

Project Title: Invasive Carp Detection, Distribution and Suppression Efforts in Oklahoma Systems

Geographic Location: Grand Lake O' the Cherokees system (Neosho, Spring and Elk rivers); Arkansas River between the Robert S. Kerr Lock and Dam 15 to the Arkansas border.

Lead Agency and Author: Oklahoma Department of Wildlife Conservation (ODWC), Elaine Gainer (elaine.gainer@odwc.ok.gov)

Participating Agencies: N/A

Statement of Need:

There is a need for the Oklahoma Department of Wildlife Conservation (ODWC) to conduct fisheries research, monitoring, management and education on the Grand Lake O' the Cherokees Bighead Carp (*Hypophthalmichthys nobilis*) population along with the status of Bighead Carp and Silver Carp (*Hypophthalmichthys molitrix*) populations within the Arkansas River. The ODWC Aquatic Nuisance Species (ANS) Program is responsible for all aquatic invasive species throughout the state of Oklahoma. Bigheaded carp (i.e., Silver and Bighead) have aggressively invaded the midwestern portion of the United States and are continuing to cross political borders, furthering their invasion. Oklahoma, along with several other states, is the western-most extent of bigheaded carp range thus far.

Bighead Carp were first documented in the Grand River system in 1992. Oklahoma anglers continue to periodically report Bighead Carp catches. Anecdotal evidence is showing that Bighead Carp are increasing in population size within the Grand Lake system. Population assessments in the Grand Lake system are being studied by Missouri State University. Missouri State's efforts coupled with increasing angler reports on the Grand Lake system suggest a need for further research, monitoring and eventually management or suppression of the Bighead Carp populations.

Grand Lake consists of over 41,000 surface acres with three rivers feeding into it (Neosho, Spring and Elk Rivers), creating plenty of escape opportunities. Historically, Bighead Carp have been captured as bycatch in the ODWC winter paddlefish netting or unintentionally snagged by paddlefish anglers. Reports have been minimal but, have been increasing in the last couple of years. Notorious for their shy, fleeing behavior, successful Bighead Carp capture within the Grand Lake system is going to require a suite of gears (e.g., boat electrofishing, gill nets) and approaches (e.g., herding techniques, Garmin Live Scope identification).

The Arkansas River provides a corridor for ANS transfer between Arkansas and Oklahoma. Currently, invasive carp have not been reported in the Oklahoma portion of the Arkansas River but have been collected in the Arkansas portion of the river from Lake Dardanelle to the confluence with the Mississippi River. Bighead carp have been documented in the Grand River system since 1992, which is part of the Arkansas River drainage. Grand Lake consists of over 41,000 surface acres with three rivers feeding into it (Neosho, Spring and Elk Rivers), creating plenty of escape opportunities. Historically, Bighead Carp have been captured as bycatch in the

ODWC winter paddlefish netting or snagged by paddlefish anglers. Those anglers are not as prevalent on the Arkansas River, therefore invasive carp could be in the area. The use of environmental DNA (eDNA) for invasive carp in the system can help in early detection of these species and help suppress further invasions into Oklahoma.

There is a need for the ODWC to work collaboratively with both public and private entities in order to best manage and conserve the fisheries resources and to meet the needs and expectations of anglers. Information regarding impacts from invasive species on the environment, economy, and society can be beneficial for future management and suppression efforts.

Furthermore, ANS Program of ODWC consists of two full time employees, a biologist and a technician. Since the introduction of invasive carps, ODWC's ANS Program has an increased workload yet has been unable to increase its number of personnel or purchase the necessary equipment to research, monitoring, and control invasive carps. ODWC is requesting funding from FY23 plus-up to increase personnel and equipment capacity of its ANS Program to effectively and safely conduct activities related to invasive carps. ODWC is seeking to add two additional employees to assist current staff with ongoing and proposed invasive carp project efforts (see project list below) related to invasive carp research, monitoring, and control. The ODWC ANS Program will benefit greatly from this addition and will more effectively meet the goals and objectives outlined in the two submitted proposals to the Arkansas-Red-White Basin.

Project Objectives:

- Collect baseline Bighead Carp population demographic information including relative abundance, age and growth, size structure, along with any other possible pertinent information for a population assessment.
- Identify locations within the Grand Lake system for removal, and/or eradication efforts.
- Environmental DNA throughout Arkansas River system from the Robert S. Kerr Reservoir lock and dam 15 to the Oklahoma-Arkansas border for presence/absence of invasive carp (bighead and silver) in Oklahoma in conjunction with physical samples to confirm that invasive carp are physically present.
- Use collected information from project to make future management, monitoring, research, education and/or eradication decisions.
- Support the Arkansas-Red-White and Lower Mississippi River Invasive Carp Partnerships and ODWC projects by providing equipment, supplies, and personnel to ODWC.

Project Highlights:

With our project being ongoing we still plan to:

- Boat electrofish in conjunction with gill net and/or trap net sets
- Tag fish for telemetry efforts
- Collect water samples seasonally within the Arkansas River in Oklahoma below the Robert S. Kerr Lock and Dam to the Arkansas Border

- Collect water samples in temporarily unconnected waters along the Arkansas River, if accessible
- Ploidy testing depending on number of fish captured
- Physical collection attempts depending on eDNA results

Methods (October 2023-December 2023):

After receiving initial funding in October 2023, ODWC hired on a Carp Technician, who began working the middle of November 2023. From October to December, the project lead as well as the Carp Technician began working to obtain sampling equipment and other supplies to reach project objectives. One bighead carp was obtained during the duration of the requested reporting period as bycatch in winter paddlefish nets. Samples were collected off of this fish and combined with previously caught fish for potential analysis in the future. Below are the methods lined out in our proposal and/or work plan that we are working towards.

Grand Lake O' the Cherokees

ODWC will use standard sampling methods (e.g., gillnets and/or boat electrofishing) to assess Bighead Carp demographics throughout the Neosho River/Grand Lake system. Other approaches may include using Garmin Live Scope and working with fishing guides to help locate Bighead Carp. Demographics will be used to estimate the level of harvest needed to reduce the size of the Bighead Carp population within the Neosho River/Grand Lake system, if adequate numbers are successfully sampled. Use detections of Bighead Carp within the Neosho River/Grand Lake System to guide targeted removal efforts. Broadscale Bighead Carp movement and location may be monitored using telemetry methods. After location is identified, ODWC will target Bighead Carp for removal from the system using standard sampling methods (e.g., gillnets and/or boat electrofishing), and or non-traditional such as Live Scope and targeted snagging. Captured fish will be tested for ploidy.

Arkansas River System

ODWC will collect water samples for invasive carp eDNA detections along the river gradient seasonally for two years. In conjunction with eDNA water samples, ODWC may perform herding techniques in confined areas near eDNA water collection areas with the goal of triggering invasive carp leaping behavior. This will allow for physical detection opportunities. Physical detection in the system will allow for eDNA ground-truthing.

Additional Support

Assist with ongoing and upcoming invasive carp projects within the Arkansas-Red-White and Lower Mississippi River Partnerships through additional personnel, equipment and supplies. Manage and administer grants and prepare reports. Conduct surveys and analyses in support of invasive carp projects of the ODWC ANS Program.

Results and Discussion:

From October to December 2023 (when grant was awarded to end of reporting period), management objectives or implications cannot be suggested based off of the information

gathered. As the project continues for a longer duration, we foresee more useful information to be gathered, of which we hope will meet the objectives lined out in our proposal and work plan.

Tables and Figures: N/A

Recommendation: We have no recommendations to make at this time.

References: N/A