North Central Division of the American Fisheries Society

Ictalurid Technical Committee 2020 State Reports

Contributors -

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Dakota Territory
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Dave Lucchesi, Dakota Chapter ITC Representative

Ongoing Work:

Catfish studies in the lower James River, South Dakota

Benjamin J. Schall and David O. Lucchesi, South Dakota Game, Fish and Parks - Sioux Falls

South Dakota Game, Fish and Parks (GFP) staff attended the Scotland Days Catfish Tournament for the fourth consecutive year to collect information from angler-caught fish. A total of 175 Channel Catfish and 3 Flathead Catfish were weighed in. The total weight recorded was 338.6 kg, the heaviest in the past 4 years. The 2020 weight was roughly 118 kg heavier than the second heaviest weight of 220 kg recorded in 2017 and this occurred in spite of difficult fishing conditions with the extremely high-water levels. Pectoral spines were pulled on all individuals, and otoliths were removed from a subsample of 100 fish. Channel Catfish ranged in length from 368 to 795 mm, and Flathead Catfish ranged from 383 to 758 mm. Fish condition responded positively to flooding conditions in the James River for the second year in a row with mean relative weight values of 107 and 96 for Channel Catfish and Flathead Catfish, respectively. Aging structures will be examined this winter, and ages assigned to all collected individuals. We plan to continue utilizing fish caught during this tournament to assess the relationship between parameters estimated from angler-caught fish and from fish caught in standard sampling gears.

Record high water levels were recorded on the James, Vermillion and Big Sioux Rivers in 2019. The 2020 angler and electrofishing tag returns of 2018-tagged Channel Catfish and Flathead Catfish showed that high water and an inundated flood plain coincided with extraordinary growth. For example, a 460 mm Flathead Catfish grew to 700 mm and nearly quadrupled in weight over the 2-year period. Two angler-caught tagged Channel Catfish increased in weight from 0.15 kg to 1.4 kg and from 0.3 kg to 1.8 kg, respectively. Other reported fish had more than doubled in weight in 2 years. Tagged fish were often recaptured a ways upstream (> 30 rkm) from their tagging location.

Game, Fish and Parks catfish work in central South Dakota

Cameron Goble, South Dakota Game, Fish and Parks - Pierre

Pierre GFP captured Channel Catfish in the Missouri River and Bad Rivers and stocked them into smaller area waters in June 2020. Waters with high Black Bullhead abundance and/or a close proximity to a population center were selected for stocking. They moved a total of 860 adult fish (> 1lb a piece) to six waters. Objectives were to evaluate whether or not stocking of Channel Catfish would have an impact on populations of abundant, small Black Bullheads and to provide community fishing opportunities.

North Dakota Game and Fish catfish work

Scott Gangl, North Dakota Game and Fish Department

North Dakota Game and Fish (NDGF) staff continued to utilize channel catfish, collected as bycatch during spring spawning operations, to stock various lakes around the state. In some cases, catfish were

stocked as a predator, particularly where bullheads were abundant. But in most cases, stocked catfish provided a unique fishing opportunity for their community fisheries (i.e., “kids” ponds, but most are open to adults as well).

Plans to survey the Red River in 2020, including fish population assessment and creel survey directed primarily at channel catfish populations, were postponed until 2021 due to Covid-19 restrictions. A product we were hoping would come out of the surveys was a comparison of catfish genetics collected from each side of the continental divide (Hudson Bay and Missouri River drainages) in North Dakota. Although we did not collect Hudson Bay drainage catfish in 2020, we were able to collect tissue from catfish in the Missouri River drainage at Lake Oahe and Lake Sakakawea. These samples were sent to a Minnesota Department of Natural Resources geneticist in St. Paul for examination. We hope to collect the Hudson Bay drainage samples from the Red River in 2021.

Illinois
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Nathan J. Lederman, Illinois Chapter ITC Representative

Project Name or Description: Catfish harvest regulations evaluation of the Fox River.

Contact Information

Name: *Steve Pescitelli*
Email: *Steve.Pescitelli@Illinois.gov*
Name: *Tristan Widloe*
Email: *Tristan.Widloe@Illinois.gov*
Name: Vic Santucci
Email: Vic.Santucci@Illinois.gov

Affiliations*:* Illinois Department of Natural Resources

Objective:

1. Evaluate impacts of newly implemented catfish regulations.

Status: Ongoing

Following a five year study, catfish harvest regulations were established on the Fox River located in Northeastern Illinois in 2017. Regulations limited harvest of Flatheads larger than 28 inches to one per day, with a three fish total daily creel in an effort to direct harvest toward the more abundant, smaller fish. Population monitoring over the past few years, including 2020, indicates relatively stable numbers of fish. The fish pictured here was 39 inches and 26 pounds and likely a recap from the previous 2017 study based on the adipose fin that appeared to be scarred due to clipping. Floy tags were also used for a fairly short time during the study (1 - 2 years). An interesting side note: this large Flathead tried to eat a 30 inch musky in the holding tank and managed to get it half way down for a short time - missed photo op of our careers.

Project Name or Description: Catfish in the Upper Mississippi River

Contact Information

Name: *Kristopher Maxson*
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Name: *Levi Solomon*
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Name: *Dr. James Lamer*
Email: *lamer@illinois.edu*

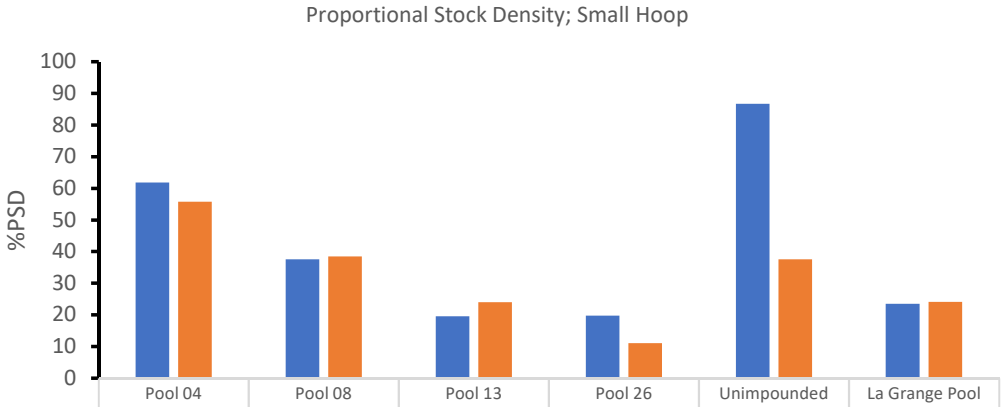
Affiliations*: Illinois Natural History Survey, Illinois River Biological Station*

Objective:

1. Assess population demographics, genetic structure and large scale movement patterns via otolith microchemistry in the Upper Mississippi River and La Grange pool of the Illinois River.

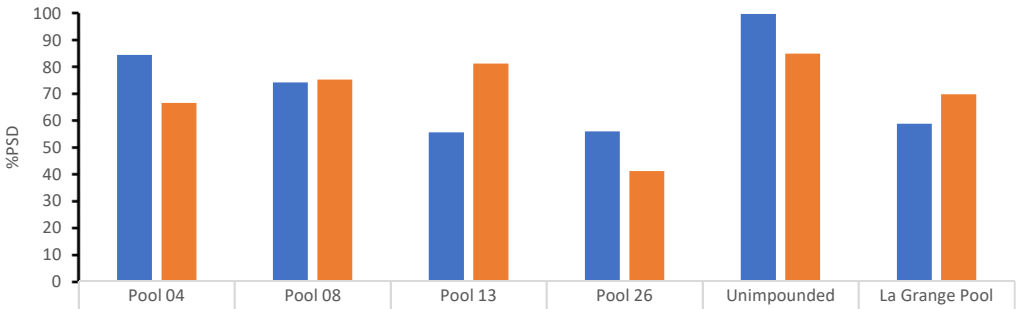
Status: Ongoing

Channel Catfish have been collected from Pool 26 of the Mississippi River and the La Grange pool of the Illinois River from 2018-2020. These collections coincided with identical collection protocols implemented on Pools 4, 8, and 13 and the Open River Reach of the Mississippi River (RM 78-20) with a goal of studying population demographics, genetic structure, and large scale movement patterns via otolith microchemistry. Aging work is being completed by Dr. Quinton Phelps's lab at Missouri State University, genetics work by University of Wisconsin at LaCrosse and the University of Illinois and otolith microchemistry being ran at Dr. Greg Whitledge's lab at Southern Illinois University Carbondale. Proportional Stock Density (PSD) were calculated from the LTRM Graphical Fisheries Database Browser (https://umesc.usgs.gov/data_library/fisheries/graphical/fish_front.html) for Channel Catfish, a subset of which was retained for this study. Catch per net set were also calculated from the LTRM Graphical Fisheries Database Browser.



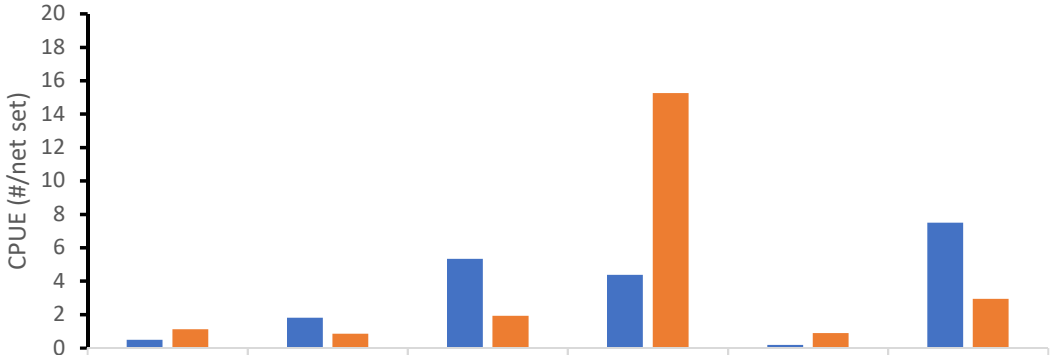
	Pool 04 Mississippi River: Lake City, MN	Pool 08 Mississippi River: La Crosse, WI	Pool 13 Mississippi River: Bellevue, IA	Pool 26 Mississippi River: East Alton, IL	Unimpounded Mississippi River: Jackson, MO	La Grange Pool Illinois River: Havana, IL
2018	61.76	37.5	19.57	19.72	86.67	23.48
2019	55.74	38.46	24	11.03	37.5	24.04

Proportional Stock Density; Large Hoop



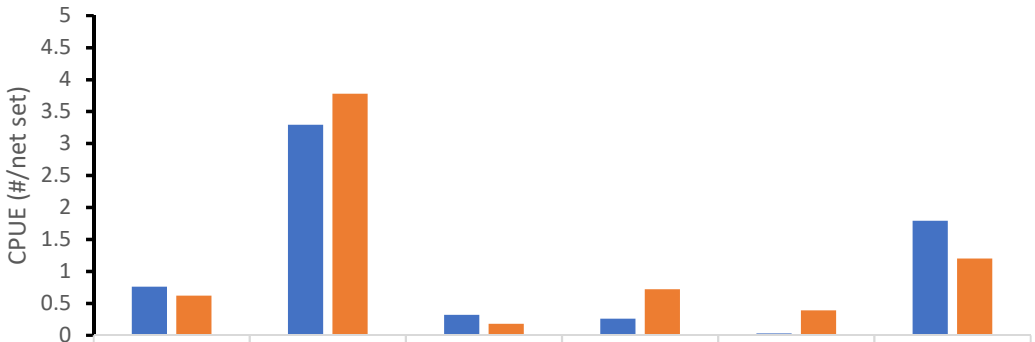
	Pool 04 Mississippi River: Lake City, MN	Pool 08 Mississippi River: La Crosse, WI	Pool 13 Mississippi River: Bellevue, IA	Pool 26 Mississippi River: East Alton, IL	Unimpounded Mississippi River: Jackson, MO	La Grange Pool Illinois River: Havana, IL
2018	84.62	74.27	55.56	56	100	58.79
2019	66.67	75.36	81.36	41.1	85	69.86

Catch Per Unit Effort; Small Hoop



	Pool 04 Mississippi River: Lake City, MN	Pool 08 Mississippi River: La Crosse, WI	Pool 13 Mississippi River: Bellevue, IA	Pool 26 Mississippi River: East Alton, IL	Unimpounded Mississippi River: Jackson, MO	La Grange Pool Illinois River: Havana, IL
2018	0.48	1.8	5.33	4.37	0.17	7.49
2019	1.11	0.85	1.93	15.25	0.89	2.93

Catch Per Unit Effort; Large Hoop



	Pool 04 Mississippi River: Lake City, MN	Pool 08 Mississippi River: La Crosse, WI	Pool 13 Mississippi River: Bellevue, IA	Pool 26 Mississippi River: East Alton, IL	Unimpounded Mississippi River: Jackson, MO	La Grange Pool Illinois River: Havana, IL
2018	0.76	3.29	0.32	0.26	0.03	1.79
2019	0.62	3.78	0.18	0.72	0.39	1.2

The following 2 links are recorded presentations from Catfish 2020 specifically dealing with this project:

Hae Kim – Vital rates of Channel Catfish in the Upper Mississippi River
https://www.youtube.com/watch?v=u9NQCFeZPHU

Hae Kim – Gear specific catch rates and size structure of Channel Catfish in the Upper Mississippi River
https://www.youtube.com/watch?v=RFiZa9deP2A

Project Name or Description: Flathead Catfish artificial structure use in the Rock River

Contact Information

Name: *Spencer Phillips*
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Name: *Dr. James Lamer*
Email: *lamer@illinois.edu*

Affiliations *University of Illinois, Urbana-Champaign and Illinois Natural History Survey, Illinois River Biological Station*

Objective:

1. Understand if Flathead Catfish are utilizing artificial nesting structures that were placed within a section of the river in 2015

Status: Ongoing

A Flathead Catfish telemetry project was started on the Rock River in Illinois. The main premise is to understand if Flathead Catfish are utilizing artificial nesting structures that were placed within a section of the river in 2015. We tagged 225 fish during October and have plans to tag about 40 more fish this spring. The radio telemetry project with funding from the Illinois Department of Natural Resources.

Project Name or Description: Commercial Fishing Program

Contact Information

Name: *Matt O'Hara*
Email: Matt.OHara@Illinois.Gov
Name: *Rob Maher (retired)*
Email: *Rob.Maher@illinois.gov*

Affiliations *Illinois Department of Natural Resource*

Literature Available: 2019 Annual Commercial Catch Report Exclusive of Lake Michigan

Objective:

1. Summarize commercial fish harvest for 2019.

Status: Complete

Abbreviate Abstract

Commercial harvest for Ictalurids occurred in the Mississippi, Illinois, Kaskaskia, Wabash, Ohio, Sangamon, Embarrass, Big Muddy and Little Wabash River watersheds. Nearly 600,000 pounds of Ictalurids were harvested during 2019 in Illinois. Channel Catfish were the dominate Ictalurid species removed by commercial harvesters from Illinois waters during 2019 (60.1%). Mississippi River Ictalurids represented the majority of the those harvested (73.0%) followed by the Illinois River (16.1%). Hoop nets harvested the majority of the Ictalurids (78.6%), followed by trammel nets (11.3%), gill nets (6.8%), trot lines (3.0%) and seines (0.3%).

Species/ Group	Size limit	Pounds	Percentage of commercial harvest	Percentage of Ictalurid harvest	State wide average wholesale	Estimated wholesale value
Blue Catfish	> 15 "	92,779	1.13	15.96	$0.71	$65,873.09
Channel Catfish	> 15 "	349,425	4.24	60.11	$0.56	$195,678.00
Flathead Catfish	> 15 "	138,453	1.68	23.82	$0.87	$120,454.11
Bullheads	No size limit	655	0.01	0.11	$0.35	$229.25
Total		**581,312**	**7.1**	**100.00**	**$0.62**	**$382,234.45**

Project Name or Description: Hatchery stockings

Contact Information

Name: *John Zeigler*

Email: john.zeigler@Illinois.Gov

Affiliations *Illinois Department of Natural Resource*

Objective:

1. Assess the number and species of Ictalurids produced and stocked within Illinois waters.

Status: Complete

Abbreviate Abstract

Illinois has a hatchery system consisting of 3 facilities dedicated to enhancing fish populations in Illinois waters. These hatcheries produced and stocked 82,898 Blue Catfish (3.5 - 4.8 inches) and 775,580 Channel Catfish (3.25 - 9 inches). Blue Catfish were stocked in 8 lakes throughout 8 Illinois counties during May and October. The majority (87%) of lakes were stocked once with Blue Catfish in 2020 with one lake being stocked twice. Channel Catfish were stocked in 262 lakes throughout 80 Illinois counties during May through September. Again, most (92%) lakes were stocked once with Channel Catfish in 2020 with 17 lakes were stocked twice and 2 lakes were stocked three times.

Indiana
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Craig Jansen, IN ITC Representative

A catfish survey was conducted on the Wabash River; effort consisted of 160 overnight hoop net lifts (20 per site) and 8 hours of electrofishing (1 hour per site; split between low and high pulse DC) across 8 sites. In total, 557 catfish were collected, including 256 flatheads, 261 channels, and 40 blues. The largest catfish collected was a blue catfish measuring 45 inches and 51 pounds. A total of 6 trophy (>35") flathead and 6 trophy blue catfish, and 3 trophy channel catfish (>28") were collected.

Assisted KDFWR with sampling J.T. Myers Pool of the Ohio River via trotlines (32 overnight trotline sets in total). Trotlines were baited with fresh cut silver carp, and the average catch rate was 6.5 catfish/line. A total of 210 catfish were collected, including 106 blues, 103 channels, and 1 flathead. Nine trophy size (>35") blue catfish were collected in the sample. The largest blue catfish collected was 42" and weighed 34 lbs.

Approximately 75,000 catchable size (8-12") channel catfish were stocked at 147 locations around the state. Many urban parks are stocked multiple times throughout the summer months.

A statewide catfish strategic plan is currently being written. This plan summarizes all previous management history, current status information, and will provide guidance for future catfish management in the state.

Biologists are working with catfish tournament organizers to gather available historic catfish tournament data from around the state. We plan to collaborate with them more in the future and develop a standardized tournament reporting form that organizers can submit to the Division to better track tournament trends and catch rates throughout time.

Iowa
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Tyler Stubbs, Iowa AFS ITC Representative

Population Characteristics of Flathead Catfish in Large Impoundments in Iowa – Ongoing

Savannah Muhlbauer
Chariton Research Station
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641-774-2958

Relatively little published research exists for lentic populations of flathead catfish *Pylodictis olivaris*, particularly in northern states such as Iowa. We collected flathead catfish data from two Iowa reservoirs (Lake Red Rock and Rathbun Lake) to increase our understanding of catfish populations in Iowa and inform future management decisions. Population dynamics such as size and age structure, growth, and mortality were calculated and compared between reservoirs, and the effects of protective length regulations were modeled using simulation. An understanding of the current status of flathead populations will allow biologists to better manage populations via informed decision making and help protect catfish populations as their popularity with anglers increases.

Blue Catfish in Southwest Iowa Impoundments – Ongoing

Andy Jansen
Mt. Ayr Fish Management
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641-464-3108

Three-Mile Lake was renovated in 2016 due to declining water quality and sportfish community due to increasing populations of Common Carp and Yellow Bass. Catfish anglers in Iowa have expressed interest in having a Blue Catfish fishery somewhere in Iowa and we thought this may be a good opportunity to try to create a Blue Catfish fishery. The Mount Ayr Fish Hatchery stocked 35,390 Blue Catfish fingerlings (average length 3.3 inch) and 29,986 advanced Blue Catfish fingerlings (average length 7.1 inch) in Three-Mile Lake from 2016-2019. In 2020, the Mount Ayr Fish Hatchery stocked 18,432 advanced fingerling Blue Catfish (avg. length 5.6 inch) into Three-Mile Lake. Mount Ayr Fisheries staff have tried a variety of fish sampling techniques (eg. gillnets, hoop nets, fyke nets, low-pulse electrofishing, and jug lines) to evaluate the developing Blue Catfish population in Three-Mile Lake. In 2020, Mount Ayr Fisheries staff caught four Blue Catfish ranging from 23-26 inches during a spring gillnetting survey. The largest Blue Catfish sampled was 8.8 lbs. Staff received numerous reports of anglers catching Blue Catfish at Three-Mile Lake in 2020. The two most common length categories caught by anglers are 14-20 inch fish and 24-28 inch fish. In addition to stocking Three-Mile Lake, 7,900 advanced fingerling Blue Catfish (avg. length 5.8 inches) were stocked into Lake Icaria (665 acres) in 2020. Mount Ayr Fisheries staff caught two 12-13 inch Blue Catfish at Lake Icaria during a baited hoop net survey in 2020. These fish may be from the initial stocking in 2019. Staff will continue to try multiple fish sampling techniques to evaluate both populations.

Iowa Hatchery Channel Catfish Production – Ongoing

Jay Rudacille
Rathbun Fish Hatchery
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In 2020, a total of 94,574 8-inch Channel Catfish were produced at Rathbun Fish Hatchery for stocking into public lakes, urban ponds, and reservoirs of Iowa. Channel Catfish were harvested from 9/8/20 to 10/1/20 and stocking consisted of 44 trips, which included 219 lakes, 1 school, and Genoa NFH. An overall survival rate of 88.2% was attained which was slightly less than the five-year average of 89.1%. At harvest, fish averaged 8.2 inches (Figure 1) and 5.2 fish/lb with a mean feed conversion ratio of 1.1. Our goal of 75% of fish being greater than 7.5 inches was not achieved as only 72.9% met this criterion at harvest.

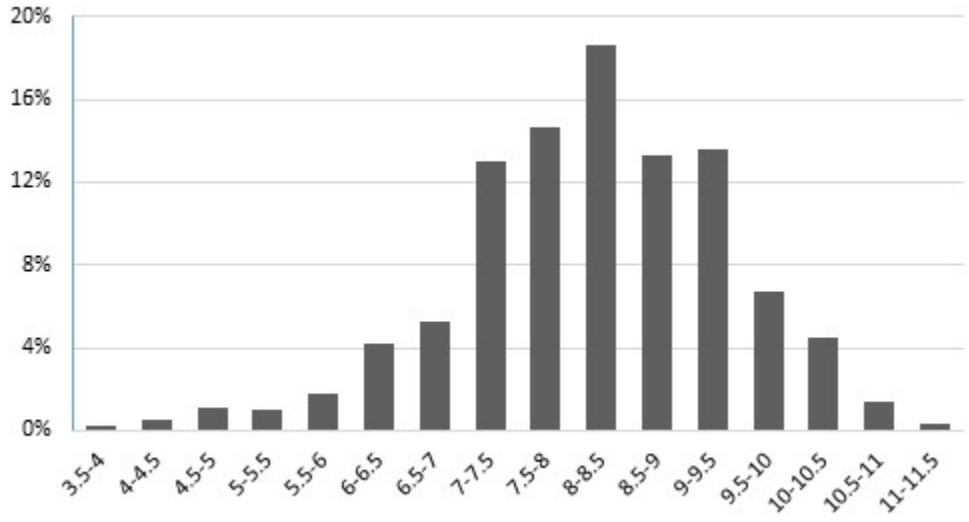

Figure 1. Length frequency of advanced fingerling Channel Catfish harvested from 1.0 production ponds at Rathbun Fish Hatchery in 2020.

Statewide Catfish Management Plan – Ongoing

Tyler Stubbs
Community Fishing Program
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In 2020 the Iowa DNR started coordinating an effort to develop a statewide catfish management plan for Channel Catfish, Flathead Catfish, and Blue Catfish based on management, production, and research history. The plan is separated into various sections of natural lakes, interior rivers and streams, large

rivers, large reservoirs, small impoundments, and urban ponds Staff from around the state are working on developing a plan that can be used in the future to better manage catfish in the state. A first full draft is expected by the end of 2021.

Catfish 2020 Conference

Savannah Muhlbauer and Tyler Stubbs attended and presented at the Catfish 2020 conference in Little Rock, Arkansas. Both were submitted for publication. Presentation titles and contact information are below.

Population Characteristics of Flathead Catfish in Large Impoundments in Iowa
Savannah Muhlbauer
Chariton Research Station
savannah.fernholz@dnr.iowa.gov
641-774-2958

Strategic Planning for Catfish Angling in the Future: An Example from Urban Iowa
Rebecca Krogman
Chariton Research Station
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Rebecca.krogman@dnr.iowa.gov

Tyler Stubbs
Community Fishing Program
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Kansas
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Bryan Sowards, Kansas Chapter ITC Representative

Catfish management and research continues to be important in Kansas. Blue Catfish research currently dominates the narrative. Below you will find summaries of completed studies and ongoing projects related to ictalurid catfishes in Kansas. Submitted by Bryan Sowards, Kansas ITC Representative.

Blue Catfish livewell stress evaluation

Nick Kramer[1], Ely Sprenkle, Brett Miller

Ongoing research

Catfish tournaments are on the rise in Kansas. Rivers and reservoirs in the Sunflower State are attracting more catfish tournaments and these tournaments are attracting more participants. The Kansas Department of Wildlife, Parks, and Tourism currently has thorough rules and requirements for Black Bass tournaments but tournaments for other species, including catfish, are the "wild west" with no regulations. This study will evaluate the effects of various livewell designs on the stress levels of Blue Catfish. Stress will be measured as changes in blood glucose levels detected using readily available blood glucose meters commonly used by diabetics. Work done earlier in 2020 showed that differences in blood glucose can be detected after a stress event. A survey was sent to avid tournament anglers to gather information on average livewell dimension and types of accessories used (e.g., oxygen tanks, additives, aerators) to help guide the livewell trials next summer. This information may be used to guide KDWPT in implementing regulations to ensure Blue Catfish survival during tournaments.

[1]Kansas Department of Wildlife, Parks, and Tourism – nick.kramer@ks.gov

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Figuring out floatlines

Nick Kramer[1]

Ongoing research

Floatlines, or juglines, have been used in recent years as a supplemental gear to sample Blue Catfish in Kansas. The gear is relatively simple but can be fine-tuned to improve catch rates. In 2019, I evaluated if certain cuts of Gizzard Shad or Common Carp could catch more fish. Common Carp side pieces caught significantly more fish than any cut of shad and the retention was much higher. There was no difference in the mean length of fish caught using any of the different baits. In 2019, I compared the size of Common Carp side piece and its ability to catch fish. There was no difference in catch rates between a 2"x2" piece and a 2"x4" piece. There was also no difference in the mean length of fish sampled. In the future I plan to evaluate different hook size to evaluate eye wounds and fresh vs. frozen bait to determine there are any differences in catch rates.

1Kansas Department of Wildlife, Parks, and Tourism – nick.kramer@ks.gov

Status of Blue Catfish in El Dorado Reservoir

Ben Neely[1], Craig Johnson, Jeff Koch
Kansas Department of Wildlife, Parks, and Tourism

El Dorado Reservoir (~8,000 surface acres) supports one of the most popular Blue Catfish fisheries in Kansas. Increased angler effort in the early and mid-2010s raised concern that the population would experience over-fishing and subsequently cease to support a quality fishery. To mitigate these concerns, a protected slot-length limit of 25-35 in with a five-fish daily limit and no more than two over 35 in was instituted January 1, 2016. However, the population continued to be characterized by a large abundance of individuals < 25 in and few > 25 in. This prompted questions about population size, angler exploitation, and fish growth. A mark-recapture project was initiated to collect these data and the population size component was completed in 2020. We estimated 32,820 individuals ≥ 12 in (95% CI: 24,449 to 41,190) and 12,361 individuals ≥ 20 in (8,478 to 18,709) in the population. Angler exploitation has not yet been formally evaluated, but preliminary results suggest greater vulnerability of large fish to angler catch. Within seven months, anglers have reported catching 51 of 1,922 tagged individuals < 25 in (2.7%) with 65% harvest. In the same time frame, anglers have reported catching 6 of 62 tagged individuals (9.7%) within the protected slot with 0% harvest. Individual growth and age structure of this population will be evaluated from samples collected in 2020.

[1]Kansas Department of Wildlife, Parks, and Tourism – ben.neely@ks.gov

Spawning Habits of Blue Catfish in a Kansas Reservoir

Scott Waters[1], Ben Neely, and Jeff Koch
1Kansas Department of Wildlife, Parks, and Tourism

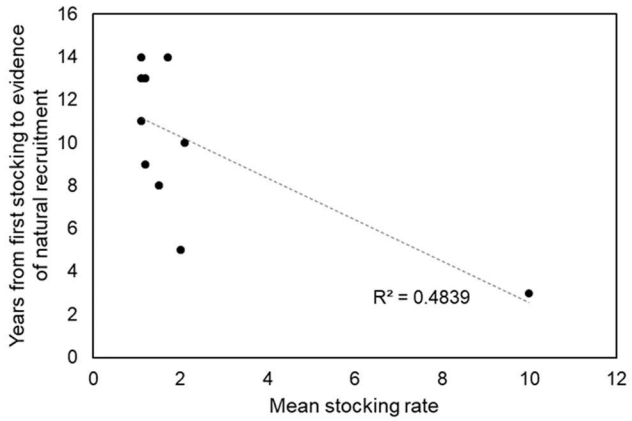
Blue catfish are a relatively new sportfish introduced into many of Kansas' reservoirs and are quickly gaining momentum as one of the most popular sportfish species in Kansas. Little is known about the spawning behavior of blue catfish including precise timing, spawning locations, and behavior of both males and females during this annual activity. Eleven adult blue catfish were implanted with ultrasonic transmitters in June 2020 to study their movements and habitat selection during the spawn in addition to the remainder of the year. Fish were implanted near the conclusion of the 2020 spawn; thus the 2021 spawn will be our first chance to examine their behavior. Fish were located twice each month through September, then relocated periodically through the winter. Fish generally occupied the upper end of the reservoir in 10-20 feet of water during the summer and early fall with many of the fish migrating toward the mid- and lower sections of the reservoir as the water cooled in December. The fish were also attracted to the outlet area during periods of high release. An additional 10 to 15 fish will be implanted with transmitters in early May to increase the sample size and fish will be located a minimum of twice monthly beginning in April but sample frequency may increase during May and June when the fish are thought to be spawning.

[1]Kansas Department of Wildlife, Parks, and Tourism – scott.waters@ks.gov

Natural recruitment of Blue Catfish in Kansas reservoirs

Bryan Sowards[1]

Blue Catfish age to maturity has been estimated throughout their range at 3 to 7 or more years, depending on growth, latitude, and other factors. Blue Catfish in Kansas reservoirs were initially stocked from 1990 to 2016 and, therefore, mature individuals should be common. Natural recruitment has been documented in 12 of 21 impoundments (57%). The number of years from first stocking to detection of natural recruitment range from 3 to 14 years with a mean of 10 ± 2.4 years. Age to maturity has not been estimated for these populations but it is likely that natural recruitment isn't being realized as soon as maturity is being reached. Blue Catfish have typically been stocked at low rates (1-2 per acre per year) although some recent stockings have been denser. It is likely that low stocking rates and low densities have delayed recruitment in most Kansas reservoirs (Figure 1). However, future research should attempt to determine recruitment bottlenecks of Blue Catfish.



[1]Kansas Department of Wildlife, Parks, and Tourism – bryan.sowards@ks.gov

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Motivations, preferences, attitudes, and expenditures of Kansas anglers

Christopher Chizinski, Susan Steffen[1]

Future project objectives:

Identify catfish angler preferences relating to species, type of location, and waterbody.

Evaluate angler attitudes, preferences, and motivations of anglers who use put-and-take and put-grow-take catfish fisheries.

Determine angler attitudes and preferences for catfish management.

Determine economic impact of catfish angling in Kansas.

Provide management implications that KDWPT can use to guide future management.

[1]Kansas Department of Wildlife, Parks, and Tourism – susan.steffen@ks.gov

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Has Neosho Madtom Abundance Responded to Improving Water Quality in the Spring River?

Kali L. Boroughs, James E. Whitney[1], Joshua A. Holloway, Aliyah N. Clemens, Alexandra D. King, and Austin D. Thompson

Pittsburg State University, KS

Water pollution imperils the Neosho Madtom (*Noturus placidus*), which is threatened in Kansas and federally. In Kansas the Neosho Madtom occurs in the Neosho-Cottonwood and Spring Rivers. Neosho Madtom densities were historically lower in the Spring River compared to the Cottonwood and Neosho Rivers, which was attributed to mining pollution arising from inputs of cadmium, lead, and zinc within the Tri-State Mining District. However, long-term reductions in metal concentrations in the Spring River and its tributaries have occurred, but to date no study has examined whether Neosho Madtom densities have responded to this improving water quality. We are addressing this question by comparing Neosho Madtom densities between the Neosho-Cottonwood River system and the Spring River. In 2020 we sampled for Neosho Madtom in riffle and moderate velocity gravel bar habitats via kick-seining at 12 sites in the Neosho-Cottonwood River system and 10 sites on the Spring River. Our survey in the Cottonwood and Neosho Rivers detected 359 Neosho Madtom at 7/12 sites. However, 342/359 (95%) Neosho Madtom were found upstream of John Redmond Reservoir, even though only 4/12 sample sites were upstream from this reservoir. In the Spring River we found 119 Neosho Madtom at 8/10 sites sampled, with individuals occurring both up- and downstream from metal pollution inputs. Furthermore, we found 73 Neosho Madtom at a single site located downstream from metal pollution, and as such it appears that Neosho Madtom densities in the Spring River have responded positively to the improved water quality resulting from the reduction in toxic metal concentrations. This project is funded by a State Wildlife Grant from the U.S. Fish and Wildlife Service that is administered by the Kansas Department of Wildlife, Parks and Tourism.

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Michigan
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Jay Wesley, Michigan AFS ITC Representative

Michigan DNR lake sampling program was compromised by COVID restrictions limiting data collections for Ictalurid species. Also, there was no Channel Catfish stocking in 2020.

Minnesota
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting, February 8, 2021

Submitted by Tony Sindt, Minnesota AFS ITC Representative

Catfish 2020 Attendees

Four Minnesota Department of natural resources (DNR) staff attended the 3rd International Catfish Symposium in Little Rock, Arkansas. Tony Sindt gave a presentation titled "Channel Catfish population dynamics upstream and downstream of Granite Falls Dam in the Minnesota River", Neil Rude was a co-author on two presentations, and Nick Schlesser gave a presentation titled "Public input in a post-public meeting world: a border water case study".

Flathead Catfish telemetry

Minnesota DNR staff continue monitoring movement patterns of Flathead Catfish implanted with acoustic transmitters in the Mississippi River, St. Croix River, and Minnesota River.

Synopsis of Minnesota Catfish Fisheries and Management

The Minnesota DNR Catfish Technical Committee is developing a synopsis of catfish fisheries and catfish management in Minnesota.

MN-WI Border Water Catfish Regulation Change

The possession limit for catfish (Channel Catfish and Flathead Catfish combined) on the border water portion of the Mississippi River was changed from 10 (of any size) to 10 with only 1 over 30". The statewide (non-border water) possession limit remains 5 catfish, no more than 2 can be Flathead Catfish, and only 1 catfish over 24" (with a closed season for Flathead Catfish from December 1 through March 31).

Red River of the North Update

The paired MN DNR Channel Catfish population and creel surveys have been deferred to summer of 2022. Although the surveys are typically completed every 5 years, there were lingering concerns that the COVID-19 crisis would adversely affect the creel survey. The inter-state and -provincial Red River Fisheries Steering Committee agreed that the pandemic likely has affected angler behavior, and any survey might not be representative of "typical" angler behavior. Notable side projects that will be included in the Red River survey in 2022 include a coarse-scale Channel Catfish population genetics project, a centralized spine aging effort, a cooperative Walleye and Sauger genetics project (Manitoba led), and a cooperative Walleye and Sauger aging project (Manitoba led). The cooperative Red River/Lake Winnipeg acoustic telemetry project continues, now entering its fifth year. To date, Channel Catfish, Bigmouth Buffalo, Freshwater Drum, Common Carp, Walleye, and Lake Sturgeon have been tagged and released into the receiver array. The array covers the Red River near Breckenridge, MN, to Lake

Winnipeg, a substantial portion of the south Lake Winnipeg basin, and parts of the Assiniboine and Winnipeg Rivers.

The management focus in Minnesota's Red River Basin remains stream and river habitat. The "Reconnecting the Red" effort continues to have widespread success, with 40 of the 77 dams in the basin now modified for fish passage. An additional 8 MN DNR and partner dam removals are in various stages, ranging from land acquisition to initial design/engineering. The USACE is also modifying the last remaining lowhead dam on the mainstem Red River for fish passage (Drayton Dam) as part of their mitigation permit requirements for the Fargo-Moorhead Diversion project.

Another project funded as part of the Fargo-Moorehead diversion mitigation and with USACE 1135 study implementation dollars aims to reconnect oxbow meanders along a 19 mile channelized reach of the Lower Ottertail River. The Lower Ottertail is a popular paddling and fishing destination, with high abundance of quality Channel Catfish. Habitat improvements are expected to enhance this already thriving fishery.

For more information about the Red River of the North, contact nicholas.kludt@state.mn.us.

Missouri
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Virtual Meeting February 8th, 2021

Submitted by Chris Brooke, Missouri Chapter ITC Representative

Project Name or Description: Assessment of Vital Rates (Exploitation, Size Structure, Age and Growth, and Total Annual Mortality) to Evaluate the Current Harvest Regulations for Blue Catfish and Flathead Catfish in the Missouri and Mississippi Rivers.

Contact Information:

Name: Kyle Winders
Email: kyle.winders@mdc.mo.gov
Phone: 660-646-3140 x1377

Name: Joe McMullen
Email: joe.mcmullen@mdc.mo.gov
Phone: 314-577-9555 x76048

Objectives:

1.) Determine current commercial and recreational exploitation rates for Blue Catfish and Flathead Catfish in the Missouri and Mississippi rivers.
2.) Determine population demographics (size structure, age and growth, and total annual mortality) of Blue Catfish and Flathead Catfish in the Missouri and Mississippi rivers.
3.) Determine if growth or recruitment overfishing of Blue Catfish and Flathead Catfish is occurring on the Missouri and Mississippi rivers, and if modifying harvest regulations is warranted.
4.) Harvest regulation recommendations will focus on ensuring quality growth and recruitment among large river catfish fisheries and increasing the yield of catfish available to fishers.

Status: Completed

Abbreviated Abstract: Blue Catfish and Flathead Catfish are native to the Missouri and Mississippi rivers, and support extremely important fisheries on these big rivers. However, these populations have not been intensively managed in the past, and information needed to

inform management and regulatory decisions is limiting. We sampled Blue Catfish and Flathead Catfish primarily using low frequency pulsed-DC electrofishing. Blue Catfish and Flathead Catfish grew slowly, reaching a preferred size (762 mm total length, TL) in about 10-11 years. Annual mortality was estimated for each population using a weighted catch curve and tag recovery model and ranged from 31.0% to 38.2%. Using reward tags, we estimated exploitation to be between 10% and 12%, and modeled the effects of multiple minimum length limits on yield and size structure of the Blue Catfish and Flathead Catfish populations relative to a baseline of 381 mm TL, the smallest fish usually harvested by anglers. All minimum length limits increased the proportion of larger fish (>762 mm TL) in the population while also increasing yield or not reducing yield by more than 2%, except for a 9% decrease in yield of Flathead Catfish on the Mississippi River with the 610-mm limit. We continue to develop and work through our communication and outreach strategy with a coordinated survey to identify the attitudes and preferences associated with catfish management, angling, and harvest on big rivers. Once popular attitudes toward exploitation of these fisheries are fully understood, a regulation change could be considered to address the desires of fishers who prefer catching larger fish (i.e., size favored over yield).

Project Name or Description: Hatchery Program

Literature Available: *2020 Warmwater Hatcheries Annual Report*

Contact Information:

Name: James Civiello
Email: james.civiello@mdc.mo.gov
Phone: 417-348-1305 x4508

Objectives: Document the number and species of fish produced at and stocked from each hatchery, with a cost analysis.

Status: Ongoing

Abbreviated Abstract: Missouri Department of Conservation warm-water hatcheries (Chesapeake and Hunnewell hatcheries) produced approximately 221,231 channel catfish (8-12”). Channel Catfish are age-0 and cost about $0.80 each at the time of stocking; we accomplish the 8-12” size in one growing season from February to October with the use of a heat pump providing temperature control to concrete raceway spawning pens. During October 2020, a fleet of 17 stocking trucks were used to stock 375 public lakes, over a 4-day period.

Hatchery production of blue catfish at Hunnewell hatchery produced 29,738 fry for Iowa, 50,000 fry for Nebraska, 80,840 fry for Colorado, 6,000 <8” for Kansas and 2,500 8-10” for eight Missouri lakes. Due to COVID neighboring state line transfers were required under our travel restrictions.

Project Name or Description: Commercial Fishing Program

Literature Available: *Missouri Commercial Fish Harvest 2019*

Contact Information:

Name: Joe McMullen
Email: joe.mcmullen@mdc.mo.gov
Phone: 314-577-9555 x76048

Objectives: Document and summarize Missouri's commercial fish harvest for 2019 and annual harvest trends since 1945.

Status: Complete

Abbreviated Abstract: Blue catfish accounted for the largest proportion (70%) of the total catfish harvest and increased from 75,083 lbs. in 2018 to 104,951 lbs. in 2019. Flathead catfish accounted for 25% of the total catfish harvest, increasing from 19,638 lbs. in 2018 (the lowest recorded harvest since 1966) to 37,102 lbs. in 2019. Channel catfish accounted for 5% of the total catfish harvest, increasing from 4,791 lbs. in 2018 (the lowest harvest ever recorded) to 7,456 lbs. in 2019.

Pounds of commercially harvested catfish, by river and for all rivers combined, and estimated, live-weight, wholesale value, during 2019.

Species/ Species Group	Mississippi River	Missouri River	St. Francis River	Total	Live-Weight, Wholesale Value
Blue Catfish	104,940	Prohibited	11	**104,951**	**$56,673.54**
Flathead Catfish	36,458	Prohibited	644	**37,102**	**$20,035.08**
Channel Catfish	7,125	Prohibited	331	**7,456**	**$4,175.36**
Bullheads	51	0	0	**51**	**$14.28**
Total	**148,574**	**0**	**986**	**149,560**	**$80,898.26**

Project Name: Determining Electrofishing Response Thresholds of Blue Catfish and Flathead Catfish: A Critical Step to Develop a Standardized Sampling Protocol

Information Links: 1) https://mdc.mo.gov/conmag/2017-08/nature-lab
2) Morris 2018:https://mospace.umsystem.edu/xmlui/handle/10355/67621
3) Thomas 2020 (double-click file icon): 
Thomas_Thesis_final_May2020.pdf

Contact Information:

Name: Zach Ford (Missouri Department of Conservation)
Co-Authors: Dr. Craig Paukert, Zach Morris and Mike Thomas (University of Missouri-Columbia) and Andy Turner (Missouri Department of Conservation)
Email: zach.ford@mdc.mo.gov -or- paukertc@missouri.edu
Phone: 660-885-8179 x4936

Objectives:

1.) Determine the effective conductivity of live Blue Catfish and Flathead Catfish based on the behavioral response to electrofishing (i.e., response threshold method).
2.) Develop species-specific standardized electrofishing output goals to achieve constant power transfer to fish across a range of water conductivities and water temperatures.
3.) Evaluate these output goals in the field and develop power output tables for each species that can be referenced by field staff to standardize electrofishing output across water temperatures and water conductivity levels.

Status: This project was completed with two M.S. theses (links above) and manuscripts to come.

Abbreviated Abstract: We found that effective fish conductivity of Blue Catfish and Flathead Catfish were 69 µS/cm, and 94 µS/cm, respectively, which were previously unavailable in the literature yet needed to establish species-specific electrofishing power output goals. A detailed summary of final recommendations can be found in Thomas (2020), but below is a summary of suggested modifications to current sampling protocols for these species.

Based on the results Morris (2018) and Thomas (2020), we recommend that catfish managers consider the following:

1. Sample in water temperatures between 18 and 27 ˚C. Our results suggest that increased water temperatures reduced capture efficiency of large Flathead Catfish (i.e., > 750 mm, TL) and that capture efficiency of small Blue Catfish (i.e., 350 – 760 mm, TL) increased as water temperatures approached 18 ˚C.
2. Follow the combined Blue Catfish and Flathead Catfish output peak power goal (see Morris 2018) if targeting a single species or both species in rivers or reservoirs. Our results indicate that capture efficiencies may be reduced if sampling with a peak power output less than the target level recommended by Morris (2018).
3. Use the 15 Hertz (or pulses), 30% duty cycle pulsed DC output waveform if sampling Blue Catfish or both catfish species together. For Flathead Catfish, we recommend using either the 15 Hertz (or pulses), 30% duty cycle pulsed DC waveform or the 8 Hertz, 10% duty cycle waveform.
4. Use electrofishing control boxes that allow the operator to independently select pulse frequency and duty cycle to match these output goal recommendations.
5. Consider potential size selectivity when using data obtained from low-frequency electrofishing (LFE) to estimate abundance and size- or age-structure. Our results suggest that LFE is selective for smaller Blue Catfish and larger Flathead Catfish.
6. Conduct LFE for a minimum of two minutes in a given area before moving on to sample other areas or habitats. Based on unmanned aerial system (i.e., drone) footage obtained throughout our study, catfish (both species) typically surfaced between 61 and 135 seconds after electrofishing output (power on) was initiated.

Project Name: Flathead Catfish population assessments in several of Missouri's large reservoirs and small impoundments

Contact Information:

Name: Zach Ford (Missouri Department of Conservation)
Co-PI: Dr. Leah Berkman (Missouri Department of Conservation)
Email: zach.ford@mdc.mo.gov
Phone: 660-885-8179 x4936

Objectives:

1.) Sample Flathead Catfish populations in a suite of large reservoirs (ranging from 2,400 to 55,600 acres) and small impoundments (<200 acres) to determine population demographics including length distribution, length-based metrics (e.g., mean total length, proportional size distributions [PSDs]), age structure, total annual mortality, and relative abundance.
2.) Examine the population genetic structure including genetic effective population size (N_e), level of inbreeding, population mixing/isolation, and predict the effects of low, medium, and high exploitation on N_e and reproductive variance of Flathead Catfish in each waterbody.
3.) Conduct modeling simulations of each Flathead Catfish population to assess the efficacy of existing regulations and explore the potential of alternative harvest regulations to improve or sustain each fishery.
4.) Develop long-term standard sampling protocols for managers to examine population trends.

Status: Initial pilot sampling was conducted in 2020 with spring/summer/fall sampling to continue through 2023. Preliminary results will be shared once more sampling is conducted in 2021.

Project Name or Description: Population Assessment and Angler Exploitation of Blue Catfish in Mark Twain Lake

Contact Information:

Name: Ross Dames
Email: Ross.Dames@mdc.mo.gov
Phone: 573-248-2530

Objectives:

1) To determine population demographics (i.e., size structure, age and growth, mortality) of blue catfish in Mark Twain Lake.
2) To determine angler exploitation of blue catfish in Mark Twain Lake.
3) To determine if new harvest regulations would improve the size structure of blue catfish in Mark Twain Lake.

Abbreviated Abstract

The Missouri Department of Conservation (MDC) recently completed a seven-year assessment of blue catfish and flathead catfish in Mark Twain Lake.

Simulation modelling yielded the following results for blue catfish:

EXPECTED RESPONSE TO A MINIMUM LENGTH LIMIT (MLL)

Variable	20-inch MLL	24-inch MLL	26-inch MLL	30-inch MLL
Yield (kg)	4% to 13%	0% to 13%	-6% to 18%	-25% to 7%
Harvested (N)	-24% to -21%	-48% to -38%	-57% to -54%	-74 to -63%
Number at least 35 inches long	18% to 29%	40% to 66%	55% to 93%	208% to 294%

Yield = total weight of blue catfish harvested, **Harvested (N)** = number of blue catfish harvested, **Number at least 35 inches long** = number of blue catfish in the population at least 35 inches long. A **negative** percent means a decrease.

- MDC planned two open houses at Mark Twain Lake, but because of Covid-19 these were canceled, and comments and surveys were collected online and by mail.

- Ross Dames and Paul Michaletz shared study results and recommendations in a recorded power point presentation on the MDC website and during a live webcast.

- Online comments were accepted from July 1-August 1, 2020

- A questionnaire was mailed to all anglers who returned a tag from a blue catfish caught in Mark Twain Lake.

Online Survey and Comments

- From July 1-August 1, 2020, online comments were provided by 109 people (see appendix).

- Nearly all respondents considered themselves an angler.

- Respondents were predominately male.

- Respondents from 35-54 years old were most common.

- Respondents heard about the proposed regulations changes from social media, followed by the MDC website.

- Over 60 percent felt having an increased opportunity to catch a large catfish was most important when fishing for catfish at Mark Twain Lake, and 40 percent felt keeping blue catfish and flathead catfish to eat was more important.

- When asked which of the following potential harvest regulation changes best met their catfish fishing preferences at Mark Twain Lake:
    - 21 percent preferred a 24-inch minimum length limit
    - 21 percent preferred a 26-inch minimum length limit
    - 16 percent preferred a 20-inch minimum length limit
    - 15 percent referred a 30-inch minimum length limit
    - 15 percent preferred no change
    - Overall, 73 percent chose one of the minimum length limits

- The most common themes when asked to share additional thoughts pertaining to catfish on Mark Twain Lake include (see appendix for full comments and responses):
    - Support size limits for both blue catfish and flathead catfish
    - Manage for world-class blue catfish
    - Slot limits like Lake of the Ozarks and Truman Lake
    - Limit trot lines, jug lines and the number of hooks per person
    - Enforce regulations

Mark Twain Lake Angler Mail Survey

- 108 of 227 mailed surveys were returned.
- 86 percent of respondents considered themselves a catfish angler.
- Most anglers made one to ten fishing trips to Mark Twain Lake in the past 12 months.
- 68 percent rated blue catfish fishing as good or excellent.
- 67 percent rated flathead catfish fishing as fair or poor.
- 52 percent felt keeping catfish fish to eat was more important than the opportunity to catch a large catfish, and 33 percent felt the opportunity to catch a large catfish was more important.

- When asked which of the following potential harvest regulation changes best met their catfish fishing preferences at Mark Twain Lake:

    - 23 percent preferred a 24-inch minimum length limit
    - 18 percent preferred a 20-inch minimum length limit
    - 13 percent preferred a 26-inch minimum length limit
    - 12 percent preferred a 30-inch minimum length limit
    - 32 percent preferred no change
    - Overall, 66 percent chose one of the minimum length limits

Recommendation

The online survey, which was open to anyone, and the mail survey, which only included anglers that returned a tag, yielded different results when asked about the importance of keeping fish to eat or the opportunity to catch a large fish. Most anglers in the online survey indicated that the opportunity to catch a large fish was more important, while most anglers in the mail survey said keeping catfish to eat was more important. Regardless, over two-thirds of anglers in both surveys supported one of our suggested minimum length limits. Our simulation results indicated that a 24- or 26-inch minimum length limit would provide substantial increases in the number of catfish at least 35 inches long, while minimizing the risk of reducing yield. I

recommend implementation of a **26-inch minimum length limit** because it provides the best combination of increasing the number of large catfish while limiting a reduction in yield. This rule provides a good compromise for anglers who prefer catching a large catfish and those who prefer keeping catfish to eat. In addition, I do not recommend changes to daily limits or allowable fishing methods as these are generally not effective or supported by most anglers.

Even though we were not able to capture enough flathead catfish to complete an assessment, I recommend we implement the same minimum length limit, 26 inches, for both blue catfish and flathead catfish. It is clear from the mail survey that anglers were dissatisfied with flathead catfish fishing in Mark Twain Lake. A minimum length limit could help increase flathead catfish density in the lake, assuming harvest is currently limiting abundance and recruitment.

Project Name or Description: Responses of Fish Communities to Predator Introductions in Small Missouri Impoundments

Project Lead:

Name: Paul Michaletz

Status: Completed.

Abbreviated Abstract: Paul retired in 2020 and is no longer with the department. However, he did publish a journal article related to a study he recently completed that included Flathead Catfish work.

Michaletz, P. H. (2020). Bolstering piscivore abundance to restructure small impoundment fish communities. North American Journal of Fisheries Management, 40(5), 1276-1293.

Project Name or Description: Diet Composition of Blue and Channel Catfish during Different Seasons in the Lower Missouri River

Contact Information:

Name: Erik Griffen (University of Missouri)
Email: erikgriffen@mail.missouri.edu

Name: Thomas Boersig
Email: Thomas.Boersig@mdc.mo.gov (Missouri Department of Conservation)

Status: Completed.

Abbreviated Abstract Blue and Channel Catfish are important sportfish that inhabit large, turbid rivers like the Missouri River. Both species coexist as adults in similar habitats by consuming different prey species, but little is known about the diet of juvenile catfish. Our goal was to quantify and compare diet composition of juvenile Blue and Channel Catfish throughout the summer to assess diet partitioning in early life stages. We opportunistically sampled catfish captured during Pallid Sturgeon sampling June-August on the lower Missouri River from River Mile 130-212 via bow and hand trawl. Blue and Channel Catfish were classified into small (0-100mm) and large (101-200mm) size classes. To investigate seasonal diet, catfish were classified as early, mid, and late seasons of the summer. Stomachs were dissected and contents were identified as fish, crustaceans, plants, terrestrial insects, unidentified, and order for aquatic insects. We found significant differences in diet composition across both size classes for both species. We used regression analyses to understand the relationship of discharge and stomach fullness. Stomach fullness and discharge were statistically significant for small Channel Catfish. Large Blue Catfish consumed mostly Plants (34%), Diptera (24%), and Trichopterans (18%), and Large Channels consumed Plants (46-49%), Diptera (8-20%), Trichoptera (13-15%), and Ephemeroptera (18%). Small Blue Catfish consumed mostly Trichoptera (37-35%), Diptera (26-35%), and Ephemeroptera (16-20%). Small Channels consumed mainly Diptera (17-30%), Trichoptera (17-26), and Plant (22-28%) for early and mid-seasons. For the late season, Diptera (80%), Trichoptera (11%), and Ephemeroptera (6%) were consumed. Channel Catfish are highly omnivorous compared to Blue and consume more plant material. Blue Catfish consume more insects at small sizes than Channel Catfish. In the future, larger sample sizes of catfish across broad discharges will create higher accuracy for stomach fullness and discharge relationships. Based on the results, diet partitioning likely assists coexistence of juvenile Channel and Blue Catfish in the Missouri River.

Nebraska
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Submitted by Tony Barada, Nebraska ITC Representative

Below you will find catfish-related updates from work being conducted in Nebraska or by Nebraska researchers.

Pawnee Reservoir Blue Catfish Investigations

Jordan D Katt, Nebraska Game and Parks Commission

Sampling of Blue Catfish that were stocked into Pawnee Reservoir the fall of 2015 (6,515 fish; mean length 9.8") continued in 2020. Annual electrofishing has been conducted to assess this population and to learn about their habitat preferences as they grow. Relative abundance of Blue Catfish had steadily increased from 2016-2019 but dropped off sharply during 2020. This was likely due to the fish moving to different habitats within the reservoir rather than mortality in the population, as additional sampling at new habitats found increased catch rates. Growth of the Blue Catfish in Pawnee Reservoir appears to be fast, and compared with more southern populations where growth should generally be faster. Relative weights for fish sub-stock and on the low-end of stock-quality length group were good, but declined as fish grew through the length group. Once fish approached quality-preferred length group, the relative weights rebounded and were good again. A report summarizing the sampling data has been prepared and can be obtained upon request.

Population Characteristics and Movement of Blue Catfish in the Kansas River

Quintin J. Dean, M.S., University of Nebraska-Lincoln, 2020
Advisors: Martin J. Hamel & Mark A. Pegg

*Kansas may have included this in their report as well, but thought we would include since the work was conducted the University of Nebraska.

Blue Catfish *Ictalurus furcatus* is a mobile, large-river species native to the Missouri River and its tributaries, including the Kansas River. Historical data regarding the Kansas River population is negligible, limiting managers' ability to appropriately manage this population. Multiple anthropogenic barriers along the Kansas River create a gradient of connectivity within the Kansas River, and with the Missouri River, possibly limiting Blue Catfish movement. Additionally, the contribution of tributary-reservoir populations to the Kansas River remains unknown. My objectives were to: 1) describe population characteristics and 2) quantify stock contributions from the Missouri River and Kansas River tributary reservoirs to the lower Kansas River population. Relative abundance and condition were variable among years but similar across the gradient of connectivity. Somatic growth in the disconnected reach were greater than connected reaches; however, mean length of adult age groups were consistent across the study area. River segments connected with the Missouri River had lower annual mortality and higher proportions of large fish compared to the disconnected reach. Upstream passage was not documented at the second barrier on the Kansas River, suggesting the population upstream of the barrier is isolated from the Missouri River. Adult fish collected within river reaches connected to the Missouri River displayed relatively equal natal contributions from the Kansas River and Missouri River. Half of adult and juvenile fish sampled in reaches disconnected from the Missouri River originated from Kansas River

tributary reservoirs. Our data suggests adopting two spatial scales for investigating and managing Blue Catfish in the Kansas River, with the second barrier as a point of division. Current statewide regulations are adequate for maintaining high trophy-potential in downstream river reaches. The large number of fish using the Missouri River indicates appropriate management requires a broad spatial scale that incorporates a dendritic river network framework. Future monitoring efforts, particularly for the disconnected reaches, is imperative as large reservoir stock contributions may elicit change in population characteristics.

Cedar River Channel Catfish, 2020

Rivers and Streams Program (Thad Huenemann, Zach Horstman, Joe Spooner), Nebraska Game and Parks Commission

Fish migrations occur during the life of a species that is triggered by spawning, spatial needs, water temperature, or other factors. The Channel Catfish (*Ictalurus punctatus*), a migratory species, is one of Nebraska's most important stream sportfish. Studies conducted in the early 2000's found that Channel Catfish populations between Spalding, NE and Ericson, NE were near zero and impacted by Spalding dam. In 2015, a Denil fishway was completed on the Cedar River to allow fish passage through the Spalding dam. Monitoring conducted by the Nebraska Game and Parks Commission revealed that many native fish, including the Channel Catfish, were navigating the fishway with high success. In March of 2019, historic flooding caused the earthen portion of the Spalding dam to breach, and provided an opportunity to study the Cedar River with natural connectivity. Surveys were conducted at upstream and downstream segments of the Cedar River using baited hoop nets and barge electrofishing in June of 2020. To summarize, Channel Catfish catch rates upstream (2.55/net night) and downstream (2.15/net night) Spalding dam were similar to previous time-periods when the system was open. Our results suggest that Channel Catfish were utilizing the natural open system in 2020, dispersing upstream and likely congregating at Ericson dam (approx. 27 miles upstream). Results indicated Channel Catfish abundances above Spalding dam were similar to 2003 when the Cedar River bypassed the Spalding dam during repairs. We would have expected similar population abundances when the fishway was operational (2015 to 2019), however, speculation is difficult because of differences in study design. We plan to continue monitoring fish passage through the fishway and assess both populations upstream and downstream of Spalding dam, once it becomes operational again.

CATFISH 2020 Involvement

Nebraska was well represented at the symposium with 11 Nebraska-related presentations given and involvement on the planning committee (Mark Porath – Proceedings, Tony Barada – Finance). A huge thank you is owed to Mark as much progress has been made and he continues to devote effort to manuscript reviews for this important process.

Ohio
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Submitted by Ethan Simmons, Ohio ITC Representative

Project Name - Assessing the importance of single- versus chase-boat configurations when developing a low-frequency electrofishing standard population assessment for Blue Catfish and Flathead Catfish Ohio Department of Natural Resources Division of Wildlife

Authors - Jeremy J. Pritt, Joseph D. Conroy, and Stephen M. Tyszko
Agency - Ohio Department of Natural Resources Division of Wildlife
Contact email – Jeremy.pritt@dnr.ohio.gov

Fisheries managers commonly use low-frequency electrofishing to assess Blue Catfish *Ictalurus furcatus* and Flathead Catfish *Pylodictis olivaris* populations; however, inconsistent methodology prohibits standardized assessments. Here, we compared single- and chase-boat low-frequency electrofishing configurations to inform standard sampling of catfishes. Our objectives were to (1) compare Blue Catfish and Flathead Catfish CPUE and size distributions and (2) evaluate the number of sites needed to achieve pre-defined precision and catch objectives between single- and chase-boat configurations in three Ohio River navigational pools. We found that CPUE was greater with the chase boat for both Blue Catfish (chase-boat mean CPUE: 10 catfish/h, single-boat: 4 catfish/h) and Flathead Catfish (chase-boat: 49 catfish/h, single-boat: 34 catfish/h). Size distributions of individuals captured did not differ for either species between electrofishing configurations. We found that a similar number of sites were needed to achieve the precision objective (relative standard error of CPUE < 25%) for both configurations (35 sites/pool for Blue Catfish, 8 sites/pool for Flathead Catfish); however, to achieve the catch objective (capture 100 stock-length catfish/pool), more single-boat sites/pool were needed (>100 sites for Blue Catfish, 24 sites for Flathead Catfish) compared to chase-boat sites/pool (66 sites for Blue Catfish, 18 sites for Flathead Catfish). Given that the additional boat and crew needed for the chase-boat configuration may limit the number of sites that can be routinely sampled, tradeoffs between electrofishing configuration performance and the effort needed to achieve assessment objectives must be considered when developing low-frequency electrofishing assessments for catfishes.

Project Name - FIDR23/Assessment of reservoir Channel Catfish populations
Authors – Steve Tyszko, Jeremy Pritt and Joseph Conroy
Agency – Ohio Department of Natural Resources Division of Wildlife
Contact email – stephen.tyszko@dnr.ohio.gov

Objectives:
1. Evaluate the performance of tandem hoop nets as a gear to sample Channel Catfish populations in Ohio reservoirs and develop a method to effectively age Channel Catfish and explore variation among Ohio reservoir populations.

Summary of Significant Results:

- Slow growth if CPUE > 50 fish/net set
- Reservoirs < 102 ha favor slow growth
- Fastest growth in largest reservoirs at low densities
- Unable to explain variation in Channel Catfish density among reservoirs
    - Highest densities and slow growth occur in large, unstocked reservoirs.
- Fast growth favors high PSD
- Tandem, baited hoop net method CPUE indexes Channel Catfish density in reservoirs
    - Catchability can vary among reservoirs
    - Can only detect very large (> 2:1) differences in Channel Catfish density
- Channel Catfish < 300 mm had lowest catchability
- Peak catchability of Channel Catfish in tandem, baited hoop net surveys is at 450 mm total length, often at age seven and older.
- Low total annual mortality (< 25%) in all study reservoirs suggests low exploitation statewide.

Manuscripts:

Indexing Reservoir Channel Catfish Population Density and Size Structure with Tandem, Baited Hoop Net Surveys
Stephen M. Tyszko, Jeremy J. Pritt, and Joseph D. Conroy
Inland Fisheries Research Unit, Division of Wildlife, Ohio Department of Natural Resources, 10517 Canal Road SE, Hebron, Ohio 43025, USA

Abstract

Fisheries managers efficiently sample reservoir Channel Catfish populations with tandem, baited hoop nets. However, catchability of Channel Catfish with this gear and the size selectivity of this gear is not fully known. Further, scientists have not identified a standard sampling period that maximizes catches while minimizing variation in catchability. Here, we estimated Channel Catfish population density (number/ha) and catchability with tandem, baited hoop nets using mark-recapture methods in three Ohio reservoirs during May–July, 2016–2018. We tested for differences in catchability (1) among reservoirs; (2) among 50-mm length categories; and, (3) by week during spring and summer. We then tested CPUE as an index of density by simulating sampling of populations with different densities based on observed variation in catchability and estimating statistical power to detect these differences. We found that total catchability differed among study reservoirs, among length categories, and among sampling events but did not consistently change during the May–July sampling period. Catchability of 50-mm length categories did not differ among reservoirs. Channel Catfish 400–649 mm had the greatest

catchability. Our power analysis showed that we could detect a large (> 2:1 effect sizes) difference in density with 80% power using 20 or more sample sites. Furthermore, our length-category-specific catchability estimates provide information to correct Channel Catfish samples collected with tandem, baited hoop nets to reduce bias in size structure, growth, and mortality estimates. We encourage further development of this gear to better understand differences in reservoir Channel Catfish densities and size structures.

Explaining Channel Catfish Population Characteristics in Ohio Reservoirs

Stephen M. Tyszko, Jeremy J. Pritt, and Joseph D. Conroy
Inland Fisheries Research Unit, Division of Wildlife, Ohio Department of Natural Resources, 10517 Canal Road SE, Hebron, Ohio 43025, USA

Abstract

North American fisheries management agencies commit considerable resources to managing reservoir Channel Catfish *Ictalurus punctatus* fisheries, which often includes stocking. However, Channel Catfish population characteristics often vary greatly among reservoirs, resulting in variable and unpredictable fishery quality. We sampled Channel Catfish populations in 44 Ohio reservoirs with tandem, baited hoop nets to understand relationships among population characteristics (density, as CPUE from hoop nets; growth, as mean length at age 7; mortality, as total annual mortality from catch curve analysis; and, size structure, as PSD), stocking, and the relationships among these characteristics with reservoir size (as surface area) and productivity (as chlorophyll-*a* concentration). We used multiple linear regression and an information theoretic approach to select the most parsimonious models for explaining observed variation in Channel Catfish density, growth, mortality, and size structure. We found that population density varied greatly among our study reservoirs and none of our models sufficiently explained variation in density. Reservoir size and the interaction between reservoir size and population density explained variation in Channel Catfish growth: small reservoirs (≤ 101 ha) had low to moderate densities and growth was uniformly slow, but in larger reservoirs low densities resulted in faster growth. Total annual mortality was uniformly low (< 0.26) but increased with density. Faster growth led to populations with larger size structures. These outcomes show that the largest reservoirs (≥ 406 ha) are the most suitable for supporting populations with fast growth and large size structures. Dense populations (CPUE > 50 Channel Catfish/net set) resulted in slower growth, greater mortality, and poor size structure. Given our findings that density strongly shapes fishery quality (i.e., sizes available to anglers), we recommend further research to better understand the factors that control reservoir Channel Catfish population density.

Project Name – Otolith Aging Precision from Channel Catfish
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Buckmeier et al. (2002) described a technique for aging Channel Catfish lapilliar otoliths (Long and Stewart 2010), and validated ages estimate with this technique up to age four. Although we were not able to validate age estimates of wild Channel Catfish, precision can be an important indicator of overall quality and reliability of age estimates (Campana 2001). Therefore, we removed lapilliar otoliths from 5 Channel Catfish in each 10-mm length group from tandem, baited hoop net surveys conducted in 2018 and prepared them as described in Buckmeier et al. (2002). The age of each aged fish was estimated independently by three separate readers, and the precision of these independent ages was estimated using average coefficient of variation (ACV) as in Tyszko and Pritt (2017). Because prepared otoliths were found to degrade quickly, all ages were estimated from digital images of the prepared otolith.

Grand mean ACV among study reservoirs where precision has been assessed to this point was 9.29 (Table 1), which is greater than the benchmark (ACV = 5) proposed by Campana (2001). Further, personnel aging otoliths were learning a new technique and using new imaging software; it is likely that precision will increase as personnel develop their skills and gain experience.

Management Implications

- Managing for high proportions of large fish is most likely to succeed at the largest reservoirs at densities < 50 fish/net set
- Small (< 102 ha) reservoirs should not be expected to yield populations with a large proportion of large fish.
- Because Channel Catfish density is highly variable among reservoirs stocked at the same density (62 yearlings/ha) and mortality is universally low, stocking can be experimentally reduced or discontinued at many reservoirs.
- Changes in density and growth resulting from management actions (changes in stocking regime) may be delayed due to longevity and low mortality of Channel Catfish.
- Detecting responses to management actions may be delayed by late age of peak selectivity in sampling gear.
- Evaluating effectiveness of management actions will likely require a BACI design with a relatively high number of replicate reservoirs to substitute space for time to increase statistical power.
- Lapillar otoliths provide useful ages, but some staff may need additional experience and training

Management Recommendations

- Stock fingerlings instead of yearlings
    - Reduces production cost
    - Survival of fingerlings will be lower than yearlings, which may lead to reduced density in high-density, stocked populations
- Discontinue stocking for five years at stocked reservoirs where CPUE ≥ 50 fish/net set
    - Continue monitoring
    - Reassess density, growth, and PSD after five years
    - Determine if stocking should resume based on these metrics
    - Changes in density, growth, and PSD may require more than five years without stocking
- Stock other reservoirs with fingerlings at several experimental densities using a BACI design.

    - 30, 60, 90, and 120 fingerling/ha
    - 5-10 reservoirs per stocking density treatment
    - Assess differences in density, growth, and PSD among stocking density treatments after five and 10 years
    - These results will inform management strategies to achieve Channel Catfish populations with desired characteristics
- Remove 6-fish daily limit for Channel Catfish.
- Continue using lapillar otoliths to estimate ages for five Channel Catfish per 10 mm collected in IMS surveys
    - Continue to asses precision of age estimate among staff
    - Continue training where necessary
    - Target ACV for otolith age estimates: ≤ 5
- Explore options for reducing density at large, unstocked reservoirs with density > 50 fish/net set

Project Name - Channel Catfish Sampling Assessment & Stocking Evaluation in Ohio Reservoirs
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Manuscripts:

Alternative prey reduces post-stocking mortality of fingerling (age-0) Channel Catfish *Ictalurus punctatus*: Implications for reservoir stocking programs
Cory Becher, Stephen M. Tyszko, Richard D. Zweifel, Joseph D. Conroy, Jeremy J. Pritt, and Stuart A. Ludsin

Abstract

Channel Catfish *Ictalurus punctatus* is a commonly stocked sportfish in reservoirs throughout the United States, where most management agencies stock individuals at a large size and old age (i.e., as yearlings) to reduce potential predation mortality despite the higher production cost. However, the extent of predation on stocked age-0 Channel Catfish in reservoirs remains unknown. Thus, better understanding the extent to which predation influences the survival of stocked age-0 fingerlings could help managers determine whether stocking younger individuals can achieve management goals at a reduced production cost. Toward this end, we conducted an experiment in which fingerling Channel Catfish were stocked into 0.4 ha hatchery ponds with predators (adult Largemouth Bass *Micropterus salmoides*) with and without alternative prey fishes (n = 6/treatment). We found that, in the absence of alternative prey, Channel Catfish survival during the first 7 d post-stocking was significantly ($P <$ 0.01) lower (88% survival) than in the ponds with alternative prey (98%) or in the control treatment with no Largemouth Bass (97%). While alternative prey likely buffer Channel Catfish fingerlings from predation by Largemouth Bass, our findings also suggest a potential for alternative prey to reduce predation by decreasing water clarity. Regardless of the mechanism, our experiment demonstrates that predation by Largemouth Bass on fingerling Channel Catfish immediately post-stocking may not be as high as previously thought, especially when

alternative prey is abundant. While research is still needed to determine the long-term survival of stocked fingerlings, our findings indicate that in reservoirs with abundant prey, stocking fingerlings can offer a less costly alternative to achieving management goals than stocking larger, older individuals.

Quantifying contributions of stocked Channel Catfish in reservoir populations using otolith microchemistry

Cory Becher, Stephen M. Tyszko, John W. Olesik, Stuart A. Ludsin

Abstract

Stocking is a common tool used to establish or enhance fisheries in reservoir ecosystems, yet post-stocking assessments of the contribution that stocked individuals make to the fishable population are oftentimes not conducted. Inability to discern stocked individuals from wild-produced ones is a primary reason that such assessments are not done. To help assess the efficacy of the Channel Catfish (*Ictalurus punctatus*) stocking program in Ohio reservoirs, we have been evaluating the use of otolith microchemistry as a natural tag to discriminate between stocked and wild-produced individuals. We used laser-ablation inductively coupled plasma-mass spectrometry (LA-ICP-MS) to quantify the trace-metal composition in otoliths. Herein, we first present results from predictive quadratic discriminate function (QDF) models that we developed to differentiate stocked individuals from wild-produced ones across Ohio reservoirs. We built these models using otolith signatures derived from fish of known hatchery or reservoir origin. Afterwards, we present findings from our predictive analyses, which used the QDF models to classify individuals of unknown origin (captured in reservoirs with standardized hoop-net sampling) as either stocked (hatchery origin) or wild-produced. Our preliminary findings indicate high model accuracies (75-100%) across reservoirs, thus concluding that otolith microchemistry can be used as a tool to identify the natal origin of wild-caught fish in our study reservoirs. Contributions of stocked fish vary across reservoirs (3-86%), but on average comprising less than half of the population at large in Ohio reservoirs. We ultimately discuss the value of this approach for helping management agencies assess the effectiveness of their Channel Catfish stocking programs.

Project – Hatchery production of blue catfish
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The Ohio Division of Wildlife started stocking blue catfish in 2011 in Hoover Reservoir with the hopes of creating a successful fishery that could be duplicated in other inland reservoirs. Hoover was/is successful and the program has expanded to four reservoirs in recent years. The production of the fish has come from various sources over the years. This year all the fish stocked were obtained from broodstock that are housed at our Hebron State Fish Hatchery in central Ohio. The fish were started as brood around the time of the first Hoover stocking. They were inventoried this year and some fish were in the 40 lb range. Around 85 lbs of eggs were collected and produced nearly 200,000 advanced yearlings as well as surplus fry. The program is doing very well. Below is a picture of hatchery staff inventorying and assessing the broodstock.

Project – Hoover Reservoir Blue Catfish Fishery
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The Division of Wildlife started stocking blue catfish in Hoover Reservoir in 2011. Hoover Reservoir is a water supply reservoir for the city of Columbus. It's approximately 2900 acres. The lake level is managed to maintain as much water as possible, so it doesn't have massive releases of water like flood control reservoirs, although the water level can lower dramatically during periods of low precipitation as the water is used for the City. The initial stocking was done with yearlings and advanced yearlings and subsequent annual stockings have been with advanced yearlings at a rate of approximately 20 per acre. We started sampling the population using low frequency electrofishing in 2016 and conducted annual surveys during June until 2019. Covid-19 concerns kept us from sampling in 2020. The fishery is doing very well with the average size fish from our 2019 survey around 18.5" with a range from 5.5 to 31" long. The anglers, so far, have done much better at capturing the largest blue cats. It has become a very popular fishery with many avid anglers specifically targeting the blue cats, although there is a decent flathead and excellent channel catfish fishery as well. We will be conducting a 40 hr/week creel survey in 2022. Below are some of the larger blue catfish caught at Hoover Reservoir in 2020. A local angler maintains a website that documents much of the "happenings" at Hoover. Fishandtales.net

Photos: Fishandtales.net

Kyle Gibney

John Kuenzh

Wisconsin
2020 Annual Report
to the
NCD Ictalurid Technical Committee

Submitted by Brad Simms, Ohio ITC Representative

Wisconsin's catfish species team submitted the first catfish species regulation toolbox for approval by our Fisheries Management Policy Team. The toolbox contains reference regulations for biologist when proposing a new regulation or change in existing regulation. The toolbox contains 4 categories (Consumptive, Quality, Memorable, and Trophy/Biomanipulation) with separate regulations for channel catfish and flathead catfish. Bullhead species have two categories (Consumptive and Quality).

Having no propagation system for catfish, Wisconsin utilizes fish farm purchases or in-state field transfers. The catfish species team submitted a stocking guidance for restoration and urban pond put grow and take program. Guidance summarizes stocking rates and frequencies for adult field transfers and purchase of yearling catfish.

The COVID-19 pandemic brought many restrictions to our sampling protocol in 2020, however, large river catfish sampling continued as we were able to social distance and keep sampling crews at 2 per boat. Fisheries staff in completed 9 hoop net surveys and 1 low pulse electrofishing survey on 9 river systems located throughout the state. Surveys target channel catfish and flathead catfish populations as part of our statewide baseline monitoring program.

Work continues throughout the Winnebago system evaluating the effects of a flathead catfish regulation change that went into effect on 2009. The regulation for flathead catfish changed from a daily bag limit of 2 and no size limit to a daily bag limit of 1 with a 30 inch minimum length limit, and 36 – 42 inch protected slot limit. Data from PIT tagged adult flathead catfish is used to estimate changes in survival, change in size structure, change in CPUE from total catches, change in CPUE of size classes that correspond to the new regulation, and modeling how different variables (e.g., water temperature, flow, the regulation change, daylight length, and others) effect catches in hoop netting surveys.

Surveys:
Hoop net Yahara River 76 net nights CPE:14.1
Hoop net Rock River 100 net nights CPE: 5.17
Hoop net Fox River 80 net nights CPE 2.6
Hoop net St. Croix River 104 net nights unbaited CPE 0.39
Low Pulse Rock River for YOY channel catfish 1208 CPE 176.6/mile

Catfish surveys were also conducted on the other following waters:

Lower Wisconsin River
Pecatonica River
East Br. Pecatonica
Grant River
Wolf River system