Mississippi River Basin Panel on Aquatic Invasive Species

Panel Coordination Meeting in Gulfport, Mississippi

Compiled Member Reports

February 11-12, 2025

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State of Alabama, Division of Wildlife and Freshwater Fisheries

Submitted by Dave Armstrong, ANS Coordinator

Invasive Carp (IC): Efforts on invasive carp by Alabama Department of Conservation & Natural Resources (ADCNR) staff were expended on evaluation and selection of increased sample sites, monitoring of abundance and distribution, assistance and collaboration with partner agencies, examining other collection methods and eradication. Field and non-field activities included:

- Thirty-nine (39) field days were spent on electrofisher (boat and dozer trawl) monitoring of invasive carp population abundance, distribution and demographics. Data were collected from 240 fixed-site samples (40 sites x 6 reps) using an occupancy strategy in Pickwick and Wilson Lakes. Additional sampling targeted 3 tailwaters using Early Detection protocol at multiple creek-cove sites (n=37 sites) using 2- to 7-boat ganged electrofisher boats for herding. Ecologically-sensitive species (n=24 species; e.g., Gizzard Shad) were also sampled using dozer-trawl electrofishing at 33 sites in Pickwick, Wheeler and Wilson Lakes.

- Sixty-seven (67) days were spent on non-biological work or assistance to agencies, including: Collection of telemetry receiver data at Guntersville and Wilson Dam pools and tailwaters. Install of invasive carp awareness signage (n=86 signs, 81 sites) in the Mobile-Tensaw Delta, as well as the Tennessee, Black Warrior, Alabama and Tombigbee Rivers. Agencies collaborated with included: TWRA, Mississippi Interstate Cooperative Resource Association [MICRA, Invasive Carp Assessment Committee (ICAC) and respective Data Analysis (DAW) and Sample Approach (SAW) Workgroups], US Corp of Engineers Section 509 WRDA Pilot Program; USFWS in multiple offices, Tennessee-Cumberland Rivers Partnership (TNCR), Tennessee Wildlife Federation (TWF), Friends of Avon Lake, IL-IN Sea Grant; USGS in multiple offices, Mobile Bay National Estuary Program and Auburn University Extension Service.

Aquatic Nuisance Species (ANS) state grant activities in Alabama

The following summarizes “non-carp” invasive aquatic species control activities by ADWFF staff.

- ADCNR staff secured a third year of a state funding of an USFWS invasive species grant to address “non-carp” issues. Primary goals include: educational objectives to improve our Conservation Department (ADCNR) website, explore educational media, review and recommend further limitations on invasive species (i.e., vertebrates, invertebrates, aquatic plants) importation and stocking through proposed legislation and species-specific work.

- Eight (8) field days were expended on assisting Samford University with sampling of Zebra Mussel veligers on five reservoirs within the Tennessee and Black Warrior Rivers. Further work included retrieval of aquatic plant samples for Tennessee Tech University at Wheeler Lake.

- Twenty-eight (28) days included compilation of statewide reservoir data for a Zebra Mussel risk assessment model, compilation and reporting of aquatic invasive species (IAS) to the USGS NAS website and database, assisted Auburn University Extension Service with a leaflet on SAV vegetation treatments for landowners, discussions with USFWS and research on Virile Crayfish

status in Alabama as well as its influence on Slenderclaw Crayfish (P1 species) and other native crayfishes, compilation of IAS species from the public. Agencies assisted included: Samford University, USFWS Tuscaloosa Office, USFWS-USGS on the Alabama EDRR initiative; Assist Mobile Bay National Estuary Program and Auburn Extension on an invasive weed control document and discuss status of invasive species in Threemile Creek, Mobile. Staff coordinated a virtual meeting with the Invasive Species Action Network (ISAN) to discuss a potential partnering opportunity with their Don't Let It Loose campaign.

- ADCNR staff provided educational opportunities at five (5) events for children, adults and agency scientists. A presentation was made to 34 scientists from multiple agencies in the Alabama Department of Environmental Management' water quality and bio-monitoring meeting titled "*Aquatic Nuisance Species (ANS) in Alabama: Distribution, monitoring, & management actions in state waters*". More than 250 children with disabilities were assisted in the "Fishing Not Just Wishing event at Oak Mountain State Park. More than 200 individuals attended the Bassmaster Elite Series Expo at Ingall's Harbor where an aquatic invasive species booth was placed with assistance from TVA. Assisted Hartselle High School (n= 35 adults, children) with an educational discussion about fish diversity on the Tennessee River. An additional three days were expended, placing carp deterrence meeting flyers at retail/bait shops (n=19) for a public meeting held in Florence, AL. The meeting focused on the USACE intent to provide a forum with information (PowerPoint presentations and displays) on a potential carp deterrent BAFF located in Alabama public waters and the meeting was attended by 32 adults.

State of Arkansas, Game and Fish Commission

Submitted by Matt Horton, ANS Coordinator

AGFC's Aquatic Nuisance Species Program Staff

The Arkansas Game and Fish Commission's ANS Program staff consisted of 1 full-time Program Coordinator, 1 full-time Invasive Carp Biologist (just hired in January 2025) whose initial duties will be to develop and implement state-wide invasive carp monitoring activities, 1 full-time Invasive Carp Biologists who supervises the Invasive Carp Removal Program, 5 part-time Natural Resource Technicians who conduct invasive carp removals in the Arkansas and White river systems for the Invasive Carp Removal Program, and 1 part-time Administrative Assistant who helps the ANS Coordinator administer the Invasive Carp Harvest Incentive Program (initiated in January 2024). All staff salaries except for the ANS Coordinator are funded through USFWS grants.

New ANS Introductions

Giant Apple Snail (*Pomacea maculata)*:

In March 2024, AGFC discovered Giant Apple Snails in live crawfish shipments intended for human consumption, which originated from distributors in Louisiana. This discovery was made through AGFC's pilot monitoring efforts to identify hitchhikers in crawfish shipments, and was the first documented report of apple snails moving through live crawfish/seafood shipments in the U.S. In total, AGFC collected five adult Giant Apple Snails from two Arkansas seafood vendors from March-April 2024. It should be noted that this discovery occurred during a time when severe drought conditions had significantly impacted commercial crawfish production across the southeast. The ANS Coordinator worked with state and federal partners in Arkansas and Louisiana, including both state's Department of Agriculture, USDA APHIS, Arkansas Department of Health, Louisiana Department of Wildlife and Fisheries, and Farm Bureau to develop mitigation and outreach strategies to prevent the spread of apple snails through the commercial crawfish industry. AGFC developed an online reporting form for apple snails (both wild observation and those discovered in live crawfish shipments) on its website https://www.agfc.com/ans, conducted several interviews for local TV stations and newspapers who ran stories on the issue, ran targeted social media ads to increase awareness, and developed an informational flyer. The flyer included information on apple snail identification, threats, reporting, and disposal. Flyers were distributed to food, agriculture, and aquaculture industries, Arkansas ANS Task Force, Cooperative Extension Service, USFWS, and others. The outreach efforts resulted in several public reports of suspected apple snails; however, no apple snails were confirmed in the wild in Arkansas. Live crawfish shipments will continue to be monitored in 2025.

Northern Snakehead (*Channa argus*):

In June 2024, an angler caught and release back a live Northern Snakehead in the AGFC Jacksonville Shooting Sports Complex public fishing pond. It is unknown if the fish was moved there by someone, but it could have originated from Bayou Two Prairie, a tributary that drains into Pool 3 of the Arkansas River, indicating Northern Snakehead have expanded their range into a new drainage further up the Arkansas River. Also, AGFC partnered with Missouri Department of Conservation, USFWS, USGS, and others to help develop Northern Snakehead EDRR and control strategies following a significant increase in their northern range expansion into Missouri through the St Francis River system during 2024.

Giant Salvinia (*Salvinia molesta*):
AGFC responded to contain and successfully eradicate two new introductions of Giant Salvinia. In June 2024, AGFC Fisheries staff discovered a small mat of Giant Salvinia in a pool reach of the Illinois Bayou, located 30 miles above the Lake Dardanelle (Arkansas River reservoir) confluence in west central Arkansas. Subsequent surveys indicated AGFC staff had successfully removed all plants. Further investigation revealed an adjacent landowner had been illegally propagating and just released Giant Salvinia into the Illinois Bayou to "feed turtles". In July 2024, AGFC Fisheries staff discovered Giant Salvinia on a boat trailer and near the boat ramp at Clear Lake, adjacent to Felsenthal NWR in south central Arkansas. Staff successfully removed all plants and educated the boat owner on the importance of clean, drain, dry.

Purple Loosestrife (*Lythrum salicaria*):
In August 2024, the ANS Coordinator reported Purple Loosestrife observations found on iNaturalist to the Arkansas Department of Agriculture's (ADA) Plant Industries Division, who confirmed over two dozen Purple Loosestrife plants were found around Lake Bentonville in northwest Arkansas. Purple Loosestrife is listed as a prohibited plant in Arkansas. This was the first confirmed report in over a decade. ADA initiated eradication efforts with the Park, removing seed heads and treating all plants with herbicide.

Cuban Bulrush (*Oxycaryum cubense*):
Cuban bulrush was discovered for the first time in four waterbodies (Lake Georgia-Pacific, Millwood Lake, Lake Grampus, and Pool 2 of the Arkansas River) during September-October 2024. In December 2024, it was discovered in Felsenthal NWR, where it had not been reported since 2018. AGFC staff partnered with local, state, and federal jurisdictions to install 1,000 ft. of containment boom and apply herbicides to control Cuban bulrush at Lakes Georgia-Pacific and Millwood. Containment boom was installed at Lake Grampus to prevent further spread. Planning is underway to further contain and control Cuban bulrush at all new locations in spring 2025.

Invasive Carp Removal Program
AGFC's Invasive Carp Removal Program continued removal efforts in the Arkansas and White river systems. The program, which initiated in October 2021, is funded by USFWS grants. Two boat crews are used to target and remove invasive carp using active gill net sets. From April-December 2024, the program removed 184,537 pounds of invasive carp. Their most successful month was October 2024 (78,550 lbs.). To date, the program has removed 488,624 pounds of invasive carp from Arkansas waters.

Invasive Carp Harvest Incentive Program (ICHIP)
Since AGFC initiated ICHIP in January 2024, a total of 44 commercial fishers have enrolled, and 361,570 pounds of invasive carp were harvested and sold for market use. The program is funded by USFWS grants. AGFC offers ICHIP participants start-up fishing supplies (gill net webbing and rope) and an $0.18/lb. subsidy for carp harvested and sold from Arkansas waters, provided they submit a bill of sale and follow commercial harvest reporting requirements. Market access remains a major limiting factor for commercial harvest of invasive carp. To improve markets and market access for fishers, AGFC developed and advertised a new grant opportunity in December 2024, which offered up to $150,000 to local and out-of-state entities willing to establish and operate remote invasive carp buying locations in

Arkansas. Applications have been reviewed and grant recipients have been selected. Grant recipients will receive a one-year subgrant agreement, and be reimbursed based on a set per pound price for invasive carp purchased through remote buying locations. Grant funding will be used by recipients to help cover expenses related to buying location operation, fish preservation, and transport of fish to processing locations.

Aquatic Invasive Plant Control

AGFC continued efforts to monitor and control aquatic invasive plants across the state. From April-October 2024, AGFC spent roughly $115,000 on contracted chemical control of Giant Salvinia, Alligatorweed, Cuban Bulrush, Curly-leaf Pondweed, and Water Hyacinth in 11 public waterbodies. Management drawdowns, chemical control, containment boom, and subfreezing winter temperatures continue to keep Giant Salvinia densities manageable in the two infested waters (Lakes Erling and Columbia). The ANS Coordinator provided management advice and 1,200 feet of floating containment boom to assist USACE efforts to eradicate Water Hyacinth infesting over 50 acres of public waters at Willow Beach Park in central AR.

Zebra Mussel Monitoring

Substrate samplers were monitored in nine reservoirs. No new zebra mussel detections occurred from April 2024 – January 2025. Zebra mussels are currently present in Beaver Lake, upper 37 miles of the Bull Shoals Tailwater (White River), and all pools of the Arkansas River. The ANS Coordinator worked with local AGFC Fisheries and USACE project staff to quarantine and decontaminate four vessels that were being moved from zebra mussel positive waterbodies to lakes Norfork, Greers Ferry, and DeGray.

Research

AGFC is currently supporting two AIS research project:

1) *Juvenile recruitment and habitat use of Silver Carp in the lower Arkansas and lower White Rivers* – University of Arkansas at Pine Bluff. The purpose of this project is to document juvenile recruitment, growth rates, backwater habitat use, and infer natal spawning systems of juvenile Silver Carp collected in backwaters of the lower Arkansas and White Rivers.
2) *Identifying candidate species for an aquatic nuisance species watchlist in Arkansas*: *Customizing and improving ecological risk screening summaries for aquatic invasive species* – University of Arkansas, Fayetteville. The purpose of project is to customize and make improvements on the USFWS ERSS protocols for Arkansas and implement the new Arkansas ecological risk screening summary protocols on the top 10 heighted risk freshwater fish species identified in the U.S. Geological Survey's Vertebrates in Trade Horizon Scan.

Regulations

New changes to AGFC's Code of Regulations went into effect on January 1, 2025, which included the listing of several fish and mollusk species to the Prohibited Exotic Aquatic Species List. New prohibited species include Prussian Carp *Carassius gibelio*, Crucian Carp *Carassius carassius*, Wels Catfish *Silurus glanis*, Largescale Silver Carp *Hypophthalmichthys harmandi*, Eurasian Minnow *Phoxinus phoxinus*, Stone Moroko *Pseudorasbora parva*, European Perch *Perca fluviatilis*, Nile Perch *Lates niloticus*, Amur Sleeper *Perccottus glenii*, Zander *Sander lucioperca*, Giant Apple Snail *Pomacea maculate*, Golden Mussel *Limnoperna fortune*, and Japanese Mystery Snail *Cipangopaludina japonica*. Also, new Code Addendum

(J1.04) was created to simplify and combine prohibited aquatic species lists https://apps.agfc.com/regulations/J1.04/.

Outreach

The following are outreach efforts conducted by AGFC's ANS Program staff to increased public awareness of ANS management activities, regulations, reporting, species identification, and prevention:

- Updated ANS identification, regulations, and prevention messaging for the AGFC Fishing, Trout Fishing, Hunting, and Waterfowl Hunting Guidebooks.
- Conducted 10 TV and newspaper interviews related to apple snails found in live crawfish shipments, invasive carp control, and invasive plant management and prevention.
- Published articles in the AGFC Arkansas Wildlife Newsletter on invasive carp management, clean, drain, dry prevention behaviors, use of watercraft cleaning stations, invasive aquatic plant control and prevention, and reporting ANS observations.
- Gave 7 in-person presentations on ANS management, regulations, and prevention at public meetings and state and regional conferences.
- Made several posts related to ANS prevention and management activities on AGFC Fisheries Division Facebook page and Fisheries Division email listserv.
- Provided Wildlife Forever with Arkansas' watercraft cleaning station and AIS prevention regulation information for inclusion in its new Expect to Expect website.
- Ran numerous targeted social media ads on Facebook (statewide) to increase public awareness of ANS, encourage clean, drain, dry prevention behaviors, and public reporting of ANS.

Training

The ANS Coordinator and Invasive Carp Biologist conducted a half-day invasive carp workshop for the MRBP Coordination Meeting held in Little Rock, Arkansas on April 16, 2024. The workshop included an in-field demonstration on how AGFC's Invasive Carp Removal Program catches invasive carp with gill nets in the Arkansas River, an invasive carp dissection/morphology demonstration, and identification of juvenile Bighead, Silver, Black and Grass Carp.

State of Colorado, Colorado Parks and Wildlife

Submitted by Jennifer Murray, Invasive Species Specialist

Sampling/Monitoring

CPW sampling staff performing a plankton tow as part of the early detection monitoring program.

CPW has sampled 584 "at-risk" waters for aquatic invasive species since inception. While CPW ANS staff has historically monitored the state's public waters for numerous invasive plants and animal species, and cataloged native species along the way, the focus of sampling is on the early detection of zebra and quagga mussels.

The state follows a three-tier sampling protocol targeting the three life cycles of the zebra or quagga mussel: (1) conducting plankton tows to find the veligers, (2) deploying and checking substrates to find the juvenile "settlers" or attached adult mussels and (3) conducting surveys along the shoreline and existing structures for settled juveniles or attached adults.

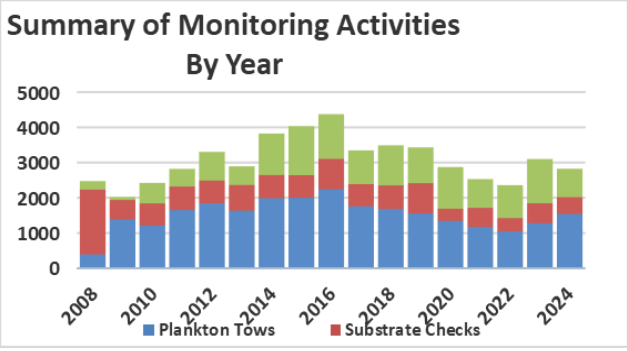
The state requires three steps to identify, verify and confirm a detection of zebra or quagga mussel veligers: (1) visual analysis of plankton tows using a cross-polarized light microscope (2) DNA verification utilizing polymerase chain reaction [PCR] and (3) DNA confirmation utilizing gene sequencing.

The sampling teams conduct early detection sampling for zebra and quagga mussels on public lakes and reservoirs. CPW has met western regional minimum standards for zebra and quagga mussel monitoring.

In 2024, crews sampled 209 standing, and 26 flowing waters statewide. 21 of these waters had never been sampled for ANS. These sampling efforts produced 1,544 plankton samples, all of which were processed by CPW's own ANS Laboratory. In addition to CPW's ANS crew, 253 plankton samples were also received from partner organizations. Their contributions can be seen in Table 1.

Partner Organization	Samples Contributed
Wyoming Game and Fish	105
Tahoe Regional Planning Agency	62
Curecanti NRA (NPS)	52
Aquatic Animal Health Lab	32
NM Dept of Game and Fish	2

Table 1. The total number of samples received from partners during the 2024 sampling season.



The graph on the right provides a summary of the annual sampling work performed.

In 2024, CPW was able to hire an Early Detection and Rapid Response (EDRR) Specialist who will be overseeing the sampling and monitoring program moving forward. The EDRR Specialist will be responsible for managing the sampling teams as well as the ANS Laboratory. They will also be coordinating and responding to any ANS detections that will require rapid response efforts.

Zebra Mussels

Zebra mussels were initially detected in Highline Lake in September of 2022 through routine early detection monitoring. This was the first finding of adult mussels in the state of Colorado. After exhaustive sampling in the surrounding area and a successful application of Earthtech QZ, an EPA registered copper based molluscicide, in March of 2023, ongoing monitoring continued throughout the summer. In October of 2023, at the conclusion of Highline's boating season, inspection of operational equipment like buoys and boat docks led to the finding of additional adult zebra mussels. In November of 2023, another Earthtec QZ treatment was conducted, not with the intent of eradication, but to limit zebra mussel reproduction and the potential of viable veligers moving downstream of Highline Lake into the Colorado River.

Highline Lake was closed to all motorized boating for the 2024 boating season in part due to the partial lowering of the reservoir to expedite its complete draining in the fall of 2024, and in part to limit the risk of the spread of zebra mussels to surrounding waters. Routine early detection monitoring within Highline Lake, as well as locations upstream and downstream continued beginning in March of 2024. As a result of this monitoring, zebra mussel veligers were detected at two locations within the Government Highline Canal on July 1st, 2024. Follow-up sampling revealed veligers detected at another location within the canal on July 8th, and at several locations on the Colorado River from DeBeque to the city of Grand Junction between July 8th and July 15th.

Sampling frequency on the Colorado River was increased in partnership with the BOR and USFWS to increase river access and collect more representative samples. An autonomous sampler was deployed with support from USGS to detect the presence of eDNA and inform ongoing monitoring strategy. Sampling was also conducted at both publicly and privately owned bodies of water with connectivity to the Colorado River in an attempt to discover the source of these veligers and understand the extent of the infestation. To date, no adult zebra mussels have been detected in the Colorado River or the Government Highline Canal. No additional veligers were detected within the river, canal, or connected bodies of water after July 15th. As an additional containment measure, outreach technicians were hired to educate nonmotorized boaters about the presence of veligers in the river and give guidance on best practices to minimize the risk of the accidental transportation of zebra mussel veligers.

Before the conclusion of the irrigation season, and in light of the discovery of zebra mussel veligers in the Colorado River and the Government Highline Canal, the Grand Valley Water Users Association elected to perform a proactive molluscicide treatment using EarthTec QZ within the Government Highline Canal. The residual water containing copper was released into and held within Highline Lake until the copper levels measured below the acute and chronic aquatic life standards and was safe to release downstream in order to complete the draining of the lake.

At the end of October of 2024, when the treatment of the canal was complete and irrigation water no longer needed to flow through the lake, CPW initiated the process of completely draining Highline Lake. This eradication attempt will allow the least amount of variables influencing its success. Highline Lake is expected to be completely dry for several months over the winter of 2024/2025 before refilling in April of 2025. All eradication efforts are performed with respect for the irrigation needs of the Grand Valley

as these are the systems that the ANS program strives to protect from harmful aquatic nuisance species. During the draining process, five adult mussels were found on infrastructure within the lake. All mussels were dead at the time of detection.

Other ANS

Rusty Crayfish

Rusty crayfish is an invasive species that was first discovered in 2009 in a main-stem impoundment of the Yampa River and at two river locations between Stagecoach Reservoir and Steamboat Springs. The ANS Program conducted extensive surveys statewide and detected a population in Sanchez Reservoir State Wildlife Area in 2010 and Stagecoach State Park in 2011. There are no current efforts ongoing to map crustaceans or control rusty crayfish in Colorado.

Rusty Crayfish

CPW implemented regulations passed by the Wildlife Commission in November 2010 in which all crayfish caught west of the Continental Divide must be immediately killed and taken into possession, or immediately returned to the water from which they were taken. There are no crayfish native to the Western Slope. The same restriction applies to Sanchez Reservoir in Costilla County due to the invasive rusty crayfish.

Rusty crayfish are native to the Ohio River Basin and have expanded their native range to include several U.S. states and Ontario, Canada. They colonize lakes, rivers, and streams throughout North America. They are more aggressive than native crayfish, better able to avoid fish predation, and can harm native fish populations by eating their eggs and young. They can displace native crayfish and hybridize with them. They graze on and eliminate aquatic plant populations that provide necessary habitat and food source for native fish and waterfowl.

Rusty crayfish were detected in Lake Granby in 2023. CPW implemented an extensive crayfish survey of Lake Granby in 2024 which determined that Rusty crayfish populations within the reservoir had grown in both quantity and size. CPW intends to continue surveying this population on an annual basis.

New Zealand Mudsnail (NZMS)

This tiny invasive snail was first found in Colorado in 2004 in Boulder Creek, the South Platte River below Eleven Mile dam, and the Green River in Dinosaur National Monument. These animals are accidentally transported and moved primarily by anglers. They hide in the mud on the bottom of boots and equipment. There is no viable method for control of these very small, asexual animals. CPW places a strong emphasis on angler education, providing wader brushes and instructional rack cards to anglers. The only way to stop the spread of these invaders is through educating anglers to clean their waders and gear in between each and every use.

NZMS were confirmed in three new locations in 2024 – Antero Reservoir, Redtail Lake in South Platte Park, and Turkey in Bear Creek Lake Park.

Eurasian Watermilfoil (EWM)

The Invasive Species Program has coordinated EWM management statewide since 2005. A detailed Geographic Information System (GIS) database of EWM locations and control efforts was developed and is maintained and updated annually by CPW.

Eurasian watermilfoil infestation at Pueblo Reservoir State Park

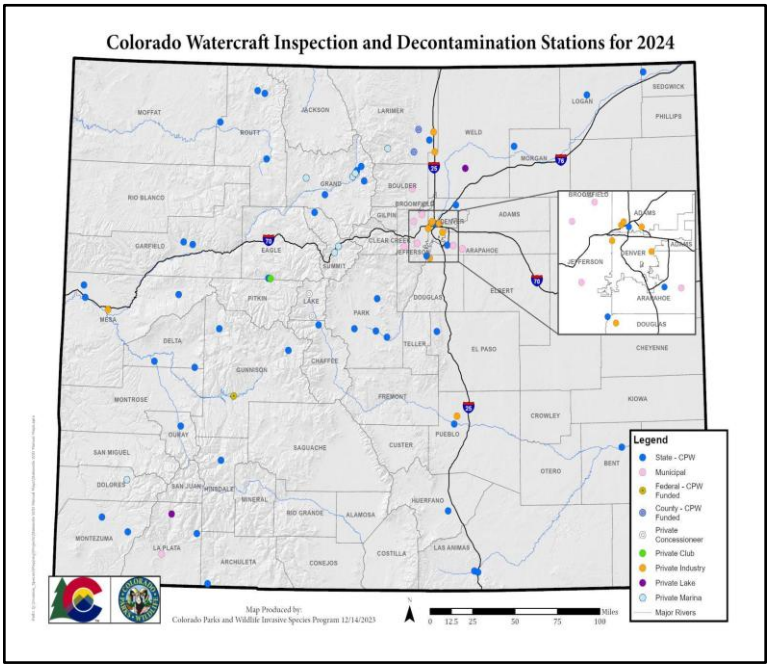
The Colorado Department of Agriculture lists EWM as a List B Noxious Weed and has a statewide management plan documented in rule.

CPW is concerned about the fisheries and ecological impacts from this noxious weed. Public safety is also a serious concern when this plant invades because it poses a significant hazard to swimmers and recreationists due to its dense structure that can cause people to be tangled and even result in drownings. It creates dense mats that provide ideal habitat for mosquitoes that may carry West Nile Virus. EWM stops and slows the flow of water for agricultural and industrial use and clogs hydroelectric facilities. Finally, EWM changes the water chemistry causing taste and odor problems for drinking water.

In 2024, CPW implemented an extensive Eurasian watermilfoil survey of the Arkansas River from Cañon City through Pueblo. This survey identified a new population of Eurasian watermilfoil in Fountain Lake and its outlet into the Arkansas River in Pueblo.

Watercraft Inspection and Decontamination (WID)

CPW coordinates a vast network of WID stations operated by CPW, the National Park Service, Larimer County, several municipalities, and numerous private industry locations including businesses, concessioners, marinas, clubs and private lakes. In total, the state has collectively performed **7.4+ million inspections and 265,882 decontaminations since 2008.**



Per the state ANS Regulations, trailered watercraft must submit to an inspection, and decontamination if needed, prior to entrance in Colorado's waters following boating out of state or boating on a positive or suspect water. Boaters are also required to submit to an inspection prior to entering a water body where inspections are required by the managing agency. All persons performing inspections and/or decontaminations must be certified by CPW.

CPW taught 30 WID certification courses in 2024, in addition to maintaining an online recertification program for experienced inspectors and decontaminators. 25 of these 30 classes were taught virtually in 2024. There have been a total of 1,033 training sessions since the program's inception. In addition to the

online course for experienced staff, the Invasive Species Program within CPW also provides two other specialized courses: (1) WID Trainer's certification and (2) Advanced Decontamination. CPW certified 741 individuals last year, for a total of 11,410 people certified or re-certified to perform WID since the implementation of statewide training and certification program in 2009.

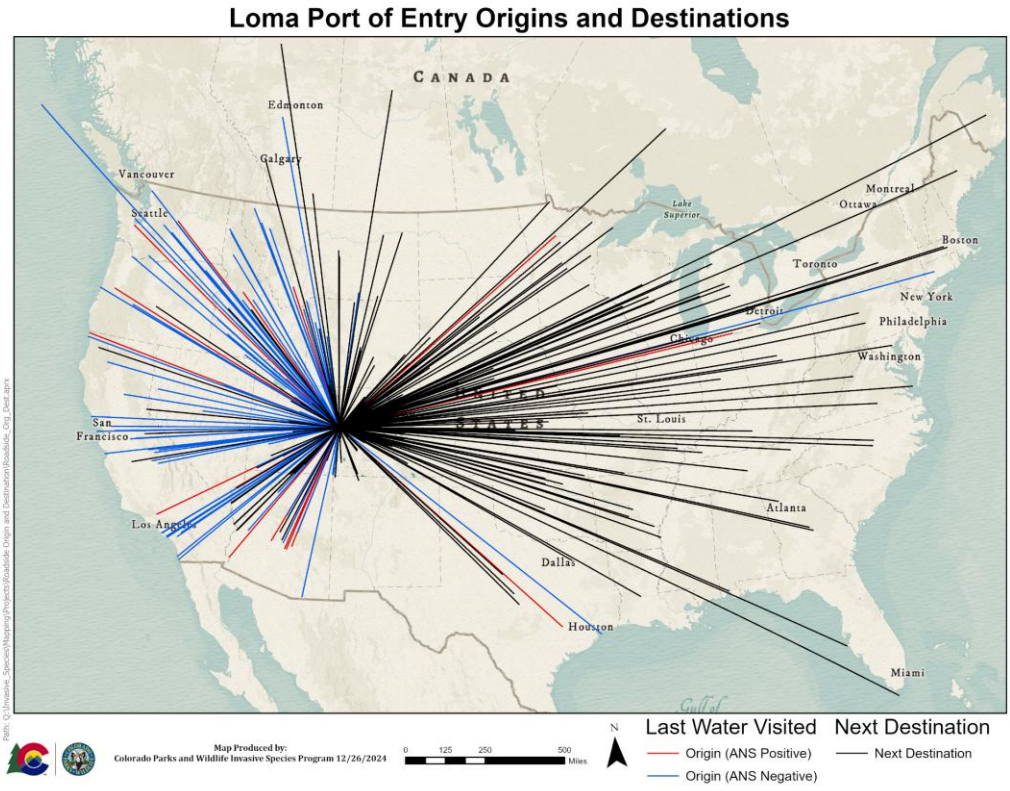
In 2024, CPW authorized 77 locations to perform watercraft inspection and decontamination. Eleven locations operated as containment for other ANS. The focus of the containment program is to inspect watercraft leaving the lakes/reservoirs to prevent boats from moving ANS overland into currently uninfested areas, while maintaining prevention activities upon entrance to the reservoir.

Sixty-four locations operated as prevention locations. Prevention locations are those that are negative for all ANS or are not located at a waterbody (e.g. offices or marine dealers).

Colorado conducted a total of 463,710 inspections and 32,584 decontaminations in 2024. Decontamination numbers have remained high in recent years as a direct result of CPW adapting to mitigate new threats. Increased invasions in the Colorado River Basin, from Lake Powell in Utah and Arizona downstream, as well as new infestations in states to our east continue to increase the need for diligent prevention at home in Colorado.

HB21-1226

HB21-1226, named the *More Robust Aquatic Nuisance Species Check Stations Act*, provided Colorado Parks and Wildlife the authority to inspect and decontaminate watercraft at roadside locations. It was initially implemented as a highly successful two-year pilot program in 2022 and 2023. The pilot phase of this program provided valuable insight into watercraft movement into the state.



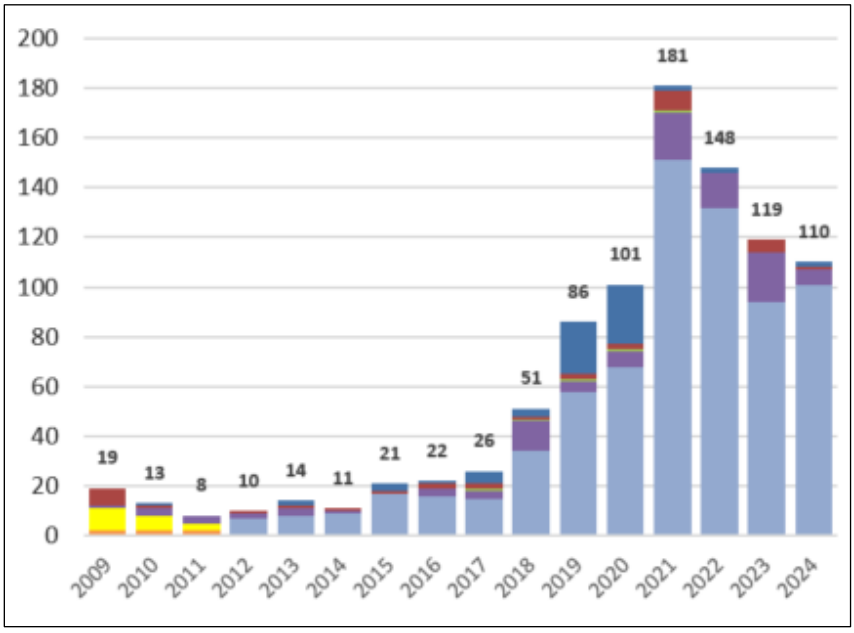
Utilizing the information gathered in the pilot phase of the program, in collaboration with the Colorado Department of Transportation and Colorado State Patrol Port of Entry staff, two semi-permanent roadside check stations were established at the Trinidad and Loma Ports of Entry in 2024.

In addition to these check stations, a roving team was established to gather more information on boater movement on the borders of the state. The roving roadside team

would operate out of a different Port of Entry each week, and these locations included: Fort Morgan, Fort Collins, Limon, Lamar, and Cortez. These operated from mid-March to the end of October, Thursday-Mondays, and while open all motorized vessels were required to stop for inspection.

Due to the high volume of boating traffic from the nearby quagga mussel infested Lake Powell, Loma had the highest number of mussel infested watercraft intercepted. Mussel infested vessels were also intercepted at Fort Morgan, Trinidad, and Cortez. At Loma, these mussel infested watercraft were all coming from Lake Powell, Lake Mead, and Lake Havasu. At Cortez and Trinidad, mussel infested watercraft were traveling from various Texas lakes. Lastly, the mussel infested watercraft intercepted at Fort Morgan was traveling from the mussel infested Illinois River, in Illinois.

Roadside Inspection Effort Summary					
	Inspected	**Decontaminated**	**Total Encountered**	**Bypassed**	**ANS Found**
2022	95	60	108	13	26
2023	21	10	63	42	2
2024	3370	859	4326	1719	39
Total	**3486**	**929**	**4497**	**1774**	**67**



Mussel Boat Interceptions
This year, 110 mussel fouled watercraft were intercepted in the state. All of these watercraft were fully decontaminated prior to being allowed into Colorado's waters. Since 2009, a total of 940 boats with adult zebra or quagga mussels have been intercepted coming into Colorado.

The majority of the intercepted vessels were coming from Arizona, Lake Powell, the Great Lakes, or Mississippi River states. All boats were fully decontaminated to ensure all mussels were dead, and no mussels were visibly attached to the vessel.

Information and Outreach

CPW and partner agencies have implemented a comprehensive, multi-faceted, public education campaign focused on boaters and anglers to prevent the spread of ANS utilizing a variety of mediums. The Invasive Species Program within CPW has been conducting information, education and outreach efforts for terrestrial and aquatic plants (noxious weeds), animals, insects, and diseases. Accomplishments include distribution of tens of thousands of printed rack cards, brochures, handouts, DVDs, posters and signs at offices, boat ramps and water-access points. In addition, staff have implemented an aggressive media relations campaign, using press releases and conducting web-based, radio, print and television interviews. CPW staff hosted numerous outreach seminars to boating and angling groups, marine dealers, HOAs, watershed groups, basin roundtables, ditch companies, municipal water managers and providers, schools and youth educational opportunities.

In 2024, CPW placed a high priority on and implemented a multifaceted approach to educating non-motorized recreators on the importance of cleaning, draining, and drying their gear. One method by which CPW undertook this effort was to hire dedicated technicians to attend and provide education at events and provide face-to-face education at launch sites frequented by non-motorized users.

CPW staff educating Colorado River users

In total, these technicians along with other ANS staff participated in 37 different outreach events. These events spanned a wide array of settings, from large-scale expos and festivals to focused educational sessions. Each event provided an opportunity to interact directly with a diverse audience, educating them on the risks posed by ANS and encouraging preventative action. The wide range of these events helped to elevate awareness across multiple communities.

When not attending events, these outreach-focused technicians set up educational displays at popular launch sites, educated and assisted non-motorized users on the importance of cleaning, draining, and drying their gear, and assisted with the process. While this effort was initially intended to be a broad statewide effort, much emphasis was placed upon the Colorado River in Grand Junction following the detection of zebra mussel veligers. These technicians made more than 6,000 face-to-face contacts at launch sites during the 2024 season. The information gathered by these technicians will be utilized to inform broader educational efforts to these user groups moving forward.

CD3 at Colorado River

Beyond these efforts, CPW has identified and prioritized the development of educational materials specific to these non-motorized user groups. In collaboration with CPW's education section, 8 focused instructional videos were produced that show different non-motorized user groups how to clean, drain, and dry their gear. A complementary series of rack cards was also produced and all of this information is now available on CPW's newly launched website. CPW aims to widely disseminate these resources beginning with the 2025 boating season.

State of Illinois, Department of Natural Resources

Submitted by Brian Schoenung, ANS Program Manager

Removal: Invasive carp harvest

Removal of invasive carps in the Upper Illinois Waterway downstream of the Electric Dispersal Barrier System is conducted annually via contracted commercial fishing with oversight from IDNR biologists. In 2024, invasive carp harvest was conducted from March to December. Highlights include:

- Deployment of 646,510 yards (367 miles) of gill and trammel net within the uppermost 54 miles of the carp invasion
- Removal of 193,103 silver carp, 572 bighead carp, and 674 grass carp for a total of 194,349 invasive carp removed or 1,273,294 pounds (~637 tons) of invasive carp
- One seine haul in December removed 475,000 pounds of invasive carp
- From 2010-2024, 1,922,882 silver carp, 106,487 bighead carp, and 13,083 grass carp have been removed, totaling 2,042,452 invasive carp or 15,792,894 pounds (~7897 tons)

Removal: Carp harvest on the Lower Illinois River

The enhanced contract fishing program provides funding to subcontract 20-30 commercial fishers on behalf of Illinois DNR to remove invasive carp from the lower three pools on the Illinois River, covering approximately 240 river miles. These pools have established populations of invasive carp with all life stages present, and removal in the lower river will reduce the number of fish reaching the upper Illinois River and threatening the Great Lakes. Contracted fishers are compensated per pound of invasive carp removed and sold to fish processors. Funding in 2024 supported the removal of approximately 6 million pounds of invasive carp.

Detection: Seasonal Intensive Monitoring

Intensive, multi-agency sampling events are conducted in the Chicago Area Waterway System upstream of the Electric Dispersal Barrier System in the Chicago Area Waterway System. The goal is to detect and remove any invasive carp upstream of the Electric Dispersal Barrier System. In 2024, two-week sampling events were conducted in May and October with crews from the Illinois Department of Natural Resources, US Fish and Wildlife Service, US Army Corps of Engineers, Illinois Natural History Survey, and contracted commercial fishers. Gears utilized include fixed and random site sampling with boat electrofishing, gill nets, and a commercial seine.

- In total, sampling crews conducted 140 hours of electrofishing at 560 sites, set 102 miles of gill net at 908 locations, and set 3,200 yards of commercial seine at 4 locations in Lake Calumet near Lake Michigan.
- No bighead or silver carp were captured or observed
- Two grass carp were harvested from Lake Calumet, with a third observed but not captured
- Sampling was conducted throughout the Chicago Area Waterway System, but the densest sampling occurred in the Calumet region, where two Silver Carp and one Bighead Carp have been captured between 2010 and 2022.

Detection: Urban Ponds

While community ponds in the Chicago area are not hydrologically connected to the Chicago Area Waterway System, they can be a source of occasional invasive carps due to contaminated stocking or illegal fish releases by members of the public. In 2024, US Fish and Wildlife Service used eDNA techniques to sample 4 Chicago Park District Lagoons. All of the results were negative. Positive samples or credible public reports result in follow-up surveys by IDNR.

Monitoring: Multiple Agency Monitoring

This project began in 2019 and utilizes the Long-Term Resource Monitoring (LTRM) sampling design to provide a more robust and statistically powerful fish population dataset that monitors invasive carp population demographics and assesses native fish communities that may be impacted by invasive carp. Standardized, multi-gear sampling is conducted by multiple agencies from June to October in the Illinois Waterway downstream of the Electric Dispersal Barrier System. 2024 highlights:

- Initiative led by IDNR with INHS, USACE, USFWS, and USGS collaborating.
- Effort included 684 transects/171 hours of boat electrofishing, 448 mini-fyke net sets, 672 paired hoop net sets, 98 fyke nets, and 695 transects/57.5 hours of electrified dozer trawling
- No invasive carp were detected upstream of Brandon Road Lock and Dam on the Des Plaines River
- No invasive carp range expansion was detected compared to prior years of sampling

Black carp

Black carp have not been found in the upper Illinois River, but there is concern about movement towards the Great Lakes. Several monitoring and management projects were conducted in 2024 to evaluate the population status, assess recruitment to sampling gears, and collecting specimens for demographic research.

- Conducted hoop net sampling for black carp in the lower Illinois River and tested experimental baits to assess preference
- Incentive payments of $100 per Black Carp were provided to recreational anglers and commercial fishers who submitted verified claims of Black Carp captures. Black Carp individuals removed by the bounty program are used for evaluation and research into demographics, diet, etc.
- Additional research into sampling gears, range assessment, populations dynamics, and black carp reproduction

Law enforcement

In 2012, Illinois DNR formed the Invasive Species Unit (ISU), a specialized law enforcement unit that targets illegal activities that increase the risk of aquatic invasive species introduction and/or expansion within the waters of the State of Illinois and jurisdictions throughout the Great Lakes Basin. The IL DNR ISU specializes in more closely regulating water-related industries that are likely to be a source of future introductions or expansion of AIS into state waters. Industries include sport and commercial fishing, aquaculture, fish transportation, bait, pet, aquarium, fish stocking, and live food markets.

In addition to surveillance, investigation, and enforcement, this unit also liaises with other law enforcement and non-enforcement personnel and provides public education. 2024 highlights include:

- The seizure of 145 pounds of live red swamp crayfish in April
- Communication with airlines about prohibitions on shipments of live red swamp crayfish, which should drastically reduce illegal live crayfish sales in Illinois
- In May, ISU and University of Illinois staff hosted the first IDNR Office of Law Enforcement aquatic invasive species workshop, which trained 102 conservation police officers in aquatic invasive species identification and enforcement methods
- Continuing collaboration on the Great Lakes Fishery Commission Law Enforcement Committee's "least wanted" aquatic invasive species project, which is intended to identify distributors of aquatic invasive species within the Great Lakes basin and stop their illegal activities through enforcement actions
- Frequent compliance checks and inspections, including the inspection of moss balls for suspected zebra mussels and the citation of an angler using live rusty crayfish, an Illinois injurious species, as bait

Hydrilla

An outbreak of Hydrilla was confirmed in northeastern Illinois in October 2024. This is only the second detection of Hydrilla in Illinois. Initial site surveys indicate that the infestation is substantial, occupying more than 10 acres in a 26 acre impoundment along a stream system and having already been detected downstream of the initial site. Herbicide treatment will begin in 2025 along the entirety of the impacted stream system and is planned to continue for several years along with an ongoing regimen of delineation, monitoring, and assessment.

Regulation

In December 2023, an update to the Illinois Injurious Species administrative rule was finalized. This updated rule provides a more comprehensive list of Injurious Species in Illinois, which are prohibited from possession, propagation, transportation, sale, or purchase without IDNR permitting.

Partner activities

The Monitoring and Response Workgroup of the Invasive Carp Regional Coordinating Committee is chaired by the Illinois DNR and the Great Lakes Fishery Commission and comprised of state and federal agencies. This group works on a series of detection, management and control, and response projects in Illinois dedicated to preventing invasive carp from establishing populations in the Chicago Area Waterway System and Lake Michigan. IDNR spearheads many of these initiatives as described above, but some additional work is also highlighted below:

- Ichtyoplankton sampling to monitor for the presence of invasive carp eggs and larvae to assess extent, location, timing, and magnitude of reproduction in IWW (Illinois Natural History Survey)
- Invasive carp eDNA monitoring in the Chicago Area Waterway System (USFWS)
- Invasive carp demographics research (USFWS)
- Hydroacoustic surveys of the Illinois Waterway for invasive carp stock assessment and monitoring fish abundance and distribution at the Electric Dispersal Barrier System (Southern Illinois University and USFWS)

- Maintenance of interagency acoustic telemetry receiver array, real-time telemetry receivers, and fish tagging to track invasive carp and surrogate species movement through the Illinois Waterway (USGS, SIU, USACE, USFWS)
- Operation and maintenance of existing deterrent technology at the Electric Dispersal Barrier System and testing of CO2 and acoustic deterrents (USACE, USGS)
- Development of deterrents at Brandon Road Lock and Dam (USACE)
- Monitoring the Des Plaines River for invasive carp as part of alternative pathway surveillance (USFWS)
- Community outreach at shows, fairs, and special events by IDNR and its partner agencies to spread awareness of the threat of invasive species

State of Indiana, Department of Natural Resources

Submitted by Eric Fischer, AIS Supervisor

The Indiana Department of Natural Resources continues its efforts to prevent the spread of AIS species throughout the state of Indiana with staff currently divided between our focused all taxa work throughout the state but also focused on the Watershed divide between the Mississippi River Basin watershed and the Great Lakes watershed and our dedicated Invasive Carp unit. In 2024 we were fortunate to be able to bring our Invasive Carp biologist staff's staff unit up to full capacity by refilling the 2 assistant biologist positions, refilling the vacant AIS coordinator position, and hiring an Invasive Carp permit program manager to oversee our new Carp permit program.

Indiana Department of Natural Resources has continued to utilize state and Great Lakes Restoration Initiative funding along with state AIS management plan funding to provide for the implementation of the state AIS management plan implementation. Continuing the control and management work from past years we also have continued to fight the spread of Eurasian Watermilfoil and the growth of Starry Stonewort in northeast Indiana. Starry stonewort a macro algae especially, has proven very difficult to control but we continue to try different chemical prescriptions and are coordinating with universities and plant control companies with hopes of finding better tools that are effective at limiting the growth and success of this invasive aquatic plant. The aggressive and large-scale control and eradication efforts on over 375 acres of infestation in 2024, leveraging the use of Great Lakes Restoration Initiative grant funding, state LARE funding, and private lake association treatments we have slowed the spread of this aggressive macro alga but has yet to provide the answers to the best path forward.

In the 5 years+ the Indiana DNR has put special emphasis and funding toward a dedicated Invasive Carp program to engage with neighboring states and region partnerships and committees to contribute to better understanding and implementation of control strategies across the drainages. Including the following

- All of Indiana's Ohio River Basin invasive carp work contributes directly to the goals of the 4 major project areas: Abundance and Distribution of Early Life Stages, Early Detection and Evaluation of Removal, Movement and Habitat Use, and Control and Containment.
- Specific to early life stage INDNR organized a larval ID workshop for project partners in fall of 2024 and we increased efforts to evaluate YOY carp through ichthyoplankton tows and surface trawls throughout the system including movement and passage into Hovey Lake a potentially significant recruitment area.
- In 2024 the agency established an Invasive Carp Harvest Permit that allows for a person to use seines and/or gill nets to capture invasive carp species in Indiana waters that would otherwise or was previously closed to those gear types with protections in place to ensure only invasive carp are harvested.

Along with many other representatives of the AIS programs in the Midwest we continue to be engaged and participating in the following groups: Great Lakes Panel, Mississippi River Basin Panel, the Invasive Mussel Collaborative, Interstate ANS planning group, Indiana Invasive Species Council, regional hydrilla coordination and Invasive Carp Regional Coordinating Committee.

State of Iowa, Department of Natural Resources

Submitted by Kim Bogenschutz, AIS Coordinator

Following is the Iowa DNR Aquatic Invasive Species Program update for 2024.

The Aquatic Invasive Species Program (DNR–AIS) staff in 2024 consisted of 1 full-time Coordinator/Natural Resources Biologist, 1 full-time Vegetation Management/Natural Resources Biologist, 1 full-time Natural Resources Technician, 18 seasonal Natural Resources Aides (i.e., watercraft inspectors, survey crews), and 1 Administrative Intern who surveyed waterbodies for AIS across the state.

Major accomplishments in 2024 included the following:

- Employed 18 Seasonal Workers and 1 Administrative Intern
- Conducted 2,763 watercraft inspections reaching 6,883 people on 104 waterbodies
- Conducted 257 angler interviews on 25 trout streams
- Supported 29 partnerships and cooperative projects
- Used geofencing, search retargeting, and contextual and content targeting to serve 400,000 ads to visitors at 68 boat ramps and 1 within lake area
- Ran 190,000 OTT and OTT retargeting commercials targeting boaters and anglers in Iowa
- Ran 313 commercials on Des Moines television stations and Dickinson County radio stations
- Ran 16,666 online commercials via a Des Moines television station
- Recorded 3 segments for the Iowa Live television program
- Gave 25 presentations at conferences, outdoor events and trainings
- Targeted water recreationists with AIS prevention messages using news station website takeovers, boat ramp signs, news releases, social media and displays
- Completed 140 presence/absence and 70 comprehensive full-lake vegetation surveys
- Surveyed vegetation at 225 access points on 50 lakes
- Chemically treated invasive aquatic plants in 31 waterbodies
- Placed 100 zebra mussel veliger settlement samplers in 38 lakes and reservoirs
- Collected 70 water samples from 47 lakes and reservoirs and analyzed them for zebra mussel veligers
- Collected 22 larval tows from to monitor for Bighead and Silver Carp reproduction
- Collaborated with Iowa State University and the U.S. Fish and Wildlife Service to acquire grants for 4 Bighead and Silver Carp projects in the Upper Mississippi and Missouri River Basins in Iowa
- Purchased and repaired equipment and supplies for DNR Fisheries management stations and hatcheries to prevent the spread of AIS during operations

Three new infestations of Eurasian watermilfoil and seven new infestations of brittle naiad were discovered in Iowa in 2024.

Two new infestations (large reservoirs on the Des Moines River) of zebra mussels were discovered in Iowa in 2024.

State of Kansas, Department of Wildlife and Parks

Submitted by Chris Steffen, AIS Coordinator

AIS Program Summary:

The Kansas Aquatic Nuisance Species Management Plan was approved by the ANSTF in May 2005. The goals of the plan are to prevent new introductions of ANS to Kansas, prevent dispersal of established populations of ANS, eradicate or control to minimize the adverse ecological, economic, social, and public health effects of ANS, educate all aquatic users of ANS risks, and to support ANS research in Kansas. The coordinated efforts contained within the plan are designed to protect residents of Kansas and the state's aquatic resources from the multitude of potential losses associated with ANS plants and animals.

The KDWP Aquatic Invasive Species Program staff consists of 1 full-time AIS Coordinator/Supervisor; 1 full-time AIS Biologist focused on WID and vegetation management; 1 full-time AIS Biologist focused on commercial bait permitting and inspection and outreach and education; 1 full-time Invasive Carp Biologist; and 1 full-time Invasive Carp Technician.

- **Continued Watercraft Inspection and Decontamination (WID) efforts in Kansas –** Funding through the Bureau of Reclamation provided KDWP the ability to conduct WID activities at 6 BOR waters in Northwest Kansas:
  - Norton Reservoir – not known to contain zebra mussels
  - Lovewell Reservoir – not known to contain zebra mussels
  - Webster Reservoir - not known to contain zebra mussels
  - Kirwin Reservoir - not known to contain zebra mussels
  - Cedar Bluff Reservoir – zebra mussel infested
  - Glen Elder Reservoir – zebra mussel infested

  More than 1,200 boats were inspected and KDWP plans to maintain and expand WID efforts in future years as funding and staffing allows. For 2025, KDWP received QZAP funding to conduct WID at zebra mussel infested water bodies within Kansas.

- **Continued removal of invasive carps from the Kansas River below the Bowersock dam.** In 2024, approximately 25,000 pounds of invasive carps were removed from the Kansas River below the Bowersock Dam to prevent upstream range expansion and to benefit native species and river users below this barrier. KDWP conducted these agency staff removal efforts using traditional and electrified dozer trawl electrofishing boats and gill nets. Comparisons of demographic data between the area being targeted for removal and two unfished locations (KS River below WaterOne Weir and the MO River at Atchison, KS) revealed that there are differences between the removal location population and the unfished populations. Fifty (50%) of sampled carp in the population being fished were >718 mm in length compared to 654mm (Kansas River below WaterOne Weir) and 624 mm (Missouri River). Size structure of the population being fished is shifted toward larger fish than the two control populations. The population being fished is also exhibiting faster growth than the two unfished populations.

- **Initiated bighead carp telemetry project on Neosho River - Grand Lake system to inform removal**

  In collaboration with Oklahoma Department of Wildlife Conservation and Missouri State University, invasive carp are being targeted for capture throughout the Neosho River Grand Lake system. All invasive carp captured are implanted with ultrasonic transmitters (Vemco V16-5H; 69kHz). Once fishes are fitted with transmitters, movement and passage will be documented throughout the life of the transmitters (up to 5 years). We are utilizing a monitoring array that is a combination of stationary receivers and manual tracking. The stationary receiver array will extend throughout Grand Lake, Neosho River, and Spring River. Manual tracking is also being conducted at regular intervals and concentrated during seasons with high movement (e.g., spawning movement) throughout the study to garner more fine scale habitat information (e.g., spawning locations) and "hot spots" (e.g., areas of high Asian carp concentration). The receivers will provide enough spatial coverage to detect longitudinal movement throughout the system. Receivers place above and below low head dams will inform passage across these structures.

- **KDWP initiated invasive crayfish in Kansas lakes.** In 2024 KDWP AIS biologists initiated invasive crayfish detection sampling across Kansas. Sampling was completed at 25 high risk lakes. Wild, invasive Red Swamp and Rusty Crayfish populations were both detected in Kansas within the last 5 years and largescale crayfish sampling for invasive crayfish detection has never been conducted in the state of Kansas. This effort is meant to provide KDWP with baseline information on the presence/absence of invasive crayfish in lakes across Kansas to inform future invasive crayfish management decisions.

- **Conducted bait shop inspections across the state.**
  Inspections were conducted at bait shops statewide; no invasive species were found in commercial bait tanks during the inspection process. Bait identification posters and AIS literature were distributed to the bait shops during inspections.

- Education and outreach efforts were continued through a variety of media outlets including internet ads, press releases, and direct mailings. We contracted a marketing firm to revamp our education and outreach materials, which are being used currently for AIS swag and other outreach efforts and will be used in upcoming billboard and social media campaigns.

- AIS literature and outreach materials were distributed to all KDWP offices, state parks, nature centers, bait shops, marinas and at educational events.

- AIS signage was maintained at AIS infested waters and prevention and awareness signs were placed at uninfested lakes.

- Kansas continues to participate in the *Don't Let it Loose* campaign. The program has been well received and is very popular with pet shop owners. We are supplying additional bags as pet shops request them. We plan to continue purchasing bags in the future and revisiting the locations.

- 105 waterbodies not known to contain zebra mussels were sampled for zebra mussel veligers in 2024 (all 150 are planned to be sampled in 2025 as well).

- Zebra mussels were detected 3 new waterbodies in 2024: Carbondale East Lake, Great Bend – Stone Lake, and Shawnee State Fishing Lake.

- Previously, zebra mussels were discovered in El Dorado Reservoir in 2003; Winfield City Lake in December 2006; Cheney Reservoir, and Perry Reservoir in 2007; Marion Reservoir and Lake Afton in 2008; Milford and Wilson Reservoirs in 2009; Council Grove City Lake and John Redmond Reservoir in 2010; Council Grove, Melvern, and Kanopolis Reservoirs and Jeffery Energy Center Lakes (2) in 2011; Coffey County-Wolf Creek Lake and Chase County State Fishing Lake in 2012; lakes Shawnee and Wabaunsee and Clinton and Glen Elder (Waconda Lake) Reservoirs in 2013; Pomona Reservoir in 2014; Paola City Lake (Miola Lake) in 2015; Wellington City Lake in 2015; Hillsdale and Cedar Bluff Reservoirs in 2016; Osage State Fishing Lake, Tuttle Creek Reservoir, and Geary State Fishing Lake in 2017; Lyon State Fishing Lake in 2019; Linn Valley Lakes - Main Lake and Emerald Bay in 2020; Lebo City Lake in 2021; and Gardner City Lake in 2023.

State of Kentucky, Department of Fish and Wildlife Resources

Submitted by Jeff Herod, ANS Coordinator

Aquatic Invasive Plant Treatment and Monitoring

KDFWR Fisheries Division continues its efforts to detect, treat, and monitor aquatic invasive plant species in high priority management areas. The two (2) highest priority species are Eurasian watermilfoil and Hydrilla.

- Eurasian watermilfoil is continuing to be monitored at Cave Run Lake and Clear Creek Lake (USFS property). Cave Run locations have been outcompeted by hydrilla in 2024. Clear Creek Lake is being treated with a stocking of triploid grass carp. Staff continue to work with agency partners to monitor the distribution of the plant and future potential treatment solutions.
- Staff continue to chemically treat patches of hydrilla at high traffic areas on Cave Run Lake and Dewey Lake. This is to prevent potential fragments attaching to boats, trailers, or personal watercraft. Previous treatments not near the municipal water intake at Paintsville Lake have shown to be successful. Treatment sites near municipal water intakes have been ineffective due to the minimum ppm concentrations required through EPA restrictions. Signage has been posted at all access areas of the potential threat and to provide public guidance on checking equipment for potential hydrilla fragments. Staff are working with other agency partners on public outreach campaigns and potential solutions to addressing the invasive plant.

Other Aquatic Invasive Species Efforts

KDFWR Fisheries Division is working on several AIS issues that involve multiple partners. The current reporting period included efforts to prevent and manage zebra mussels, revise the State ANS Plan, review and revise bait regulations, and participation in Watercraft Inspection and Decontamination (WID) training.

- KDFWR continues efforts to prevent the spread of zebra mussels. Jeff Herod (KDFWR Aquatic Nuisance Species Coordinator) and the Central Fisheries District staff are working with malacologist Dr. Monte McGregor of the Center for Mollusk Conservation to monitor zebra mussels in Williamstown Lake, KY. KDFWR met with local officials and the U.S. Geological Survey (USGS) to discuss options. The group developed a plan of action, KDFWR collected additional data on the lake's thermocline, shared links to free watercraft inspection training, and worked with the Williamstown Lake Association to post signage at all access areas warning residents and visitors of the potential threats.
- KDFWR is planning to revise its State Aquatic Nuisance Species Plan (KANSP). The process will involve a team of experts representing various federal, state, and non-government. An internal review was initiated to develop a work activity plan. KDFWR managers developed a list of potential participants that will be invited to join the ad hoc revision team. KDFWR has discussed with U.S. Fish and Wildlife Service (USFWS) several potential types of revision and timelines.
- KDFWR in partnership with the Kentucky State Nature Preserves has formed an ad hoc team to work collaboratively on revising several regulations to prevent the spread of aquatic invasive species. Regulations being reviewed include Live Bait for Personal Use, Sale of Live Bait, Live Fish

Sales and Handling, and Importation Possession and Prohibited Aquatic Species. The group is gathering comments on issues, reviewing the literature on live bait as a pathway for invasive species, and reviewing other State regulations on live bait.

- Five staff completed Aquatic Invasive Species Watercraft Inspection and Decontamination Training (WID). The classes included an overview of education and outreach, AIS biology and impacts, watercraft anatomy and function, inspection procedures, decontamination standards, and strategies for implementation.

Invasive Carp

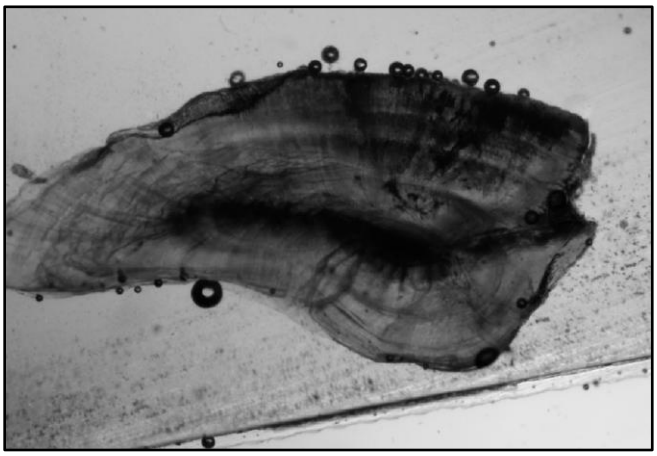
KDFWR Fisheries Division continues a myriad of efforts to detect, track the movements, control/ harvest, and contain invasive carps. KDFWR initiated reporting on its FY2024 efforts for two Mississippi River subbasins. KDFWR is active in both the Tennessee-Cumberland River Basin and the Ohio River Basin. In addition to harvest, KDFWR works on early life stage projects, occupancy sampling, community assessments, age and growth, and telemetry. Its annual activities are in coordination and collaboration among many other partners working in these subbasins. These project accomplishments are linked to national and subbasin priorities.

- KDFWR continues its efforts as a partner working on invasive carp issues in the Ohio River Basin. KDFWR is involved in the Early Life Stages project, Telemetry project, Control and Containment project, and leads the Early Detection and Evaluation project. KDFWR implements projects in J.T. Myers pool to Meldahl pool. These projects collect invasive carp data and analyze it for year-over-years trends as well as for intra-annual changes. Data collected includes species, individual counts, lengths, weights, sex, location, and movement. The partnership looks to detect, define, and measure the impact that harvest has on invasive carp populations (i.e., agency and commercial fishers).

- KDFWR is working with U.S. Fish and Wildlife Service Region 3 (USFWS) to sample invasive carp using eDNA. Two locations were sampled in October 2024. Taylorsville and Cave Run lakes are in the Ohio River Basin and connected to known invasive carp populations by the Salt and Licking rivers, respectively. This is part of KDFWR Early Detection Rapid Response (EDRR) efforts to address threats to high priority inland fisheries and develop response plans. The first surveys are focused on invasive carp with future surveys including additional aquatic invasive species. Future KDFWR work was discussed with USFWS Region 3 and Region 4 on an eDNA coordination call in December.
- KDFWR continues its efforts to manage established invasive carp populations with commercial harvest. Ohio River Basin Commercial fishers between Federal Fiscal Years 2014-2024 harvested a total of approximately 7,000,000 pounds of Silver carp, 329,715 pounds of Bighead carp, and

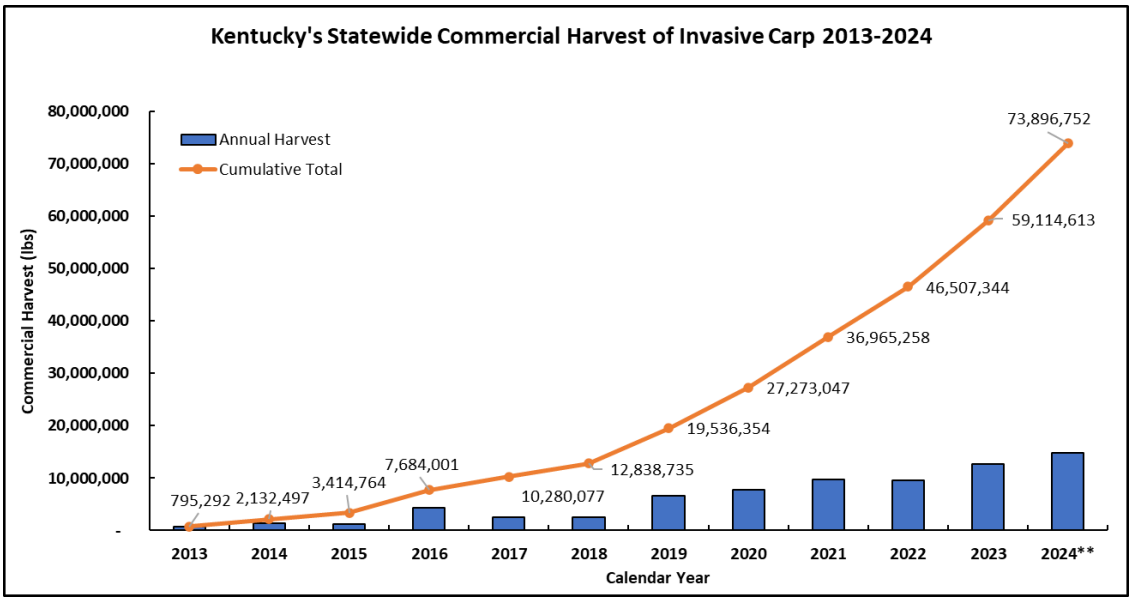
196,691 pounds of Grass carp. KDFWR collects data on a subsample of these harvested invasive carp using observers on the contract fishing vessels.

- KDFWR, West Virginia University (WVU), Indiana Department of Natural Resources (INDNR), and U.S. Fish and Wildlife Service (USFWS) held a call to discuss the final steps in the development of an occupancy model using invasive carp. This model resulted in a tool that provides a power analysis to inform sampling effort to detect invasive carp. WVU Drs. Bayer, Rota, and Murry developed the tool that was built using data from partners in the Ohio River Basin. A manuscript is in preparation and a web application is to follow.
- Silver carp age data collected in the Ohio River Basin by KDFWR indicates that Silver carp in Cannelton, McAlpine, and Markland pools have an age range between 1-18 years old. In Cannelton pool, which is the Intensive Management Zone, the most common Silver carp ages range between 4-7 years old, but there was one (1) 18 year old individual.



- KDFWR presented a proposal to determine the feasibility of using a low-voltage fish fence to harvest invasive carp in the Salt River (Intensive Management Zone in the Ohio River Basin). KDFWR received approval from their Commission to contract with Carp Solutions LLC. KDFWR, U.S. Fish and Wildlife Service (USFWS), and Carp Solutions are looking to examine >10 locations in the Salt River. This first phase of the project is to assess each location to determine that it meets the needs of the device, and the location is feasible to design and build the device to operate there. The pilot project has multiple phases, and each phase has metrics that assess the feasibility of the project proceeding to the next phase.
- KDFWR assisted with the decommissioning of the HTI telemetry array at Barkley lock associated with the end of the BAFF assessment study.
- Completed YOY black carp sampling on the LMR, Lower Ohio, Tennessee, and Cumberland rivers. Some YOY black carp were likely collected but lab verification is not complete yet.
- Completed the pilot year of adult black carp monitoring in the Olmstead pool of the Ohio river and the confluence with the Cumberland River. One adult black carp collected in the lower Cumberland River, out of a total of 74 net nights of effort.

- In the fall of 2024, KDFWR assisted USFWS Columbia FWCO staff with Paupier sampling on Kentucky reservoir, to monitor long term trends in silver carp relative abundance.
- In the fall of 2024, KDFWR assisted USFWS Columbia FWCO staff with Paupier sampling on Kentucky reservoir, to monitor long term trends in silver carp relative abundance.
- 2 million pounds of invasive carp were harvested by one fisher, using a seine in Barkley tailwaters.
- KDFWR staff completed 106 ride alongs with commercial fishers in the invasive carp harvest program in 2024.
- KDFWR assisted TWRA with tagging 1000 silver carp in the TNCR for an exploitation study in 2024.
- KDFWR documented another extensive silver carp die off in the tailwaters below Barkley and Kentucky reservoirs in late spring through early summer of 2024.
- KDFWR collected no YOY invasive carp in Barkley or Kentucky reservoirs in 2024.
- KDFWR awarded 3 new experimental gear permits at the Tier 1 level in the fall of 2024.
- The Barkley and Kentucky reservoirs account for >80% of Kentucky's statewide invasive carp harvest that exceed 70 million pounds harvested from 2013 to 2024.



Deterrents and Planning

- KDFWR assisted with the decommissioning of the HTI telemetry array at Barkley lock associated with the end of the Bio-Acoustic Fish Fence (BAFF) assessment study.
- KDFWR continued to maintain an extensive telemetry array within the TNCR, with over 70 Vemco receivers being maintained by the Murray carp staff. Data was offloaded quarterly and shared with partners to inform several projects within and across subbasins.
- The BAFF was operated in a state continuous ***ON*** during 2024.

Education and Outreach

KDFWR Fisheries Division continues to engage the public with updates on species and best methods they can use to prevent the spread of aquatic invasive species. KDFWR focused on engaging different groups of people at venues ranging from 20 to 200 people about invasive carp and KDFWR management efforts. These events were held in western Kentucky (Calloway, McCracken, and Graves Counties). Each event consists of a tasting, filleting demo, and presentation on invasive carp biology and ecology. KDFWR Fisheries Biologist, Matt Dollenbacher, shares his recipes and prepared smoked invasive carp dip, invasive carp tacos, and invasive carp salad – his take on tuna salad.

- Venue Kentucky Backcountry Hunters and Anglers in Paducah, KY
- Venue KDFWR Hook & Cook in Mayfield, KY
- Murray State University Fish and Wildlife Society in Murray, KY

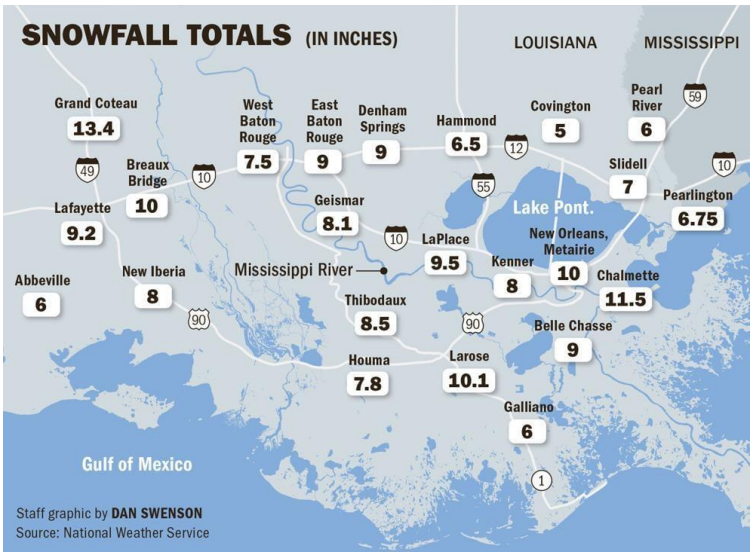
State of Louisiana, Department of Wildlife and Fisheries

Submitted by Rob Bourgeois, AIS Coordinator

Record snowfall and record cold

During the week of January 20, 2025, LA experienced a record snowfall event. All of Louisiana south of Interstate 10 received up to 11 inches of snow. This was record snowfall for much of the area. This was accompanied by extreme cold weather and water temperatures that dropped to below 35 F in some coastal reporting stations. Even barrier islands experienced significant snowfall.

The effects of this cold weather are unknown at this time. Based on previous experience, Apple Snail reports should be reduced compared to previous years. The 2 main populations of tilapia did experience water temperatures near 35 F for 8 to 10 hours. In 2019, a population of tilapia was eradicated by similar temperatures. However, the 2025 cold weather was shorter in duration but more severe.



New Reported ANS:

Tilapia:

Nile or Blue Tilapia (or hybrids) have been confirmed in the drainage canals in Jefferson parish. LDWF is sampling to get a range and to determine if they have escaped the canal system after Hurricane Francine.

Blue Land Crab:
A blue land crab was reported on Grand Isle. LDWF has anecdotal reports of these crabs occurring periodically on Grand Isle "back to the 50s after a winter without a freeze." We will see what happens to reports of these crabs after the recent freeze.


Blunt-Tooth Swimming Crab

Blunt-Tooth Swimming Crab:
(Callinectes bocourti)
A commercial fisherman caught this crab in Terrebonne Bay. These occasionally appear in commercial catches and are not considered an established population.

Chinese Mitten Crab:
(Eriocheir sinensis)
A Chinese Mitten Crab was reported from Breton Sound. This is the second report in the last 3 years. Before these latest reports, the only reports were in 1980s and 1990s.


Chinese Mitten Crab

Update to recently reported ANS:

Northern Snakehead:
No new snakeheads have been reported to LDWF. LDWF will continue to monitor the MS River backwaters for snakeheads during regular sampling tasks.

Status of established ANS :

Apple Snail:
Apple snails have been reported in Alexandria, LA. In Spring 2025, we will see if the population persists. No other confirmed major expansions have occurred. The northern range of Apple Snails appears to be along US Highway 190 from MS to TX.

Asian Swamp Eels:
Asian swamp eels (*Monopterus cuchia*) were found in Bayou St John, New Orleans in June 2019. LDWF and a local university professor continue to monitor and sample the population. LDWF electrofishing did not detect any swamp eels. It is believed that this is a population with very low numbers at this time. There have been no reports of swamp eels in 2024.

Invasive Carp:
Small YOY(presumed) Silver Carp have been found in the MS River. This is a size class not usually found. Otoliths have been removed and pending future funding will be aged to confirm if they are YOY.

Rio Grande Cichlids:
In late September, Rio Grande cichlids were found in the drainage canals in Baton Rouge. Earlier this summer, they were also reported in a canal off of the Intercoastal Waterway in the Houma area.

State of Minnesota, Department of Natural Resources

Submitted by Adam Doll, Legislative Coordinator

Watercraft Inspection and Enforcement

In 2024, Minnesota DNR and local government watercraft inspection partners completed 451,551 inspections on watercraft arriving and leaving water accesses within Minnesota. The DNR employed 40 Level 1 (inspection) and 35 Level 2 (inspection and decontamination) inspectors in 2024 with an additional 763 inspectors hired by tribal or local units of government. The DNR trains all watercraft inspectors through a hybrid learning system consisting of online and in-person training. In addition to the DNR staff who received in person training in 2024, three DNR Trainers also trained tribal or local government inspectors at 62 in-person Level 1 trainings and 29 in-person Level 2 trainings.

DNR conservation officers provided 10,345 hours of AIS enforcement and education. Conservation officers worked in partnership with watercraft inspectors to conduct seven roadside check stations to inspect watercraft and equipment transported within Minnesota.

Invasive Carp

The Minnesota Legislature appropriated $12 million, as recommended by the Lessard-Sams Outdoor Heritage Council, to the DNR to design, construct, and begin operating and maintaining a deterrent for invasive carp at Lock and Dam No. 5 on the Mississippi River to protect Minnesota's aquatic habitat through an adaptive management approach. The DNR partnered with agencies with relevant expertise and jurisdiction to begin scoping this project in 2024. The design for a selective lock deterrent will be completed by June 30, 2026, and the deterrent will be installed no later than June 30, 2029. The project also includes other components to improve the function of the lock deterrent such as a trap-and-sort system to remove invasive carp and developing deterrents for use at the tainter and roller gates. The DNR also published an update to the statewide Invasive Carp Action Plan in 2024, which describes Minnesota’s approach to prevention and management of invasive carp. The key purpose of this plan is to slow the spread of invasive carp, minimize their impact, and reduce the likelihood of invasive carp reproducing in Minnesota waters. DNR continues to monitor, tag and track, and remove invasive carp and partners with other agencies to continually refine and expand these activities.

Regulation

In February 2024 the DNR finalized proposed rule changes to add 13 new species and species groups to the state prohibited invasive species list including priority species like jumping worms and nonnative Phragmites. Twelve species were listed as prohibited in February of 2024, and jumping worms were listed as prohibited on July 1, 2024.

County AIS Prevention Aid

The Minnesota DNR provides support to local government staff leading their county's AIS prevention programs by facilitating regional workshops and providing technical support. In February and March 2024, the DNR hosted a series of four online workshops and two in-person collaboration meetings. These workshops included topics of interest including: new approaches, partnerships, learn from experts, and public engagement. Online workshops attracted 70-90 attendees each. In April, the in-person collaboration meetings attracted more than 40 staff and stakeholders involved in developing and implementing local AIS programs attended. These attendees included but were not limited to local and tribal government staff overseeing prevention AIS programs, watercraft inspection staff, regional and statewide partners, non-government organizations, and representatives from academia and private businesses.

Early Detection (signal crayfish)

In September 2023, the DNR confirmed the presence of nonnative signal crayfish in Lake Winona, Douglas County. This was the first confirmation of signal crayfish in Minnesota waters, and the first confirmation of signal crayfish in the Midwest. The Minnesota DNR partnered with Douglas County and the Minnesota Aquatic Invasive Species Research Center (MAISRC) to coordinate multiple trapping efforts on Lake Winona and seven nearby lakes in 2024.

Douglas County hired a commercial harvester and baited 160 funnel traps along 10 trap lines and an additional 25 traps near a Lake Winona culvert flowing into connected Lake Agnes. Traps were checked daily and re-baited and moved to new locations. Douglas County's trapping project ran from April 23rd through May 19th.

MAISRC set baited funnel traps to target adult crayfish and 36 artificial refuge traps targeting juveniles and females. A total of seven trapping days were conducted from April through October. Additionally, MAISRC, DNR, and citizen scientists collected 107 eDNA samples from Winona and nearby lakes.

DNR staff utilized funds from a US Fish and Wildlife invasive species rapid response grant to conduct additional trapping efforts. Sixty-one baited funnel traps were set individually along lake shores or in sets of 5 on trap lines in Lake Winona and seven nearby lakes. Traps were checked daily and re-baited and moved to new locations. Four three-day trapping campaigns were conducted from August through October.

No signal crayfish have been captured during any of the trapping sessions as of January 2025. Traps did capture native virile and calico crayfish as well as larger fish such as bullhead and bluegill. eDNA samples are being analyzed by MAISRC and results from the lab are pending.

Early Detection (prickly water lily)

In the fall of 2024, a population of prickly water lily (*Euryale ferox*) was found in Minnesota. Staff from the Capitol Region Watershed District (CRWD) in Ramsey County discovered the new population, and Ramsey County staff, CRWD and Minnesota DNR invasive species program staff coordinated to manually

remove as much biomass as possible in southern portions of Loeb Lake, Ramsey County (Saint Paul). This is the first known occurrence of the plant in Minnesota and there is some evidence that the plant may be successfully overwintering; our partners will be monitoring the water body going forward.

Invasive Aquatic Plant Management Grants

In 2024, the Minnesota DNR Invasive Species Program issued 422 permits to control invasive aquatic plants. Through our grant program, $409,600 was made available to local partners such as lake associations, watershed districts, and lake improvement districts. This money was distributed to 99 projects to treat Eurasian watermilfoil, curly-leaf pondweed, flowering rush, and starry stonewort.

Invasive Aquatic Plant Management (nonnative *Phragmites*)

The DNR continued to work with partners throughout the state to implement a coordinated response to nonnative *Phragmites* (*Phragmites australis* subsp. *australis*) in Minnesota. In 2024, Conservation Corps of Minnesota and Iowa staff visited 700 previously treated sites prior to the 2024 treatment season. Nonnative *Phragmites* was not detected at 280 of those sites. DNR contractors visited 638 nonnative *Phragmites* sites in 41 counties. Most of the treated sites were very small. For example, out of the 561 sites where treatment occurred, 470 of them were one-tenth acre or less.

State of Missouri, Department of Conservation

Submitted by Joe McMullen, Scientist - Big Rivers Specialist

Invasive Species Management Program

MDC Contact Information
Name: Angela Sokolowski - Invasive Species Ecologist
Email: angela.sokolowski@mdc.mo.gov
Phone: 573-522-4115 x3641

ANS Grant: MDC was awarded the State ANS Grant from USFWS in 2024 again after a hiatus of several years (due to vacancy of Invasive Species position and Federal Aid staff capacity. Funds will be utilized to develop a Survey123 App that incorporates an existing Hydrilla survey app and adds other AIS species such as Zebra Mussel, Northern Snakehead, and aquatic vegetation target species like Curly-leaf pondweed. The app will be used by staff, partners, and trained volunteers with the Master Naturalists and Missouri Stream Team Program. Grant funds will also be used to procure two CD3 Systems solar waterless decontamination stations that promote Clean Drain Dry Dispose actions by recreationalists. A stationary unit will be installed at a lake managed by one of our Hydrilla Partnership organizations in Springfield, and the other unit will be a mobile, trailer mounted station that will be used by MDC across the state.

Regulations: MDC's Invasive Species Working Group is leading an effort to propose changes to *The Wildlife Code of Missouri* related to triploid Grass Carp and Bighead Carp:

1. Remove Bighead Carp from the Approved Aquatic Species List
2. Require that grass carp produced, imported, and distributed in Missouri be certified as triploid.

Currently the working group is conducting an information review, developing a communications plan, crafting the recommended regulations language, and plans to submit the proposed changes in 2025.

Literature/Reports:
Invasive and Nuisance Species

Hydrilla

MDC Contact Information
Name: Kara Tvedt - Fisheries Biologist
Email: kara.tvedt@mdc.mo.gov
Phone: 417-895-6881 x1626

Efforts to eradicate hydrilla continue. As of December 2024, we now have 38 hydrilla sites that have been detected in southwest Missouri. Of the 38, only one is a public waterbody. These sites are in the James, Little Sac, Pomme de Terre, Niangua, and White River watersheds. Of the known sites, 36 of 38 are under a hydrilla eradication plan which includes an initial multi-year "treatment" phase followed by a multi-year "monitoring-only" phase. Hydrilla has already been reduced to non-detectable levels in

over 80 percent of the sites (31 sites total) and 10 of those sites have stayed hydrilla free for at least five consecutive years (i.e., now considered eradicated). Only 5 of the 38 sites remain in the "treatment" phase. The two remaining sites made it to the "monitoring-only" phase before the sites changed ownership. Since then, we have been unable to engage with the new owners. Efforts to reach the new landowners and get the sites back on track will continue in 2025. Similar hydrilla eradication efforts are also ongoing at a handful of sites in Kansas City Region, with one site in the treatment phase and several sites in "monitoring-only" phase.

Literature/Reports:
Hydrilla Control

Northern Snakehead

MDC Contact Information
Name: Dave Knuth - Fisheries Biologist
Email: dave.knuth@mdc.mo.gov
Phone: 573-290-5858 x4434

More Northern Snakehead were caught or seen by anglers in southeast Missouri this year. Snakeheads are confirmed upstream on the St. Francis River to the Lake Wappapello spillway. MDC created a Northern Snakehead Reporting webpage for the public to help us track the species: Snakehead Fish Reporting.

Literature/Reports:
- Snakeheads | Missouri Department of Conservation (mo.gov)
- NatureBoost Podcast Episode 55: Northern Snakehead

Round Goby

MDC Contact Information:
Name: Sarah Peper - Fisheries Biologist
Email: sarah.peper@mdc.mo.gov
Phone: 636-441-4554 x4130

Monitoring for Round Goby in Missouri continues. During 2024, three Round Goby were captured from the Mississippi River in trawls. Two specimens were collected in June at RM 118 near the confluence of the Kaskaskia River (most downstream records to date) and another was collected in November at RM 190 near St. Louis. No Round Goby have been detected in the Missouri or Meramec rivers.

Literature/Reports:
MDC asks anglers to help stop invasive round gobies

Invasive Carp Telemetry

MDC Contact Information
Name: Josh Abner - Scientist
Email: joshua.abner@mdc.mo.gov
Phone: 573-290-5730 x4485

Document movement of invasive carp throughout the Mississippi River basin to inform management, control, and containment actions (e.g., location of potential deterrent technologies and removal efforts) and determine residence time and movement in association with season, environmental conditions, and barriers.

Literature/Reports:

- Lower Mississippi River Sub-Basin Annual Summary Reports - Mississippi Interstate Cooperative Resource Association (micrarivers.org)
- Upper Mississippi River Sub-Basin Annual Summary Reports - Mississippi Interstate Cooperative Resource Association (micrarivers.org)
- Missouri River Sub-Basin Annual Summary Reports - Mississippi Interstate Cooperative Resource Association (micrarivers.org)

Invasive Carp Control & Removal

MDC Contact Information
Name: Joe McMullen - Scientist
Email: joe.mcmullen@mdc.mo.gov
Phone: 314-301-1506 x4215

Status: Ongoing

Description: On 12 October 2023, the Missouri Incentivized Carp Harvest Program (MO-ICHP) was launched to promote the commercial harvest of invasive carp. The program offers $0.10/lb. for invasive carp (silver carp, bighead carp, grass carp, and black carp) caught in designated waters (Missouri and Mississippi rivers) and sold to a processor for at least $0.07/lb. As of December 2024, 50 commercial fishers are enrolled in the program and have reported the harvest of 3,147,542 lbs. of invasive carp.

Literature/Reports:

- Lower Mississippi River Sub-Basin Annual Summary Reports - Mississippi Interstate Cooperative Resource Association (micrarivers.org)
- Upper Mississippi River Sub-Basin Annual Summary Reports - Mississippi Interstate Cooperative Resource Association (micrarivers.org)

Lamine River Invasive Carp Removal

MDC Contact Information:
Name: Adam McDaniel - Scientist
Email: adam.mcdaniel@mdc.mo.gov
Phone: 660-646-3140 x1381

MDC reports that 43,401 pounds of invasive carp were removed from the Lamine River in September during a focused removal project. MDC, U.S. Fish and Wildlife Service, and Kansas Department of Wildlife and Parks used nets and electrofishing from Sept. 9-12 and Sept. 23-26, 2024 on portions of the Lamine River between the Harriman Hill and De Bourgmont Accesses. The project improved available river habitat for native fish and provided information for how commercial operations might be used in the future to reduce invasive carp. A commercial fishing business will market the fish caught during this operation for various forms of fishing bait.

Literature/Reports:

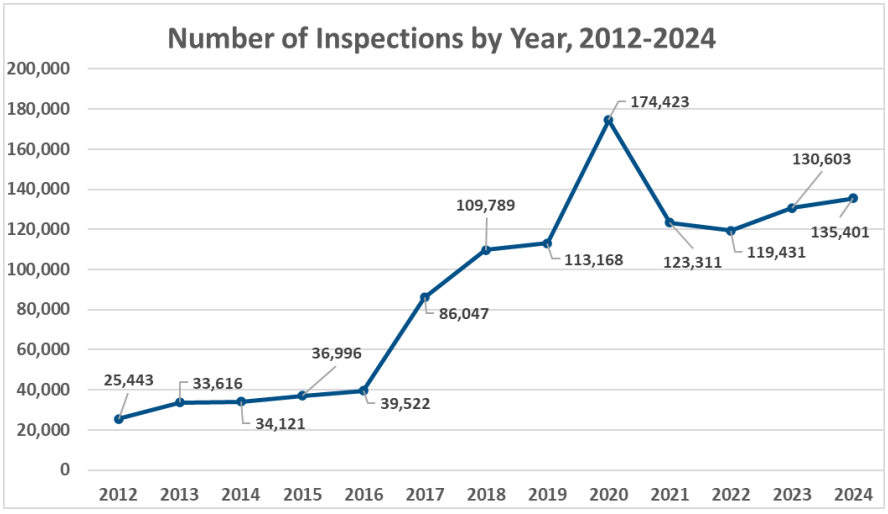
- Missouri River Sub-Basin Annual Summary Reports - Mississippi Interstate Cooperative Resource Association (micrarivers.org)
- MDC successfully removes over 43,000 pounds of invasive carp from the Lamine River

State of Montana, Department of Fish, Wildlife, and Parks

Submitted by Tom Woolf, AIS Bureau Chief

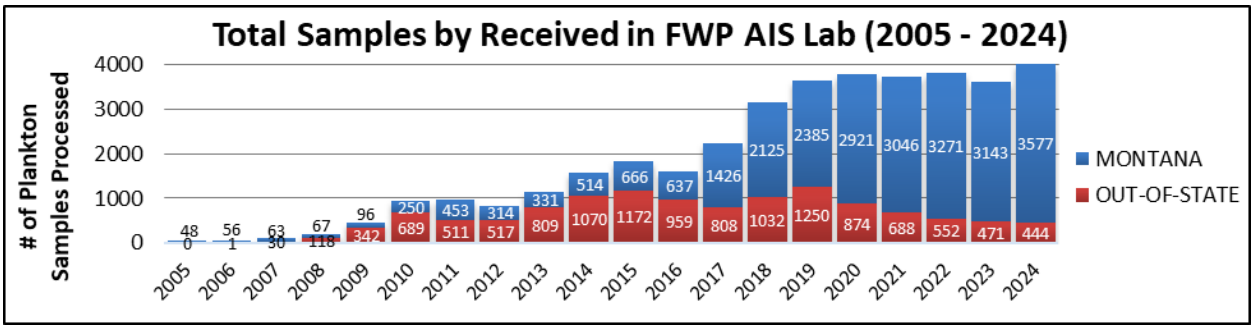
Prevention:

- Over 135,000 watercraft inspected for AIS in 2024 at 20 inspection stations.
    - 47 mussel fouled vessels intercepted. Over 800 transporting aquatic vegetation.
    - Watercraft inspection stations are operated in partnership with local partners including the Confederated Salish and Kootenai Tribes, the Blackfeet Nation, the Little Shell of the Chippewa Tribe, Missoula County, the City of Whitefish, seven Conservation Districts and two National Parks.
    - Inspection before launch verification at Fort Peck and Flathead Lake identified less than 3% of launching boaters that failed to meet inspection before launch requirements.
        - This illustrates that over 97% of boats that are entering Montana or crossing west over the Continental Divide are receiving an inspection at a roadside station prior to arriving at the boat ramp.

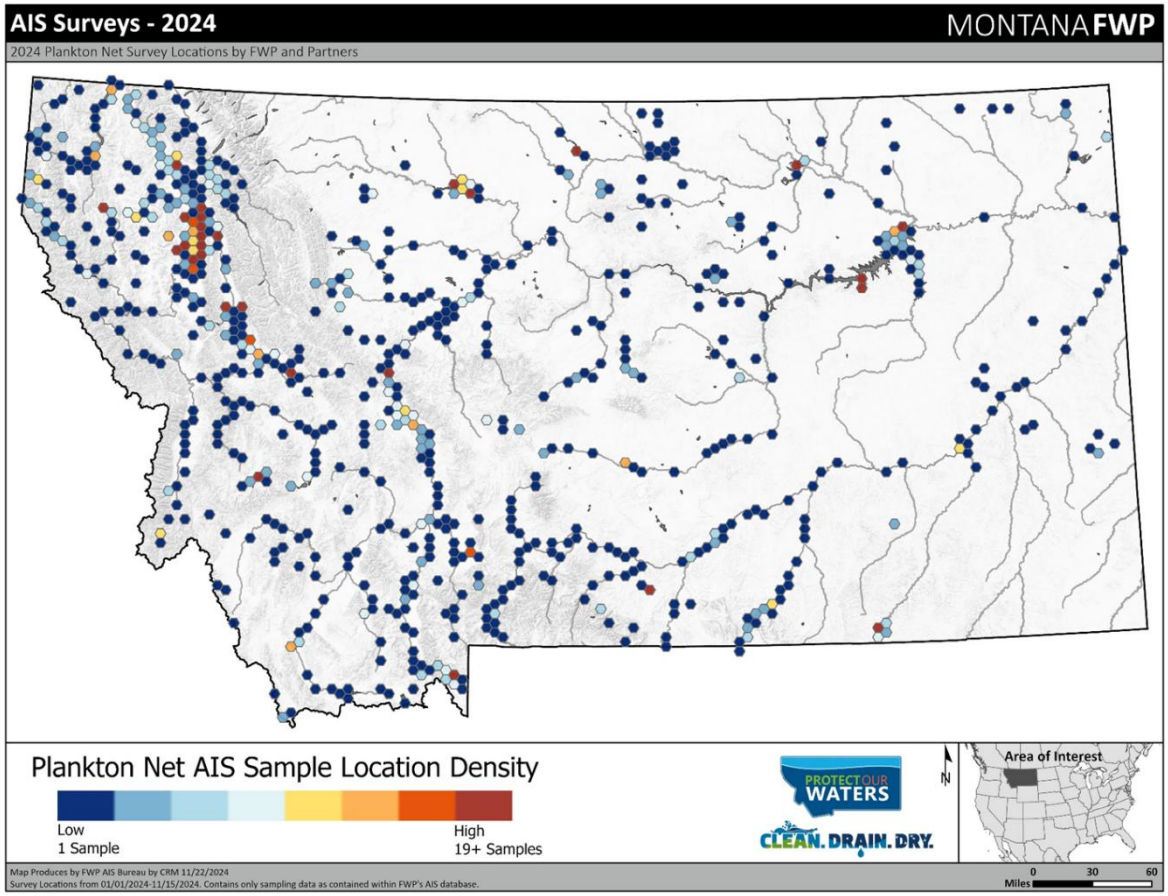


Early Detection

- 3,500 AIS early detection samples were collected and processed in 2024 with **NO** invasive mussel detected. Sample analysis included microscopy and eDNA methods.



- All major water bodies were sampled with particular focus in high use waters.



- New AIS detections in 2024 included:
    - The first detection of yellow floating heart in a private pond. Working with the pond owner on eradication.
    - New populations of New Zealand mudsnails identified in the Upper Clark Fork River near Butte and in a small creek in Billings.
- Participated in or hosted 10 workshops where AIS staff trained partners and the public on AIS identification and survey.
    - Working with the Montana Heritage Program to promote community science and expand AIS surveillance and reporting through partners and the public.
- Continued several delineation and eradication projects on populations of Eurasian watermilfoil, mystery snails and corbicula clams.

Outreach and Education:

- Continued a state-wide marketing campaign through print, radio and virtual media to help ensure boaters that come to Montana receive an inspection before launching.
- Expanded social media interactions targeting younger demographics.
- Hosted an AmeriCorps member who expanded AIS outreach and engagement with interested partners and at local events.

State of Nebraska, Game and Parks Commission

Submitted by Kristopher Stahr, AIS Program Manager

In 2024 Nebraska continued to perform watercraft inspections statewide at selected boat ramps. This year a total of 8,258 watercraft inspections were completed by a total of 9 watercraft inspectors, a new state record number of inspections. Nebraska continues to utilize a roving inspection system that maximizes the number of boater contacts in areas with high likelihood of zebra mussel and other invasive species introduction.

More than 200 veliger samples were taken statewide in 2024 between May and September. All samples were analyzed in-house at Nebraska Game and Parks' headquarters in Lincoln. No new zebra mussel detections were made this year. Nebraska continues to remain a stronghold against widespread zebra mussel spread, with its only infestations remaining contained to border waters with just two exceptions, which are both private water bodies not managed by the state.

In 2021 Ironhorse Lake in North Platte was confirmed to be infested with hybrid Eurasian watermilfoil. Efforts to treat the milfoil population began in May 2024, beginning with a transect vegetation survey comprised of 126 points. One half of the lake was chemically treated in July utilizing ProcellaCOR. The second treatment occurred 2 weeks later on the second half of the lake. A follow-up survey was conducted 30 days after the final treatment in which only dead or dying milfoil was identified. Further follow-up will take place in Spring 2025.

The Nebraska AIS Program created and filled the AIS Biologist position in June 2024. This became the second full-time permanent staff member in the program. Between this position and the AIS Program Manager, 30 vegetation surveys were conducted and the program began trials for invasive crayfish surveying. Additionally, the AIS Program was able to participate in various educational outreach events, providing education regarding AIS threats to Nebraska to the public. An estimated 15,000 promotional items were dispersed by inspectors and at education events, promoting AIS awareness and messaging. Additionally, all state hatcheries were personally inspected by the Program Manager and no invasive species presence was detected at any hatchery.

Despite its small program size, Nebraska has continued to defend against highly damaging invasive species and successfully eradicating others. With an increase in staff and a projected increase in budget from in-house sources, the Nebraska AIS Program intends to continue this standard into 2025.

State of North Dakota, Game and Fish Department

Submitted by Ben Holen, ANS Coordinator

This was the first full year of the Aquatic Plant Control - Watercraft Inspection and Decontamination (APC-WID) cost share between the US Army Corps of Engineers (USACE) and the North Dakota Game and Fish Department (NDGFD). The cost share reimburses NDGFD ~50 percent for costs incurred during WID activities and QZM monitoring. Unfortunately, due to staffing issues, realized WID efforts were not as extensive as the Department's original WID work plan. The APC-WID cost share did bolster prevention, education, and monitoring efforts in North Dakota in 2024.

Outreach:

NDGFD continues to implement a comprehensive ANS education/outreach program. NDGFD utilizes print materials, radio, television, social media, digital marketing, and personal contacts to raise ANS awareness at a regional level. We continue to partner with Midco, a regional TV/internet provider, to develop and disseminate ANS commercials. Midco produced 3 new television commercials in 2024. These new commercials played during prominent sporting events and television shows that Midco carried. Total Marketing efforts in North Dakota resulted in:

- 7M impressions on social media, reaching 723k unique individuals.
- 3M impressions on display, search, and video Ads, resulting in 336,999 engagements (11.2% interaction rate)
- 10,496 TV exposures
- 548,121 impressions on OTT/CTV
- Radio advertising throughout much of the state
- Miscellaneous- ice box raps, posters, swag, magazine articles, podcasts, billboards, window clings, target emails, press releases, pet store bags, etc.

Monitoring:

<u>Zebra mussel</u>

NDGFD collected 1956 plankton tow net samples from 172 waters in 2024. These efforts led to the detection of a new zebra mussel population at South Golden Lake. In addition to plankton tows, NDGFD uses substrate deployment/searches, eDNA, and snorkeling to look for new QZM and corbicula populations. To date, six lakes and three rivers are classified as zebra mussel infested waters in North Dakota.

<u>Invasive carp</u>

Silver carp continued to be documented in the James River in low abundance. NDGFD assisted the USFWS in eDNA sampling along the northern leading edge of their range in 2024. Results pending.

<u>Nuisance vegetation</u>

Eurasian watermilfoil was detected for the first time in the Missouri River system in North Dakota near Williston. Flowering rush was detected at School Section Lake in the Turtle Mountains. Both populations are a result of downstream drift. In 2024, NDGFD collected 1662 rake samples statewide to look for nuisance vegetation.

Watercraft Inspection and Decontamination (WID)

NDGFD hired 18 seasonal employees that conduct watercraft inspections at 22 different water bodies. In 2024, the Department inspected 10,016 watercraft. Boater compliance with ANS regulations remains relatively high. Large commercial equipment, including barges and tugboats, remains one of the highest risk vectors for spreading zebra mussels. NDGFD inspected over 125 pieces of large industrial equipment this year. Efforts led to the finding of fouled vessels with zebra mussels, Eurasian watermilfoil, and curly-leaf pondweed.

In addition to inspection efforts, NDGFD supports ANS prevention devices, CD3s, ILIDS (virtual inspection cameras), and free-to-use boat wash stations. The purpose of these devices is to raise ANS awareness and increase compliance with ANS regulations. NDGFD placed two new CD3 Wayside at high-use ramps on the Missouri River System. In total, NDGFD supports 15 ANS prevention devices across the state. Thousands of boaters interact with these devices every season.

Facility Inspections

NDGFD inspects many different facilities on an annual basis for ANS; this includes bait vendors, pet stores, and federal/private fish hatcheries.

State of Ohio, Department of Natural Resources

Submitted by John Navarro, Aquatic Stewardship Program Administrator

- There was a discovery of Round Gobies in a small pond managed by the City of Columbus. Our District 1 Division of Wildlife staff drained the pond to eradicate the population and monitored the receiving waters (Olentangy River) and no fish were found. We will continue to monitor the situation.
- Continue control efforts of *Hydrilla* at several inland impoundments in the Ohio River basins, including Mosquito Creek Lake and Alum Creek. Seneca Lake had a recent *Hydrilla* discovery, and the Muskingum Watershed Conservancy District implemented control actions.
- Continue to monitor for Bighead Carp and Silver Carp in the Ohio and Muskingum Rivers using telemetry and eDNA. Silver Carp eDNA has been detected up to Luke Chute Lock and Dam. This river is monitored because of its connection to the two-medium risk GLMRIS project areas.
- Continue to work on closing the GLMRIS connections at Little Killbuck Creek. Phase I will be completed in early 2025 and planning is underway for subsequent phases.
- Continue the surveillance of Ohio's bait supply chain to determine if AIS, including Bighead and Silver Carp, are being transported through this pathway. No high-risk AIS found to date.
- Continue an AIS outreach campaign through Wildlife Forever to target anglers moving AIS in bait. This outreach program includes billboards, print media, and items for distribution at events with the slogan "Trash Unused Bait".
- Completed the second edition of the *Ohio Aquatic Invasive Species* guide developed through Ohio Sea Grant, The Ohio State University, Ohio DNR, and Cleveland Metroparks.
- Participated in the following groups: Great Lakes Panel, Mississippi River Basin Panel, Ohio Aquatic Invasive Species Committee, and Asian Carp Regional Coordinating Committee.

State of Oklahoma, Department of Wildlife Conservation

Submitted by Elaine Gainer, ANS and Fish Kill Coordinator

The Oklahoma Department of Wildlife Conservation (ODWC) hired an Invasive Carp Biologist starting February 1, 2025. Oklahoma's ANS activities have recently included invasive carp sampling and specimen collections, white perch collections, zebra mussel veliger sampling, hydrilla mapping, triploid grass carp certification documentation from the US Fish and Wildlife Service, approval or denial of aquatic import/export permits, participating in the Invasive Species Action Network's Don't Let It Loose program, updating signage, working with our Communication and Education division for outreach efforts, and other miscellaneous activities.

Invasive Carp

In 2024, eight bighead carp were removed from the Grand Lake O' the Cherokees system. Samples were taken from the bighead carp that were donated to ODWC for ageing, genetics, and microchemistry. Missouri State University is continuing research on the Grand Lake system (including Neosho and Spring rivers) in cooperation with Kansas Department of Wildlife and Parks, collaborating with ODWC and US Fish and Wildlife Services. Telemetry work on this bighead carp population is underway. Thus far, five bighead carp and four grass carp have been tagged in the system.

Due to extensive flooding and debris within the Grand Lake/Neosho River system, the ODWC ANS team was unable to make any targeted attempts using gillnets and electrofishing to capture bighead carp during their expected run up the river in May. The ANS team along with Missouri State University and additional ODWC employees did attempt to block off backwater areas from the main river and shock extensively using high and low frequency electrofishing. However, no bighead carp were successfully captured using this method.

The ODWC ANS team started Environmental DNA collections on the Arkansas River below Robert S. Kerr Reservoir to the Arkansas border. We sampled in late Winter and Summer in 2024, finding no positive hits for invasive carp within the Arkansas River. We are going to continue sampling and adjust our sampling protocols in an effort to better capture a representative sample.

Zebra Mussels

Zebra Mussel veliger sampling efforts were completed in the months of May and June on 51 historically clean reservoirs throughout the state. Samples were sent to the Bureau of Reclamation ECOLAB in Denver, Colorado. We were notified of two new positive bodies of water- Fort Supply and Dave Boyer. Lake operators were informed, and public releases of notification were sent out from the ODWC.

Hydrilla

During the Summer 2024, ODWC was notified of the presence of hydrilla in Robert S. Kerr Reservoir, which previously had not been documented there. After ODWC confirmed the presence of hydrilla within the reservoir, staff spent time mapping out the visible extent of the hydrilla mats. Hydrilla was found nearly all throughout the reservoir in substantial quantities, especially along shorelines. Lake operators were informed, however, steps towards treatment or eradication efforts are unclear at this time. The Arkansas Game and Fish Commission was also informed of these findings as Robert S. Kerr is in close proximity to Arkansas waters.

White Perch

In the Fall of 2024, the ANS team assisted regional fisheries managers with gillnetting on Keystone Lake, in an effort to collect more data on white perch within that system. A total of 105 individuals were collected, weighed and measured. Ageing structures were also collected but ages are still being assigned.

Future Directions

Plans for the future include continuing to assist universities in the field with ongoing and upcoming invasive carp projects, continuing our internal invasive carp projects on the Grand Lake system and Arkansas River, continuing and expanding efforts on white perch population assessments, cooperating and collaborating with various agencies and municipalities on other statewide ANS issues, updating and performing ANS signage checks around public waters, performing shoreline observations, hiring an hourly position, attending annual meetings, when feasible, and writing interim/final reports for grants.

State of Pennsylvania, Fish and Boat Commission

Submitted by Sean *Hartzell, AIS Coordinator*

- The Pennsylvania Fish and Boat Commission (PFBC), in partnership with Pennsylvania Sea Grant, has been working on establishing more formal objective criteria for listing prohibited AIS under Title 58 of the Pennsylvania Code, Chapter 71a.11. In the past, species were added to this prohibited list based solely on expert opinion, or to match listings by other state or federal agencies. A proposed process based on what other states use and similar to the process for listing Threatened and Endangered species in Pennsylvania was presented to the PFBC's Commissioners in October 2024 for comment. The agency is currently working on formulating this into a formal standard operating procedure document for implementation.

- Revised Title 58 Pa. Code Chapter 71a became effective on Jan 1st 2024. This regulatory update enhanced regulations related to the introduction of fish and other aquatic organisms into Commonwealth waters. Notable updates include a required Notice of Stocking, regulations requiring boaters to drain and inspect boats to prevent the spread of listed AIS and aquatic plants, regulations prohibiting the release of unused baitfish, and enhanced fish health regulations (which will become effective in 2026).

- During Winter 2023-2024, PFBC installed AIS Composting Stations at select agency-owned boat launches with known infestations of AIS such as Zebra Mussels or Hydrilla. These are intended for boaters to use to help clean boats to prevent the spread of AIS. This was supported by federal AIS Management Plan grant funding in partnership with Pennsylvania Sea Grant and based on a design previously used by the Pennsylvania Department of Conservation and Natural Resources at Pymatuning State Park. Stations were installed at several lakes/reservoirs in western and central Pennsylvania.

- Using AIS Management Plan grant funding, the PFBC created signs to remind anglers of regulations restricting the usage of all live crayfish species as bait and prohibitions on the transport of live crayfish for use as bait statewide. These have been provided to PFBC's Law Enforcement staff for posting statewide in their districts.

- PFBC staff have continued surveys for invasive New Zealand Mudsnails in most regions of Pennsylvania. The only notable new find in 2024 was a new county records for Snyder County, PA (Susquehanna River basin).

- PFBC staff are currently beginning a project to evaluate the impacts of invasive Northern Snakehead in Pennsylvania's reservoirs and bioaccumulation of contaminants in Northern Snakehead tissues in partnership with Penn State University.

- PFBC staff are currently working with Allegheny College on a study to evaluate the movement and abundance of the invasive Round Goby in the French Creek watershed.

- In Spring 2024, PFBC collaborated with PA DEP (panel members Sean Hartzell and Matthew Shank) on a statewide chemical suitability analysis for the invasive New Zealand Mudsnail at the HUC 12 level. Results of this study suggest that water chemistry associated with limestone bedrock, urbanization, and agricultural land use are most suitably for the New Zealand Mudsnail, and that parts of central, southeastern, and southwestern Pennsylvania are at the greatest risk of mudsnail, colonization. This project was written up as a manuscript which was accepted for publication and is available to read in "early view" in the journal *Hydrobiologia*:

  Hartzell, S.M. and Shank, M.K. 2024. Chemical variables predicting colonization risk of the invasive New Zealand mudsnail (*Potamopyrgus antipodarum*) in Pennsylvania's flowing waters. *Hydrobiologia.* https://doi.org/10.1007/s10750-024-05711-2

- PFBC staff recently published a manuscript reporting on the use of modified minnow traps as an effective sampling technique for invasive Chinese Mystery Snails in the journal *Freshwater Mollusk Biology and Conservation:*

  Hartzell, S.M. and Nauman, B.J. 2024. Funnel traps for sampling Chinese Mystery Snails, *Cipangopaludina chinensis* (Viviparidae). *Freshwater Mollusk Biology and Conservation*. 27:39-41.

State of Tennessee, Wildlife Resources Agency

Submitted by Cole Harty, ANS Coordinator and MRBP Third-Term Co-Chair

- Participated in and developed numerous ANS outreach actions including webinars, press releases, expos, news interviews, radio interviews, newspaper interviews, pamphlets, signs, etc.
- Participated in invasive carp sub-basin partnerships (Tennessee/Cumberland and Lower Mississippi River sub-basins), Invasive Carp Advisory Committee of MICRA, AIS Committee of MICRA, and MRBP.
- Hired three interns from University of Tennessee – Knoxville to do statewide ANS outreach during summer 2024. Interns assisted with regional ANS sampling, improved and replaced signage at access points, and developed draft ANS outreach material and media posts.
- Hired interns from University of Tennessee – Martin to assist with invasive carp study evaluating reproductive success, establishing leading edges and abundance of age-0 carp in Kentucky and Barkley Lakes using larval light traps, larval tows, and mini-fyke nets.
- Continued assessment of spatial variation in relative abundance of invasive carp in Kentucky, Pickwick, Barkley, Cheatham, and Old Hickory reservoirs.
- Monitored invasive carp movement and lock and dam passage in the Tennessee and Cumberland rivers. Assisted efforts by USGS and Tennessee Tech to implant acoustic tags in Silver Carp.
- TWRA has continued surveillance and outreach for invasive carp in response an angler reported Silver Carp in Chickamauga Lake from January 2020. Extensive search efforts in East Tennessee reservoirs and tailwaters have found no additional Silver Carp.
- TWRA Tennessee Carp Harvest Incentive Program (TCHIP) supports commercial fishers and wholesale buyers with monetary incentives applied to harvested invasive carp. As of 12/31/2024, the program has resulted in the harvest of more than 36 million lbs. of invasive carp from Kentucky, Barkley, Pickwick, Cheatham, and Old Hickory lakes since its inception in September 2018.
- TWRA has been actively engaged in discussions and structured decision-making processes with partners regarding the implementation of barriers on lock and dam sites on the Tennessee and Cumberland rivers. WRDA 2020, Sec. 509, authorized the US Army Corps of Engineers (USACE) to implement and invasive carp control pilot program – TWRA has worked with state and federal partners to provide information to USACE and to prioritize deterrent site locations.
- TWRA worked with USGS to report capture of an adult Black Carp from Pickwick Reservoir.
- TWRA staff fielded multiple reports of Japanese Mystery Snail in South Holston and Boone reservoirs.
- TWRA staff received information on a private pond infested with Starry Stonewort and are scoping control options.

State of Texas, Parks and Wildlife Department

Submitted by Monica McGarrity, Senior Scientist for Aquatic Invasive Species

Zebra/Quagga Mussels

Since the last MRBP report, zebra mussels were detected in the City of Early Town Center Pond. This is a small, 7-acre Community Fishing Lake with no motorized boat traffic and poses low risk for zebra mussel transfer to new water bodies, although specialized prevention signage was installed. The lake received and likely will continue to receive water from zebra mussel infested Lake Brownwood and has been designated as fully infested.

The quagga mussel situation at Lake Amistad continues to be monitored by the NPS in collaboration with TPWD. Quagga mussel larvae (and eDNA) were detected in very low numbers in spring/summer 2021 and spring/summer 2022. However, there have been no quagga detections since 2022 and settled quagga mussels have not been found on settlement samplers or in shoreline searches. Monitoring is ongoing and will continue for at least five years from the last quagga mussel detection (i.e., through 2027) to assess status. Zebra mussels continue to be detected and are increasing in abundance.

Several barges subcontracted for work on TxDOT construction projects infested with zebra mussels were intercepted at Lake Granbury and decontaminated and quarantined. TPWD subsequently worked successfully with TxDOT to update BMPs and provide training/prevention videos on the BMPs website for contractors.

Bi-annual early detection monitoring continues on more than 50 high risk water bodies around the state in conjunction with 8 partner agencies.

Invasive Carp

TPWD is continuing to work with Oklahoma Department of Wildlife Conservation, Arkansas Game and Fish Commission, Auburn University, and Texas Tech University to assess the population status of invasive bighead carp in the Lower Red River Basin across the tri-state area. From 2021-2023, 313 Silver Carp and 108 Bighead Carp were found in the Red River upstream to Denison Dam below Lake Texoma and in all monitored tributaries (including the Sulphur River). Thus far, successful reproduction has not been documented as no fish less than three years old have been captured; however, ovary histology suggests spawning success. Telemetry work is underway in the Red River and tributaries with 25 Silver Carp and 25 Bighead Carp tagged, to provide movement data to augment population monitoring. Baseline native fish assemblage data were also collected. This project is nearly complete, and telemetry analysis and a final report is anticipated soon.

Aquatic Invasive Plants

Giant salvinia continues to be the most problematic aquatic invasive plant in Texas and is present in 26 reservoirs and 7 river systems. Early detection and rapid response efforts are ongoing and have resulted in giant salvinia being extirpated from three public water bodies. Biological control using giant salvinia weevils continues to show success and the weevils are being used as part of our IPM strategy on 15 water bodies with a total of 83,207 weevils released in fiscal year 2024. Self-sustaining weevil populations are now present at J.D. Murphree WMA lakes, Toledo Bend Reservoir, Sheldon Lake, Lake

Naconiche, Lake Nacogdoches, and Lake Raven. Over-wintering populations continued to occur at Lake Murvaul and Caddo Lake but cold weather continues to reduce giant salvinia coverage on both lakes, removing the weevil's food source and preventing population expansion. Herbicide treatments are also used to control giant salvinia on 35 water bodies, with approximately 8,368 acres treated in fiscal year 2024. Fewer acres treated in fiscal year 2024 are attributed to substantial decrease in giant salvinia from cold weather, flooding, intentional water level drawdowns, and herbicide treatments.

Water hyacinth also continues to be problematic and is present in 58 reservoirs and all major rivers across the state. In fiscal year 2024, approximately 6,808 acres of water hyacinth were treated with herbicides in 18 water bodies. Water hyacinth has substantially increased statewide following the previous year's drought.

Crested floating heart is currently found in 4 water bodies and yellow floating heart in 2 water bodies, as well as the latter being present on the Louisiana side of Toledo Bend Reservoir on the state border. Treatment using ProcellaCOR has been highly effective, and infestations have been significantly reduced on most water bodies.

Because hydrilla in many cases provides much needed fish habitat in those aging reservoirs in Texas with minimal littoral zones, treatments of this species are limited to addressing access issues at swimming areas, campsites, along shorelines where it has become problematic for lakefront landowners for access, boat ramps, and boat lanes unless coverage exceeds 40%. Control strategies include herbicides and triploid grass carp. In fiscal year 2024, 45 acres of hydrilla were treated across 4 water bodies, substantially lower than previous years but lack of treatment need was explained by high lake levels in the Spring.

Riparian Invasive Plants

Giant reed (Arundo donax) control is ongoing in Central Texas to reduce impacts and improve river and stream habitat across the Pedernales, Blanco, Guadalupe, Medina, Nueces, and Llano river watersheds and San Felipe Creek. Control is implemented on hundreds of private and public properties across these basins in collaboration with the landowners.

Saltcedar control on the Upper Brazos River in critical habitat for smalleye and sharpnose shiners in collaboration with the USFWS continues to be a priority. To date, nearly 23,000 acres have been treated across approximately 150 primarily private properties. In summer/fall 2024, 2,641 acres were treated.

Watershed-scale elephant ear control on the Llano River continues, with over 50 river miles in monitoring or active management status. At least one survey and treatment event is conducted each summer.

Aquatic Invasive Species Outreach

Outreach and prevention remains a high priority in Texas. The TPWD, with support from 13 partners, implements an annual 'Protect the Lakes You Love' clean, drain, dry campaign targeting watercraft owners/operators during peak boating season. The campaign includes billboards and gas station advertising as well as a variety of paid targeted digital media including social media platforms, apps, digital radio, and pre-roll video. The TPWD is also implementing the 'Never Dump Your Tank' outreach campaign using digital media strategies to encourage aquarium owners to seek alternatives to release of

aquarium life. Additionally, targeted email outreach is used to spread the word about invasive carp spread prevention and reporting in key target areas. In fiscal year 2024, over 68 million “impressions” were generated by the campaign along with communication with 433 thousand registered boaters and signage being maintained at
294 boat ramps.

Aquatic Invasive Species Research

The TPWD is currently funding three AIS research projects in fiscal year 2024-2025, as described below. Reports for previously funded projects can be found on our past research webpage.

Developing spawning protocols and identifying the sex determining regions in suckermouth armored catfish to facilitate the production of neofemales and YY males for use in population control

Texas A&M University

This project seeks to develop genomic resources for invasive suckermouth armored catfish to facilitate production of YY males for use in genetic/biological population control. This project will also begin to test protocols for spawning these species and beginning the process of feminizing males. This work will contribute to furthering efforts to control these invasive species. To date the genome has been sequenced and preliminary species trees developed. Additional re-sequencing data analysis is underway. Additionally, armored catfish husbandry techniques have been successfully developed, as the first step toward spawning trials. Assessing seasonal variation in thermal refugia use and drivers of angler participation in removal efforts of suckermouth armored catfish in San Felipe Creek, Val Verde County
University of Texas at San Antonio

This study will evaluate use of thermal refuges (e.g., springs) by suckermouth armored catfish during winter months to increase survival. Locating aggregations of this invasive species can aid in enhancing removal efforts. This study will also examine angler interest in participating in removal tournaments, including any seasonal differences in willingness to participate. This work will aid in enhancing ongoing removal efforts. Four seasonal armored catfish surveys have been completed and the angler survey has been developed and distributed, although response rate is low and efforts are being made to increase responses.

Distribution of the Australian redclaw crayfish in Texas

University of Texas at Tyler

Invasive Australian redclaw crayfish have become established in South Texas, but little is known of their distribution. This study will evaluate distribution of this species in Texas as well as abundance and life-history traits. This work is an important step toward better understanding this invasion as well as facilitating potential future assessments of impacts on native species. Other research using specimens from this study will assess the species’ physiological tolerances. During the first two survey events, only 15 Australian redclaw crayfish have been caught from four sites, including “ground zero,” including two juveniles and one intersex individual. In November 2024, a total of 85 Australian redclaw crayfish were caught, primarily from one site, with additional juveniles and intersexuals. Additional surveys are planned in the remainder of year 2 to continue to gather distribution and life-history trait data.

State of West Virginia, DNR Wildlife Resources

Submitted by Katie Zipfel, Ohio River Fisheries Biologist/AIS Coordinator

Invasive Carp Monitoring

WVDNR currently collaborates with numerous state and federal partners on invasive carp related issues within the Ohio River basin. WVDNR is a participating agency on the Early Detection and Monitoring, Control and Containment, Telemetry and Early Life Stages Projects within the Ohio River Basin Framework.

Monitoring & Early Detection

WVDNR collaborated with USFWS to complete annual monitoring boat electrofishing surveys on the R.C. Byrd and Greenup pools of the Ohio River in Spring 2024. No invasive carps were collected. Throughout April 2024, WVDNR deployed gill nets (2250 feet) in the R.C. Byrd Pool of the Ohio River. Three Silver Carp were captured and removed from Raccoon Creek. In Fall 2024, the WVDNR deployed gillnets in the R.C. Byrd (1650 ft.) and Greenup (1650 ft.) pools. One Silver Carp was captured and removed during this sampling period, also from Raccoon Creek. In addition, WVDNR also collected fish community data (via boat electrofishing) for use in a community size-spectra analysis.

Control and Containment

WVDNR conducted a total of three attempts in 2024 in R.C. Byrd Pool of the Ohio River yielding no fish. River conditions over the summer months (low and clear) were not conducive to catching carp in the tributaries. A total effort of 900ft of gill nets were deployed for these efforts. Additionally, one adult Bighead and one adult Silver carp were caught and removed via gill nets targeting Paddlefish in October of 2024. Upon receipt of additional equipment, WVDNR will expand removal efforts in the future.

Early Life Stages

In 2024, WVDNR conducted two sets of ichthyoplankton tows for invasive carp eggs and larvae in Raccoon Creek and the Kanawha River, both tributaries of the Ohio River in the R.C. Byrd Pool. Protocols state sampling should occur after a river rise event, but after May, no significant river rises were observed during the sampling time period. All larval fishes that were collected were idented in the lab and any suspicious samples were sent to INDNR for species conformation. No suspect eggs or larvae have been collected to date. WVDNR is collaborating with INDNR, KDFWR and USFWS on increasing juvenile fish sampling in Ohio River tributaries further upstream in the Ohio River sub-basin.

Telemetry

The WVDNR continues to maintain an array of stationary VEMCO VR-2 receivers in the R.C. Byrd pool that were previously installed for a catfish movement study. Receivers are offloaded every two months

and data is shared with USFWS and Kentucky DFWR. Data shows three tagged Silver Carp (one from Markland Pool and one from Meldahl Pool) are currently inhabiting the R.C. Byrd Pool of the Ohio River. Up until June, 2024 we were still tracking a Bighead Carp that was tagged in 2016. In November, 2024, WVDNR and USFWS began collaboration on expanding our knowledge of invasive carp movements in areas where they are less dense (i.e. R.C. Byrd Pool) in the hopes we can predict behavior given certain river conditions. The tags implanted in the fish currently in R.C. Byrd Pool are due to time out soon. To increase tracking data, additional fish were tagged and released into the pool. Gill nets were deployed within the disused lock chambers at R.C. Byrd Dam and the mouth of Raccoon Creek. Five Silver and two Bighead carp were captured, tagged and released.

Hydrilla

WVDNR continues to communicate with ORSANCO in monitoring the advancement of Hydrilla downstream in the mainstem Ohio River. River conditions in 2024 resulted in an increased presence of hydrilla throughout occupied pools.
WVDNR has also instigated an herbicide application in cooperation with local marinas with an angler/boater informational campaign on Cheat Lake.

Northern Snakehead

Despite proximity, WVDNR has yet to receive any reports of sightings or catches of Northern snakehead in the WV portion of the Potomac River drainage.

Alabama Bass

WVDNR is collaborating with WVU in screening Smallmouth and Spotted bass populations for the presence of Alabama Bass genes in the southern portion of the state, particularly in the New River drainage. Virginia Department of Game and Inland Fisheries has reported Alabama Bass in their portion of the New River.

Regulatory Actions

No new regulations have been put into place.

State of Wyoming, Game and Fish Department

Submitted by Josh Leonard, AIS Coordinator

AIS Program Activities

1. In 2024, watercraft check stations were operated from March 1 through November 30 at sixteen permanent check stations at port of entry, rest area, and other locations to intercept watercraft entering the state. Roving crews focused on inspections at major waters throughout the state to contact resident boaters. In 2024, 78,278 inspections were conducted. Of these, 6,846 were high risk watercraft and 1,284 were decontaminated for water onboard or suspected AIS. A total of forty-seven boats were intercepted with mussels attached or in compartments.
2. The Wyoming Game and Fish Department (WGFD) increased seasonal personnel hiring in 2024 with 2 new seasonal positions to staff check stations on the western part of the state in response to the Quagga mussel discovery in Idaho. Our technician's hourly wages were increased from $16.11 to $18.71 to address recruitment and retention issues from previous years. Additionally, the AIS program converted three contract AIS Specialist positions to FTE positions in Evanston, Jackson, and Laramie. The program now operates with 77 personnel during peak season; 8 FTE personnel, one 12-month contract Specialists, 5 crew leads and 63 seasonal inspectors.
3. The Glendo AIS check station will be relocating in 2025 as our lease with the existing owner expired. We will likely start at the boat ramps this spring until a more suitable long-term location is identified.
4. The WGFD is continuing to upgrade utilities at check stations around the state in an effort to provide power and water to locations historically operated using generators and water hauling in an effort to transition to on-demand decontaminations which have proven to be more reliable and efficient.
5. The WGFD will continue to upgrade utilities at check stations while transitioning mobile decontamination units to on-demand units, to help deliver more reliable temperatures when performing decontaminations.
6. The WGFD is in the process of constructing a new check station at Keyhole Reservoir and upgrading the Beulah AIS Check Station to more efficiently and effectively decontaminate watercraft coming from South Dakota.

U.S. Army Corps of Engineers

Submitted by Mark Cornish, Biologist - Senior Technical Specialist

The U.S. Army Corps of Engineers is the steward of 12 million acres of public lands and waters at hundreds of water resources projects nationwide. In the efforts to conserve, protect and restore these lands and waters it is necessary to manage and control invasive species. Through its Civil Works missions, the Corps of Engineers has constructed and/or operates infrastructure in most major river systems and coastlines nationwide, with significant impacts on aquatic ecosystems and the species that depend on them. This infrastructure has taken the form of large dams to support its flood risk management, hydropower, and water supply missions as well as; locks, dams, and canals to support navigation, levee systems, diversions, and coastal storm protection features. In the area covered by the Mississippi River Basin Panel (MRBP), the Corps of Engineers has five Divisions that generally fall along watershed boundaries, including the Mississippi Valley Division (Mississippi River), Great Lakes & Ohio River Division (Ohio River), Northwest Division (Missouri River), Southwest Division (Red River), and the South Atlantic Division. Within each Division are Districts that oversee the management of the Corps of Engineers' activities within their respective areas of responsibility. Example activities include both terrestrial and aquatic nuisance species management through authorized projects, Ecosystem Restoration programs and the Environmental Stewardship programs. The Corps of Engineers also has a research facility based in Vicksburg, MS, the Army Engineer Research and Development Center, that oversees the Aquatic Plant Control Research Program and the Aquatic Nuisance Species Research Program. This summary highlights both authorized projects and research activities relating to invasive carp and is not intended to be comprehensive. There are numerous other aquatic nuisance species activities that involve plant, insect, and animal control that are not included in this summary.

Electric Dispersal Barrier System (EDBS) – Operation and Maintenance – Chicago Sanitary and Ship Canal, Romeoville, IL

The Corps of Engineers has operated electric barriers in the Chicago Sanitary and Ship Canal since 2002. Congress funded the Corps of Engineers' construction and operation of an underwater electric dispersal barrier system in the Chicago Sanitary and Ship Canal, a hydrologic link between the Great Lakes and the Mississippi River, to help prevent the spread of invasive species. The Electric Dispersal Barrier System is in the Chicago Sanitary and Ship Canal, a man-made waterway creating the only continuous connection between Lake Michigan and the Mississippi River Basin. Over the years, several operational and procedural improvements were implemented to improve the effectiveness and continuously deliver an uninterrupted flow of electricity to the water to deter fish.

In support of barrier efforts the Corps of Engineers tracks and monitors fish throughout the Chicago area waterway system to monitor the upstream passage of large fishes, assess the risk of Bighead Carp and Silver Carp presence, identify lock operations and vessel characteristics that may contribute to the passage of fish through navigation locks in the Chicago area waterway system, and evaluating temporal and spatial patterns of habitat use at the leading edge of the invasion front.

In 2025, the Corps of Engineers will continue to operate and maintain the barriers and monitor fish movement in the upper Illinois Waterway including the Chicago Area Waterway System. Program Manager Jeff Zuercher jeffrey.k.zuercher@usace.army.mil.

Brandon Road Lock and Dam Aquatic Nuisance Species Barrier Project – Construction phase – Des Plaines River, Joliet, IL

The Water Resources Development Act of 2020 (WRDA 2020; Division AA of P.L. 116-260) included provisions related to the Corps of Engineers' invasive species efforts and authorized the Brandon Road Project. The project includes a layered system of structural controls (built) and non-structural measures (monitoring, fishing). The structural plan includes a new control point on the Des Plaines River at Brandon Road Lock and Dam in addition to the control point that is already provided by the Chicago Sanitary and Ship Canal Electric Dispersal Barrier System in Romeoville, Illinois. The new structural control point at Brandon Road Lock and Dam would include:

- Underwater Acoustic Deterrent System (uADS) – an underwater apparatus with speakers that produce various sounds to repel carp away from the lock or dam.
- Bubble deterrent – a wall of bubbles that creates a tactile and flow deterrent to repel carp.
- Engineered channel – an undeveloped portion of the approach channel reserved for operating monitoring equipment and testing and spiraling future technologies.
- Electric dispersal deterrent - a deterrent that repels fish with a strong electrical field.
- Flushing lock - a replumbing of the lock to reduce turbulence so that the water in the chamber washes downstream when the lock is emptied.
- Automated barge clearing (barge entrainment) deterrent – a burst of bubbles from the riverbed that dislodges small fish and floating organisms around barge hulls.
- Boat ramps – needed for monitoring, rapid response, and emergency access to the deterrent systems.

The project includes managing the waterway below Brandon Road Lock and Dam as a "population reduction zone" where monitoring and overfishing would occur. Non-structural measures that may be implemented primarily by other federal and state agencies include public education and outreach, nonstructural monitoring, integrated pest management, piscicides, manual or mechanical removal of fish, research, and development and two boat launches. WRDA 2024, Sec 1316 changed the cost share of operation and maintenance to 90/10 for the first ten years of operation.

Construction of the project began in 2025 with tree clearing and excavation of the lower approach channel in January and February. Construction Increment I includes a bubble deterrent, acoustic deterrent, automated barge clearing (entrainment) deterrent, support facilities, upstream boat launch, site prep, and channel rock excavation. Construction Increments II and III will start after the completion of Construction Increment I. Program Manager Scott Whitney scott.d.whitney@usace.army.mil

Pilot study of underwater Acoustic Deterrent System (uADS) (Year 4) - Lock and Dam 19 – Mississippi River, Keokuk, IA

Researchers from the Engineer Research and Development Center (ERDC) with the U.S. Geological Survey (USGS)continue to test and operate the Underwater Acoustic Deterrent System (uADS) to deter invasive carps at Lock 19 on the Mississippi River, near Keokuk, Iowa.

For this large-scale deployment, underwater sound equipment was installed at a "pinch point" in the river system where carp are only able to swim upstream through a lock chamber because the head height of the dam structure is impassable. In addition to field-testing uADS, research efforts in the lab

will continue to refine and optimize sound frequencies, sound pressure levels, and speaker designs to repel invasive carp while limiting or eliminating undesirable effects on native species.

2025 activities include maintenance of the uADS. If a sponsor is not identified the Underwater Acoustic Deterrent System may be dismantled in April 2026. Principal Investigators Christa Woodley christa.m.woodley@usace.army.mil (USACE), and Marybeth Brey mbrey@usgs.gov (USGS).

Invasive carp Deterrent Development Project - Lock and Dam 5 – Mississippi River, Minnesota City, MN

The Corps of Engineers is working with the State of Minnesota through the Section 408 process to identify potential control techniques at Lock and Dam 5 of the Upper Mississippi River. The Section 408 program verifies that changes to authorized Corps of Engineers Civil Works projects will not be injurious to the public interest and will not impair the usefulness of the project. This requirement was established in Section 14 of the Rivers and Harbors Act of 1899, which has since been amended several times, and is codified at 33 U.S.C. 408–the section of U.S. Code that gives the program its name.

The Minnesota Department of Natural Resources' objective of the Lock and Dam 5 project is to install an invasive carp deterrent and combine implementation of complementary actions to reduce the upstream passage of invasive carp. Complimentary actions may include trapping, monitoring, abundance assessment, additional spillway gate deterrents, and commercial fishing.

In 2025, the Corps of Engineers will continue to work with the Minnesota Department of Natural Resources as deterrent techniques are identified and designed for Lock and Dam 5. Corps of Engineers Project Manager Michelle Prosser michelle.e.prosser@usace.army.mil, Minnesota Department of Natural Resources Project Coordinator Carli Wagner carli.wagner@state.mn.us.

Invasive Carp Pilot Program - Invasive Carp Management Plan - Tennessee and Cumberland Rivers and the Tennessee-Tombigbee Waterway - TN, AL, KY, MS

The Water Resources Development Act of 2020 authorized the Corps of Engineers to implement an Invasive Carp Prevention and Control Pilot Program in conjunction with the Tennessee Valley Authority and other relevant Federal Agencies to carry out projects to manage and prevent the spread of invasive carp using innovative technologies, methods, and measures in the Tennessee, and Cumberland River basins, and the Tombigbee Waterway. The program is a 75/25 percent federal/non-federal cost share program for multi-year pilot projects to better understand invasive carp deterrents. Each project will generate an efficiency report, which will be removed at the end of the pilot project if a non-federal sponsor is not identified.

Proposed management measures may include:

- Underwater Acoustic Deterrent System (uADS)
- Bio-acoustic Fish Fence (BAFF) –a curtain of bubbles, sound, and light from the riverbed to the water surface, which deters invasive carp from entering the lock chamber.
- Carbon Dioxide (CO2) Infusion –infusing water with recycled CO2 gas to discourage the movement of invasive carp.
- Electric dispersal deterrent

Section 509 of WRDA 2020 authorizes no more than ten projects to be carried out in the pilot program. The evaluation prioritized ten locations from the following project sites. Those prioritized by the Mississippi Interstate Cooperative Resource Association (MICRA) as first starts are in bold:

Tennessee River Locations

- **Kentucky Lake Lock and Dam (Kentucky)**
- **Pickwick Lake Lock and Dam (Tennessee)**
- **Wilson Lock and Dam (Alabama)**
- Wheeler Lock and Dam (Alabama)
- Guntersville Lock and Dam (Alabama)
- Nickajack Lock and Dam (Tennessee)
- Chickamauga Lock and Dam (Tennessee)
- Watts Bar Lock and Dam (Tennessee)
- Melton Hill Lock and Dam (Tennessee)
- Fort Loudon Lock and Dam (Tennessee)

Cumberland River Locations

- **Barkley Lake Lock and Dam (Kentucky)**
- Cheatham Lock and Dam (Tennessee)
- Old Hickory Lock and Dam (Tennessee)
- Cordell Hull Lock and Dam (Tennessee)

Tennessee-Tombigbee Location

- **Bay Springs Lake/Jamie Whitten Lock and Dam (Mississippi)**

The Corps of Engineers Nashville District coordinated the development of the Invasive Carp Management Plan and draft Programmatic Environmental Assessment through a series of meetings in August 2024 to evaluate measures and alternatives to manage and prevent the spread of invasive carp. In 2024 the project was temporarily halted in October when the authorization date expired. Section 1303(f) of WRDA 2024 extended the date to 2030, restarting the project in January 2025.

In 2025 the Corps of Engineers will work with State and Federal agencies to develop the Invasive Carp Management Plan. Corps of Engineers Project Managers Julie Duck julie.duck@usace.army.mil and Chip Hall charles.w.hall@usace.army.mil

Watercraft Inspection Station Program – West and Central U.S.

Section 104 of the River and Harbor Act of 1958, as amended (33 U.S.C. §610), authorizes the Aquatic Plant Control Program, a program for the prevention, control, and progressive eradication of noxious aquatic plant growths and aquatic invasive species in U.S. waters. The program supports research and development of management solutions for invasive aquatic plants that affect the Corps of Engineers missions. The Water Resources Reform and Development Act of 2014 (P.L. 113-121) amended this authority to also allow for the Corps of Engineers to establish watercraft inspections stations in selected river basins to prevent the spread of aquatic invasive species, including plants and animals (such as quagga and zebra mussels) at Corps of Engineers managed reservoirs. These watercraft inspection stations are to be constructed, operated, and maintained with a 50% federal cost share. The Watercraft Inspection Station Program includes the Columbia River Basin (including WY and NV), the Upper

Missouri River Basin, the Upper Colorado; South Platte; and Arkansas River Basins, and the Russian River Basin (CA).

In 2025, the Corps of Engineers will work on implementation guidance for changes created by WRDA 2024. Corps of Engineers Program Manager, Jonas Grundman Jonas.Grundman@usace.army.mil

Upper Midwest Watercraft Inspection Station Program – Minnesota, Wisconsin, Ohio, Michigan

WRDA of 2020 authorized the Corps of Engineers to expand the geographic scope of the Watercraft Inspection Station program to basins and watersheds that adjoin an international border between the United States and Canada including the northern tier of States in the Upper Midwest. The cost for the development of the Upper Midwest Watercraft Inspection Station program Letter Report with integrated Environmental Assessment is 100% Federal for Planning and 50/50 cost share for Operations of the check stations paid by the project sponsor.

In 2025, the Corps of Engineers will continue working on the Letter Report with integrated Environmental Assessment and involve State natural resources specialist who are interested in participating in the project. Corps of Engineers Project Planner Amanda Goldstein amanda.c.goldstein@usace.army.mil.

USDA Forest Service, Southern Region

Submitted by Amy Commens-Carson, Regional Fisheries Program Manager

Crayfish

Work completed by Susan Adams, susan.adams@usda.gov

We reviewed primary historical documents and early dictionaries of indigenous languages to better understand the historical presence of crayfish in Montana. The work focused on the Columbia River Basin but included references for the whole state. In the Missouri River Basin, we found no early references to crayfish in the state but found indications of crayfish introductions in the upper Missouri River Basin. Genetic work is ongoing to further address questions of where crayfish are native in the state. It is possible that virile crayfish are only native to the far eastern portions of the state, but we will likely never know with certainty. A manuscript on the historical research is in press in WIRES water.

We, along with colleagues in Spain, are preparing a manuscript documenting crayfish plague outbreaks in Montana—a first in North America. All of the severe outbreaks are in crayfish populations that are almost certainly non-native in the state.

We seek funding to: (1) examine the ecological effects of non-native crayfish in Montana waters (for example, non-native crayfish effects on native invertebrates), (2) map crayfish plague outbreaks beyond Montana, in both native and non-native crayfishes, and (3) to better understand the drivers and impacts of crayfish plague outbreaks in Montana.