Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee – 2021 State Reports

Arkansas

Name of Representative to Technical Committee: Justin Homan

Date Submitted: 2/18/2021

Project Name or Description: Arkansas River Catfish Sampling-Year 2

Contact Information:

Name: Chelsea Tucker
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Objective: Describe population demographics of Blue and Flathead Catfish populations along pools of the Arkansas River

Current Status: On-going; Year 2 of sampling completed

Abbreviated abstract:

The second year of a two year study using low frequency electrofishing to sample catfishes was conducted on 5 pools of the Arkansas River (Pool 10-Lake Dardanelle, Pool 8, Pool 6-Little Rock, Pool 4-Pine Bluff, and Pool 2-Dumas) in 2020. The Arkansas River is a popular recreational and commercial fishery among resident catfish anglers; however, catfishes are poorly represented under our current sampling regime and no forms of commercial reporting are currently required. Therefore, the purpose of this study is to describe catfish population demographics along the Arkansas River to evaluate existing regulations. Sampling began in 2019 and primarily targeted Blue Catfish. In 2020, sampling took place in August and September, primarily focusing on targeting Flathead Catfish.

We used a systematic random sampling design and sampled 15 transects per pool standardized by 10-minutes of effort along with a chase boat. General site locations were the same in 2019 and 2020; however, in 2020, a predator-style approach was used within each sample reach to target optimal Flathead Catfish habitats (rip-rap revetted bank, woody habitat, dikes). In total, 80 electrofishing transects were competed and 3,861 catfish were collected

(Tables 1 and 2). Flathead Catfish dominated the species composition for all pools in 2020 (Figure 1).

Catch rates of Flathead Catfish from Pine Bluff were significantly greater than all other pools (Table 1), which also displayed the lowest size structure indices. The length-frequency distribution of Flathead Catfish from Pine Bluff was also significantly different from all other pools, suggesting a high abundance of smaller fish (<300 mm). Results for Blue Catfish were similar in 2019, where catch rates significantly differed among pools with Lake Dardanelle exceeding all other pools except Dumas. The length-frequency distribution at Lake Dardanelle also significantly differed and size structure indices were lower than all other pools suggesting a high abundance of smaller fish (< 300 mm). In general, relative weight values for Blue and Flathead Catfish in the Arkansas River were above 80; however, several length categories within the Little Rock sample fell below 80. All length frequency distributions of Flathead and Blue Catfish significantly differed from 2019 to 2020.

In addition to length and weight data, left pectoral spines were collected from 10 Flathead Catfish per 25 mm group per pool for age and growth analysis, and additional Blue Catfish spines were collected to supplement some length groups from the 2019 age sample. A total of 1,219 pectoral spines were collected among all pools sampled, comprised of 901 Flathead Catfish and 318 Blue Catfish. Lapilli otoliths were also extracted from all Blue and Flathead Catfish exceeding 750 mm total length to be compared to ages assigned using pectoral spines. Age assignment is still on-going for Blue Catfish collected in 2019 and will continue through 2021. Upon this project's completion, catfish population parameters will be modelled river-wide as well as within respective pools to evaluate existing regulations and the potential for overfishing.

Table 1. Number of transects (Sites), total sample size (N), overall catch rate (fish/hour ± standard error) of all Flathead Catfish, proportional size distribution of quality, preferred, and memorable sized fish sampled from pools of the Arkansas River in 2020.

Pool Name	Sites	N	CPUE	PSD	PSD-P	PSD-M
Dumas	15	368	136 (22)	42 (6)	6 (3)	1
Pine Bluff	15	753	282 (38)	37 (5)	2 (2)	0
Little Rock	15	148	56 (12)	51 (8)	10 (5)	8
Pool 8	15	394	147 (22)	30 (6)	2 (2)	2
Lake Dardanelle	20	168	48 (7)	60 (8)	12 (5)	3
Pooled Data	80	1,831	129 (13)	42 (3)	6 (1)	2

Table 2. Number of transects (Sites), total sample size (N), overall catch rate (fish/hour ± standard error) of all Blue Catfish, proportional size distribution of quality, preferred, and memorable sized fish, sampled from pools of the Arkansas River in 2020.

Pool Name	Sites	N	CPUE	PSD	PSD-P	PSD-M
Dumas	15	362	134 (29)	52 (4)	6 (2)	0
Pine Bluff	15	246	92 (16)	54 (5)	3 (2)	0
Little Rock	15	260	97 (30)	29 (4)	3 (1)	1
Pool 8	15	184	69 (16)	29 (4)	0	0
Lake Dardanelle	20	978	276 (60)	13 (2)	0	0
Pooled Data	80	2,030	142 (19)	31 (2)	2 (0)	0

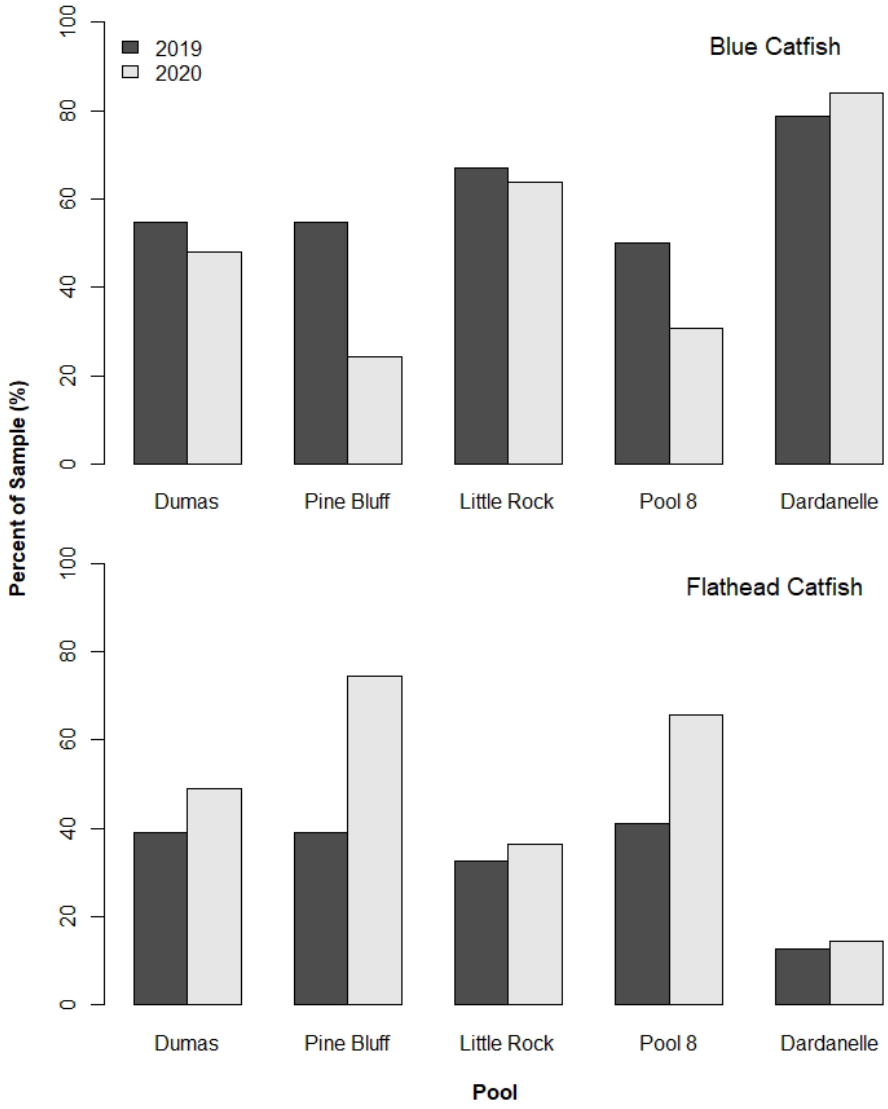

Figure 1.
Composition of sample by species (Blue and Flathead Catfish) collected from Dumas, Pine Bluff, Little Rock, Pool 8, and Lake Dardanelle, Arkansas, during 2019 and 2020 catfish samples

Florida

Nothing to report / No future projects planned

Georgia

Name of Representative to Technical Committee: Jim Page

Project Name or Description: Noteworthy Recreational Angler Catches

Contact Information:

Name: Jim Page
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Objective: To report catches of noteworthy catfish captured by recreational anglers

Current Status: Ongoing

Abbreviated Abstract: The Georgia Dept. of Natural Resources (GADNR) is tasked with managing natural resources in our state, including those enjoyed for the purposes of fishing. In that realm, GADNR celebrates and promotes the diversity of fish species we have to offer to the fishing public, including several catfish species. During the reporting period, the following notable catfish catches were reported:

NEW LAKE RECORDS:

Lake Allatoona – Blue Catfish – record broken twice in 2020 – a 44lb blue catfish was caught on 10/10, followed by a new lake record 52lb 1oz blue catfish caught on 10/27/20.

West Point Lake – Flathead Catfish – new record 48lb fish caught on 8/22/20

NEW PUBLIC FISHING AREA (PFA) RECORDS:

Rocky Mountain PFA – Channel Catfish – new record 12lb 15oz fish caught on 12/6/20

Dodge County PFA – Channel Catfish – new record 13lb 7.5oz fish caught on 1/5/21 (see below)

Hugh Gillis PFA – Channel Catfish – new record 10lb 15 oz fish caught on 3/30/20 (see below)

Thomas Muncher- Dodge PFA

Leon Morris - Gillis PFA

NEW STATE RECORD:

Tim Trone of Havana, FL caught a new state record blue catfish on 10/17/20. His catch, caught on the Chattahoochee River (Stewart County), weighed 110 lb, 6 oz, beating the previous record over 17 lbs!

We congratulate each of the anglers who captured these impressive fish, and we are excited to see records continue to fall! For those who haven't done so yet, **GO FISH GEORGIA**!!!!

Project Name or Description: Flathead and Blue Catfish Removal on the Satilla River

Contact Information:

Name: Jim Page
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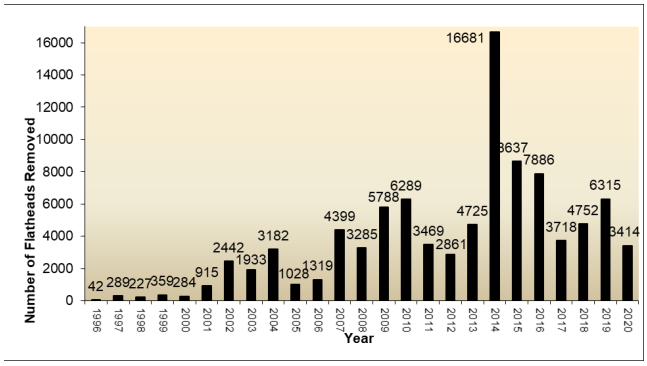
Objective: To evaluate the effects of long-term boat electrofishing removals on the survival, biomass, condition, relative abundance, size structure, and age structure of flathead catfish in the Satilla River, GA.

Current Status: Ongoing effort

Abbreviated Abstract: Modeling indicates that increased exploitation on the flathead catfish (*Pylodictis olivaris)* can be an avenue for native species recovery. After flatheads were introduced into the Satilla River in the 1990's, the GADNR initiated an intensive electrofishing removal effort in 2007. From 2007 to 2020, 82,160 flatheads (3,414 in 2020) totaling 74,168 kg (3,319 kg in 2020) were removed from roughly a 150-km stretch of the Satilla River. Size structure has changed substantially from containing many large individuals (≥510mm TL) in 2007 to mainly small fish (≤375 mm TL) in recent years. Total biomass per effort ranged from 57.05 kg/hr in 2007 to 10.9 kg/hr in 2012, totaling 20.4 kg/hr in 2020. The average weight of removed fish ranged from 2.6kg in 2007 to 0.4kg in 2013, equaling 0.9kg in 2020. Fish age structure continues to be truncated, and there is evidence for higher recruitment and earlier maturation, which would require that intensive harvest be maintained to prevent the population from rebuilding within 2-5 years. Catch-curves revealed total annual mortality (*A*) rates for the 10-year period (2007-2017) ranged from 37-63%, averaging 51%. For a long-lived species that presumably cannot withstand excessive rates of exploitation (i.e., >25% U), flatheads do seem to be responding to removal efforts. Our results indicate that an electrofishing removal program is a reasonable management option for state agencies aiming to control this apex predator, though continual removal will be required.



The discovery of blue catfish (*Ictalurus furcatus*), a second non-native, in 2011 led to GADNR staff to include this species in its removal efforts. After removing 7 blue catfish in 2011, no fish were observed in the 2012 – 2015 removal efforts. In 2016, a total of 224 blue catfish, including

a large gravid female (840mm and Age 7), were shocked and removed. The significant increase in the numbers of blue catfish observed in 2016 and the capture of a gravid female suggest reproduction in the river is occurring. In 2019, staff removed 663 blue cats, the most thus far. In 2020, only 187 individuals were removed.

Project Name or Description: Annual Standardized Sampling of Catfish on Various GA Rivers

Contact Information:

Name: Jim Page
Coauthors: Tim Bonvechio, Chad Kaiser, Bryant Bowen, Several DNR staff
Email: Jim.Page@dnr.ga.gov
Phone: 912-285-6485

Objective: To Monitor and Manage Catfish Populations in Various Georgia Rivers

Current Status: Ongoing effort

Abbreviated Abstract: The GADNR conducts standardized sampling of catfish populations via electrofishing in several Georgia rivers. These include the Altamaha, Chattahoochee, Flint, Ogeechee, Satilla, and Savannah (all annually), along with the Ogeechee (every 2 years) rivers in 2020. Catch rates varied by river, but were as follow (CPUE is #fish/hr):

Altamaha (CPUE): Blue Catfish (2020: 63.5; 2019: 73.2); Flathead Catfish (2020:111.9; 2019:99.2); Channel Catfish (2020:15.3; 2019:14.3)

Chattahoochee (CPUE): Blue Catfish (2020: 6.8 fish/hr; 2019: 24.0 fish/hr); Flathead Catfish (2020: 104.2fish/hr; 2019: 98.0 fish/hr)

Flint (CPUE): Blue Catfish (2020: 2.0 fish/hr; 2019: 4.0 fish/hr); Flathead Catfish (2020: 87.9 fish/hr; 2019: 96.7 fish/hr)

Oconee (CPUE): Blue Catfish (2020: 24.8 fish/hr; 2019:N/A); Flathead Catfish (2020: 59.2 fish/hr; 2019:N/A); Channel Catfish (2020: 4.9 fish/hr; 2019:N/A)

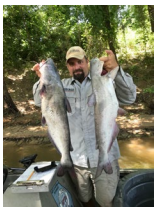
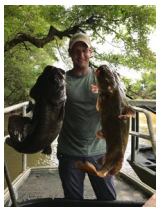
Ogeechee (CPUE): Brown Bullhead (2020: 47.3 fish/hr); Snail Bullhead (2020: 41.0 fish/hr); White Catfish (2020: 36.0 fish/hr)

Satilla (CPUE): Flathead Catfish (2020: 26.3 fish/hr; 2019: 50.7 fish/hr); Channel Catfish (2020: 25.3 fish/hr; 2019: 18.7 fish/hr); White Catfish (2020: 6.0 fish/hr; 2019: 4.3 fish/hr)

Savannah (CPUE): Snail Bullhead (2020: 24.75 fish/hr); White Catfish (2020: 22.7 fish/hr); Flathead Catfish (2020: 10.0 fish/hr)

Major takeaways from 2020 sampling, as compared to 2019 sampling, were that blue catfish catches in the Chattahoochee rose significantly; flathead catfish catches in the Satilla were way down in 2020; and thus far Sav. River snail bullhead are doing o.k. despite the newly emerging presence of flathead catfish.



Project Name or Description: First Time Records of Catfish Introductions

Contact Information:

Name: Jim Page
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Objective: To Monitor and Record First Instances of Catfish in Various Georgia Waterbodies

Current Status: Ongoing effort

Abbreviated Abstract: The GADNR continues to monitor and record first records/instances of various fish species, including catfish, in public waterbodies throughout the state. Below are first records of catfish species as reported in 2020:

Lake Lanier – Blue Catfish - GADNR staff confirmed their presence in November 2020 (pic below)

Kentucky

Name of Representative to Technical Committee: Jay Herrala

Project Name or Description: Evaluation of new recreational and commercial regulations on catfish in the Ohio River

Contact Information:
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Objective: 1) Determine abundance (CPUE), size structure, and condition of blue catfish, channel catfish, and flathead catfish in the Ohio River. 2) Evaluate the effects of new regulation on blue catfish, channel catfish, and flathead catfish in the Ohio River, particularly trophy-size catfish. 3) Quantify age, growth, mortality of the three species.

Current Status: Ongoing

Abbreviated Abstract:

The conflict between commercial fishermen and recreational catfish anglers on the Ohio River has been apparent for nearly a decade, with the main issue being a perceived switch from a harvest market predominantly for flesh to a largely trophy fish harvest for sale to pay lakes component. In 2013, KDFWR standardized its catfish data collection methods and began expanding the effort river-wide to more accurately estimate population dynamics of blue catfish, channel catfish, and flathead catfish. On December 1, 2014 the following regulation became law:

Recreational anglers on the main-stem Ohio River are allowed one blue catfish ≥35.0 in, one flathead catfish ≥35.0 in, and one channel catfish ≥28.0 in per day. Harvest of fish below their respective length limits is not regulated.

The majority of commercial fishers fishing in the legal waters of the Ohio River and its tributaries are allowed one blue catfish ≥35.0 in, one flathead catfish ≥35.0 in, and one channel catfish ≥28.0 in per day. However, up to 50 commercial fishers (This number was reduced to 15 commercial fishers in 2019) that harvested over 10,000 lbs of catfish in at least 2 of the last 3 years along with an additional six commercial fishers, who are chosen by a lottery drawing, are allowed a daily harvest of four (in aggregate) blue catfish and flathead catfish ≥40.0 in and channel catfish ≥30.0 inches in Kentucky's portion of the Ohio River and its tributaries open to commercial fishing below Cannelton Lock and Dam. Harvest of fish below their respective length limits is not regulated.

Accusations by recreational anglers that overharvest was still occurring surfaced again in 2018. Multiple meetings were held with KDFWR staff, recreational anglers, commercial fishermen, and paylake owners all present to work towards another compromise. Several regulations were proposed and submitted for review. At the time of this report the following regulations have been made law:

The number of commercial fishers awarded trophy permits was reduced to 15 (previously 50). There will be no more than two licensed commercial fisherman per boat. If more are present, they may only keep a two limits of trophy catfish.

A possession limit (twice the daily limit) was placed on trophy catfish for commercial fishers. This applies when on the water and when trailering fish.

Trotlines—Catch rate of blue catfish (5.4 fish/line) was down slightly from 2019, but still above the historical average and well very similar to the previous two years. Trophy blue catfish were captured in all pools sampled during trotline sampling, and CPUE of trophy catfish was 0.7 fish/line.

Electrofishing—Blue catfish CPUE (20.1 fish/hr) was the lowest since 2016 but was still above the historical average (CPUE = 17.1 fish/hr). CPUE of flathead catfish was a record high 59.6 fish/hr, and CPUE of trophy flathead catfish was also a record high (1.3 fish/hr). Trophy blue catfish were captured in all pools except Cannelton, and flathead catfish were captured in all pools except McAlpine.

Project Name or Description: Can channel catfish nesting boxes replace stocking in small impoundments?

Contact Information:

Name: Justin Heflin
Coauthors:
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Phone: (606) 783-8650

Objective: Because channel catfish are not able to produce self-sustaining fisheries in small impoundments, KDFWR has been experimenting with artificial nesting boxes as a replacement to stockings.

Current Status: Project is in its early phases with 4 of the 5 lakes in the project just completing their first season in the water.

Abbreviated abstract: In most small impoundments, channel catfish do not produce a self-sustaining population of fish and anglers are reliant on state agencies to stock fish in order to maintain a fishable population. The limiting factor in most instances is a lack of spawning habitat such as: hollow logs, undercut banks and rock crevices. Several other states have experimented with adding artificial spawning habitat in the form of nesting boxes to their lakes and have had success in creating habitat necessary to have self-sustaining fish populations in small impoundments. With hatchery space limited and expense of raising and stocking these fish high, alternative strategies for providing fish to small impoundments is of particular interest to state agencies. If channel catfish can self-sustain through artificial nesting boxes, then hatcheries can be freed up to use space and funding for other projects. The goals of this project are to (1) determine if artificial nesting boxes can create a self-sustaining population of channel catfish and (2) if so what rate of boxes are needed to maintain high quality populations of channel catfish.

Louisiana

Name of Representative to Technical Committee: Brian Heimann

Date Submitted: January 2021

Project Name or Description: LDWF sampling for catfish in Louisiana

Contact Information:

Name: Brian Heimann
Coauthors:
Email: bheimann@wlf.la.gov
Phone: 225-765-2337

Objective: Monitor catfish populations in commercially important areas

Current Status: Ongoing

Abbreviated Abstract: In 2020, sampling was conducted to monitor catfish populations in three LDWF Inland Fisheries districts. In District 7, baited tandem hoop net sets were utilized in a series of 3 lakes in southeast Louisiana. These lakes are large (26,000 acres total area) connected coastal lakes surrounded by cypress/tupelo swamp. Channel Catfish was the targeted species. Also, in District 7, hoop nets were utilized in the Mississippi River in 3 separate areas from St. Francisville, LA south to Plaquemine, LA. Target species was Flathead Catfish. In District 6, catfish were sampled in the Red River below lock and dam 1, where the Black River and Red River meet. Three sample locations in the river were sampled utilizing gill nets and

electrofishing. Targeted species were Flathead and Blue catfish. District 10 sampled the upper Sabine River with electrofishing surveys and hoop nets to capture Blue Catfish and Flathead Catfish. Lengths and weights were recorded for all captured fish in order to determine length frequencies and relative weights.

Project Name or Description: Impact of Channel Catfish in Poverty Point Lake, LA

Contact Information:

Name: Ryan Daniel
Coauthors:
Email: rdaniel@wlf.la.gov
Phone: 318-343-4044

Objective: Determine if Channel Catfish are impacting centrarchid nesting success, as well as best capture method of Channel Catfish in Poverty Point Lake, LA

Current Status: Ongoing

Abbreviated Abstract: In LDWF District 2, recent observations by field staff during routine sampling trips to Poverty Point Lake (2,700 acres) have given reason to suspect that the lake may be overpopulated with Channel Catfish. It is also suspected that the increased abundance of Channel Catfish has led to a decline in the nesting success of centrarchids. In an attempt to assess the impact of Channel Catfish, baited wire traps are being utilized in various areas of the lake to determine those areas with increased Channel Catfish density. Lengths and weights are recorded, and stomach contents are analyzed. Other methods to reduce the Channel Catfish population are being considered, including allowing the use of wire traps or slat traps, catfish tournaments, and large-scale removal events.

Mississippi

Name of Representative to Technical Committee: Samantha Bergeron

Project Name or Description: Flathead Catfish Introduction to Elvis Presley Lake

Contact Information:

Name: Dustin Rodgers
Co-Authors: Stanley Sullivan
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Phone: (662) 840-5176

Objective: To create a Flathead Catfish fishery in a small impoundment

Current Status: Unable to survey in 2019 or 2020, study ongoing

Abbreviated abstract:

MDWFP fisheries personnel stocked 9,600 fingerling Flathead Catfish in Elvis Presley Lake during the fall of 2018. Elvis Presley Lake is a 330-acre state fishing lake located near Tupelo, MS. Historically, the lake has received low fishing pressure due to subpar bass and bream populations. As supplemental forage for the catfish, as well as bass, 34,000 threadfin shad were also stocked. The catfish were stocked in an effort to create a flathead catfish fishery, which could boost angler trips to the lake.

Name of Representative to Technical Committee: Samantha Bergeron

Project Name or Description: MS River Angler Catfish Tagging Project

Contact Information:

Name: Jerry Brown
Co-Authors: Samantha Bergeron
Email: Jerry.Brown@wfp.ms.gov
Phone: (601)432-2204

Objective: To obtain recapture and movement data for large angler caught catfish in the MS River

Current Status: Ongoing

Abbreviated abstract:

MDWFP is cooperating with trophy catfish fishing guides to monitor large catfish recapture and movement on the Mississippi River. The fishing guides are collecting length (in) and weight (lbs) for catfish caught, along with GPS coordinates of the release locations. Catfish are caught using hook and line, double tagged with floy tags, and released at or near the capture locations. Fishing guides report the data to MDWFP on a monthly basis. The tagging project began in March 2020 and as of December 31, 2020 no recaptures have been reported. A total of 59 catfish

fish have been tagged consisting of one 58 Blue Catfish and one Flathead Catfish. The average total length of catfish tagged was 38.25 inches and the mean weight was 30 pounds

Missouri

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. Little bullhead harvest was reported during 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)
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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
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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)
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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.

North Carolina

Name of Representative to Technical Committee: Ben Ricks

Project Name or Description: Assessment of Tar River catfish populations, 2020

Contact Information: North Carolina Wildlife Resource Commission (NCWRC)

Name: Todd D. VanMiddlesworth (NCWRC District 2 Assistant Fisheries Biologist)
Coauthors: Benjamin R. Ricks (NCWRC District 2 Lead Fisheries Biologist)
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Objective: The objective of this survey was to continue documenting the Tar River catfish populations for changes in population characteristics.

Current Status: Complete

Abbreviated Abstract: Ictalurids in the Tar River were surveyed using boat-electrofishing in summer 2020. Field staff collected 383 Flathead Catfish, 61 Channel Catfish, 10 White Catfish, and 3 Blue Catfish from 55 sample sites. Flathead Catfish CPUE was 27.0 at LFE sites, Channel Catfish CPUE was 6.0 at HFE sites, White Catfish was 0.5 at LFE sites, and Blue Catfish was 0.2 at LFE sites. The majority of Flathead Catfish were in the quality-length range followed by preferred-, memorable-, and trophy-length ranges. Channel Catfish were mostly in the quality-length range followed by preferred-length range. Body condition (W_r) of Flathead Catfish and Channel Catfish indicated adequate forage availability and a lack of density dependent growth. Flathead Catfish mortality was calculated using a Beverton-Holt length-based mortality estimator, indicating an annual Flathead Catfish mortality of A = 22%. Channel Catfish ages were observed to range from 0−8. Native ictalurid populations were observed to be in low abundance. The low abundance of native ictalurids is likely due to the competition of and predation from the robust Flathead Catfish population in the Tar River. Flathead Catfish exploitation is quite low despite the popularity of catfish angling in the Tar River. Low Flathead Catfish exploitation indicates minimal fishing activity impacts in the Tar River. Future surveys should investigate the distribution of native ictalurids in the Tar River and continue monitoring non-native catfish effects on resident fish communities.

Project Name or Description: Effects of Hurricane Florence on standing stocks of invasive catfish in southeastern North Carolina

Contact Information:

Name: Dr. Fred Scharf, University of North Carolina-Wilmington (UNCW)
Co-Author: Claire Pelletier (M.S. candidate)
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Background:
This research project intends to capitalize on the opportunity to utilize methods established in recent research (DIF-0028) to repeat the pre-hurricane mark-recapture experiment one year following Hurricane Florence. This follow-up research on the Cape Fear River will provide direct estimates of the population impacts and provide the baseline to track invasive Flathead Catfish and Blue Catfish recovery during the next two years immediately following a hurricane event.

This project started in July 2019 with MS candidate Claire Pelletier hired in January 2020. Field work began in spring 2020 with additional safety guidelines and procedures in place to address coronavirus concerns while also completing field work during an essential period (spring spawning migrations) that would not be able to be sampled in accordance with project objectives. Project continue through May 2021.

Objectives and preliminary results

1) Repeat the pre-hurricane mark-recapture experiment to generate a post-hurricane estimate of standing stock for Flathead Catfish and Blue Catfish.

a. Mark-recap started in July 2019. Catch rates were reasonable, yet not as low as expected following Hurricane Florence induced fish kills. A few tagged fish were collected from 2018, so there were definitely were some post-Florence survivors.

2) Quantify seasonal patterns of movement and habitat use of Flathead Catfish through passive and active tracking of acoustically tagged individuals.

a. During October 2019, acoustic transmitters were implanted into 25 Flathead Catfish spread among the three major tributaries. Since release, active tracking efforts have relocated several of the tagged individuals and a network of fixed acoustic receivers is in the process of being deployed to monitor the seasonal movements of these fish.

b. During spring 2020, preliminary data downloads have indicated fish tagged in Castle Hayne being detected upriver in Burgaw, fish tagged in Burgaw being detected upriver in Kenansville, fish tagged in the lower and middle Black River being detected upriver near Ivanhoe, and 4 of 9 fish tagged in the lower mainstem Cape Fear being detected above the LD1 rock arch near Elwell.

c. Plans for spring 2021 include detection downloads and battery replacement for our fixed receiver array in January 2021. Fish locations from the fixed receiver detection patterns will be used to design additional targeted listening surveys to locate fish throughout the spring. Analysis of migratory behaviors during spring 2021 will inform the repeatability (year to year) of flathead catfish migration strategies and point to potential spawning habitat locations.

3) Refine prey fish identifications through the use of DNA barcoding techniques

a. Stomachs from collected catfish will be removed and frozen during spring 2020 collections. Frozen stomach contents will be thawed, organized by prey type, and evaluated for use in molecular analyses.

b. Ms. Pelletier will be learning the techniques from a current PhD candidate using methods vetted by the UNCW laboratory as well the Schall Laboratory at Pennsylvania State University. After using a common DNA extraction kit as well as a PCR inhibitor remover, we will apply a series of DNA primer cocktails, specialized for fish, to target certain areas of the DNA and obtain a clear sequence that can then be matched to existing DNA catalogued in established data bases. In addition to sequencing the DNA of our unidentified fish prey we will include a small control group of already identified fish prey as a baseline.

4) Determine size- and age-based maturation schedules and fecundity estimates for catfish species

a. Sampling will target a broad size range of fish (200 – 1000+ mm TL) for histological analysis of gonads to quantify the size dependence of both maturity and egg production and will continue through at least summer to ensure complete coverage of spawning period, focusing on pre-spawning, spawning, and immediate post-spawning seasonal periods.

b. After sorting all samples selected for histological analysis, 233 samples of flathead catfish gonadal tissue have been prepared to be delivered to the South Carolina Department of Natural Resources (SCDNR) histology facility for full processing, including tissue embedding, sectioning, mounting, and staining.

Oklahoma

Name of Representative to Technical Committee: Jeremy Duck

Date Submitted: February 2021

Project Name or Description: An evaluation of the effectiveness of a trophy Blue Catfish regulation in Oklahoma

Contact Information:

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Co-Authors: Co-Authors: Richard A. Snow – *Oklahoma Department of Wildlife Conservation, Oklahoma Fishery Research Laboratory, 500 East Constellation, Norman, Oklahoma 73072, USA*
James M. Long – *U.S. Geological Survey, Oklahoma Cooperative Fish and Wildlife Research Unit, Department of Natural Resource Ecology and Management, Oklahoma State University, 007 Agriculture Hall, Stillwater, Oklahoma 74078, USA*

Objective: The objective of this study is to evaluate the effectiveness of the 2010 ODWC maximum length limit regulation for Blue Catfish at seven Oklahoma reservoirs.

Current Status: Complete

Abbreviated abstract: Growing interest in trophy Blue Catfish *Ictalurus furcatus* angling has resulted in implementation of trophy regulations by some natural resource agencies. On January 1, 2010, the Oklahoma Department of Wildlife Conservation adopted a regulation that only one Blue Catfish over 760 mm can be harvested per day to redirect angler harvest towards smaller fish, control harvest of large fish, and improve the overall size structure of these populations. This study evaluates whether the 762 mm length regulation has resulted in improved size structure of Blue Catfish in Oklahoma reservoirs. We compared pre- (2003-2006) and post- (2017-2018) regulation population parameters from seven Oklahoma reservoirs and found significant differences in length frequencies in all sampled reservoirs and age frequencies on the three reservoirs where otoliths were collected, although not necessarily congruent with expectations from the trophy regulation. Two lakes, for example Texoma and Ellsworth, exhibited significant increases in PSD, indicating a greater abundance of larger fish, but the other five lakes exhibited opposite or no clear trend. As of 2018, it appears the regulation change has been ineffective at meeting its stated goals, at least on a state-wide basis.

Project Name or Description: Population dynamics of lotic Blue Catfish and Flathead Catfish in Oklahoma

Contact Information:

Name: **Anthony Rodger**
Co-Authors: **Trevor Starks**
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Phone: 918-260-3231

Objective: Establish a baseline contemporary dataset to monitor trends in dynamic rate functions, generate statewide standards for growth and size structure to facilitate population comparisons, and evaluate harvest regulations under an adaptive management framework.

Current Status: Ongoing

Abbreviated abstract: Surveys of Oklahoma angler preferences have revealed that Blue Catfish *Ictalurus furcatus* and Flathead Catfish *Pylodictis olivaris* are the most sought after species by anglers in rivers and streams. Therefore, catfish represent an important natural stream resource warranting management in Oklahoma. Despite their popularity, catfish population management has received very little attention in Oklahoma lotic systems. Consequently, lotic catfish population dynamics data are almost non-existent. Beginning in 2016, the Oklahoma Department of Wildlife Conservation Streams Program instituted a catfish monitoring effort for Blue Catfish and Flathead Catfish. In 2020, we conducted 7 surveys on the lower Red River. Blue Catfish and Flathead Catfish sample sizes were 146 and 61, respectively. The Stream Program has sampled 7 rivers since 2016 with a cumulative sample size of 1,298 Blue Catfish and 405 Flathead Catfish. Max size, max age, fecundity, sex ratios, catch-per-unit effort, proportional size distributions, von Bertalanffy growth parameters, and annual mortality rates have been estimated for the rivers surveyed.

Project Name or Description: Population Characteristics and Potential Factors Influencing Recruitment Variability of Blue Catfish, Channel Catfish, and Flathead Catfish in Thunderbird Reservoir, Oklahoma

Contact Information:

Name: Austin D. Griffin - *Oklahoma Department of Wildlife Conservation, Oklahoma Fishery Research Laboratory, 500 East Constellation, Norman, OK 73072*
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Objective: The objectives of this study are to 1) describe age, size structure, condition, growth, and mortality of blue catfish, channel catfish, and flathead catfish from Thunderbird Reservoir, Oklahoma, and 2) evaluate the effects of reservoir hydrology, water quality, and temperature on the year-class strength of the three catfish species.

Current Status: Complete

Abbreviated abstract: Blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), and flathead catfish (*Pylodictis olivaris*) are popular sport fishes throughout North America, and are therefore intensively managed by some natural resource agencies. Catfish fisheries rely on sufficient natural reproduction and recruitment to sustain these populations, but few studies have evaluated the variables that affect catfish recruitment. Therefore, this study sought to describe population characteristics of blue, channel, and flathead catfish in Thunderbird Reservoir, Oklahoma, and evaluate the effects of hydrology, water quality, and temperature on year-class strength. During 2017 and 2018, 235 blue catfish, 194 channel catfish and 120 flathead catfish were collected and aged using otoliths. In general, these catfish species in Thunderbird Reservoir were slow growing, long-lived, had low mortality rates, and experienced variable recruitment. Variables effecting catfish recruitment included air temperature, exchange rate, reservoir volume, and water hardness. This study is one of the first to describe potential variables influencing year-class formation of blue catfish, channel catfish, and flathead catfish in reservoirs.

Project Name or Description: Gear Bias of Low-Frequency Electrofishing for Flathead Catfish *Pylodictis olivaris* in Reservoirs

Contact Information:

Name: Graham Montague, Oklahoma State University, Department of Natural Resource Ecology & Management
Co-Authors: Dan Shoup, Oklahoma State University, Department of Natural Resource Ecology & Management
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Objective: The objective of this study is to quantify precision and accuracy of low-frequency electrofishing for Flathead Catfish in reservoir habitats

Current Status: Ongoing

Abbreviated abstract: Flathead Catfish are popular among anglers. Unfortunately, information about sampling Flathead Catfish is limited, making information about proper Flathead Catfish sampling a high priority for management agencies. Low frequency electrofishing (LFE; < 30 pulses per second [pps], commonly 15 pps) is the most commonly used method for sampling Flathead Catfish. Although, the accuracy and precision of this gear is unknown, many think it may be biased against fish >600mm. To quantify the accuracy and precision of LFE for Flathead Catfish at different temperatures, we created known populations by tagging Flathead Catfish in Lake Carl Blackwell (n=1,078), Lake McMurtry (n=820), and Boomer Lake (n= 120) with numbered operculum Carlin Dangler tags. Preliminary results from sampling these marked populations suggest that Flathead Catfish catch rates begin to decrease when the water temperature is <21ºC, and Flathead Catfish > 500 mm TL are captured in lower frequency than their actual abundance. We plan to continue our mark-recapture study throughout May 2021 to compare the catch rates over a range of temperatures.

Tennessee

Nothing to report / No future projects planned

Texas

Name of Representative to Technical Committee: Kris Bodine

Project Name or Description: Evaluation of an experimental 30”-45” slot length limit for blue catfish in three Texas reservoirs

Contact Information:

Name: John Tibbs
Coauthors: Tom Hungerford, Rick Ott, TBD
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Phone: 254-666-5190

Objective: 1) Quantify winter jugline and pole-and-line angler effort for blue catfish before and after the regulation is enacted, 2) Measure attitude and opinions toward juglining, as well as economic impact, before and after the regulation is enacted, 3) Measure angler attitude and opinions toward pole-and-line angling, as well as economic impact, after the regulation is enacted, 4) Measure size structure of jugline harvest and size structure of the total blue catfish population before and after the regulation is enacted, 5) Determine if large blue catfish contaminants are above action levels.

Current Status: Ongoing, all samples have been collected

Abbreviated Abstract: Contaminant samples for sub-slot and slot fish have been collected and metals processed; otoliths have been collected and age determined; mail-out survey to jugliners had > 50% response rate with only a single mailing; mail-out survey of catfish pole-and-line anglers complete. Information has been used in discussions surrounding the new regulations proposed for Texas reservoirs.

Project Name or Description: Revised Catfish Regulations in Texas

Contact Information:

Name: John Tibbs, Numerous (TPWD Catfish Committee)
Coauthors:
Email: John.Tibbs@tpwd.texas.gov
Phone: 254-666-5190

Objective: Evaluate and revise Texas’ catfish regulations to better accommodate the range of biological and sociological issues associated with catfish fisheries statewide.

Current Status: Ongoing; the new suite of regulations has been proposed and submitted to our commission. Additional formal angler feedback will be gathered through March, when our commission will make a final decision.

Abbreviated Abstract: Many of Texas' existing catfish regulations are outdated, redundant, or are not functioning as intended (either biologically or sociologically). Thus, under direction of the division chief, the Texas Parks and Wildlife formed a committee to identify a new suite of regulations that better achieve TPWD fishery management goals. Based on the most recent statewide catfish angler survey, there are five primary types of catfish anglers to which management goals should focus: generalists, high catch rates, high harvest rates, high harvest of preferred size catfish, and trophy angling. After extensive evaluation and analysis of Texas' existing catfish data and regulations, the TPWD has proposed a new suite of regulations for the state. Regulations have been submitted to the commission for review and subsequent formal angler input.

New regulations:

1) Statewide: Channel, blue, their hybrids & subspecies. No minimum length limit; daily bag limit = 25 fish in any combination. Of the 25-fish bag, no more than 10 can be 20 inches or longer. Most Texas reservoirs larger than 500 acres will be managed with this regulation (about 85% of the total).

2) Channel, blue, their hybrids & subspecies. Minimum length limit: 14 inches. Daily Bag = 15 in any combination. Proposed for Braunig, Calaveras, Choke Canyon, Fayette and Proctor. This regulation is appropriate where excessive harvest is indicated, and spawning/recruitment is an issue.

3) Channel, blue, their hybrids & subspecies No minimum length limit; daily bag limit = 25 fish in any combination. Of the 25-fish bag, no more than five can be 20 inches or longer, and no more than one of those can be 30 inches or longer. Proposed for Belton, Bob Sandlin, Conroe, Hubbard Creek, Kirby, Lavon, Lewisville, Palestine, Ray Hubbard, Richland Chambers, Tawakoni and Waco. This regulation is designed to increase the numbers of quality and trophy-sized Blue Catfish. It is appropriate for reservoirs with good to excellent Blue Catfish populations that exhibit average to fast growth, have existing trophy fish or trophy potential, and a supportive angler base that desire a population with more larger fish.

Retained regulations (Interjurisdictional)

4) For Blue and Channel Catfish, no MLL and daily bag = 15. Only one Blue Catfish 30" or greater by be retained each day. For Flathead Catfish, no MLL and daily bag = 5 (Texoma and the Red River below Texoma).

5) For Blue and Channel Catfish, no MLL and daily bag and possession limit = 50 in any combination of which no more than 5 Blue or Channel Catfish 30" or greater may be retained. (Toledo Bend, Caddo). Livingston and Sam Rayburn are also proposed for this regulation. This regulation is appropriate for large east Texas reservoirs where blue catfish are abundant and there

is stable recruitment and good growth. There is also low exploitation by mostly passive gear anglers who are harvest-oriented.

Project Name or Description: Blue and Channel Catfish growth, mortality, and gill net selectivity in Texas reservoirs

Contact Information:

Name: Lynn Wright
Coauthors: Michael Homer, John Tibbs, Greg Binion, Greg Cummings, Quinten Dean
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Objective: 1) Estimate instantaneous mortality and growth rates for Blue and Channel Catfish populations, 2) Estimate size selectivity of TPWD experimental gill nets for Blue Catfish and Channel Catfish, 3) Compare estimates of size structure and instantaneous mortality rates from unadjusted gill net data and size-bias corrected data within and among reservoirs.

Current Status: Ongoing. Initial sampling began in 2020 and will continue through 2023.

Abbreviated Abstract: The TPWD catfish regulation committee identified a lack of robust estimates on dynamic rate functions (i.e., growth and mortality) for Texas Blue and Channel Catfish populations. This project will provide a significant number of needed growth and mortality estimates across a wide spatial scale and help fill a vital data gap. We plan to collect growth and mortality data on approximately ten Blue Catfish and four Channel Catfish populations. This data would be enabled fisheries managers to conduct more robust population and regulation modelling and ultimately make more informed decisions regarding appropriate catfish regulations. Gill nets are one of the most widely used fisheries sampling gears and are deployed by biologists statewide in Texas to assess various metrics in catfish populations. However, gill nets have inherent size biases that can result in catfish size structure data that is not representative of the population. Evaluating size bias in our TPWD standard gill nets and creating a size-bias correction factor can improve the quality of our catfish gill net data. Biologist statewide would be able to use this size-bias correction to improve estimates of size structure related metrics.

Project Name or Description: Evaluation of Ghost-fishing of Abandoned Trotlines in a Texas Reservoir

Contact Information:

Name: Dusty McDonald
Coauthors: Greg Binion, Warren Schlechte, Donovan Patterson, Dan Ashe, Amanda Boyles
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Objective: 1) Evaluate Channel Catfish / hook interaction with an abandoned trotline simulation (controlled pond study), 2) determine the fresh cut-bait retention and total catch within a 24-hour period, comparisons between set times (morning/evening) and season (winter, summer; field study), and 3) determine the impact of multiple trotlines on the fishery and the integrity of the trotlines throughout time with a seasonal component (field study).

Current Status: These objectives have been met. Two papers were written and submitted to NAJFM, reviewers decided that the diel study should be removed and the two other projects combined into one manuscript and resubmitted. I'm currently in the process of doing this. The diel portion still has relevancy so it may be submitted as a Management Data Series, an internal TPWD publication. This research was presented at SDAFS in Little Rock 2020.

Abbreviated Abstract: Reports of ghost-fishing by abandoned freshwater trotlines exist within the media. These reports suggest abandoned trotlines can be a hazard to human waterbody users, and indiscriminately kill or injure aquatic life. Previous experimental work evaluating ghost-fishing has been focused on gears used in the marine environments. In contrast, freshwater trotlines, have never been evaluated. Numerous factors (e.g., hook style, timing of set, season of set) influence the potential for ghost-fishing. We designed a multi-stage study to examine these elements: 1) we used an abandoned trotline simulation within hatchery ponds to determine whether hook style, bait presence, and season had any effect on catch rates, retention and mortality of Channel Catfish 2) we used a field study to demonstrate what was caught and killed, and how the timing of sets (morning or evening) and season (winter or summer) may affect catch rates over a 24-h period, and 3) we examined the long-term resiliency of trotlines in a freshwater reservoir exposed to winter and summer seasons. We observed evidence of ghost-fishing in both the hatchery ponds and within the field studies. We found that unbaited hooks caught 12 species of fish, turtles and birds. Our long-term study is ongoing, but we have determined that the cooler water temperatures of the winter tended to result in higher catch rates and longer retention rates of aquatic organisms compared to summer-set trotlines. In our simulated abandoned trotline study, both baited and unbaited hooks caught fish ($\bar{x}$ baited = 18.4, $\bar{x}$ unbaited = 15.3; P=0.33). This validates the previous reports of ghost-fishing occurring with abandoned trotlines. Our field study determined that the timing and the season of the trotline set had no significant effect (P = 0.1306; P= 0.2746 respectively) with overall field catch rates. The resiliency of trotlines appears to decrease rapidly after being set and differed by season; Winter trotlines lost 50% of hooks at 78.3 days compared to 62.3 days for summer-set trotlines. We give some baseline data on how efficient abandoned freshwater trotlines are at collecting aquatic organisms and make recommendations on how to manage trotline fisheries with this gear.

Project Name or Description: Determining factors limiting establishment of a Channel Catfish fishery at Lake Raven, Texas.

Contact Information:

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Objective: Determine if barriers to natural reproduction or to recruitment limit the Channel Catfish fishery at Lake Raven in Huntsville, Tx.

Current Status: Completed third year of the study with natural reproduction observed all years. Population and year class surveys was conducted in the spring 2020 and will continue to determine recruitment into Channel Catfish population.

Abbreviated Abstract: Lake Raven in Huntsville State Park, in Huntsville, Tx is an aging reservoir with high levels of siltation and little habitat appropriate for Channel Catfish spawning. Lake Raven has also been utilized for experimental Largemouth Bass selective breeding and high-intensity stocking programs and hosts a robust Largemouth Bass population. Natural Channel Catfish recruitment has never been observed in Lake Raven and it is unclear if the lack of recruitment is due to a lack of natural reproduction or excessive predation on young fish. Seventy-eight spawning barrels were installed in the spring of 2018. Reproduction was observed in the barrels in 2019 and 2020. In the May of 2020, baited tandem hoop nets were used to survey the catfish population. Five fish under 14" were collected and aged. Due to the timing of the collection, which was in the period of annulus formation, it was difficult to age with a high level of confidence. One fish had a single annulus ring and the others had two. It was determined that they were 2019- and 2018-year class fish.

Next steps: Subsequent hoop net surveys will be conducted earlier in the spring. Observation of reproduction activity will continue for several more years and annual hoop net surveys will be used to determine recruitment to the gear.

Virginia

Nothing to report / No future projects planned

West Virginia

Name of Representative to Technical Committee: Nate Taylor

Project Name or Description: Ohio River Catfish Population Assessment

Contact Information:

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Objective: Assessment of Catfish Population Characteristics in Various Ohio River Pools

Current Status: Ongoing

Abbreviated abstract: Beginning in 2018, our annual catfish population assessment protocol was altered to coincide with KDFWR's pool-wide, multi-gear sampling approach. Previous lock and dam tailwater low frequency boat electrofishing surveys focused primarily on Flathead Catfish populations, and with the growing popularity of Blue Catfish it was necessary to move to a multi-gear approach to allow for the assessment of Blue, Channel and Flathead Catfishes.

Hoop nets, trotlines, and shore-line low-frequency pulsed DC boat-mounted electrofishing surveys were conducted in the Belleville, Hannibal and Robert C. Byrd pools of the Ohio River from May to July 2020. Hoop nets (15; baited with Zote soap) were set at three locations (upper, middle, and lower sections) within each pool, strategically positioned in outside bends and river margins. Hoop nets were fished for three consecutive nights. Trotlines (25 hooks (125-ft.) or 50 hooks (250-feet)) were set in the same three sections of the Belleville and Hannibal pools. Trotline length depended on river conditions, ensuring 250 hooks per location; fifty hook lines were prioritized to better reach deeper sections of the river. Hooks were baited with cut rough fish, set in the evening, and fished overnight. Lines were pulled, rebaited and reset for a second night. Low-frequency electrofishing surveys (DC output ~200V, 2 amps, 15 pulse/second) were conducted at five sites throughout the Belleville and Hannibal pools focusing on areas with outside bends and/or rocky shorelines. Surveys consisted of five 15-min transects at each location with an associated chase boat. All catfish collected were measured for total length (mm) and otoliths were taken from a subset of channel catfish (n = 191) from the Belleville Pool for age and growth analysis. The trotline and low-frequency electrofishing surveys in the R.C. Byrd Pool were conducted as part another project; details can be found in that project description (below).

With the completion of the third sampling year, results continue to suggest that this methodology effectively samples all species of catfish. Flathead Catfish CPUE via boat electrofishing surveys ranged from 46.9 ± 17.4 fish/hr in the Hannibal Pool to 105.6 ± 25.95 fish/hr in the Belleville Pool. Catch rates for Channel Catfish in hoop nets varied by pool, from 1.01/net night in the

Hannibal pool to 4.11/net night in the Belleville pool. Only one location on the R.C. Byrd pool was successfully sampled using hoop nets in 2020 due to changes in river conditions during the set; with only 15 hoop nets, channel catfish CPUE was 4.47/net night. Hoop nets continued to capture trophy-sized Flathead Catfish (n = 10). Trotline catch rates were comparable to 2019, even after doubling the number of hooks in the Hannibal pool. In June and July, water temperature may have decreased catch rates using this method. Blue Catfish were more abundant in the Belleville pool in 2020. Trotlines appeared more effective sampling for Blue Catfish from 2019 (n=4) to 2020 (n=47). This increase in catch, coupled with evidence of reproduction near Parkersburg, WV, suggests that Blue Catfish are expanding into the upstream sections of the Ohio River Age and growth analysis of channel catfish is ongoing. Statistics for all gear types are summarized below in Table 1.

Table 1. Summary of data collect from hoop net (HONT), boat electrofishing (BTEF), and trotline (TROT) surveys targeting catfish in three Ohio River pools in 2020.

Belleville Pool						
Gear Type	**Effort**	**Species**	**CPUE**	**Size Range**	**N**	**PSD**
HONT	132 Net Nights	Channel	4.11 (2.18)	235-761	542	47.9
		Flathead	0.29 (0.1)	467-1135	39	94.8
		Blue	0.008 (0.015)	691	1	100
BTEF	5.31 Hours (21 transects)	Channel	20.8 (9.21)	86-509	111	24.5
		Flathead	105.6 (25.95)	78-1120	562	56.9
		Blue	1.7 (1.48)	259-402	9	0
TROT	44 Lines (2000 Hooks)	Channel	0.06 (0.01)	375-622	126	95.2
		Flathead	0.002 (0.002)	670-857	4	100
		Blue	0.02 (0.01)	294-1138	47	93.5
R.C. Byrd Pool						
Gear Type	**Effort**	**Species**	**CPUE**	**Size Range**	**N**	**PSD**
HONT	* 45 Net Nights	Channel	4.47 (3.02)	216-703	201	35.2
		Flathead	0.2 (0.12)	618-1142	9	100
		Blue	0.02 (0.04)	624	1	100
BTEF	10.14 Hours (40 Transects)	Channel	20.72 (7.45)	67-500	203	17
		Flathead	80.99 (21.40)	74-1140	817	57
		Blue	3.26 (1.82)	117-1174	33	80
TROT	50 Lines (1000 Hooks)	** Channel	–	–	–	–
		Flathead	0.006 (0.007)	620-1055	6	98
		Blue	0.044 (0.019)	618-1224	44	100
Hannibal Pool						
Gear Type	**Effort**	**Species**	**CPUE**	**Size Range**	**N**	**PSD**
HONT	135 Net Nights	Channel	1.01 (0.49)	202-604	137	36.1
		Flathead	0.06 (0.04)	440-745	8	62.5
		Blue	-	-	-	-
BTEF	4.8 Hours (19 transects)	Channel	4.97 (1.84)	222-460	24	14.3
		Flathead	46.9 (17.4)	83-1076	224	48.1
		Blue	0.42 (0.8)	295-388	2	0
TROT	22 Lines (1000 Hooks)	Channel	0.03 (0.02)	378-651	28	96.4
		Flathead	0.008 (0.004)	602-990	9	100
		Blue	0.0009 (0.001)	575	1	100

* Due to very high flow events, only one HONT site was completed on the R.C. Byrd Pool in 2020.

** Data was not collected on Channel Catfish during 2020 trotline surveys in the R.C. Byrd Pool.

Project Name or Description: Population Characteristics and Seasonal Movement of Blue and Flathead Catfish in the R.C. Byrd Pool of Ohio River and Kanawha River

Contact Information:

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Objectives:

1. Assess size structure, age and growth of Blue Catfish and Flathead Catfish populations within the Robert C. Byrd Pool of Ohio and Kanawha Rivers.
2. Determine population management units for Blue Catfish and Flathead Catfish by assessing movement within and between pools using acoustic telemetry

Current Status: Ongoing

Abbreviated abstract: Catfish angling is rapidly growing in popularity throughout the United States, including the Mid-Ohio River Valley. Tournaments and guide services are increasing annually within the West Virginia stretch of Ohio River mainstem. Due to an increase in angler interest of catfish fisheries, the West Virginia Division of Natural Resources (WVDNR) has been dedicating effort to monitoring catfish populations more closely in recent years. This study, beginning in 2016, has been focused on Blue Catfish and Flathead Catfish populations in the Robert C. Byrd Pool of Ohio River (61 km) and lower Kanawha River (51 km). Flathead Catfish populations in this pool are naturally occurring and reproducing. Blue Catfish were reestablished via fingerling stockings from 2004 through 2014.

During May/June, low frequency boat electrofishing surveys were conducted at 10 locations using a Smith Root GPP 5.0 using a DC output of 200V, 2–3 amps, and 15 Hz, and moving in a downstream manner approximately 10 m from the bank. A chase boat, equipped with a netter, was used to assist with collection. Surveys were conducted when water temperature was approximately 25° C.

Electrofishing CPUE was calculated as fish/hour for both Flathead Catfish (Table 1) and Blue Catfish (Table 2). CPUE was evaluated utilizing sub-stock, stock, quality, memorable, and trophy size classifications. Confidence intervals (95%) are presented for each estimate as two times the standard error. Catch rates for Flathead Catfish CPUE's are greatly reduced in relation to total length. Low numbers of memorable and trophy Flathead Catfish may be due to reduced capture efficiency in these size ranges. Blue Catfish catch rates are comparatively much lower and more variable. However, presence of sub-stock Blue Catfish are likely an indicator of natural reproduction in this recently reestablished fishery.

Table 1. CPUE (fish/hour) by size group of Flathead Catfish collected during electrofishing surveys on the R.C. Byrd Pool from 2017 - 2020.

Year	Size group (mm)						Total
	<S	S	Q	P	M	T	
	<350	350-509.9	510-709.9	710-859.9	860-1019	≥1020	
2017	15.98	11.96	8.51	2.58	0.77	0.29	40.09
2018	14.01	6.22	7.19	2.07	0.24	0.00	29.73
2019	25.10	7.00	6.60	1.70	0.70	0.20	41.30
2020	52.79	11.94	11.05	3.75	0.79	0.30	80.61
Mean	26.97	9.28	8.34	2.53	0.62	0.20	47.93
95% CI	17.88	3.10	1.98	0.89	0.26	0.14	22.40

Table 2. CPUE (fish/hour) by size group of Blue Catfish collected during electrofishing surveys on the R.C. Byrd Pool from 2017 - 2020.

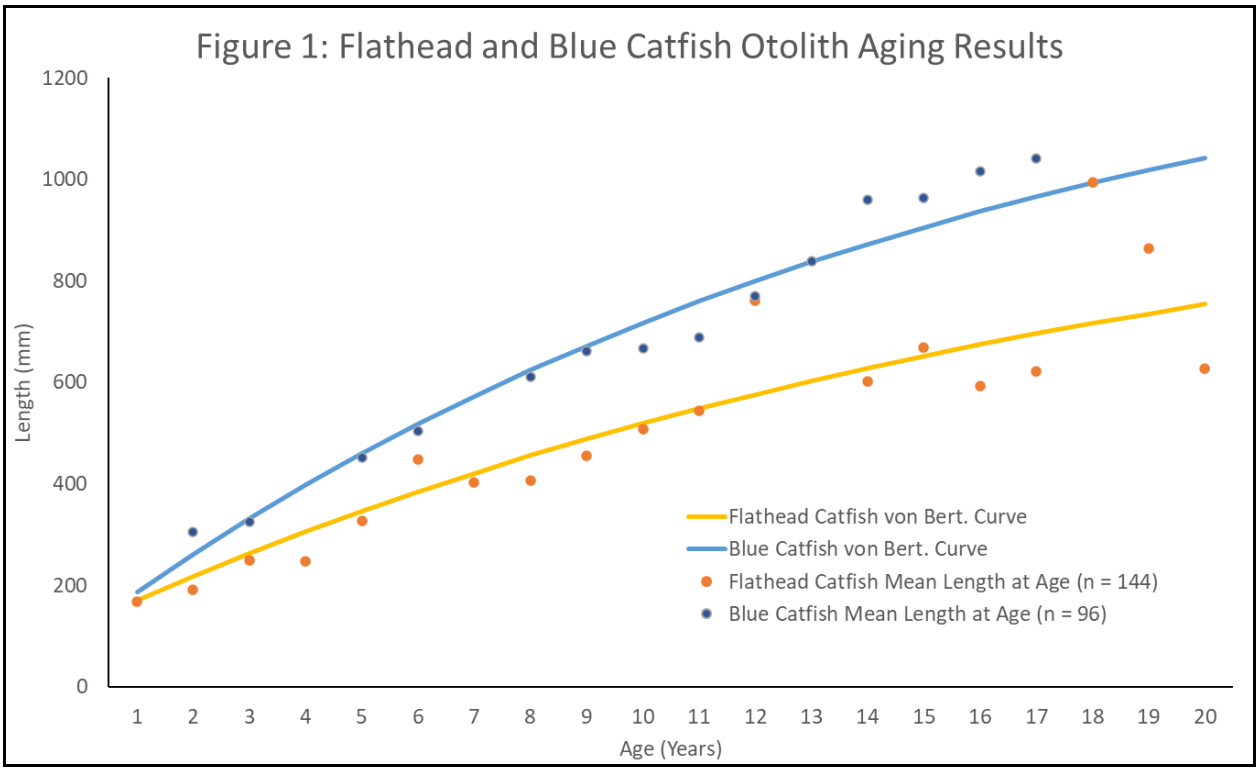
Year	Size group (mm)						Total
	<S	S	Q	P	M	T	
	<300	300-509.9	510-759.9	760-889.9	890-1139	≥1140	
2017	0.29	0.57	0.77	0.00	0.48	0.00	2.10
2018	0.37	0.73	0.49	0.24	0.00	0.00	1.83
2019	0.30	1.80	0.80	0.10	0.10	0.00	3.10
2020	1.78	0.30	0.69	0.00	0.30	0.20	3.26
Mean	0.68	0.85	0.69	0.09	0.22	0.05	2.57
95% CI	0.73	0.66	0.14	0.12	0.21	0.10	0.71

Winter trotline surveys were completed in 2020 to target Blue Catfish, owing to low catch rates during spring electrofishing and past trotline work conducted by WVDNR. Trotline surveys were conducted at the same 10 locations as spring electrofishing, with exception to tailwaters locations. Two tailwater sites were moved downstream to more conducive locations for trotlines sampling methods. Five trotlines (twenty 7/0 circle hooks hung on 0.5 m droppers, spaced 1.5 meters apart, and 30 m main line) were spaced approximately 20 m apart at each location and fished overnight. Hooks were baited with live gizzard shad with total lengths ranging from 100 to 350 mm. Trotlines were tied off to tree limbs, and lines were equipped with 3 weights and two floats, alternating every 4 hooks.

All Blue Catfish and a subset of 4 randomly selected Flathead Catfish from each transect were sacrificed during the 2019 spring electrofishing surveys for age and growth analyses. Additionally, Blue Catfish collected during 2019 trotline surveys were sacrificed to reach sample size objectives. Otoliths were mounted on a glass slide using crystal bond and sanded to reveal

annuli. Otoliths were then photographed using a Paxcam II microscope camera and aged by two independent readers.

Mean length at age and von Bertalanffy growth curves for both species are provided in Figure 1. Flathead growth is highly variable, especially among older individuals. The oldest Flathead Catfish was estimated to be 32 years old. Blue Catfish are experiencing faster growth rates than Flathead Catfish. The oldest Blue Catfish was estimated to be 21 years old, predating the initial 2004 fingerling stockings.



During trotline surveys, Blue and Flathead Catfish were surgically implanted with acoustic transmitters (Vemco V16) to assess movement. Length, sampling location, species, and sex were all taken into consideration when selecting individuals. Transmitters are custom programmed with a ping rate of 60–90 seconds and have an expected battery life of 2–3 years. Tags were surgically implanted into the coelom using an incision on the lateral surface of the fish, near the ventral edge of the ribcage. Incision size was kept to a minimum and closed with absorbable vicryl sutures. The fish were immobilized throughout the procedure, utilizing Smith Root fish handling gloves, and placed in a recovery livewell post-surgery. To date, a total of 31 Blue Catfish and 23 Flathead Catfish have been tagged with acoustic transmitters. Movement analyses of tagged fish are ongoing, utilizing an array of Vemco VR2W receivers evenly distributed throughout the pool.

Field work is finished for the project and final data analysis/report writing is on-going. Data collected will be valuable in guiding future monitoring and management of this and other riverine catfish populations in West Virginia.