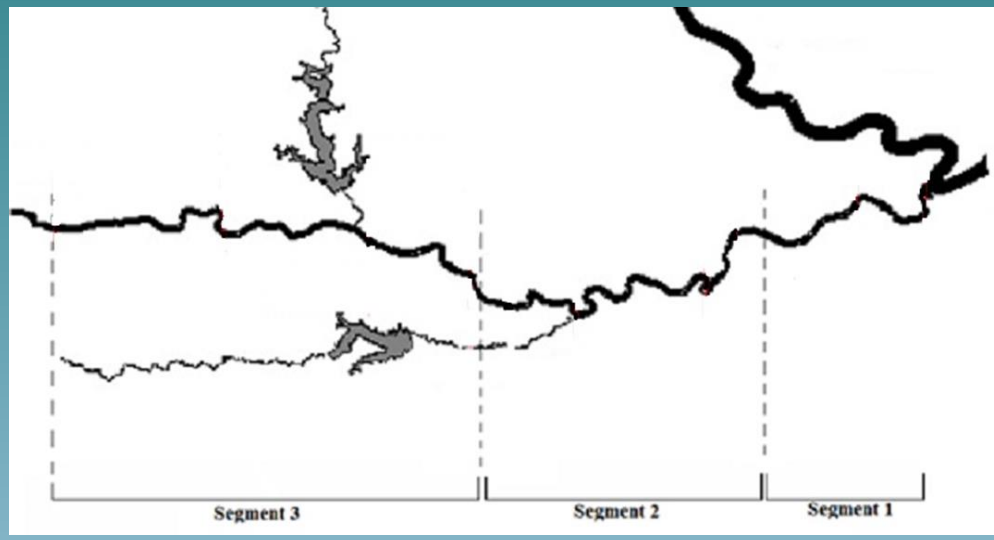
- **Goal is to develop a protocol for statewide crayfish sampling in lakes**
  - Comparing a suite of common sampling techniques to determine the best sampling methods for crayfish assemblages in Kansas lakes and streams
  - Investigating effort requirements needed to detect all species of crayfish inhabiting a lake or stream
  - Evaluating habitat-species relationships for crayfish assemblages in lakes and streams
- **Research project finishing spring of 2023**
- **Statewide sampling will begin summer of 2023**

Aquatic Vegetation

- **Limited sampling for problematic vegetation populations**
  - **Developing program, sampling/monitoring protocol and treatment protocols adapted from other states aquatic vegetation specialists**
- **In 2022, began treating some Eurasian Watermilfoil infestations**
  - Washington State Fishing Lake
  - Gridley City Lake
  - Mined Lands Pits
    - 29A
    - 8C
    - 10D
    - 14A

Population Demographics, Distribution, and Environmental History of Invasive Carp in the Kansas River: 2018-2020

- **Broad objective: Obtain necessary information to document extent of Black Carp, Grass Carp, Bighead Carp, and Silver Carp (invasive carps) in the lower Kansas River and prevent further range expansion**
- Project highlights:
  - No bighead or silver carp were observed above Bowersock Dam
  - WaterOne weir semi-impassible for silver and bighead carp
  - Invasive carp from Bowersock Dam to WaterOne Weir are largely resident fish with slow growth




Kansas River Basin
Colorado
Nebraska
Iowa
Missouri
Platte River
Republican River
Little Blue River
Big Blue River
Harlan County Reservoir
Prairie Dog Creek
Norton Reservoir
Kirwin Reservoir
Lovewell Reservoir
North Fork Solomon River
South Fork Solomon River
Webster Reservoir
Glen Elder Reservoir
Solomon River
Saline River
Chapman Creek
Milford Reservoir
Tuttle Creek Reservoir
Delaware River
Perry Reservoir
Missouri River
Kansas River
WaterOne Weir
Bowersock Dam
Wakarusa River
Cedar Bluff Reservoir
Wilson Reservoir
Smoky Hill River
Kanopolis Reservoir
Kansas
Kansas River Tributaries
Upper Kansas River Basin Reservoirs
Kansas River basin protected by Bowersock Dam
Bowersock Dam and WaterOne Weir
Kansas River between Bowersock Dam and WaterOne Weir
Kansas River Below WaterOne Weir
Border States
Platte and Missouri Rivers
AD ASTRA PER ASPERA
Kansas
Department of Wildlife and Parks
0 25 50 100 Miles
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E
S

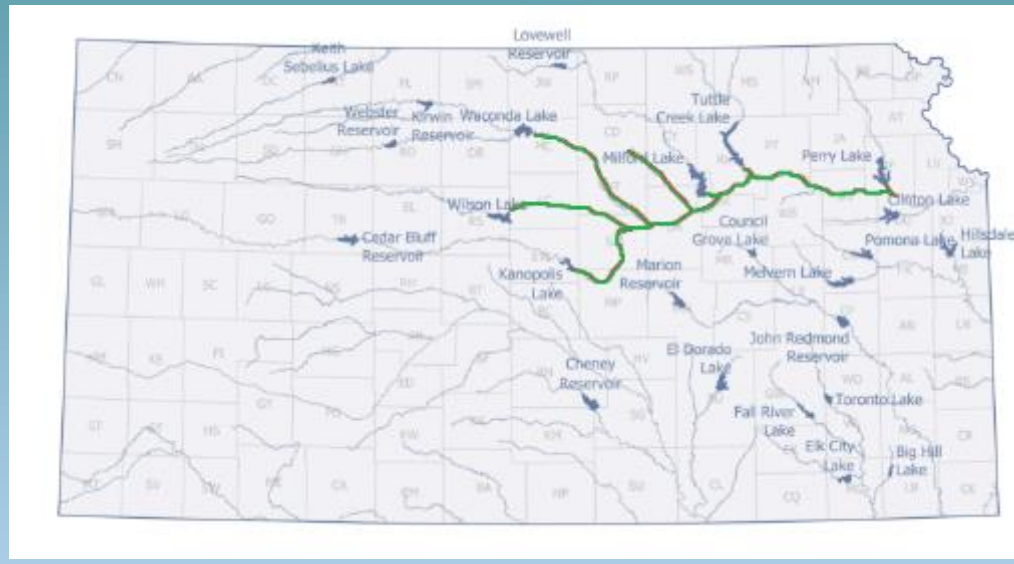
Bowersock Dam – River Mile 52 (Lawrence, KS)

WaterOne Weir – River Mile 15 (Kansas City, KS)

Bowersock Dam Invasive Carp Deterrent Feasibility Study: 2021-2023

- **Objective: Evaluate the feasibility of installing an invasive carp deterrent at Bowersock Dam**
- Collaborators: Juniper Environmental, KAWS
- Project highlights:
  - Multiple fish deterrent technologies were evaluated, and an acoustic deterrent was identified as the most applicable option for this location
  - An acoustic deterrent is unlikely to have an impact on native fish
  - An acoustic deterrent would have no human safety or recreation concerns and received no negative comments during public input
  - Two options for installation were identified:
    - Protect the most vulnerable area around the north powerhouse
    - Place deterrent across entire dam
  - Working with USGS and USACE to improve project based upon experiences at other locations
  - Seeking funding to install in 2024

Photo Credit: Debra S. Baker – Kansas Biological Survey

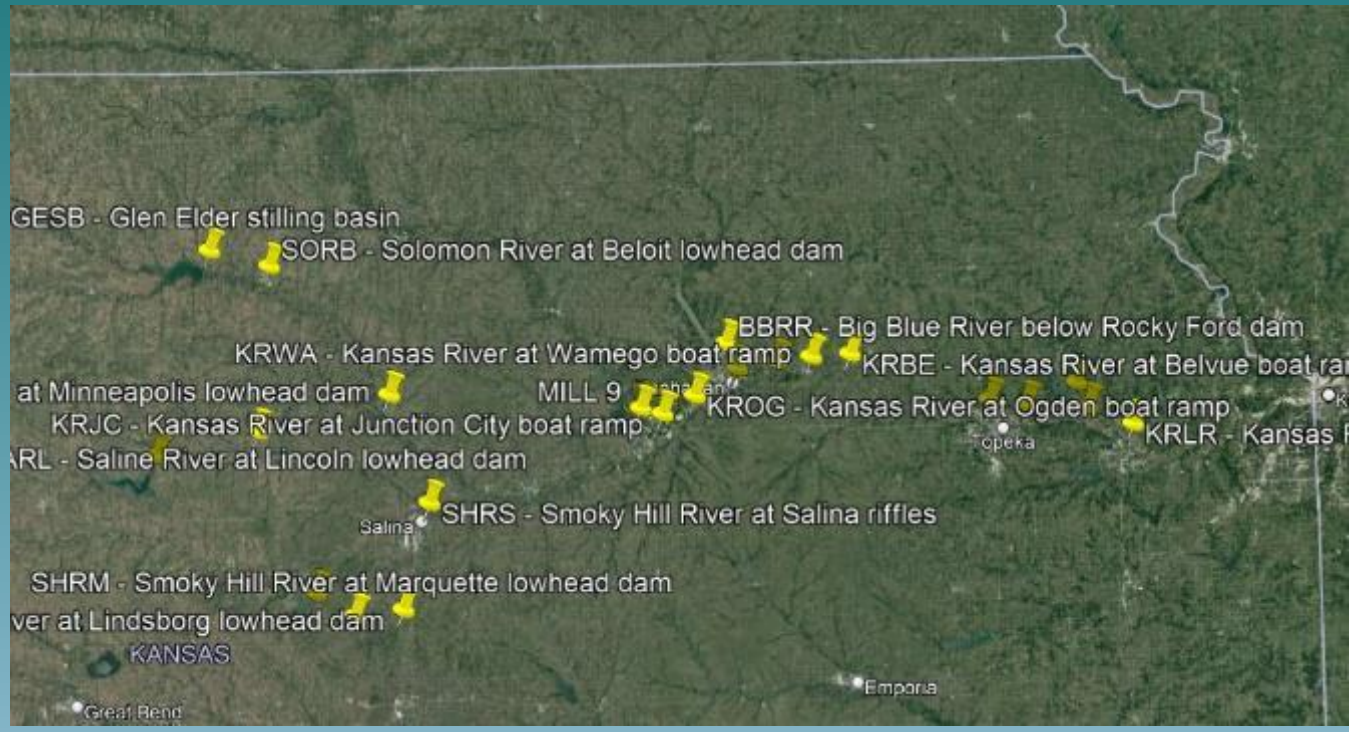


Kansas River Invasive Carp Removal: 2022 - Indefinite

- **Objective: Remove invasive carp downstream of Bowersock Dam to provide a buffer against range expansion should dam be inundated during a high flow event**
- Project highlights:
  - 22,000lbs+ of invasive carps removed so far
  - This project is planned continue at least until a carp deterrent is installed at Bowersock Dam; removal efforts may continue beyond deterrent installation depending on results

Environmental DNA (eDNA) Sampling for Invasive Carp in Upper Kansas River: 2021-2023

- **Objective: Use eDNA technology to sample for possible presence of silver and bighead carp in upper Kansas River basin**
- Project highlights:
  - Two sample events occurred in summer and fall of 2021 and two in spring and fall of 2022
  - No detections of invasive carp eDNA so far
  - 2 more sampling events scheduled through fall 2023



Kansas River Invasive Carp Food Web Study: 2022 - 2024

- **Objectives:**

1. Examine direct and indirect effects of invasive carps on native species and food-webs of high, low, and zero invasive carp density sections of the Kansas River.

2. Compare Kansas River results with similar studies in other river systems (Wabash and Illinois Rivers; Meta-analysis).

3. Provide background needed to gauge success of downstream removal efforts

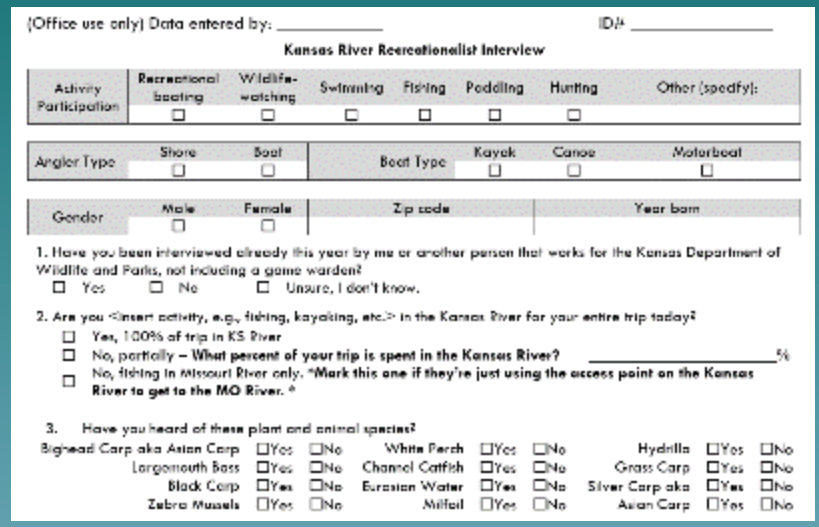
- Collaborators: Emporia State University

Kansas River Recreationalist Survey: 2022

- **Objectives:**

1. **Conduct a survey of Kansas River recreationalists to understand user groups and assess invasive carp perceptions and impacts to inform future management decisions**
2. **Raise awareness of invasive carp by distributing educational information to Kansas River recreationalists**

- Collaborators: NE Game and Parks Commission
- Project highlights:
  - Very diverse group of users: anglers, paddlers, wildlife watchers, etc.
  - ANS awareness high, but need to reach some more folks
  - Many have first-hand experience with invasive carp: jumping in boat, as bait, etc.
  - Many believe the invasive carp have impacted their fishing success



(Office use only) Data entered by: _____ ID#: _____

Kansas River Recreationalist Interview

Activity Participation	Recreational boating	Wildlife-watching	Swimming	Fishing	Paddling	Hunting	Other (specify):
	☐	☐	☐	☐	☐	☐	

Angler Type	Shore	Boat	Boat Type	Kayak	Canoe	Motorboat
	☐	☐		☐	☐	☐

Gender	Male	Female	Zip code	Year born
	☐	☐		

1. Have you been interviewed already this year by me or another person that works for the Kansas Department of Wildlife and Parks, not including a game warden?
   ☐ Yes ☐ No ☐ Unsure, I don't know.

2. Are you <insert activity, e.g., fishing, kayaking, etc.> in the Kansas River for your entire trip today?
   ☐ Yes, 100% of trip in KS River
   ☐ No, partially – **What percent of your trip is spent in the Kansas River?** _____%
   ☐ No, fishing in Missouri River only. ***Mark this one if they're just using the access point on the Kansas River to get to the MO River. ***

3. Have you heard of these plant and animal species?

Bighead Carp aka Asian Carp	☐Yes	☐No	White Perch	☐Yes	☐No	Hydrilla	☐Yes	☐No
Largemouth Bass	☐Yes	☐No	Channel Catfish	☐Yes	☐No	Grass Carp	☐Yes	☐No
Black Carp	☐Yes	☐No	Eurasian Water Milfoil	☐Yes	☐No	Silver Carp aka Asian Carp	☐Yes	☐No
Zebra Mussels	☐Yes	☐No						

Neosho River - Grand Lake Bighead Carp Study 2021-2023

- **Objectives:**

1. Identify locations of presence and upstream extent of Bighead Carp population within the Neosho River – Grand Lake system
2. Collect baseline population demographic information including relative abundance, age and growth, and size structure
3. Determine broadscale movements within the Neosho River system using otolith microchemistry
4. Identify locations within the Neosho River – Grand Lake system for containment, removal, and/or eradication efforts

- Collaborators: Missouri State University, ODWC
- Highlights:
  - Partnered and contracted with experienced invasive carp researchers at Missouri State University
  - Graduate student and techs are wrapping up sampling and report will be finished in 2023
  - Fishing guides actively reporting and providing fish
  - Evidence that invasive carps can reproduce in the system

Neosho River – Grand Lake System Bighead Carp Suppression: 2022 - Indefinite

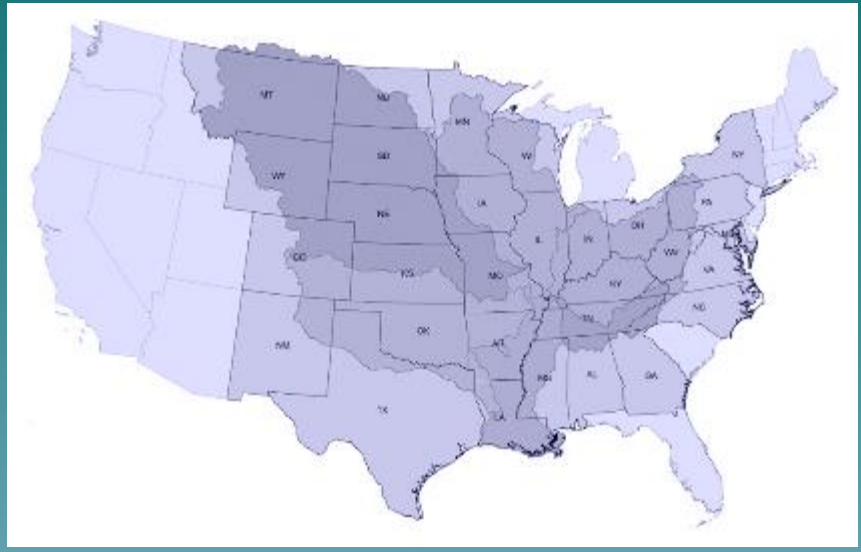
- **Objective: Suppress bighead carp within the Neosho River – Grand Lake system by removing carp at locations identified in on-going project titled "Distribution and Population Demographics of Bighead Carp in the Neosho River-Grand Lake System to Inform Removal"**

- Project highlights:
  - Build upon previous research project
  - This population of bighead carp is the only known isolated reservoir-run population of invasive carp in the country; lessons learned from this effort will be valuable to other future reservoir infestations

Regional Invasive Carp Projects

MRBP-lead project to assess water chemistry (strontium, barium, calcium, magnesium, and manganese concentrations and stable oxygen isotope ratio) of main-stem rivers and tributaries in the Mississippi River basin

- KDWP submitted samples for KS and MO River



SD-lead project to assess the risk of Silver Carp and Bighead Carp spread in the Missouri River Basin via the live bait trade and identify risk factors (state regulations, proximity to established Asian carp populations)

MRBP-lead project to collect bighead and silver carp genetic samples from across the Mississippi River basin

- KDWP collected samples from KS River

MRBP
The MISSISSIPPI RIVER BASIN PANEL
On AQUATIC NUISANCE SPECIES

Questions?

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