



Compiled Member Updates

September 2022

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U.S Federal Member Updates

USDA Forest Service-Southern Research District

Submitted by Zanethia C. Barnett, USDA Forest Service Research Fisheries Biologist

Mussels

We are evaluating the effects of *Corbicula* on native mussels in two related studies. First, we conducted a series of laboratory experiments to assess the effects of *Corbicula* on juvenile mussels. We examined how juvenile mussel survival and growth is affected by *Corbicula* abundance and how those effects are modulated by food abundance, temperature, and native mussel age. Second, we are examining relationships between *Corbicula* abundance in the wild and mussel assemblage attributes. These attributes include species richness, overall abundance, recruitment, and juvenile mussel growth. This second study will take place across about 80 streams in 12 states.

Haag, W.R., J. J. Culp, A. N. Drayer, M.A. McGregor, D.E.J. White, and S. J. Price. 2021. Abundance of an invasive bivalve, *Corbicula fluminea*, is negatively related to growth of freshwater mussels in the wild. *Freshwater Biology* 66:447-457. DOI: 10.1111/fwb.13651

Mayfield, A.E., S.J. Seybold, W.R. Haag, M.T. Johnson, B.K. Kerns, J.C. Kilgo, D.J. Larkin, R.D. Lucardi, B.D. Moltzan, D.E. Pearson, J.D. Rothlisberger, J.D. Schardt, M.K. Schwartz, and M.K. Young. 2021. Impacts of invasive species in terrestrial and aquatic systems in the United States. Pages 5-39 in Poland, T.M., Patel-Weynand, T., Finch, D., Miniati, C. F., and Lopez, V., editors. *Invasive Species in Forests and Rangelands of the United States: A Comprehensive Science Synthesis for the United States Forest Sector*. Springer International Publishing, Heidelberg, Germany.

Crayfish

We completed the second year of a two-year statewide survey of crayfishes in Montana in cooperation with MT Fish, Wildlife, and Parks (MFWP). We sampled >200 sites. In addition, MFWP Aquatic Invasive Species crews looked for and identified crayfish during their routine sampling of an additional 400 sites, and FWP fish biologists collected crayfish vouchers during fish sampling. We are using genetic approaches to address questions about the native status of species and possibly the sources of nonnative populations. We have found five taxa in the state, including the nonnative *Procambarus simulans*. *Faxonius immunis* (Calico Crayfish), which is widespread in southeastern MT, is currently presumed to be nonnative in MT. While *Faxonius virilis* (Virile Crayfish) is native to parts of MT east of the divide, it occurs in numerous locations where it is invasive on both sides of the divide. We continue to work towards understanding whether the two *Pacifastacus* taxa are native or not.

State Member Updates

Alabama Division of Wildlife and Freshwater Fisheries

Submitted by Dave Armstrong, Alabama Aquatic Invasive Species Coordinator

Since April 1, ADWFF staff have sampled 31 days, though only captured 2 Silver Carp and 7 White amur, primarily from spring standard gillnet sites. We performed 113 occupancy samples and 11 tailwater samples, the latter to assist TWRA Early Detection and Propagule project for TNCR efforts. To date, Pickwick Lake is still the only location we have sampled Silver Carp.

ADWFF applied for ANS state funds, and with the USFWS match, will secure its very first round of match funding (approx. 129K total) for FY23. This will allow us to pursue other ANS initiatives and non-carp species issues. We look to build a council so that many other objectives and tasks can be pursued in conformity with the Alabama ANS plan. This is timely given the reports of more apple snails, Zebra mussels and Giant Salvinia in state waters.

ADWFF has secured a new office location (1631 L. Gray Blvd., Athens, AL 35611) and is looking to hire a new biologist to assist management efforts early this fall.

Arkansas Game and Fish Commission

Submitted by Matt Horton, Arkansas ANS Program Coordinator

Invasive Carp Removal Program

The Arkansas Invasive Carp Removal Program, funded through the ARW and LMR sub-basin partnership grants, has continued efforts to improve invasive carp removal equipment and methodology. Primary removal is conducted using 4-inch or 5-inch monofilament gill nets, tied together, and set in a spiral around and within a school of carp. The boat operator then uses the boat to harass the fish into the nets. So far, this has been the most successful method for capturing invasive carp. Capture of carp observed encountering the gill nets is not optimal, so gill nets with red, 4 1/2-inch webbing have been ordered for the crews to test. Turnover of removal crew members has also slowed removal efforts, with two of the five crew members taking other positions within the AGFC and hiring a replacement for the fifth crew member has been ongoing for over a month. Also, high water levels in the Arkansas and White Rivers drastically hindered removal efforts from March to July. Despite these setbacks, the Program has removed 3,812 invasive carp, weighing 60,488 pounds, since removal efforts began last October.

ANS Research

LMR/ARW Sub-basin Invasive Carp Research Projects

The three contracts for ongoing invasive carp research projects, being conducted by Texas Tech University, Auburn University, and University of Arkansas at Pine Bluff, in the Red, White, and Arkansas Rivers are in the process of being extended from October 1, 2022, to June 30, 2023. All projects experienced delays due to unsafe environmental conditions, hiring personnel, and COVID related delays with project initiation.

Black Carp Research

The Invasive Carp Biologist collected two Black Carp from on oxbow in the lower Arkansas River and sent them to the USGS Columbia Environmental Research Center in Missouri for ongoing collection of biological data in the Mississippi River Basin.

Northern Snakehead eDNA Study

The ANS Program Coordinator is working with other AGFC staff, USFWS, and USGS to conduct eDNA field validation and occupancy modeling for Northern Snakeheads (NSH) in Arkansas. This project was initiated by the UFWS Region 3 eDNA Coordinator in July. The purpose of the study is to improve eDNA sampling methodology for different aquatic systems, outside of the northeastern US. Results from this project will be used to improve sampling protocols for the use of eDNA to detect and monitor range expansion of NSH. NSH from Arkansas have been collected to compare genetic markers with other NSH populations in the US. The field validation study is scheduled for October 2022.

Northern Snakehead & Silver Carp Parasite Sampling

The ANS Program Coordinator and other AGFC Fisheries staff assisted Dr. Ash Bullard, Director of the Auburn University Cooperative Fish Disease Lab, with collection of Silver Carp and Northern Snakehead in Arkansas. Dr. Bullard is conducting research to identify what parasites, native or nonnative, these invasive fish species are hosting in their introduced range in the US, to determine what secondary threats they may pose as range expansion increases. Arkansas was the first state to contribute fish for this study. Results from this project are not available yet.

Silver Carp Genetics Study

The Invasive Carp Biologist collected Silver Carp genetic samples from the Arkansas and White Rivers, for a MRBP funded research project to identify any differences in Silver Carp genetics along the leading edge of invasion in the Mississippi River basin. The samples were sent to Southern Illinois University for analysis.

Hydrilla Genetics Study

The ANS Program Coordinator is assisting the USACE with a research project to identify if there have been any new Hydrilla introductions in the US. Hydrilla genetic

samples are being collected from seven water bodies in Arkansas. Dr. Dean Williams, with Texas Christian University, is the principle investigator for this project.

Giant Salvinia Risk Assessment

The Arkansas Game and Fish Commission is contracting the University of Arkansas to conduct a risk assessment of Giant Salvinia in Arkansas waters. The objectives of this project are to develop a risk assessment tool that 1) facilitates early detection of Giant Salvinia by quantifying the likelihood of Giant Salvinia invasion in Arkansas under different climate scenarios and 2) determines the feasibility of successfully eradicating Giant Salvinia in water bodies if Giant Salvinia is introduced. Ranked lists of Arkansas water bodies will be created according to preventative management priority. The project will begin in September and should conclude by June 2023. Dr. Caleb Roberts, Assistant Unit Leader of the Arkansas Cooperative Fish and Wildlife Research Unit, is the principal investigator for this project.

ANS Distributions & Introductions

Giant Salvinia

There has been no change in the distribution of Giant Salvinia in Arkansas. It is still contained in two lakes, Columbia and Erling, in southwest Arkansas. Equipment, such as high-pressure spray rigs, containment fence booms, and a trailered boom reel are being purchased to improve rapid response and control efforts in the state. Also, a mobile CD3 boat cleaning station has been acquired by the AGFC. It will be placed at the primary public boat ramp on Lake Erling to provide boaters, hunters, and anglers with a free and convenient option to clean and remove Giant Salvinia from their boats, trailers, and equipment. The station's onboard software will allow AGFC to track use of the cleaning station and will be used to help justify purchases of additional boat clean stations. Seasonal drawdowns and herbicide applications, although limited, are being used to control Giant Salvinia in both lakes, and containment booms are still in place at public access areas on Lake Columbia. New signs will soon be installed at roughly 100 public boat ramps in south Arkansas, to increase public awareness, aid in identification, and encourage reporting of Giant Salvinia.

Mystery Snails

Mystery Snails (sp. unknown) were reported from two private lakes (Granada and Estrella) in the Hot Springs Village, located in southwest Arkansas. The lakes are in urban areas, and introduction likely occurred by illegal aquarium releases or release/escapement from private water gardens. The ANS Coordinator conducted a rapid response survey of the lakes on May 9th. Mystery Snails ranging in size from 7-mm to 69-mm in height were observed in both lakes, indicating the snails have established and most likely occurred in the lake for a few years. Snails were sent off for molecular identification of the species (*japonica* or *chinensis*), and to determine what parasites they are hosting. Genetic results are pending, but a larval nematode (*Spiroxys* sp.) and a larval trematode (*Allogosidium* cf. *corti/kenti*) were identified in the snails. Luckily, both parasites pose no zoonotic threat. The nematode is most genetically similar (98.7% match) with *Spiroxys hanzaki*, which is a non-native parasite that infects the gastrointestinal tract of the Japanese Giant Salamander and is in the

same family as the Ozark Hellbender (*Cryptobranchidae*), an endangered species. The trematode is native to Arkansas and most likely matures in North American catfishes. Work is ongoing to collect catfish and turtles from these lakes to provide adult parasites for species confirmation. Both lakes drain into the Middle Fork Saline River, which is home to threatened and endangered mussel species. A survey of the lake drainages indicate the snails have not been successful at reaching the Middle Fork Saline River. Given the resiliency of Mystery Snails to drawdowns, toxicants, and lack of viable biocontrol's, eradication of Mystery Snails from these lakes appears to be unfeasible.

Northern Snakeheads

Northern Snakeheads (NSH) continue to increase their range in Arkansas. In June, the first report of a NSH was confirmed in Ramsey Slough, an oxbow immediately above the White River dam at Batesville. Now that they have moved above this barrier, they have unimpeded access to the Buffalo River, Crooked Creek, and Sylamore Creek, which are popular Smallmouth Bass fisheries, and the Bull Shoals and Norfolk Tail Waters, which are nationally recognized trout fisheries. It is unknown what ecological impact NSH will have in these systems, which have little aquatic vegetation, limited backwater habitat, and flashy watersheds.

Ongoing ANS Projects

Invasive Aquatic Plant Rapid Response Plan

The ANS Program Coordinator is working with the Arkansas ANS Task Force to develop a rapid response plan for invasive aquatic plants in Arkansas. The document is currently under development, and will hopefully be completed by the end of the year.

ANS Dashboard Development

The ANS Coordinator is working to finalize a dashboard, which will show the geographic distribution of all confirmed ANS reports in Arkansas. The dashboard will be housed on the AGFC's ANS webpage www.agfc.com/ans, and made available to the public to improve public awareness of where ANS have been observed and encourage reporting.

Report ANS App Development

The ANS Program Coordinator is working to develop a smartphone reporting app for ANS to improve convenience and encourage reporting of ANS. App development is in the design phase.

Invasive Aquatic Plant Publications

The ANS Program Coordinator is working with the Arkansas ANS Task Force and University of Arkansas at Pine Bluff extension specialists to create and publish an Arkansas Aquatic Invasive Plant Identification and Control publication, as well as a laminated field card deck for identification of Arkansas' aquatic invasive plants. Final drafts are currently under review.

Indiana Department of Natural Resources

Submitted by Eric Fisher, Indiana Aquatic Invasive Species Coordinator

The Indiana Department of Natural Resources continues its efforts to prevent the spread of AIS species throughout the state of Indiana but especially across the Watershed divide between the Mississippi River Basin watershed and the Great Lakes watershed.

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 356 acres of infestation so far in 2022 that we have put in place through Great Lakes Restoration Initiative grant funding has slowed the spread of this aggressive macro alga but has yet to provide the answers to the best path forward.

In the past year plus 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 working on a state Invasive Carp permit, working with regional partners on telemetry, early life history, otolith microchemistry and exploring the use of contract/commercial fishing.

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.

Iowa Department of Natural Resources

Submitted by Kim Bogenschutz, Iowa AIS Program Coordinator

Following is the final Iowa DNR Aquatic Invasive Species Program update for 2021.

The Aquatic Invasive Species Program (DNR–AIS) staff in 2021 consisted of 1 full-time Coordinator/Natural Resources Biologist, 1 full-time Natural Resources Technician, and 19 seasonal Natural Resources Aides (i.e., watercraft inspectors, survey crews).

Major accomplishments 2021 included the following:

Conducted 6,015 watercraft inspections reaching 17,480 people on 95 waterbodies

Conducted 110 angler interviews on 18 trout streams

Supported 17 partnerships and cooperative projects

Gave 22 live and virtual presentations at conferences, outdoor events and trainings

Used geo-fencing to target 4000,000 ads to visitors at 45 high use boat ramps

Ran 140,000 OTT commercials, videos and displays targeting registered boat owners

Ran 169,600 video ads and banner impressions on livestreaming during Olympic coverage

Targeted water recreationists with AIS prevention messages using boat ramp signs, radio interviews, websites, social media and displays

Chemically treated invasive aquatic plants in 18 waterbodies

Completed 143 full-lake vegetation surveys

Surveyed vegetation at 584 access points on 40 lakes

Surveyed adult zebra mussels in Black Hawk Lake, Storm Lake, Blue Pit and Black Pit

Placed zebra mussel veliger settlement samplers in lakes and reservoirs across the state

Collected 65 water samples from 45 waterbodies and analyzed them for zebra mussel veligers

Surveyed Asian carp and/or bigmouth buffalo populations in the Des Moines, Iowa, and Cedar Rivers

Collaborated with Iowa State University and the U.S. Fish and Wildlife Service to acquire grants totaling \$859,000 for Asian carp projects in the Upper Mississippi and Missouri River Basins in Iowa

Purchased supplies for DNR Fisheries management stations and hatcheries to prevent the spread of AIS during operations

Participated in a Rehoming Our Aquarium/Animals Responsibly (ROAR) surrender event

Submitted Proposal and Paperwork for Grant F21AP03111 from the USFWS

Participated in the AFWA Conservation and Science MultiState Conservation Grant Program Technical Review Team

One new infestation of Eurasian watermilfoil and five new infestations of brittle naiad were discovered in Iowa in 2021.

One new infestation of zebra mussels was discovered in Iowa in 2021

Kim Bogenschutz serves as an appointed member to the Upper Mississippi River Asian Carp Coordination Team and the Missouri River Basin Asian Carp Technical Committee. The DNR-AIS collaborated with Iowa State University (ISU) to acquire grants totaling \$859,000 for Asian carp projects in Iowa. These projects include monitoring movement of Asian carp in the Des Moines, Iowa and Cedar Rivers, sampling for Asian carp larvae in Iowa tributaries and monitoring Asian carp movement in the Little Sioux River and the effectiveness of the electric barrier below Lower Gar Lake. Team members also planned an invasive carp symposium for the Midwest Fish and Wildlife Conference held in Des Moines in February 2022.

Kim Bogenschutz served on the Lock and Dam 19 underwater acoustic deterrent system (uADS) project's Planning Team, Science Advisory Team, and Communications Team. Testing of the barrier began in May 2021, and Kim Bogenschutz and Jason Euchner participated in the site visit/media day in June, 2021.

Kim Bogenschutz is chairing the ANS Task Force Control and Restoration Subcommittee which completed a report on the status of and recommendations for each national ANS management and control plan, completed a draft guidance document for development of new national control and management plans and summarized comments on a survey of gaps in ANS control and restoration measures completed by the Research Subcommittee.

Following is a preliminary update for 2022.

The DNR-AIS Program is operating similar to 2021 with the exception of a staffing change. An Aquatic Vegetation Management Biologist was added to the DNR-AIS, and Jason Euchner was promoted to fill that position in January. Joel Born was selected to fill the Natural Resources Technician 2 position and started in April. For the 2022 field season, three seasonal survey staff are based out of the Boone Research Station (2 for Vegetation Management), two seasonal survey staff are based out of the Clear Lake Fisheries Office (Vegetation Management), and twelve seasonal inspectors are based out of District Fisheries offices around the state.

Kim Bogenschutz and Jason Euchner submitted a Regulatory Action Description for FY 2023 to update to AIS Rule by adding additional plant and animal species to the prohibited lists.

Five (four are connected lakes) new infestations of Eurasian watermilfoil and one new infestation of brittle naiad have been discovered in Iowa so far in 2022. As of September 2, we are investigating a report of Hydrilla in southern Iowa.

No new infestations of zebra mussels have been confirmed in Iowa in 2022.

Kansas Department of Wildlife, Parks and Tourism

Submitted by Chris Steffen, Kansas Aquatic Nuisance Species Coordinator

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.

Rusty crayfish detected for the first time in Kansas in 2022 – During the crayfish research project described in the bullet below, rusty crayfish were encountered in McPherson State Fishing Lake. This is the first time this species of crayfish has been documented in the wild in Kansas. The population appears established (adults and juveniles found) and eradication appears to be unfeasible. KDWP has undertaken extensive outreach to notify the public of the situation and to discourage movement of crayfish and other aquatic species.

Continued a research project to design a protocol for sampling invasive and native crayfish in Kansas lakes and streams - This is a joint project between the Fisheries and Ecological Services divisions of Kansas Wildlife and Parks and New Mexico State University. Crayfish are the second most imperiled group of animals in North America (behind only native mussels). Negative interactions with invasive crayfish species and the diseases they carry threaten to further impact Kansas' crayfish populations. In 2019, the first introduced population of invasive Red Swamp Crayfish were found in Kansas and tested positive for crayfish plague. There is very little existing data on Kansas' crayfish and most crayfish research that has taken place in North America has focused on stream populations, therefore no good protocols exist for sampling crayfish in lakes. This project looks to address these issues by:

- Comparing a suite of common sampling techniques to determine the best sampling methods for crayfish assemblages in Kansas lakes and streams

- Investigating the effort requirements needed to detect all species of crayfish inhabiting a lake or stream

- Evaluating habitat-species relationships for crayfish assemblages in lakes and streams

- Providing management recommendations to Kansas Department of Wildlife and Parks regarding long-term monitoring of crayfish in lakes and streams

Continued bighead carp research project on Neosho River - Grand Lake system –

The project, funded in conjunction with FWS, aims to better understanding the small, isolated, but reproducing population of bighead carp in the Neosho River – Grand Lake system. The project objectives are to:

Identify locations of presence and upstream extent of bighead carp population within the Neosho River – Grand Lake system.

Collect baseline population demographic information including relative abundance, age and growth, and size structure.

Determine broadscale movements within the Neosho River system using otolith microchemistry.

Identify locations within the Neosho River – Grand Lake system for containment, removal, and/or eradication efforts.

One year of field sampling has been completed and the second season is ongoing. Field data collection will conclude fall of 2022 and a thesis and final report will be completed in the first half of 2023.

Completed a feasibility study for an invasive carp deterrent on the Kansas River –

A feasibility study (funded in part by FWS) was conducted to determine which current deterrent technologies could be integrated into the Bowersock Dam in the Kansas River to prevent upstream spread of silver and bighead carp during high flow events. KDWP contracted Juniper Environmental and the Kansas Alliance of Wetlands and Streams to conduct the feasibility study. They produced a report which concluded that an acoustic deterrent would be the best option and could prevent upstream spread of bigheaded carps. The report also includes an analysis of dam design river flows to inform when to activate a future acoustic deterrent and approximate installation and maintenance costs.

Initiated contract removal of invasive carps from the Kansas River below the Bowersock dam –

In addition to the upstream barrier (Bowersock Dam), there is a downstream semi-passable barrier (WaterOne Dam at Edwardsville, KS) that limits upstream movement of invasive carps into the Kansas River from the Missouri River. Microchemistry data from a 2018-2019 study found that the invasive carp in this section of the Kansas River are predominantly resident fish. KDWP believes that removing invasive carp downstream from the Bowersock Dam could reduce the number of fish that may attempt to pass over the Bowersock Dam during a high flow event, decreasing the potential for a breeding population to establish upstream of the dam. To meet the objective of reduction of this resident population, KDWP has contracted with a commercial fisherman to remove carp in this section of the Kansas River. The commercial fisherman has been working intermittently for 6 months, experimented with several methods of removal (seining, gill nets, trap nets, acoustically herding fish into nets, etc.), and has removed approximately 15,000lbs of invasive carps.

Collected eDNA samples to inform silver and bighead carp management efforts -

In collaboration with FWS, KDWP ANS program staff collected eDNA samples for silver

and bighead carp in the upper Kansas River basin above the Bowersock Dam. Very few silver or bighead carp records occur above this barrier. Results from this sampling will inform efforts to prevent invasive carp from establishing breeding populations above this location.

Inspections were conducted at 120 bait shops across the state. No invasive species were found at any of the bait shops. ANS literature was 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.

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

ANS signage was maintained at ANS infested waters and prevention 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.

KDWPT continues to contribute to WAFWA's YY Consortium. It is hoped that advancements in YY (Trojan male) technology will lead to opportunities for prevention, control or extermination of common carp, white perch and other invasive fishes. Idaho is having success using the technology on invasive Brook Trout.

Fish disease sampling was conducted at all four state fish hatchery facilities and 2 private fish farm locations. None of the fish tested showed signs of concerning disease.

Zebra mussels were detected in one new waterbody in 2021: Lebo City 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; and Linn Valley Lakes - Main Lake and Emerald Bay in 2020.

101 uninfested waterbodies were sampled for zebra mussel veligers in summer of 2022 and approximately 50 of those will be resampled in the fall.

Kentucky Department of Fish and Wildlife Resources

Submitted by Andrew Stump and Joshua Tompkins

The Aquatic Invasive Species program in Kentucky is housed within the Critical Species Investigations branch (CSI) of the Fisheries Division. KDFWR-CSI includes staff members at two locations and includes three full time biologists (Christopher Hickey, Joshua Tompkins, and Matthew Dollenbacher), and four full time technicians. Other fisheries staff in KDFWR contribute their time to general ANS projects on an as needed/available basis. Invasive carp are currently considered the most demanding ANS issue within the state and a considerable amount of focus has been placed on their management and control.

Accomplishments and findings to date since last reported include the following:

General ANS Management:

KDFWR currently relies on each of its seven fisheries districts to identify and manage ANS found within Kentucky's borders. Previously, an increase in coordination had been established through the formation of an ANS Management Team. This team has identified several priorities within the state including: the need to list additional prohibited species that may pose threats to native wildlife if released; the formation of content used in educating the public on ANS issues; the establishment of protocols decreasing the probability of inadvertent transport and spread of invasive species through agency work; and the submission of a revised ANS Management Plan by 2022. Accomplishments to date include:

- We have documented approximately 236 man-hours, 700 lbs of dry formulation herbicides, and 61 gallons of liquid formulation herbicides have been used in field treatments in an attempt to control nuisance aquatic weeds, such as hydrilla, curly-leaf pondweed, and Eurasian watermilfoil.
- Proposed changes to Kentucky's prohibited species list which will be recommended as additions during the next cycle of regulation changes. Notable recommendations to the prohibited species list include the marbled crayfish (*Procambarus virginalis*) and the Golden Mussel (*Limnoperna fortunei*) with some discussion remaining around including the Oriental Weatherfish (*Misgurnus anguillicaudatus*), the Amur Catfish (*Silurus asotus*), and the Yabby (*Cherax destructor*).
- The fisheries division has also purchased several hot-water pressure washers for use by district biologists, hatcheries, and research staff to promote Clean, Drain, Dry protocols and the reduction of agency mediated movement.
- The creation of outreach content in the form of 1 – 3 min AIS audio reels discussing important invasive species topics. These took the place of winter-time fishing reports when fishing tips and other content was infrequently reported or redundant.
- Edited the state ANS plan with minor edits to keep it up to date.

Invasive Carp Interagency Coordination:

KDFWR currently collaborates with numerous partners on invasive carp related issues within the Ohio River basin. These groups include West Virginia Department of Natural Resources, Ohio Department of Natural Resources, Indiana Department of Natural Resources, Illinois Department of Natural Resources, Pennsylvania Fish and Boat Commission, Tennessee Wildlife Resources Association, Mississippi Wildlife Fisheries and Parks, Alabama Wildlife and Freshwater Fisheries, United States Fish and Wildlife Service (Columbia FWCO, Cartersville FWCO, LMR FWCO, Lacrosse FWCO), United States Geological Survey (Columbia Environmental Research Center, IN-KY Water Science Center, Upper Midwest Environmental Science Center, Columbia River Environmental Research Center), United States Army Corps of Engineers (Nashville District, Louisville District, Huntington District), Tennessee Valley Authority, Tennessee Technological University, Murray State University, Southern Illinois University at Carbondale, Mississippi State University, Indiana Wildlife Federation, and the Tennessee Wildlife Federation. These partners have participated in one or more levels of coordination established through MICRA, the Ohio River Invasive Carp Technical Team, or the Tennessee & Cumberland River Invasive Carp Team.

Central Kentucky Carp Projects:

Monitoring, Early Detection, Early Life Stages, and Rapid Response to Invasive Carp in the Ohio River

KDFWR worked with basin partners to conducting spring targeted monitoring in the Cannelton, McAlpine and Markland pools of the Ohio River. This information is used to assess relative abundances of invasive carp in the Middle Ohio River and has indicated that there has been an increase in silver carp populations in Cannelton Pool since work began in 2016. Capture rates above Cannelton Pool remain so low that there are no measurable changes in relative abundance of silver carp. Currently, a new monitoring protocol involving occupancy modeling is being tested to determine its feasibility and use as a replacement to the current Ohio River standard. More than 40 larval tows were conducted in 2022 in an effort to aid INDNR with the early life stages project, which aims to determine the extent of upriver spawning. Suspected eggs and larvae will be sent for genetic verification and species identification. In addition, three weeks of intensive sampling have provided otoliths shared between the Early Life Stages and Monitoring & Evaluation projects. Otoliths will be used to describe age distributions in each pool and provide SIU with otoliths for their collaborative effort with INDNR in determining the approximate origins of silver carp recruitment in the ORB. As in 2021, time has been dedicated to improving telemetry array analysis using Power BI and expanding some telemetry monitoring into previously unmonitored pools.

Prevention and Population Control of Invasive Carp in the Ohio River

KDFWR determined that additional removal from the invasion front was necessary to aid in controlling upriver expansion of invasive carp. To aid in this strategic effort, contract fishers were placed in Cannelton Pool and have removed more than 350,160 lbs of invasive carps between September 21 and September 22. Some improvements this past season included allowing multiple fishers to access inland tributaries at the

same time, increases in seasonal personnel used for vessel observation, and a more focused effort during cooler months of the year in an attempt to decrease bycatch and bycatch mortality. In addition, KDFWR crews have focused more efforts to reduce populations above the contract fishing zone as well as in the inland waters of the Salt and Kentucky rivers.

West Kentucky Carp Projects:

Asian Carp and Scaled Rough Fish Harvest Program (ACHP)

KDFWR-CSI administers a harvest program for invasive carp species (silver carp, bighead carp, grass carp and black carp) that allows commercial fishers access to closed waters for the purpose of harvesting invasive carps with gill and trammel nets. Within the program commercial fishers must request permission to fish and are only allowed to harvest invasive carp and other scaled “rough fish” (buffalo, gar, drum, common carp, etc.). Since the program began in 2013, the Asian Carp Harvest Program has facilitated the harvest of 34 million pounds of invasive carp from Kentucky’s waters. KDFWR monitors the commercial catch in Kentucky by compiling daily reports from commercial anglers as well as conducting ride-alongs with commercial fishermen fishing within the ACHP. In 2022 KDFWR has conducted 34 ride alongs with 13 different commercial fishers to collect data on harvest and bycatch.

Invasive Carp Contract Fishing

KDFWR-CSI administers a contract fishing program for Invasive carp (bighead, silver, grass, and black carp) harvested from Kentucky Lake (Tennessee River) and Lake Barkley (Cumberland River). The program facilitates payment to the fishermen on a per pound basis. For FY 23 \$850,000 has been budgeted for the program.

Identifying Gear Types for Capturing Invasive Carp

KDFWR continued to work with vendors to increase invasive carp harvest and improve CPUE through a program for gear not legal by Kentucky’s regulation system. The program has been paused as KDFWR is undergoing some structural changes.

Tracking Silver Carp Movement in the Tennessee and Cumberland Rivers

KDFWR continued to support invasive carp telemetry projects with federal and academic partners, through collaboration, array maintenance and fish tagging.

Invasive Carp Deterrent Testing at Lake Barkley Lock

KDFWR has continued partnering with several agencies (U. S. Fish and Wildlife Service, U. S. Geological Survey, University of Minnesota, Fish Guidance Systems, and U. S. Army Corp of Engineers) to conduct field testing of a Bio-Acoustic Fish Fence at the downstream approach to the Lake Barkley Lock chamber. KDFWR will continue to tag silver carp and some native fish species to monitor movement through the lock chamber during testing of the BAFF. Additionally, KDFWR will continue to provide support to the research team for various aspects of the BAFF testing. The field trial period for the BAFF at Barkley Lock and Dam will end in the fall of 2023. KDFWR has also worked with the USGS, USFWS, and state natural resource agencies to develop a

strategic plan for Invasive carp barrier placement in the Tennessee, Cumberland, and Ohio Rivers, once funding becomes available.

Incidental Black Carp Detections and Monitoring Efforts

All black carp reported were collected by KDFWR staff, dissected, and sections were shipped on ice to the respective laboratories for analysis (Black Carp Processing Protocol, USGS). A complete listing of black carp captures and reported locations is kept by the USGS on the Nuisance Aquatic Species data base (<https://nas.er.usgs.gov/>).

Louisiana Department of Wildlife and Fisheries

Submitted by Robert Bourgeois, Aquatic Invasive Species Coordinator

New Reported ANS:

Murray Cod:

In March 2022, LDWF received a call and a picture of the fish from the public. The caller stated that the fish was caught by a friend and then released back into the pond. LDWF and other experts identified the fish in the picture as a Murray Cod. A Google image search revealed that this picture was not in any of the Google indexed images. After speaking with the angler to collect additional information, LDWF biologists went to the location, surveyed the small pond and canals in the area, and did not find any Murray Cod or other non-native fish. The color of the dirt in the picture did not match the locations, so LDWF called the angler to get more information. During that phone call, the angler directed us to a nearby pond, which was not electrofished during the first outing due to equipment issues. During this phone call, the angler said that was not his fish in the picture but one that "Google suggested". LDWF returned to the new pond to sample and did not find any non-native fish. LDWF is aware of a few Murray Cod in LA based-on aquarium forum posts so we cannot confirm that this is a false report or a misidentified fish. LDWF plans to sample this area in Fall 2022. As of now, we consider this as an unconfirmed report.

Update to recently reported ANS:

Red Piranha:

On May 26, 2021, the LDWF ANS coordinator received a report from the public of a Pacu caught in University Lake in Baton Rouge. Upon receiving the fish, it was determined to be a Red Piranha. LDWF biologists have sampled the lakes monthly and have not recovered any more piranha. LDWF has continued to sample in the area since it is located near a long-term sampling location. Since May 2021 LDWF has sampled the area 5 times and has not found any piranha. LDWF considers this to be a single introduction and will not report on the piranha after this report.

Tilapia:

Blue Tilapia were found during routine sampling in October 2019 by LDWF in University Lake located in Baton Rouge. Repeated sampling in 2020 has shown a reproducing

population. A freeze in February 2021 kept temperatures in the Baton Rouge area under 40 degrees for 137 hours and below freezing for 94 hours. LDWF believes that the population did not survive this extended freeze. No live tilapia have been found or reported since the fall of 2020. Since that time, LDWF biologists have sampled the area at least 5 times and have not found any live tilapia. This will be the last report of this population unless individuals are found again.

Status of established ANS

Apple Snail:

Public reports of Apple Snails slowed from the normal pace in previous years. With the drought conditions experienced, the snails have been found mainly in canals and bayous rather than in drainage ditches. This has reduced the visibility to the public. The LA crawfish industry is reporting large catches in their fields, and this has generated more public interest.

Limpkin populations have been increasing in LA. These birds eat Apple Snails and many piles of empty shells have been reported in areas where Limpkins are found. LDWF is hopeful that these birds may help reduce the Apple Snail numbers in some areas.

Invasive Carp:

In the fiscal year 2020, LDWF started two projects funded through USFWS's Lower Mississippi River Invasive Carp Partnership and the Atchafalaya, Red, and White Rivers Invasive Carp Partnership. These two projects should assist LDWF in locating breeding areas and in identifying potential locations for carp barriers. LDWF has also tagged approx. 107 invasive carp to help increase the understanding of the movement of the carp in South Louisiana. Of the 107 invasive carp tagged, 57 have been detected. Those fish movements will assist in determining their seasonal migration patterns. A Grass Carp tagged in Iowa was detected in the lower Atchafalaya River through this project. LDWF biologists also collected over 10,000 carp larvae in one 10-minute plankton tow on the Atchafalaya River. During plankton tows, LDWF biologists captured Silver Carp ranging from 1 to 2-inches in June. Both projects will conclude in Dec 2022.

In the fiscal year 2021, LDWF started four partnership-funded projects to investigate the developing markets for invasive carp, investigate obstacles inhibiting commercial fishermen from harvesting invasive carp, and to study the impacts of invasive carp on native commercially important fish. These projects will hopefully help increase market demand as well as help understand the impacts on native fish. The projects are still in progress and there are no results to report yet from them. For the fiscal year 2022, LDWF has additional studies to expand the telemetry project, develop commercial markets for carp, help define the exact breeding periods of the carp, continue studying impacts on native fisheries, and investigate the effectiveness of commercial gill nets in off-channel habitats. These projects will start in January 2023.

Asian Swamp Eels:

Monopterus albus was found in Bayou St John, New Orleans in June 2019. LDWF and a local college professor continue to monitor and sample the population. Two small eels

were found in samples collected in Sept 2020. No eels were found by LDWF or the college researchers from September 2020 to May 2022. In 2021, the few swamp eels that were found were attributed to the vegetation control of both LDWF and local community organizations. The vegetation control is ongoing and appears to be just as successful as last year. Only one specimen has been reported thus far in 2022 and was caught by an angler and confirmed via photograph. This specimen was caught at the original site where the swamp eels were first detected. LDWF plans to sample in the late summer or early fall of 2022.

Aquatic Plant Control Program:

LDWF continued with our control of invasive aquatic weeds using a variety of techniques. Aquatic plant control plans were developed for 74 different waterbodies during the reporting period. A total of 25,271 acres of nuisance vegetation were treated in 2021. Giant Salvinia continues to be the most problematic invasive plant in Louisiana, with herbicides being applied to 10,234 acres during that time. Additionally, 10,168 acres of Water Hyacinth were treated across the state during the reporting period. LDWF uses an integrated approach to control aquatic plants consisting of chemical, physical (booms and drawdowns), and biological (insects and grass carp) methods in an effort to achieve a greater combined benefit. In 2021, LDWF had an Aquatic Plant Control Program budget of \$3,200,000, of which more than 50% of that was spent on Giant Salvinia alone for monitoring, treatment, and research.

LA Invasive Species Project on iNaturalist:

A project was initiated where observations from members of the public are filtered on iNaturalist to produce a list of all invasive species reported. The LDWF ANS coordinator looks for new invasive species as well as any range extensions using this list of species and locations. Any observations of interest may generate a site visit to determine if the report is accurate. Thus far, no data has yielded any confirmed new invasive species.

Mississippi Department of Wildlife, Fisheries, and Parks

Submitted by Dennis Riecke, Mississippi Fisheries Coordinator

Aquatic Plant Control Activities

Giant Salvinia management in Ross Barnett Reservoir included:

- Monthly boat surveys conducted to determine presence of Giant Salvinia
- No Giant Salvinia found during this time period
- All recreational access reopened in Pelahatchie Bay on December 1, 2021

MDWFP fisheries biologists chemically treated Water Hyacinth, Alligator weed, Cuban bulrush, and Hydrilla, at Ross Barnett Reservoir.

New herbicide mixes continued to be used on alligator weed, water hyacinth, and Cuban bulrush at Ross Barnett Reservoir to increase effectiveness. Early-season mix included imazapyr (32 oz)/flumioxazin (6 oz)/nonionic surfactant (32 oz). Late-season mix included glyphosate (64 oz)/2,4-D (64 oz)/nonionic surfactant (32 oz). Early season observations were positive. These populations are monitored for long-term control by conducting an annual littoral zone vegetation survey.

Current hydrilla treatments include fluoridone (2.5 lbs./ac) in areas with little water exchange and copper (2.5 g/ ac-ft)/flumioxazin (1 lb./ac-ft) in areas with elevated water exchange. Initial results have been positive. These populations will be monitored for long-term control.

March 2022 floating containment boom was reset and secured to trees restricting colony movement. May 2022 an aerial application was conducted on water hyacinth and followed up by MDWFP airboat treatments at Horseshoe Lake.

May 2022 MDWFP biologists treated water hyacinth at Crystal Lake. MDWFP fisheries biologists chemically treated Water Hyacinth, Alligator weed, Cuban bulrush, Giant Cutgrass and Common Salvinia at Lake Tangipahoa in Percy Quin State Park.

MDWFP fisheries biologist and lake manager physically removed water hyacinth from Kemper Co. Lake in DeKalb, MS.

Giant Salvinia management in Lake Mike Conner included:
Containment with floating booms
Boat and on-foot surveys conducted for Giant Salvinia

Invasive Carp Control Activities

Reimbursing two invasive carp processing firms to pay them 18 cents /lb. if they paid at least 25 cents/lb. to fisherman for invasive carp harvested from the Mississippi River and Yazoo River Basin.

From March 2021 – June 2022 they have purchased:

Total Pounds Invasive Carp – 120,579 (x .18 cents/lb. = \$14,505 reimbursed)

Silver Carp 111,951 (92.8%)

Bighead Carp 6,455 (5.4%)

Grass Carp 2,173 (1.8%)

Black Carp 0

March and April 2022 MDWFP biologists provided assistance with the collection of silver carp for research being conducted at Eagle Lake by Mississippi State University. Research includes collecting, tagging, and monitoring movements in the south Delta.

Coordination Activities

Ongoing activities:

Coordinated and administered federal ANS grant to implement activities specified in the *Mississippi State Management Plan for Aquatic Invasive Species*.

Coordinated and administered 4 invasive carp USFWS research grants.

Attended the June and September 2021 conference calls of the Mississippi Aquatic Invasive Species Council to guide implementation of the activities specified in the *Mississippi State Management Plan for Aquatic Invasive Species*.

Assist the MS Dept. of Environmental Quality in applying for FY22 federal funds for State ANS plans.

Attended (in-person or virtually) Gulf and South Atlantic Panel on Aquatic Invasive Species meetings in Dec. 2021 and June 2022; the ANSTF and Panel Principal meetings (November 2021 and May 2022).

Participated in multiple Invasive Carp conference calls for Lower Mississippi River and Tennessee-Cumberland River Basin projects funded in FY19-21.

Votes on funding ANS research projects with USFWS Region 4 small grants program.

Continued to participate in the Mississippi Aquatic Invasive Species Council to guide implementation of the activities specified in the *Mississippi State Management Plan for Aquatic Invasive Species*.

New activities:

Commented on invasive carp barrier placement for TVA reservoir Environmental Assessment.

Sent revisions to the grant application package instructions for invasive carp grants to the USFWS regional offices.

Information & Education Activities**New activities:**

Distributed ANS brochures at the Outdoor Exposition Trade Show in Jackson.

Wrote article on invasive species for MS Outdoors Magazine.

Spoke about invasive carp on Creature Comforts radio show on MS Public Broadcasting.

Ongoing activities:

Continued distributing "Stop Aquatic Hitchhiker" cards along with all initial boat registrations and boat renewal registration cards that are mailed out.

Continued printing The Stop Aquatic Hitchhiker logo and bullet list in the annual regulation guides --- *Mississippi Outdoor Digest*, (375,000 copies printed each year) and the *Digest of Mississippi Freshwater Commercial Fishing Laws and Regulations* (8,000 copies printed each year).

Links to the Mississippi River Basin Panel on Aquatic Nuisance Species and the Gulf and South Atlantic Panel on Aquatic Invasive Species, Stop Aquatic Hitchhiker and Habitattitude websites are on the department website.

The Mississippi Museum of Natural Science has a permanent exhibit on exotic species.

Monitoring & Reporting Activities

Monitored Giant Salvinia population at Ross Barnett Reservoir.

Continued Invasive Carp Telemetry Project on Pickwick and Tennessee -Tombigbee Waterway (TTW).

Conducted early detection sampling for Invasive Carp in pools E and D on the TTW. No carp were detected.

Issued possession permits to the Corps of Engineers to import Rio Grande minnows, Brook Trout, Brown Trout and Rainbow Trout for research studies.

Continued telemetry project for Invasive Carp in TN River and TTW. Continue to sample for Invasive Carp in Pickwick, the Divide Cut, and Bay Springs.

Continued to monitor Giant Salvinia in Pickwick and the TTW. Treated as needed in Pickwick.

Research Activities

New activities:

Solicited preproposals, budgets, project narratives for 3 FY21 invasive carp research projects submitted by MS State University (TNCR data application, Miss. Alluvial Valley Oxbow Lake Typology and Eagle Lake movement study).

Prepared, submitted and edited all grant application documents and forms as required in Grant Solutions to obtain USFWS invasive carp project funding starting October 1, 2021.

Current research activities:

Mississippi State Univ. Research Project:

FY2021 Tennessee – Cumberland Rivers Data Management Application

Mississippi State Univ. Research Project:

FY 2020 Lower Mississippi River -Moon Lake Invasive Carp Tracking Research

Mississippi State Univ. Research Project:

FY 2021 Developing an adaptive framework based on connectivity for evaluating management actions that limit bigheaded carps access to floodplain lakes

Mississippi State Univ. Research Project:

FY2021 Asian Carp Movement and Assessment to Inform Management and Removal Efforts in the Lower Mississippi River (LMR) Basin

New Detections

None.

Future Activities

Conduct Invasive Carp sampling/monitoring and deploy receivers on the TTW once federal funding is secured.

Continue to work with state and federal entities to conduct sampling and tagging of Invasive Carp on Pickwick Lake and the TTW.

Continue surveying state lakes for aquatic invasive plants.

Develop management and control fact sheets on invasive aquatic plants

Purchase additional aquatic herbicides and hire contractors to treat public and private waters infested by invasive plants.

Purchase additional floating containment booms for emergency response to new detection of Giant Salvinia on public water in Mississippi.

Compose freshwater fishing bait regulations to specify what bait can be legally, sold, possessed, transported, and used in Mississippi.

Seek approval of legislation required to initiate licensing of retail bait outlets selling live freshwater fishing bait.

Adopt a list of approved, restricted and prohibited species under the authority specified in MS Code 49-7-80 and as specified in the *Mississippi State Management Plan for Aquatic Invasive Species* Amend list of approved, restricted and prohibited species as specified in the public notice that regulates aquaculture activities in Mississippi.

Establish an EDRR monitoring program comprised of state and federal personnel who sample aquatic species in Mississippi public waterways on a routine basis.

Submit backlog of reported nonnative species occurrences to ANS database.

Work on revisions to the *Mississippi State Management Plan for Aquatic Invasive Species*

Montana Fish, Wildlife and Parks

Submitted by Thomas Woolf, Montana AIS Bureau Chief

Stations have inspected over 73,000 watercraft this season, detecting over 300 transporting aquatic weeds and 41 with zebra/quagga mussels. [AIS Dashboard](#)

Most of the mussel fouled vessels are recently purchased from Great Lakes states. Over half of inspections are conducted by contracted partners including tribes, counties, and conservation districts.

Early detection survey has not found any new AIS species in the state this year, but crews have found new populations New Zealand mudsnails and curlyleaf pondweed.

Currently there is significant concern regarding the new zebra mussel detection in Pactola Reservoir in western South Dakota.

Nebraska Game and Parks Commission

Submitted by Kristopher Stahr, Nebraska AIS Program Manager

Watercraft Inspections:

The Nebraska Game and Parks Commission (NGPC) employed 6 AIS technicians from May to September to conduct watercraft inspection on selected waterbodies. In this period over 6,000 watercraft inspections were conducted, nearly 3x the previous record set in 2021 (2,054)

Zebra Mussel Monitoring:

NGPC staff conducted zebra mussel monitoring on 45 different waterbodies in 2022. At each waterbody, veliger samples were taken either once or twice per month and adults were sampled concurrently. Additionally veliger samples were taken at each Nebraska state fish hatchery as part of a new AIS annual inspection. NGPC has the capability to analyze veliger samples in-house, significantly decreasing time for rapid response zebra mussel detection.

Invasive Carp Monitoring:

AIS NGPC staff sampled 3 different stream and interior rivers for invasive carp to evaluate distribution across the state. The University of Nebraska-Lincoln currently has four invasive carp graduate students focused on various projects. Two more graduate students working on invasive carp projects are anticipated in 2023.

Aquatic Vegetation Surveys:

Aquatic vegetation surveys were first conducted on Nebraska waters in 2021. Aquatic vegetation surveys are designed to document current species distributions and to detect new invasions. Surveys in 2022 were conducted on 40 lakes, leading to 8 new detections of Eurasian watermilfoil and the first detection of Brittle Naiad in Lewis and Clark Lake. At each waterbody with Eurasian watermilfoil, genetic samples were taken to identify possible hybrid Eurasian watermilfoil. To date, hybrid Eurasian watermilfoil has been confirmed in two waterbodies. Spot treatments of invasive aquatic plants occurred on several waterbodies and whole lake treatments are scheduled for fall 2022 and early 2023.

Other activities:

An AIS inspection was conducted at each Nebraska state hatchery in 2022. The inspection consists of aquatic vegetation surveys, zebra mussel veliger samples at each inflow and outflow, and crayfish sampling. These inspections will be conducted annually. Additionally, the NGPC AIS program went through a “rebrand”, emphasizing the campaign to “Protect Our Waters from Invasive Species”.

North Dakota Fish and Game

Submitted by Ben Holen, North Dakota ANS Coordinator

Outreach

In 2022, the North Dakota Game and Fish Department (NDGFD) hired a new marketing professional that assists with the planning and implementation of the ANS education/outreach program. The state continued to use a diverse combination of billboards, radio, television, social media, digital marketing, and personal contacts to raise ANS awareness at a regional level. The Department partnered with Midco, a regional TV/internet provider, to develop and disseminate ANS commercials. These new commercials played during prominent sporting events throughout the summer that Midco carried. So far, North Dakota’s ANS digital media campaign has generated over 3 million impressions.

Monitoring

Zebra mussel

North Dakota currently has four lakes and three rivers designated as zebra mussel infested waters. NDGFD samples 140+ waters using plankton tow nets for the early detection of zebra mussels every year. Substrate deployment and snorkeling surveys are early detection techniques utilized on heavily used waters. So far, there have been no new detections of zebra mussels in 2022.

Invasive carp

Silver carp were first documented in the James River in North Dakota in 2011. Since then, a few adult silver carp have been observed/collected annually. In the fall of 2021,

small silver carp (100-140mm) were observed/collected on the James River for the first time, suggesting that limited natural reproduction may occur in the James River. It's plausible that these fish originated from the Missouri River in South Dakota, but from the point of capture, they would have had to traverse more than 800(rkm) from the confluence of the James and Missouri rivers. In addition, 2021 was a drought year for North and South Dakota inhibiting upstream movement of many fish species from downstream locations. Captured fish were sent to South Dakota Game Fish and Parks, where they will be part of an otolith microchemistry project to determine natal origin. The NDGFD will again sample the James River in the fall of 2022 to look for juvenile silver carp.

Nuisance Vegetation

Flowering rush was documented for the first time on the James and Sheyenne Rivers in 2021. No other nuisance vegetation has been documented since the last MRBP update.

Prevention/Inspection

NDGFD hires 12-15 seasonal employees that conduct watercraft inspections at 20 different waterbodies. So far, more than 5,000 watercraft have been inspected in 2022. Overall, watercraft traffic has been down in North Dakota from 2020 and 2021. Boater compliance with ANS regulations remains high. Large commercial equipment, including barges and tugboats, remain one of the highest risk vectors for spreading zebra mussels. ANS staff inspected over 100 pieces of commercial equipment in 2022 and found zebra mussels on more than a dozen. NDGFD continues to inspect private wholesale bait vendors and federal fish hatcheries in the state.

Law Enforcement Efforts

Throughout the summer, NDGFD wardens conducted 17 dedicated ANS roadside checks. So far, wardens have issued 80 ANS-related citations and 18 warnings. Most of the citations were related drain plug/water related.

Ohio Department of Natural Resources

Submitted by John Navarro, Ohio Aquatic Stewardship Program Administrator

Continue control efforts of *Hydrilla* at several inland impoundments in the Ohio River basins, including Mosquito Creek Lake and Alum Creek.

Continue to monitor for Bighead Carp and Silver Carp in the Ohio and Muskingum Rivers using telemetry.

Continue to work on closing the GLMRIS connections at Little Killbuck Creek and Grand Lake St Marys.

Continue the surveillance of Ohio's bait and Grass Carp supply chain to determine if AIS, including Bighead and Silver Carp, are being transported through the bait trade. Working with Butler County MetroParks to control a Redswamp Crayfish infestation on their property.

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".

Continue to distribute the *Ohio Aquatic Invasive Species* guide.

Participated in the following groups: Great Lakes Panel, Mississippi River Basin Panel, Ohio Aquatic Invasive Species Committee, and Asian Carp Regional Coordinating Committee.

Oklahoma Department of Wildlife Conservation

Submitted by Elaine Ewigman, Oklahoma ANS Coordinator

The Oklahoma Department of Wildlife Conservation (ODWC) had a vacancy in the ANS Coordinator position from May 18, 2022, to September 1, 2022. ANS Technician Elaine Ewigman promoted to the coordinator position September 1. Zebra Mussel veliger sampling efforts were completed in the months of May and June on 28 lakes throughout the state, resulting only in one additional positive infestation.

There are two university-based Invasive Carp projects in progress. One is focused on the Neosho-Grand River system with Dr. Quintin Phelps of Missouri State and the other on the Red River led by Dr. Shannon Brewer of Auburn University. Brian Fillmore out of the US Fish and Wildlife Service office at Tishomingo and his biologists are also working on Invasive Carp research in the Red River and cooperating with the Auburn University researchers.

Oklahoma's ANS activities have recently included assisting with Invasive Carp dissection and specimen collections, Triploid Grass Carp certification documentation from the US Fish and Wildlife Service, approval, or denial of various permits such as the aquatic import/export permit, scientific collectors permit, commercial minnow dealer permit, working with our Communication and Education division for outreach efforts, and other miscellaneous activities.

Plans for the fall include assisting in the field with the Invasive Carp projects, ANS signage checks around public waters, shoreline observations, formulating future projects in Oklahoma, hiring a technician, attending annual meetings including the MRBP annual meeting, MICRA meeting, SEAFWA annual meeting, and writing interim/final reports for grants.

South Dakota Game, Fish and Parks

Submitted by Tanner Davis, South Dakota AIS Coordinator

MANAGEMENT EFFORTS

2022 OVERVIEW

So far, inspections for aquatic invasive species (AIS) have increased in 2022 compared to 2021. The increased inspections is in part thanks to partnerships with western South Dakota Conservation Districts, Enemy Swim Preservation Association, and refocusing roadside inspections efforts to high pressure roadways. In western South Dakota, funding from the Bureau of Reclamation (BOR), the U.S. Fish and Wildlife Service (USFWS) as it is the USFWS that provides the QZAP funding, and West Dakota Water Development District supported the operation of eight inspection stations at six major reservoirs in western South Dakota.

In total, 12 inspections stations have been in operation across South Dakota on any given week during the summer months. GFP was able to hire 52 inspectors plus volunteers. Additionally, GFP law enforcement officers assisted with compliance during inspections.

GFP also continued education and outreach efforts to educate boaters and water users on best management practices, specifically focusing on 'clean, drain, dry' messaging. For a third year in a row, GFP conducted gas station television at 43 gas stations across South Dakota. Individuals who encountered these gas stations or utilized infested waterbodies received digital and/or social media advertisements following up on these messages. GFP built upon their outreach and education aspect of the AIS Program by working with the Outdoor Campus' in Sioux Falls and Rapid City to implement AIS education in with other outdoor education classes.

WATERCRAFT INSPECTION STATIONS

Maximize boater engagement to increase adoption of best practices to clean, drain, and dry watercraft between uses. Four roadside stations were operated in central and eastern South Dakota to maximize boater contacts.

Operated stations at eight boat launch areas at the six largest western South Dakota reservoirs.

The U.S. Bureau of Reclamation (BOR) and USFWS, funded stations at Angostura, Belle Fourche, Deerfield, Sheridan Pactola and Shadehill Reservoirs with the Western Dakota Water Development District also contributing.

Enemy Swim Preservation Association (ESPA) funded a station at Enemy Swim Lake in 2021 and continued this effort in 2022. To date, 16,343 watercrafts were inspected in 2022 compared to 13,455 as of August 31, 2021.

52 inspectors were hired between GFP and local County Conservation Districts. Staffing was supplemented with volunteers from the Enemy Swim Preservation Association. GFP added a new position, Western Watercraft Inspection and Decontamination Supervisor, in the Black Hills that oversaw the five most western

reservoirs (Angostura, Pactola, Sheridan, Deerfield, and Belle Fourche). GFP also advertised for five new positions in northeastern South Dakota based out of Webster but were unsuccessful in filling those positions.

Minimize transport of water, vegetation, and aquatic animals among waters by:

Increasing awareness of AIS and impacts to water users

Engaging boaters at inspection stations to help them develop best practices to slow the spread

Utilizing law enforcement to engage boaters and help increase regulation compliance

2021-2022 WATERCRAFT INSPECTIONS

13,455- Watercrafts inspected as of August. 31, 2021

16,343- Watercrafts inspected as of August 31, 2022

STATION	2021 INSPECTIONS AS OF Aug. 31, 2021	2022 INSPECTIONS AS OF Aug. 31, 2022
Ft. Pierre	792	1,276
Webster	716	664
Enemy Swim	1,191	1,094
Sioux Falls	1,125	1,705
Angostura	2,898	4,484
Pactola	1,062	2,852
Deerfield	75	72
STATION	2021 INSPECTIONS AS OF Aug. 31, 2021	2022 INSPECTIONS AS OF Aug. 31, 2022
Sheridan	392	1,594
Belle Fourche	1,778	2,124
Shadehill	863	478

93%-100% Boat plug compliance at all locations in 2022.

ENFORCEMENT INCREASES COMPLIANCE Issuance of warnings and citations for violations of AIS statutes and administrative rules helps increase compliance with boat plug, vegetation, and fish and bait transport rules. So far in 2022, approximately 72 warnings and 57 citations were given out.

72- Warnings

16,343- Watercrafts inspected in 2022

57- Citations

1,112- Watercrafts had recently been in infested waters

12- Inspection stations are set up on any given week throughout the summer.

STATE AGENCY PARTNERSHIPS

Transportation- use of DOT field locations for watercraft inspections and include a provision in construction contracts stating contractors must obey AIS regulations.

Also helped install Zebra Mussel Infested Water signs

Public Safety use of motor vehicle carrier weigh station locations for watercraft inspections.

Agriculture and Natural Resources - distribution of information to irrigators, municipalities, and businesses with surface water withdrawals.

Revenue - distribution of rack cards on “clean, drain, dry” to county treasurers for inclusion in registration renewal mailings.

FEDERAL AGENCY PARTNERSHIPS

Bureau of Reclamation - Coordination with prevention efforts and mussel veliger sampling at BOR reservoirs.

US Forest Service - Use of USFS boat ramps for watercraft inspection locations and storage of equipment as well as placement of education signage at water access point.

US Corp of Engineers - Allowed signage at their public boat ramps.

US Forest Service - Use of USFS boat ramps for watercraft inspection locations, help with 5 additional employees to conduct inspections as a rapid response effort after zebra mussel detection was confirmed, storage of equipment, as well as placement of education signage at water access points.

NGO PARTNERSHIPS

Wildlife Forever - GFP purchased hats from Wildlife Forever.

The Invasive Species Action Network - Received Don't Let It Loose signage for urban fisheries and purchased Don't Let It Loose pet store bags.

Glacial Lakes and Prairies Tourism Association - Placed rack cards at Bramble Park Zoo in Watertown for more public outreach.

EDUCATION AND OUTREACH

Reinforce key messages of “Clean, Drain, Dry”, leave boat plugs out except when launching, loading, and on the water, do not move water when transporting bait and fish, and be aware of current AIS infestations.

Tools include organic and paid social media messages, YouTube videos, gas station TV, targeted emails, news releases, rack cards, digital advertisements, lake association meetings, AIS training for volunteer inspectors, SDleastwanted.sd.gov website, Citizen Monitoring Program, and enhanced AIS signage and decontamination equipment at boat ramps. GFP also implemented AIS education into classes taught at the Outdoor Campus locations in Sioux Falls and Rapid City. Overall, AIS was discussed in 96 classes between these two locations.

GFP partnered with DOT to use interstate DOT signs for AIS messaging and partnered on installation of zebra mussel infested water signs in eastern South Dakota.

GFP also increased signage and wrote an article in the Summer Conservation Digest magazine.

Staff reached out to 32 lake associations for partnership.

1,858,757- Emails sent with ais content

12,394- Visitations to SDLEASTWANTED.

43- Gas stations running ads

341,544- Individuals reached on SD.GOV

9- Lake associations worked with GFP

11% Increase in views on ais education social media videos on GFP
YOUTUBE

South Dakota also has had three years of funding to date for invasive carp work and SD plans to continue to pursue invasive carp work going forward. Currently, SD is looking at otolith microchemistry for natal origins of invasive carp, eDNA sampling the tributaries off the Missouri River as well as conducting a joint effort telemetry study with USFWS on our tributaries. Funded work moving forward will look at risk assessment of various life stages successfully occupying SD waters and looking at LIDAR to gauge risk of further expansion of invasive carps current distribution.

SOUTH DAKOTA AIS MANAGEMENT PROGRAM TIMELINE

2015

NEW INFESTED WATER

Lewis and Clark Lake, Missouri River below.

2016

NEW REGULATION

Boat plugs must be removed unless launching, loading or on the water.
Bait and fish are now prohibited from being transported in lake water.

New Infested Water

McCook Lake

2017

NEW REGULATION

Established a list of containment waters with specific decontamination requirements. Also expanded exemptions to possessing AIS if transporting or decontamination.

2018

NEW INFESTED WATER

Yankton Lake

2019

NEW INFESTED WATER

Lake Sharpe and Lake Francis Case

2020

NEW INFESTED WATER

Pickerel Lake, Lake Kampeska, Lake Cochrane, Dahme Quarry

NEW REGULATION

Inspection and Decontamination Authorities in Statute as is Clean, Drain, Dry requirement (HB 1033).

2021

NEW INFESTED WATER

Lake Mitchell

NEW REGULATION

Allowances for lakeshore residents for AIS possession, transport and launching back into infested waters. Also repealed outdated decontamination requirements for mussel infested waters.

2022

NEW INFESTED WATER

Pactola Reservoir, Enemy Swim Lake

Tennessee Wildlife Resources Agency

Submitted by Cole Harty, Tennessee ANS Coordinator

Bass Pro Tour Tournament angler, Michael Neal, partnered with TWRA to promote ANS awareness. Michael displays Agency ANS logo on his boat, truck, and jersey. Michael has made appearances at High School Fishing Team ANS programs and taped several ANS videos for Agency distribution.

Participated in and developed numerous ANS outreach actions including webinars, press releases, expos, news interviews, radio interviews, newspaper interviews, pamphlets, signs, etc.

Hired three interns from University of Tennessee – Knoxville to do statewide ANS outreach. Interns assisted with regional ANS sampling, improved, and replaced signage at access points, and developed draft ANS outreach material and media posts.

Continued research on the use of freshwater prawns as a control for red swamp crayfish.

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.

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 over 300 Silver Carp.

Examined harvest at licensed wholesale fish dealers and collected biological information from Silver and Bighead 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 7/31/2022, the program has resulted in the harvest of more than 17.2 million lbs. of invasive carp from Kentucky and Barkley lakes since its inception in September 2018.

TWRA has been actively engaged in discussions with partners regarding the implementation of barriers on lock and dam sites on the Tennessee and Cumberland rivers.

Texas Parks and Wildlife Department

Submitted by Monica McGarrity, Texas AIS Senior Scientist

ANS Program Highlight: Aquatic invasive vegetation management has been highly successful at reducing infestation acreage and ensuring no water bodies are impaired for boater access.

Top five ANS activities/accomplishments/priorities for the past year:

Aquatic Invasive Plant Management

Aquatic invasive plant management continues to be a priority in Texas, with Giant Salvinia and Water Hyacinth remaining the most problematic species, although a high degree of control has been achieved and no water bodies are currently considered impaired for recreational access. Giant Salvinia integrated pest management strategy includes a variety of control methods including Salvinia weevil introductions as biological controls.

Riparian Invasive Plant Management

Watershed-scale riparian plant management in key Native Fish Conservation Areas also continues to be a key priority. Efforts are ongoing to manage saltcedar across the Upper Brazos River watershed, with over 150 private landowners participating and over 20,000 acres treated to date. The Healthy Creeks Initiative has partnered with more than 450 private landowners and the Nueces River Authority to treat Arundo (Arundo donax; aka giant reed) infestations along streams and rivers in the Pedernales, Blanco, Guadalupe, Medina, Nueces, and Llano River and San Felipe Creek watersheds of the Texas Hill Country in Central Texas.

Invasive Carp Population Assessment

Invasive silver and bighead carp have been detected in the waters of the Red River Basin, but information regarding this species was limited primarily to isolated angler reports. Texas partnered with Oklahoma and Arkansas and researchers from Auburn University and Texas Tech University to conduct an invasive carp population assessment and collect baseline native fish assemblage data. The project is reaching the end of the second year and has received funding for an additional year of population monitoring and two years of telemetry. Invasive carp have been detected in all studied Texas tributaries of the Red River, and TPWD changes to regulations to prevent the transfer of invasive carp have been expanded to include these waters, effective September 2022.

Zebra/Quagga Mussel Early Detection/Population Monitoring

A group of 11 partner agencies and 2 universities conduct zebra mussel early detection monitoring at 173 sites on 44 water bodies and population monitoring on 28 water bodies. This partner approach to monitoring significantly increases the number of water bodies that can be monitored, and coordination prevents duplication of efforts. In the past year, there have only been two new detections of invasive mussels in Texas- quagga mussel larvae in Lake Amistad on the Rio Grande and zebra mussels in private access only Diversion Lake in Central Texas (the latter due to downstream dispersal). Additionally, Lake Walter E. Long was upgraded from positive to fully infested status after detection of settled adult zebra mussels.

Public Outreach Campaign

Public outreach on aquatic invasive species is a key component of Texas' ANS management strategy and is funded by TPWD and a group of partners. The 'Protect the Lakes You Love' public awareness campaign made hundreds of millions of impressions through billboards; gas station advertising including clean, drain, and dry pump videos; digital pre-roll video ads; Facebook ads and posts; geofenced Pandora radio ads near infested and high-risk lakes; boater registration mailings; emails to registered boaters and marinas; and print ads in outlets such as the Outdoor Annual, Texas Parks & Wildlife magazine, and the Marina Association of Texas newsletter. Outreach this year also included focus on the Never Dump Your Tank campaign and direct, targeted angler outreach to prevent the spread of invasive carp.

Priorities for the upcoming year:

Aquatic & Riparian Invasive Plant Management

Zebra/Quagga Mussel Monitoring and Outreach/Prevention

Invasive Carp Population Assessment and Movement

Wisconsin Department of Natural Resources

Submitted by Amy Kretlow Wisconsin AIS Program Coordinator

Staffing

October 2021: We hired 3 Regional AIS Coordinators. Wisconsin now has 5 full time Regional AIS Coordinators, located throughout the state.

October 2021 and April 2022: Virtual statewide AIS meeting were held. These meeting include WI DNR staff, AIS Partners and State CISMA groups to share information regarding AIS and TIS.

New Responses in the Mississippi Basin, Summer of 2022:

A Red swamp crayfish was found collected by a citizen in the Eau Claire area. The AIS Regional Coordinator worked with LE and partners to perform response monitoring in the area. No other red swamp crayfish were detected. Follow up monitoring will be performed periodically.

A new population of New Zealand mudsnails were discovered in Walworth County. Boot brush stations were placed at the entry of the stream. Monitoring and outreach/education is being performed.

New populations of Corbicula have been discovered in the South-Central portion of the state. Monitoring will continue to determine the extent of the population.

A new population of Zebra mussels were discovered in the northwest portion of Wisconsin. Zebra mussels are only in a few lakes in that area of the state. Continued monitoring and outreach efforts are being performed.

Outreach

2022 Clean Boats Clean Waters Landing Blitz (July 1 – July 5, 2022) data entered to date (statewide):

350 Landings staffed
8000 boats inspected
17,000 people contacted

West Virginia Department of Natural Resources

Submitted by Katie Zipfel, West Virginia Ohio River Fish Manager

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.

Monitoring & Early Detection – WVDNR conducted annual monitoring boat electrofishing surveys at 26 sites (6.3hrs) on the R.C. Byrd Pool of the Ohio River in Spring 2022. One Silver Carp was collected in the upper section of the R.C.

Byrd pool. Throughout April 2022, WVDNR deployed gill nets in the R.C. Byrd (2800 feet) and Greenup pools (1800 feet) of the Ohio River. Two Bighead Carp were sampled and removed from the R.C. Byrd pool; one Grass Carp was removed from the Greenup Pool. In August 2021, WVDNR also participated in a multi-agency effort to collect otoliths from invasive carp in the McAlpine and Markland pools of the Ohio River to acquire age and growth information.

Early Life Stages - In Summer 2022, WVDNR conducted 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. All larval fishes that were collected were sent to Indiana DNR for identification.

Telemetry - WVDNR continues to assist the USFWS with the telemetry project by maintaining the receiver array deployed throughout the West Virginia section of the Ohio River. Receivers were offloaded every two months and data was shared with USFWS and Kentucky DFWR.

Control and Containment - In Summer 2022, WVDNR conducted several gill net surveys on Raccoon Creek in an effort to remove invasive carps. One Bighead Carp was removed during these efforts.

Interagency Efforts - WVDNR and USFWS biologists are planning an extensive removal effort in Raccoon Creek in September 2022.

Hydrilla

WVDNR continues to communicate with ORSANCO in monitoring the advancement of Hydrilla downstream in the mainstem Ohio River. With reports of hydrilla in small impoundments increasing, the WVDNR is collaborating with the U.S Army Corps of Engineers and Dr. Dean Williams of Texas Christian University on a large-scale genetic evaluation of hydrilla throughout the eastern United States.

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.

Regulatory Actions

No new regulations have been put into place

Wyoming Game and Fish Department

Submitted by Josh Leonard, Wyoming AIS Coordinator

Top five AIS activities/accomplishments/priorities for the past year:

In 2022, watercraft check stations began operation in late March and will remain open into October at fifteen 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. Through

August 15th, a total of 42,401 inspections have been conducted, a significant decrease compared to the increased traffic witnessed in 2020 and 2021. Of these, 3,011 were high risk watercraft and 508 were decontaminated for water onboard or suspect AIS. Thus far, forty-eight boats have been intercepted with mussels attached or in compartments, one of which was harboring live mussels.

The Wyoming Game and Fish Department (WGFD) responded to the mussel infestation detected in Pactola Lake, South Dakota mid-July. This infested water is only 27 miles from the Wyoming border, increasing the threat to Wyoming significantly. As a result, Wyoming has closed watercraft access to LAK Reservoir in northeastern Wyoming for the remainder of 2022, as infrastructure and personnel are not available to effectively protect this water. Additionally, Wyoming has increased staffing and hours of our check station bordering South Dakota to ensure watercraft entering the state are clean, drained, and dried before launching.

In 2022, Wyoming initiated the roll out of tablets and wireless printers for all AIS inspections at our permanent check stations, in an effort to cut back on data entry and interact with surrounding states real-time. Additionally, this has allowed Wyoming to intercept high risk boats that may have been overlooked in years pasting trusting watercrafts users in where they said they boated last.

The WGFD increased seasonal personnel hiring in 2022 to combat the increased workload our inspectors endured in 2020 and 2021. The program now operates with 5 FTE personnel, four 10–12-month contract Specialists, one crew lead and 51 seasonal inspectors.

The WGFD completed multiple rigorous regulation changes to further protect our state from AIS in regard to Private Hatchery fish importation, which will be implemented in 2023. The AIS program adopted the AIS Hatchery Inspection obligations in 2021 and will continue their annual monitoring of hatcheries in the coming weeks.

Priorities for the upcoming year:

Along with many western states, hiring for seasonal positions in 2022 was extremely difficult and the WGFD was never 100% fully staffed. This fall/winter we will be exploring new ideas on how to recruit and retain AIS inspectors, especially in our more remote locations.

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.

The WGFD is in the process of purchasing 10 acres of property in a prime location for a new AIS check station. Once this sale is complete in late September, the WGFD will begin the process for engineer design and hopefully construction in 2023.

To see individual originally formatted state reports please follow the google doc link below.

<https://drive.google.com/drive/folders/1xBNAd4fMuavVqcGhgEAZXMcDPdsKYVBg?usp=sharing>