

Indiana U.S. Army Corps of Engineers Reservoir Asian Carp Prevention & Monitoring Plan

Indiana Division of Fish & Wildlife

2020

Indiana is home to eight U.S. Army Corps of Engineers (USACE) flood control impoundments, J.E. Roush, Salamonie, Mississinewa, Brookville, C.M. Harden, Cagles Mill, Monroe, and Patoka lakes. The Corps partners with the state of Indiana to provide recreational access to these reservoirs, which collectively account for over 35,000 acres of water. The economic benefit to the state and local communities resulting from this recreation is significant. The Indiana Department of Natural Resources is committed to protecting these valuable recreational and biological resources from the threats of invasive species.

“Asian carp” refers to a select group of cyprinid fishes (minnow family) that are native to Asia. The United States Fish and Wildlife Service (USFWS) specifically uses “Asian carp” to refer to bighead carp (*Hypophthalmichthys nobilis*), silver carp (*H. molitrix*), grass carp (*Ctenopharyngodon idella*), and black carp (*Mylopharyngodon piceus*). Each of these species was intentionally introduced into the United States for different purposes, but they all pose a threat to Indiana’s aquatic ecosystems.



Asian carp (primarily silver and bighead carps) provide a real and tangible threat to the use and enjoyment of these reservoirs and the recreational dollars they generate. Populations of Asian carp exist below each of these dams in various abundances. The dams impounding these reservoirs provide a formidable barrier to upstream movement of Asian carp primarily due to the lack of navigational structures and run of river conditions. Navigational structures are believed to have served as the primary conduit to Asian carp expansion in the Illinois, Ohio, and Tennessee/Cumberland river systems. Asian carp can enter the lock with vessels and pass through with the water transfer. Run of river conditions also provide opportunities for Asian carp to bypass these dams.

The primary purpose for Indiana’s eight USACE reservoirs is flood control. The reservoirs are managed in cooperation with the Louisville District of the Army Corps of Engineers to alleviate flooding in Indiana and beyond. Typical management involves a fall drawdown to winter pool to increase storage capacity. Spring rains bring the reservoirs up to summer pool elevation while alleviating downstream

flooding. In years with above average rainfall, the reservoirs have the capacity to store excess runoff up to the flood pool elevation. Flood pool elevation corresponds to the height of the emergency spillway, which is designed as a failsafe to protect the dam infrastructure. Emergency spillways were designed to pass a probable maximum flood event (PMF), which is a theoretical worst case scenario of rainfall and ground saturation for a particular area.

The DNR has undertaken an analysis of potential vectors for these invasive fish species to bypass these dams. In conversations with USACE staff, it seems highly improbable that excess runoff could pass through the emergency spillway of any of these reservoirs in quantities sufficient to facilitate fish passage from the tailwater to the reservoir proper. The few events in the past in which the emergency spillways have been used provided no opportunity for fish passage. Several factors compound to make fish passage improbable. First, the emergency spillways are designed for PMF events, so only on the extremely rare occasions that rainfall has approximated PMF has there been flow through the emergency spillway.

Bypass through the emergency spillway has only happened at five of the eight USACE reservoirs and in those cases, only on a few occasions over the last 50 years. Those instances resulted in almost imperceptible flow through the emergency spillway, even when the reservoir was several feet over flood pool. The other factor making fish passage improbable is the elevation difference between the tailwater and the emergency spillway. In order for fish to move from tailwater to lake, there would need to exist enough flow and depth at low enough velocities to facilitate passage. The two impoundments with the greatest potential for this scenario to occur, due to structural design of the proximity of their tailwater and elevation height related to their emergency spillway are Monroe and Patoka. Each of those reservoirs still has hundreds of yards and many tens of feet in elevation drop that any fish would have to overcome to make ingress into the lake. Flooding at hitherto unprecedented levels both upstream and downstream would be necessary to even approach this scenario.

Accidental or intentional human assisted movement through bait or other collection and movement of juvenile or adult fish is the most likely vector for Asian carp introduction into USACE reservoirs and requires increased focus. Legislation has been suggested to prevent the collection of bait fish below USACE reservoirs. Signage has been developed and is in place at least in some locations to educate the public on the presence of Asian carp and their visual similarity to native bait fish species. Rules are currently in place to restrict the use of cast nets below USACE reservoirs. Many of the actions in this plan will focus on the need to educate Indiana's boaters and anglers on the threat these species pose, how to identify them, and the rules in place to ensure they are not intentionally moved.

USACE reservoirs receive significant fish management efforts due to their size and diversity of fish populations. Monitoring of USACE reservoir fish populations is a frequent and ongoing occurrence. More intensive specialized stocked sport fish sampling often occurs on an annual or semi-annual basis. Despite these efforts, Asian carp are notoriously difficult to catch with traditional sampling gears, and detection efforts need to be expanded. Proposed below is a comprehensive strategy to address prevention of Asian carp introduction into Indiana's USACE reservoirs and monitor to ensure their absence, as well as control strategies to use if they are discovered.

Prevention:

1. In cooperation with local USACE staff, post Asian carp identification signs in tailwater area of all USACE reservoirs.
2. Educate anglers and boaters through signage and website that Asian carp are illegal to possess alive and must be killed immediately if taken into possession.
3. Coordinate with DNR Law Enforcement to ensure local conservation officers are aware of bait fish collection laws and invasive species identification.
4. Pass legislation making it illegal to collect bait fish in tailwater areas.
5. Add additional signage in tailwaters to educate users as to the illegality of bait fish collection.
6. Educate anglers on why they should never release purchased or wild-caught bait fish into a body of water where they weren't collected.
7. Update DNR website to include educational information for the public on Asian carp.

Detection:

1. Periodically (approximately every 5 years) monitor fisheries populations in USACE reservoirs through status and trends sampling.
2. Monitor for Asian carp during more frequent specialized sport fish sampling events.
3. Incorporate signage at boat ramps to educate the public and provide opportunities for citizen reports.
4. Institute regular eDNA sampling of USACE reservoirs to provide early detection of potential introductions.

Control:

1. Upon confirmed report or capture of bighead/silver carp in a USACE reservoir, intensive sampling will be conducted using gill nets and electrofishing in the immediate area of capture/observation.
2. Any grass carp collected in USACE reservoirs will be ploidy tested.
3. Upon confirmation of bighead/silver carp in an Indiana USACE reservoir, FluEgg modeling will be conducted on the reservoir tributaries to evaluate the potential for sexual reproduction within the reservoir. This model simulates the movement and development of Asian Carp eggs until hatching, based on the physical characteristics of the waterway and the eggs.
4. Investigate strategies (check dam, bubble curtain, CO₂) to disrupt spawning migrations and reproduction should the potential for Asian carp to sexual reproduction be confirmed through modeling.
5. Promote and expand commercial harvest of Asian carp where commercial fishing is permitted to reduce Asian carp populations and reduce propagule pressure.