SDAFS – Catfish Management Technical Committee

Arkansas

Rep: Justin Homan

Project Name: Arkansas River Catfish Sampling

Contact Information:

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

Current Status: On-going; 1 year of sampling completed

Abbreviated abstract:

As part of a two year on-going study, low frequency electrofishing 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 2019. 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 occurred in July and August 2019 and was primarily focused on targeting Blue 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. Shocking efforts were largely focused along main-channel edges (>6 m deep) and around wing dikes. In total, 74 electrofishing transects were competed and 3,357 catfish were collected. Blue Catfish dominated the species composition among all pools (Table 1). Catch rates were highest in Pools 10, 4, and 2 (Table 2; Table 3). PSD values ranged from 17 to 60 for Blue Catfish and 33 to 67 for Flathead Catfish and relative weight values indicated moderate condition among pools for both species (Table 2; Table 3). In addition to length and weight data, left pectoral spines were collected from 10 fish per 25 mm group per pool for age and growth analysis. A total of 1,859 spines were collected, 1,207 from Blue Catfish and 652 from Flathead 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 will first focus on Blue Catfish and be on-going throughout 2020. Looking forward, our second year of sampling is scheduled to begin in July of 2020. We anticipate using a similar sampling design however, a predator approach targeting optimal Flathead Catfish habitats may be necessary to achieve desired sample sizes. Additionally, a multi-gear approach using un-baited hoop nets may also be needed to obtain larger size classes of fish. 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. Catfish species composition (%) for Arkansas River pools sampled in 2019.

Pool Name	Blue Catfish	Flathead Catfish	Channel Catfish
Dumas	54.7	39.1	6.1
Pine Bluff	54.3	39.2	6.5
Little Rock	66.7	33.1	0.3
Pool 8	50.0	41.1	8.9
Dardanelle	78.7	12.7	8.6
Pooled Data	59.7	33.6	6.7

Table 2. Blue Catfish catch rates, size structure, and length-weight regression parameters for pools of the Arkansas River sampled in 2019.

Pool Name	Sites	N	CPUE	Wr	PSD	PSD-P	PSD-M	a	b
Dumas	15	428	171.01 (25.84)	89.86	59.82	7.59	0.89	-5.54	3.2
Pine Bluff	14	433	182.32 (27.26)	92.51	32.55	2.75	0	-5.35	3.12
Little Rock	15	248	98.59 (22.81)	89.18	37.72	2.4	0.6	-5.54	3.19
Pool 8	15	365	146.00 (27.82)	93.53	33.97	1.15	0	-5.34	3.12
Dardanelle	15	531	212.4 (46.12)	92.22	17.26	1.02	0	-5.26	3.07
Pooled Data	74	2005	161.78 (14.26)	91.86	36.47	2.99	0.27	-5.43	3.15

Table 3. Flathead Catfish catch rates, size structure, and length-weight regression parameters for pools of the Arkansas River sampled in 2019.

Pool Name	Sites	N	CPUE	Wr	PSD	PSD-P	PSD-M	a	b
Dumas	15	306	122.26 (22.69)	88.5	66.67	0	0	-5.15	3.06
Pine Bluff	14	313	131.79 (27.14)	93.42	30.26	2.63	0	-5.09	3.04
Little Rock	15	123	48.90 (17.15)	85.63	47.62	14.29	7.14	-5.42	3.17
Pool 8	15	300	120.00 (28.79)	89.07	33.33	1.52	1.52	-5.06	3.03
Dardanelle	15	123	49.2 (17.13)	85.34	50	7.69	0	-4.94	2.98
Pooled Data	74	1165	94.00 (10.59)	91.55	39.34	5.51	1.47	-5.14	3.06

Project Name: Black River Flathead Catfish Population Assessment

Contact Information:

Name: Allison Asher, Brett Timmons
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Objective: To assess the population of Flathead Catfish in the Black River Watershed

Current Status: fall 2018 sampling complete, summer 2019 sampling complete

Abbreviated abstract: The Black River originates in the Ozark Mountains of Missouri and transitions to a 7th order, lowland river in Arkansas. Major tributaries to the Black River are Ozark Mountain streams that transition quickly to more typical lowland systems shortly before entering the Black River. The Black River and its tributaries are open to recreational and commercial fishing. Anglers report a decline in the Flathead Catfish fishery and have concerns regarding the impacts of the legal use of commercial gear by recreational fishermen. In September 2018, 452 Flathead Catfish were captured from 63 sites on the Black River with low frequency electrofishing. Overall CPUE for the Black River was 22 fish/hr, PSD was 27, and PSD-P was 2. In addition, 7 Flathead Catfish were captured from 16 sites on the Current River, a tributary to the Black River (CPUE = 1 fish/hr). In June and July 2019, biologist sampled another tributary, Spring River, with low frequency electrofishing and hoop nets. In total, 42 Flathead Catfish were captured from 22 sites by electrofishing (CPUE = 5 fish/hr) and 12 fish were captured from 19 sites with hoop nets (CPUE = 0.2 fish/net night). This is an ongoing study and pectoral spines that were collected for aging are currently being processed.

Florida

Rep: Andy Strickland

Indicated no informations to report.

Georgia

Rep: Jim Page

Project Name: 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 annual survival, biomass, condition, relative abundance, size structure, and age structure of flathead catfish in the Satilla River, Georgia

Current Status: Document year to year findings in reports and publications

Abbreviated abstract:

Recent modeling indicates that increased exploitation on the flathead catfish (*Pylodictis olivaris)* can be an avenue for native species recovery. Flatheads were illegally introduced into the Satilla River in the mid 1990's, resulting in negative impacts on native fishes. In an effort to aid in the restoration of native fishes, the Georgia Department of Natural Resources (GA DNR) initiated an intensive electrofishing removal effort in 2007. From 2007 to 2019, 78,805 flatheads (6,315 in 2019) totaling 70,896 kg (6,098 kg in 2019) were removed from roughly a 150-km stretch of the Satilla River. Size structure has changed substantially from containing many large individuals ($\geq$510mm TL) in 2007 to mainly small fish ($\leq$345 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 36.3 kg/hr in 2019. The average weight of removed fish ranged from 2.6kg in 2007 to 0.4kg in 2013, equaling 0.9kg in 2019. 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., greater than 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 to maintain low biomass levels. Though fishing success by anglers varies, a new river record redbreast was caught by an angler in 2015 in the Satilla, and fishermen reported catching some large "Rooster Reds" in each of the last 4 years.

While most removal efforts in the Satilla have focused on flatheads, the discovery of blue catfish (*Ictalurus furcatus*), a second non-native, in 2011 led to GA DNR staff to include this species in its removal efforts. After removing 7 blue catfish during the 2011 season, 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 likely occurring. In 2017, a total of 397 blue catfish were caught, including 3 notable modes in the length frequency at 10, 20 & 36 cm groups. Also, a 648 mm individual was also collected. As feared, notable increases in recruitment is occurring and multiple cohorts of blue catfish are now present. Low numbers of blue catfish were seen in 2018 (n=58), likely due to high water impacting sampling and not actually reflective of a population decline. In 2019, a total of 663 blue catfish were caught.

Project Name: Altamaha River Standardized Sampling

Contact Information:

Name: Don Harrison
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Phone: 912-285-6483

Objective: Continue to monitor and manage the Altamaha River catfish composition

Current Status: On-going

Abbreviated abstract: The Altamaha River catfish population is dominated by 2 non-native species, the Blue Catfish and the Flathead Catfish. Standardized sampling efforts for 2019 resulted in a CPUE of 99.2 fish/hr for flathead catfish, which is down slightly from 104.6 fish/hr in 2018. The Altamaha River flathead catfish also had an average weight of 2.01 kg (4.4 lbs) which is up from 1.6 kg (3.5 lbs.) in 2018. The second most abundant species was blue catfish and the 2019 CPUE was 73.2 fish/hr, which is significantly up from 54.9 fish/ hr in 2018. The average weight of blue catfish from the Altamaha was 1.3 kg (2.8lbs) in 2019 which is down from 1.8 kg (4.0 lbs) in 2018. Channel catfish catch rate decreased from 14.4 fish/hr compared to a rate of 36.7 fish/hr in 2018. Catch rates of white catfish in 2019 increased slightly from 3.2 fish/hr CPUE, as compared to 2.7 fish/hr in 2018.

Project Name: Angler Lands Large Flathead Catfish

Contact Information:

Name: Tim Bonvechio
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Phone: 912-285-6484

Objective: Document the occurrence of a 80-pound flathead catfish caught on a limbline in the Satilla River on January 11, 2020.

Abbreviated abstract: Kyle Higginbotham of Hillard, Florida caught a 80-pound flathead catfish (*Pylodictis olivaris)* on January 11, 2020 in the Satilla River near Folkston, Georgia. The fish would have come close to tying the existing state record except the fish was caught on a jug and not sport fishing tackle as required by official rules. Bush hooks, trot lines, jugs, baskets, nets, etc. are not considered sporting tackle in Georgia. The fish was 51 inches long (1,295 mm TL) and the head was almost 12 inches wide!

What makes the story even more interesting is the little red tag (#1052) that Kyle noticed that this flathead still had in its back. This flathead was originally tagged with a Hallprint dart tag by the WRD Satilla River Flathead removal team as a 27 inch- 8lb fish on April 27, 2011. So, it went from 8 lbs in 2011 to 80lb in 2020. So, in 8.75 years, it gained 72lbs! That's an average of around 8lbs per year growth!

Unusually fast growth in invasive flathead catfish found in southeast Georgia rivers is not uncommon. One of the two, current State Record rod and reel 83lb flathead catfish caught by Jim Divieney on July 22, 2006 on the Altamaha River was aged at 12 years old, which is almost 7lbs of growth per year.

GO FISH GEORGIA!

Project Name: Ocmulgee River Standardized Sampling

Contact Information:

Name: Tim Bonvechio
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Objective: Continue to monitor and manage the Ocmulgee River catfish composition

Current Status: On-going

Abbreviated abstract: The Ocmulgee River catfish population is dominated by the flathead catfish, but the Blue Catfish and Channel Catfish also are found in decent numbers. When water levels permit, standardized sampling efforts are conducted on this river every other year. For 2019 the flathead catfish catch rate resulted in a CPUE of 58.6 fish/hr for flathead catfish, which is down slightly from 56.8 fish/hr in 2017. The Ocmulgee River flathead catfish also had an average weight of 1.31 kg (2.88 lbs) which is up from 0.85 kg (1.87 lbs.) in 2017. The second most abundant species was blue catfish and the 2019 CPUE was 18.4 fish/hr, which is significantly up from 2.3 fish/ hr in

2017. The average weight of blue catfish from the Ocmulgee was 1.78 kg (3.94 lbs) in 2019 which is nearly identical to the 1.77 kg (4.0 lbs) found in 2017. Channel catfish catch rate decreased slightly from 17.4 fish/hr in 2019 compared to a rate of 17.9 fish/hr in 2017.

Project Name: First Record of Blue Catfish in Flint River Standardized Sampling

Contact Information:

Name: Jim Page
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Phone: 912-285-6485

Objective: Continue to monitor and manage the Flint River catfish composition

Current Status: On-going

Abbreviated abstract: Standardized sampling for catfish in the Flint River continues to be done annually. Though the river has been sampled annually for many years, scientists had not recorded blue catfish in the river, until now. During the 2019 sampling season, staff conducted 8 hours of sampling in the Flint River, observing the first records of blue catfish in the river, resulting in a CPUE of 3.8 fish/hour. The largest blue catfish observed in the Flint River samples was 1,010mm and weighed 14,742g! As such, staff will continue to monitor the occurrence of this species in future samples. Staff also continued to monitor the catfish population in the Chattahoochee River. In that system, staff conducted 6 hours of sampling and found blue catfish CPUEs to be 20.3 fish/hr, while flathead catfish CPUEs were 113.5 fish/hr.

Kentucky

Rep: Jay Herrala

Project Name: Monitoring Catfish Populations in Fishing in Neighborhoods Program Impoundments

Contact Information:

Name: Dane Balsman
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Objective: To determine the relative abundance and size structure of channel and channel/blue catfish hybrids in put-and-take urban lakes.

Current Status: Ongoing

Abbreviated abstract:

The Fishing in Neighborhoods (FINs) program currently has 44 lakes that receive 123,000 catfish annually. Catfish stocked for the FINs program average 1-pound and are stocked up to four times annually at up to 200 fish/acre per stocking. Current creel limits allow for a daily harvest of 4 catfish per angler. To ensure proper stocking rates, exploitation tagging studies and creel surveys have been conducted in recent years at select lakes. Additionally, tandem hoop nets are used to monitor catfish standing stocks in the fall to ensure a healthy fishery, while also maintaining high angler catch rates. Pfeiffer Hatchery, our state fish hatchery that produces catfish for the FINs program began raising hybrid catfish (blue x channel) in addition to channel catfish for the FINs program due to feed conversion rates and disease resistance with the hybrid catfish. We noted that our tandem hoop net catch rates for catfish began to decrease several years ago. Concerns were raised over the consistency of the formula of the cheese logs from Boatcycle, as well as the effectiveness of sampling hybrid catfish with tandem hoop nets, as no studies have been conducted to determine the efficacy. Zote Soap and the newly formulated cheese logs from Boatcycle were used at 16 lakes in 2016 in intra and inter lake comparisons to sample catfish with tandem hoop nets. The Zote Soap captured an average 25.9 fish per set compared to 15.7 fish per set with the cheese logs. The same

intra and inter lake comparisons were used to sample catfish at 11 lakes in 2017. However, in 2017 we used a cheese log bait called "power bait" from the Fish Net Company. The "power bait" caught 102.5 fish per set compared to 20.7 fish per set with the Zote Soap. In 2018, we again used the cheese logs from the Fish Net Company. The nets baited with Fish Net Company cheese logs caught 69.2 fish per set compared to 55.4 fish per set with the Zote Soap at 12 lakes sampled. In 2019, 18 lakes were sampled with tandem hoop nets. Sets baited with Zote soap averaged 41.1 fish per set, compared to 31.6 fish per set in nets baited with cheese logs from the Fish Net Company. We have decided to use Zote Soap at the standardized bait at FINs lakes for sampling catfish going forward. The cost and availability of Zote soap make it an acceptable bait for sampling both channel and hybrid catfish.

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

Contact Information:

Name: Jay Herrala
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Phone: (502) 892 – 4468

Objectives:

1. Determine abundance (CPUE), size structure, and condition of blue, channel, and flathead catfish in the Ohio River, and evaluate the effects of new regulations on blue, channel, and flathead catfish in the Ohio River, particularly trophy-size catfish.
2. Quantify age, growth, and mortality of the three species in each reach, and compare to previous data to determine if any changes have occurred over time.

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 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—Trotline methods were altered in 2018 with a larger focus on sampling more fish and more trophy blue catfish. Fresh cut bait of various rough fish species were gathered each week. Catch per unit effort (CPUE) of blue catfish increased from 2018. Blue catfish CPUE (5.9 fish/line) in 2019 was higher than the historical average (2.9 fish/line). Trophy blue catfish were captured in all pools sampled during trotline sampling, and CPUE of trophy catfish was 0.6 fish/line.

KDFWR hoop netting—Baited hoop net catch rates of channel catfish have increased in recent years with excellent size structure and trophy-sized fish being occasionally caught during KDFWR sampling. Channel catfish CPUE was 4.5 fish/net-night. Unbaited 4.0 ft nets proved to be effective for catching flathead catfish. CPUE of flathead catfish was 1.8 fish/net-night which was higher than the historical average from previous commercial ride-alongs (1.3 fish/net-night). Trophy flathead catfish were captured in all pools sampled.

Electrofishing—Electrofishing conducted by KDFWR yielded good catch rates of blue catfish (CPUE=22.2 fish/hr) and flathead catfish (CPUE=40.2 fish/hr) in 2019. These were decreases from 2019 (likely due to poor sampling conditions), but both still above average. Trophy blue catfish and flathead catfish were captured in all pools that received complete samples.

Louisiana

Rep: Brian Heimann

Indicated no information to report.

Mississippi

Rep: Samantha Bergeron

Project Name: Flathead Catfish Introduction to Elvis Presley Lake

Contact Information:

Name: Dustin Rodgers, Stanley Sullivan
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Objective: To create a Flathead Catfish fishery in a small impoundment

Current Status: Unable to survey in 2019, 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.

Missouri

Rep: Joe McMullen

Project Name: 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.

Information Link: https://mdc.mo.gov/conmag/2018-02/nature-lab

Contact Information:

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Phone:

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: Ongoing

Abbreviated Abstract: Missouri Department of Conservation staff completed two years of sampling and tagging for blue and flathead catfish to estimate exploitation of these species on the Missouri and Mississippi rivers. Fish were tagged with $25 and $150 reward tags, and pectoral spines were taken for aging. Pectoral spines and otoliths were collected from a sub-sample of commercially harvested fish for comparison. Blue catfish annual exploitation on the Missouri River is 12.7% while on the Mississippi River exploitation is 10%. Preliminary estimates of annual exploitation for flathead catfish on the Missouri River is 11% and for the Mississippi River is 11%. A final report for blue catfish was completed in 2019; a final report for flathead catfish will be completed in 2020. Presentations at Catfish 2020 will include:

- Size-Specific Exploitation of Blue Catfish and Flathead Catfish by Recreational and Commercial Fishers in the Missouri and Mississippi River, Missouri
- Comparison of Blue Catfish and Flathead Catfish Age Estimates Derived from Pectoral Spines and Lapilli Otoliths

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Project Name: Hatchery Program

Literature Available: *2019 Warmwater Hatcheries Annual Report*

Contact Information:

Name: James Civiello
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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 172,000 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 2019, a fleet of 15 stocking trucks were used to stock over 300 public lakes, over a 4-day period. Hatchery production of blue

catfish at Hunnewell hatchery produced 23,000 fry for Iowa, 51,000 fry for Nebraska, 6,700 <8” for Kansas and 3,800 8-10” for eight Missouri lakes.

(left) Jar incubation of Bluecatfish eggs; (top right) Photo taken at drawdown to show how the pens were configured. Water depth was maintained with approximately eight inches of freeboard throughout spawning effort; (bottom right) Checking for blue catfish eggs.

Project Name or Description: Commercial Fishing Program

Literature Available: *Missouri Commercial Fish Harvest 2018*

Contact Information:

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Phone: 314-577-9555 x76048

Objectives: Document and summarize Missouri’s commercial fish harvest for 2018 and annual harvest trends since 1945.

Status: Complete

Abbreviated Abstract: Blue catfish accounted for the largest proportion (75%) of the total catfish harvest and decreased slightly from 75,890 lbs. in 2017 to 75,083 lbs. in 2018. Harvest was focused on the lower Mississippi River near the Missouri-Arkansas border and the middle Mississippi River near St. Louis, MO. Flathead catfish accounted for 20% of the total catfish harvest, decreasing slightly from 22,830 lbs. in 2017 to 19,638 lbs. in 2018 (the lowest recorded harvest since 1966). Harvest was highest on the upper Mississippi River - Pools 25 and 20. Channel catfish accounted for 5% of the total catfish harvest, decreasing from 9,277 lbs. in 2017 to 4,791 lbs. in 2018 (the lowest harvest ever recorded)

Pounds of commercially harvested catfish, by river and for all rivers combined, and estimated, live-weight, wholesale value, during 2018.

Species/ Species Group	Mississippi River	Missouri River	St. Francis River	Total	Live-Weight, Wholesale Value
Blue Catfish	75,042	Prohibited	41	**75,083**	**$43,548.14**
Flathead Catfish	18,959	Prohibited	679	**19,638**	**$10,604.52**
Channel Catfish	4,213	Prohibited	578	**4,791**	**$2,682.96**
Bullheads	100	0	4	**104**	**$86.32**
Total	**98,314**	**0**	**1,302**	**99,616**	**$56,921.94**

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) https://mospace.umsystem.edu/xmlui/handle/10355/67621

Contact Information:

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Objectives:

1.) Determine the effective conductivity of live Smallmouth Bass, Blue Catfish and Flathead Catfish based on the behavioral response to electrofishing.
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 is a 5-year (2015-2020) project with the first of two graduate students (Zach Morris) completing work on Objectives 1 and 2 and defended his M.S. thesis in late 2018. The second graduate student (Mike Thomas) conducted field work in 2018-2019 to address Objective 3 and will be defending his M.S. thesis in May 2020.

Abbreviated Abstract: Electrofishing is commonly used to sample Blue Catfish and Flathead Catfish, but catch rates are highly variable and there is a need to refine standard sampling methods for these species. We performed laboratory and field experiments to determine how species, fish size, waveform, and power settings affect electrofishing catchability. Laboratory trials recommended two waveforms (i.e., 15 Hz 30% Duty Cycle [dc] and 8 Hz 10% Duty Cycle [dc]) and species-specific power goals based on effective conductivity values. We sought to validate this research using known numbers (n=389 Blue Catfish; n=260 Flathead Catfish) and sizes (i.e., stock-preferred, preferred and larger) of catfish in ½ acre experimental ponds (n=13). We utilized UAV footage to determine the number of fish that surfaced for greater than three seconds (i.e., available for capture). We conducted 105 field trials and used zero inflated negative binomial regression to evaluate factors influencing electrofishing catchability. For both species, water temperature ($\beta = -0.06$, $p < 0.05$) and 35% reduced power settings ($\beta = -0.44$, $p < 0.05$) decreased catchability. For Blue Catfish, the 15 Hz 30 dc waveform ($\beta = 1.13$, $p < 0.05$) showed higher catchability (M=6.8, SD=11.5) than 8 Hz 10 dc waveform (M=0.8, SD=0.3). For Flathead Catfish, relative weight ($\beta = 0.08$, $p < 0.05$) increased catchability. Catfish managers may find our study methods useful for future research involving electrofishing and our results may assist in the development of standard electrofishing protocols for these species.

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

Contact Information:

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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: Blue catfish provide a popular sport fishery in Mark Twain Lake but little is known about the population or angler exploitation. We sampled Blue Catfish using jug lines baited with pieces of Gizzard Shad *Dorosoma cepedianum*, the gear used by most anglers in this reservoir. Blue Catfish grew slowly, reaching a preferred size (762 mm total length, TL) in about 12 years. Annual mortality was estimated at 24.8% using a weighted catch curve. Using reward tags, we estimated exploitation to be between 8% and 12%, and modeled the effects of a 508-mm, 610-mm, and 660-mm minimum TL limit on yield and size structure of the Blue Catfish population relative to a baseline of 381 mm TL, the smallest fish usually harvested by anglers. All three length limits increased the proportion of larger fish (>762 mm TL) in the population without reducing yield, except for slight decreases (6 and 10%) for the 610-mm and 660-mm limit at the highest modeled natural mortality rate. We recommended a 610-mm limit instead of the 660-mm limit because it allowed more harvest and higher yields with increases in natural mortality, and still doubled the proportion of larger fish relative to the 508-mm limit.

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

Contact Information:

Name: Paul Michaletz
Email: paul.michaletz@mdc.mo.gov
Phone: 573-815-7901 x2921

Objective: To determine if stockings of hybrid striped bass and flathead catfish can improve growth rates and size structure of bluegill and crappie populations in small impoundments containing common carp and gizzard shad.

Status: Fieldwork for the study is completed and a final report is being prepared.

Abbreviated Abstract: Hybrid striped bass and flathead catfish were stocked in four small impoundments in an effort to reduce gizzard shad and common carp abundance. Hybrid striped bass were also stocked in another five impoundments. Small fingerling (50 mm total length, TL) hybrid striped bass have been stocked annually at 250 fish/ha since 2014 and flathead catfish (200-380 mm TL) were stocked at 40 fish/ha in 2014 and 2015. The nine treatment lakes were each paired with a reference lake where no predator stockings have occurred. The goal of these predator stockings is to improve growth and size structure of panfish populations. There have been some slight improvements in bluegill growth in most of the treatment lakes.

Project Name: Evaluation of a Minimum Length Limit on Channel Catfish in Impoundments in Southeastern Missouri

Contact Information:

Name: Paul Michaletz
Co-Authors: Mike Reed, Paul Cieslewicz, Dave Knuth, Salvador Mondragon
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Phone: 573-815-7901 x2921

Objective: To determine if the implementation of a 16-inch minimum length limit on channel catfish in five southeastern Missouri impoundments will improve the abundance and size structure of these populations.

Status: Sampling began in 2013 and will continue into 2020.

Abbreviated Abstract: A 16-inch minimum total length limit was imposed on channel catfish sport fisheries in five small impoundments in southeastern Missouri. Four additional impoundments are being used as reference impoundments where there is no length limit. Channel catfish populations are maintained by annual stockings of mostly 8 inch and longer fish. Overharvest appeared to be causing low abundance and poor size structure in these impoundments and the goal of the length limit is to improve abundance and size structure of channel catfish. Both treatment and references lakes are being sampled annually with tandem hoop net sets. The length limit regulation began on March 1, 2017. It appears that growth of channel catfish is very slow in some of these impoundments and stocking rates may have to be reduced for the length limit to be successful.

North Carolina

Rep: Ben Ricks

Project Name: 2019 Catfish Management Plan

Contact Information:

Name: Ben Ricks, NC Catfish Committee members
Email: ben.ricks@ncwildlife.org
Phone: 252-229-0170

Objective: Develop a steering document for catfish management in North Carolina

Current Status: Approved

Abbreviated abstract:

This management plan reviews catfish occurrence, biology, and regulations in North Carolina as well as current research on catfish. The primary goals for the plan are to support science-based management, protect and enhance native catfish, develop and implement management strategies for invasive catfish, and establish relationships and understand desires of constituents. Recommendations were made in this plan to establish population management zones and units, conduct additional research and surveys, protect native catfish of North Carolina, and emphasize the prevention of invasive catfish introductions.

The plan can be found at https://www.ncwildlife.org/Portals/0/Fishing/documents/2019FishingDocuments/NC-Catfish-Management-Plan.pdf

This plan has led to the following new regulation proposals for catfish in North Carolina (Not yet approved):

1) Designate Black Bullhead, Brown Bullhead, Flat Bullhead, Snail Bullhead, White Catfish, and Yellow Bullhead as Inland Game Fish when found in Inland Fishing Waters.
2) Establish a general statewide regulation for Black Bullhead, Brown Bullhead, Flat Bullhead, Snail Bullhead, White Catfish, and Yellow Bullhead by implementing a 10-fish daily creel limit in combination.
3) Increase the daily creel limit for Channel Catfish from six to seven fish in waters stocked and managed for catfish and located on game lands, on Commission-owned property, or on property of a cooperator, including waters within the Community Fishing Program. The daily creel will no longer apply to White or Blue catfish.
4) Add Blue Catfish to the list of species for which no permit shall be issued to stock into inland fishing waters.
5) Prohibit the harvest and possession of Margined Madtom and Tadpole Madtom in Inland fishing waters.

Project Name: Conservation of the Broadtail Madtom

Contact Information:

Name: Brena K. Jones
Co-Authors: Katharine L. DeVilbiss
Email: brena.jones@ncwildlife.org
Phone: 919-707-0369

Objective: Determine current population status and distribution of Broadtail Madtom (*Noturus* sp.), as well as locate individuals with potential for broodstock for captive propagation efforts

Current Status: Project is ongoing

Abbreviated abstract: Aquatic Wildlife Diversity Program staff conducted surveys for the Broadtail Madtom (State Special Concern), a rare, undescribed native catfish, to provide data to inform management decisions and aid species description (in process). Endemic to a handful of coastal plain basins in the Carolinas, less than a dozen of these hard-to-collect fish have been captured in surveys between 2008 and 2016. In October and November 2019, 55 sites were visited totaling 78 person-hours in Lake Waccamaw, the Lumber River and tributary creeks of the Lumber basin, and the South and Black Rivers of the Cape Fear basin. A total of nine Broadtail Madtoms were located at four sites, from the Lumber River and its tributary, Shoe Heel Creek. Sampling effort averaged 32 kick-seines per site, with an average catch per unit effort of 0.11 individuals per person-hour. No Broadtail Madtoms were collected from Lake Waccamaw or the Cape Fear basin during these targeted surveys. However, two individuals were collected by a university student group in Lake Waccamaw in October of 2019, representing the first successful capture in the lake since 2002. Twenty artificial cover structures, informally named "madtom motels", were deployed at three occupied sites in the Lumber basin. Staff will periodically check the structures for occupancy and deploy additional units across multiple localities during 2020.

Oklahoma

Rep: Jeremy Duck

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

Contact Information:

Name: Graham Montague, Dan Shoup; Oklahoma State University, Department of Natural Resource Ecology & Management
Email: gmontag@okstate.edu, dshoup@okstate.edu
Phone: 405-744-9671

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 tagged Flathead Catfish in Lake Carl Blackwell (n=563) and Lake McMurtry (n=485) with numbered modified Carlin Dangler tags. Preliminary results from sampling these marked populations suggest that Flathead Catfish catch rates begin to decrease when the water temperature is <21^{o}C, and Flathead Catfish > 500 mm TL are captured in lower frequency than their actual abundance. We plan to continue our mark-recapture study throughout September 2020 to compare the catch rates over a range of temperatures.

Project name: 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 various 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 (Jager 2015). 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 (but see Lemmons and Schnell 1994; Kuklinski and Patterson 2013). Beginning in 2016, the Oklahoma Department of Wildlife Conservation (ODWC) Streams Program instituted a catfish monitoring effort for Blue Catfish and Flathead Catfish. Ten rivers have been initially selected for catfish sampling to generate population dynamics data throughout the state.

Progress to date:

- Six rivers (Poteau, Washita, Verdigris, Deep Fork, Kiamichi, and Spring) have been surveyed, and 1,152 Blue Catfish and 344 Flathead Catfish have been sampled to date.
- Max size, max age, fecundity, sex ratios, catch-per-unit effort, proportional size distributions, von Bertalanffy growth curves, and annual mortality rates have been estimated for the rivers surveyed.

Project Name or Description: Evaluating the effectiveness of a statewide trophy length limit (762 mm) for Blue Catfish (*Ictalurus furcatus*) in Oklahoma

Contact Information:

Name: Jeremy L. Duck - Oklahoma Department of Wildlife Conservation, Ponca City Office, 417 S. Silverdale Lane, Ponca City, Oklahoma 74604, USA; 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
Email: jeremiah.duck@odwc.ok.gov
Phone: (580) 762-2248

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: Ongoing

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 762 mm minimum length regulation for Blue Catfish to redirect angler harvest towards smaller fish, control harvest of large fish, and improve the overall size structure of these populations. The impetus for this study is to evaluate 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, 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 date, it appears the regulation change has been ineffective at meeting its stated goals, at least on a state-wide basis. Progress to date:

Kaw Lake was sampled in August of 2017; 741 Blue catfish were sampled; Otoliths were pulled from 438 blue catfish for aging in 2018; Grand, Hudson, Keystone, Oologah, Ellsworth, Waurika, and Eufaula were sampled in summer of 2018; Otoliths were pulled from Eufaula, Ellsworth, Waurika for aging; Otoliths for Kaw, Ellsworth, and Waurika where aged-2019; Results have been analyzed; Final report writing is underway

Texas

Rep: Kris Bodine

Project Name or Description: Revised Catfish Regulations in Texas

Contact Information:

Name: John Tibbs**,** Numerous (TPWD Catfish Committee)
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 state wide

Current Status: Ongoing; a new suite of regulations has been proposed and reviewed by TPWD staff. We are now working to get anglers feedback/input before finalizing and submitting to our commission.

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, the TPWD has proposed a new suite of regulations for the entire state. Regulations are currently being presented to anglers for 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.

2) Channel, blue, their hybrids & subspecies. Minimum length limit: 14 inches. Daily Bag = 15 in any combination.

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.

4) **Proposed for Texoma:** 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).

Retained regulations (one interjurisdictional, one trophy)

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).

6) For Blue and Channel Catfish, no MLL and daily bag limit = 25. In the 25-fish bag, no more than 7 fish 20" or greater may be retained, and no more than 2 of those fish may be 30" or more in length. (Tawakoni).

Project Name: Relative Catchability of Channel Catfish and Blue x Channel Hybrid Catfish by Anglers in Put-And-Take Urban Fisheries

Contact Information:

Name: Thomas Hungerford**,** Kristopher A. Bodine, Randy Myers, John Tibbs, David Prangnell, Dan Daugherty
Email: Thomas.Hungerford@tpwd.texas.gov
Phone: 817-732-0761

Objective: 1) Compare post-stocking (i.e., 1 to 14 days) catchability of channel catfish and blue catfish x channel catfish hybrids via angling.

Current Status: Manuscript to be published in Catfish 2020

Abbreviated Abstract: Texas' Neighborhood Fishin' Program (NFP) provides close-to-home angling opportunities within 10 major metropolitan areas in efforts to increase angling participation among urban constituents. Waterbodies (0.4 to 2.4 ha) are typically stocked with harvestable (≈ 305-mm total length) Channel Catfish *Ictulurus punctatus* (CCF) to provided high-catch, successful fishing experiences. However, to reduce program cost, fish producers have been increasingly rearing and stocking lower-maintenance, faster-growing Channel Catfish x Blue Catfish *I. furcatus* hybrids. Although recent research in put-grow-and-take fisheries suggested no differences in catchability, anglers in put-and-take fisheries have reported lower catch rates of hybrids. Thus, we evaluated relative catchability between the two species by stocking 50% CCF and 50% hybrids in four NFP waterbodies on nine occasions during 2018. Channel Catfish and hybrids in each stocking were uniquely marked and the percent of each species harvested was measured during five systematic creel surveys across the two-week period immediately following each stocking. We observed significantly more CCF (about five times more CCF) in the first creel conducted following each stocking, but no differences in harvest between species were observed in any subsequent creel events during the two-week period. However, harvest of CCF declined precipitously across the two-week creel period, and when testing for interaction, CCF harvest during the first creel following stockings was significantly higher than harvest of either species during the final two creels. Our results suggest that CCF may be more readily accessible to anglers immediately following stocking and may also be more catchable than hybrids within 24 h of stocking. Choice of which species to stock should be dependent on relevant fishery objectives. Although CCF will likely produce higher catch rates, stocking a mixture of the two species may provide a longer-term fishery that still produces catch rates high enough to maintain or enhance satisfaction overall.

Project Name: Blue and channel catfish growth, mortality, and size specific exploitation rates in Texas reservoirs.

Contact Information:

Name: Lynn Wright, Michael Homer, Greg Binion, Evan Cartabiano
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Phone: 325-651-5556

Objective: 1) Estimate instantaneous mortality and growth rates for Blue and Channel Catfish populations, 2) Estimate size specific exploitation on reservoirs with available catfish harvest data, 3) Estimate length and age at maturity for Blue Catfish and Channel Catfish, 4) Estimate size selectivity of TPWD experimental gill nets for Blue Catfish and Channel Catfish

Current Status: Proposal in review, field work expected to begin in spring 2020.

Abbreviated Abstract: As part of the work done by the TPWD catfish regulation committee, it has been identified that we lack estimates on Blue and Channel Catfish dynamic rate functions in Texas, specifically growth and mortality estimates. This project would provide a significant number of needed growth and mortality estimates and help fill a vital data gap, which would allow us to make more informed decisions regarding appropriate catfish regulations. Additionally, size-specific exploitation can be indirectly estimated when creel data is paired with other

population level data. Understanding how or if catfish exploitation changes by length would be vitally important when developing length based harvest regulations. The current suite of scientific literature has a wide range of estimates for length and age at maturity for catfish, with no Texas specific estimates available. Understanding age and size at sexual maturity would be valuable in the consideration of setting length limits and could help inform population modelling. Finally, evaluating size bias in our experimental gill nets would benefit biologist statewide by providing a size-bias correction that can be used to improve the quality of our data.

Project Name: Customer segmentation of catfish anglers using a survey of state preferences to guide management decisions and ensure optimal customer service

Contact Information:

Name: J. Warren Schlechte, John B. Taylor, David L. Buckmeier
Email: Warren.Schlechte@tpwd.texas.gov
Phone: 830-866-3356 x 214

Objective: To marry customer segmentation with stated preferences of catfish anglers to understand how to manage and market at a localized scale.

Current Status: Draft manuscript in preparation; plan to submit to Catfish 2020.

Abbreviated Abstract: To assist the Texas Parks and Wildlife Department in developing a statewide catfish management plan, Mississippi State University surveyed 1,078 freshwater catfish anglers to examine their catch-related attitudes and trip preferences using a stated choice experiment. Initial analyses assigned anglers to five groups based on their catch-related attitudes scores. We then used ESRI's Business Analyst tool to perform customer segmentations for these clusters. Tapestries for the different clusters were analyzed using various multidimensional techniques to aid us in understanding similarities and differences among the clusters. We were able to document similarities and differences between the various groups of catfish anglers. Using this information, we were then able to produce maps that show where these various clusters reside. Understanding how our customers differ will allow us to market fishing opportunities in various parts of the state more effectively.

Project Name: Re-evaluation of a Flathead Catfish Population that has been Subjected to Hand Fishing.

Contact Information:

Name: Kris Bodine
Coauthors: Richard Ott, Jake Norman, Warren Schlechte
Email: kris.bodine@tpwd.texas.gov
Phone: 830-866-3356

Objectives: 1) Quantify relative abundance and size structure of Flathead Catfish in Lake Palestine, TX, 2) Determine is population characteristics have changed since the previous evaluation four years prior.

Current Status: Sampling will begin in April, 2018

Abbreviated Abstract: The recent legalization of hand fishing in Texas prompted the Texas Parks and Wildlife Department to evaluate potential impacts on population characteristics and dynamic rates of Flathead Catfish in Lake Palestine, Texas. Their results indicated that impacts by hand fishers would be minimal and the current regulation was sufficient to maintain the population. Despite these findings, concerns of potential overharvest remained. In response to concerns, we conducted a follow-up evaluation in April, 2018 to determine if population characteristics such as relative abundance, size-related metrics, or recruitment had changed since the previous evaluation in 2014. Sampling was conducted with low-frequency electrofishing, following similar procedures used in the previous study. We found no significant changes in any metric examined. Total catch rates and catch rates of trophy-sized fish were not significantly different, length-frequency distributions appeared to be similar, no differences were observed in mean total length or any proportional size distribution measurement, and recruitment patterns were similar. These findings suggest the addition of hand fishing has had no measurable effect on the Flathead Catfish recruitment, abundance, or size-related metrics in Lake Palestine, Texas since hand fishing was legalized.

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

Contact Information:

Name: John Tibbs
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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. Pre-regulation samples have been collected and analyzed. Post-regulation samples are in progress and will continue through spring 2020.

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.

Project Name: Effective Catfish Harvest Regulations for Achieving Fishery Objectives

Contact Information:

Name: Nate Smith
Coauthors: Kris Bodine, Warren Schlechte, Dan Shoup
Email: kris.bodine@tpwd.texas.gov
Phone: 830-866-3356

Objectives: 1) Determine appropriate regulations for achieving various fishery objectives.

Current Status: Manuscript to be published in Catfish 2020.

Abbreviated Abstract: Recently the Texas Parks and Wildlife Department developed and implemented a statewide catfish management plan. To further inform the catfish management plan, we modeled a subset of catfish regulations (14 regulations) commonly used in Texas to identify conditions when each regulation will effectively accomplish management goals. We assessed the effectiveness of Blue Catfish (*Ictalurus furcatus*) regulations using an age-structured dynamic pool model. The model was parameterized using an extensive literature review and available data from across the United States. Blue Catfish populations were simulated under various harvest conditions over a 100-year chronology, and results were reported as the mean of 1,000 simulations. Rather than directly varying exploitation, we varied length and bag limits, the factors we can control. Our outputs were relative population size, harvest, yield, and percentage of trophy-sized fish (>762 mm). We compared the current regulations to a relaxed slot limit option that allowed unlimited harvest below and above the slot and 2, 5, or 10 fish within the slot. Our modeling results indicated that, based on current angling in Texas, the existing regulations have little impact on Blue Catfish populations or harvest. On the lower end, because anglers prefer larger fish, we conclude the statewide minimum length limit of 305 mm has little effect on harvest. On the trophy end of the spectrum, limiting harvest of fish over 762 mm has limited utility because relatively few fish reach this size. In contrast, we saw that implementation of a 508 mm to 762 mm relaxed slot limit, with 2 fish in slot nearly doubled the trophy potential. Our results suggest that most of Texas’ current catfish fisheries could be managed with a relaxed slot with a variable number of fish allowed within the slot.

Project Name: A Self-Sufficient Channel Catfish Fishery by Introducing Spawning Habitat

Contact Information:

Name: Evan Cartabiano
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Phone: 903-590-0312

Objective: Create self-sufficient Channel Catfish fishery by introducing spawning habitat.

Current Status: Ongoing. Further sampling will be conducted to determine if recruitment to the sampling gear is occurring.

Abbreviated Abstract: Channel Catfish (CCF) are a popular sport fish with anglers across the United States, and there is considerable effort devoted to their management. In many small waterbodies, spawning habitat is limited, thereby limited reproduction and recruitment. Thus, many fisheries are dependent on stocking hatchery-raised fish. Mill Creek Reservoir is a 237-acre impoundment located in Van Zandt County, Texas, that historically has been dependent on stockings to maintain CCF stocks due to lack of spawning habitat. To address the lack to suitable habitat, artificial spawning habitat (nest boxes) were deployed. To determine if nest boxes were being used, a visual inspection was completed once a week during the spawning season. Visual inspections confirmed the CCF spawning taking place in the boxes. Further evaluation is ongoing to determine if CCF are successfully recruiting to fishery.

Project Name or Description: Determining the Limiting Factor for Establishing a Channel Catfish Fishery at Lake Raven, Texas

Contact Information:

Name: Carl Vignali
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Phone: 979-272-1430

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

Current Status: Completed second year of the study with natural reproduction observed both years. Population and year-class surveys will begin in spring 2020 and continue to determine recruitment into Channel Catfish population.

Abbreviated Abstract: Lake Raven in Huntsville State Park is an aging reservoir with high levels of siltation and little habitat appropriate for Channel Catfish spawning. Additionally, Lake Raven has 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. Observation of reproduction activity will continue for several more years and annual hoop-net surveys will be used to determine recruitment to the gear.

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

Contact Information:

Name: Dusty McDonald, Greg Binion, Warren Schlechte, Donovan Patterson, Dan Ashe, and Amanda Boyles
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Phone: 361-547-9712

Objectives: 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: Objectives 1 and 2; data collection has been completed, data analysis has been completed and writing has been initiated. Objective 3; data collection is close to being finished (one trotline left), some data analysis has been completed, writing has been initiated.

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.

Virginia

Rep: vacant

No report

West Virginia

Rep: Nate Taylor

Project Name or Description: Evaluation of Monongahela River Catfish Population Characteristics and Comparison of Sampling Gear Type

Contact Information:

Name: Dustin Smith (WVDNR), Kristen Chestnut-Faull (lead author; Missouri St. Univ.), Quinton Phelps (Missouri St. Univ.), David Wellman (WVDNR)
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Objective:

1. Evaluate seasonal gear effectiveness in capturing Channel Catfish and Flathead Catfish in Monongahela River.
2. Determine relative abundance, size structure, age, growth, and mortality of Channel Catfish and Flathead Catfish in Monongahela River.
3. Using population models, evaluate potential impacts of harvest and harvest regulations on Channel Catfish and Flathead Catfish in Monongahela River.

Current Status: Ongoing

Abbreviated abstract: A large tributary to the Ohio River, the Monongahela River, is a popular fishing destination and is targeted by anglers for catfish. However, catfish populations have not been thoroughly evaluated on the Monongahela River, and little is known about the population. Populations of both Channel Catfish and Flathead Catfish are present within the river, but little sampling and baseline data exist.

During 2018, we sampled seasonally (spring, summer-pre-spawn, summer-post-spawn, fall) using baited hoopnets, trotlines, and low frequency electrofishing. Two pools in the Monongahela River (Opekiska and Point Marion) were surveyed, with 5 sites located within each pool. Hoopnets were baited with 2 whole bars of Zote soap, and fished for 48 hours before retrieval. Trotlines were fished overnight and were 30.5 m in length (#24 tarred nylon twine), with 60 cm droppers (#18 tarred nylon twine) and 20 hooks per trotline. Trotline hook type/size and bait type were also varied. Five trotlines per pool used 5/0 circle hooks baited with live Gizzard Shad. Another five trotlines used alternating 3/0 circle hooks and 2/0 J hooks baited with cut shad. Finally, five trotlines used alternating 3/0 circle hooks and 2/0 J hooks baited with whole Canadian Nightcrawlers. Low frequency electrofishing (DC output ~ 200V, 2 amps, 15 pulse/second) consisted of two, 15-minute transects per site utilizing a chase boat to aid in capture of catfish.

Results from 2018 suggest that hoopnets were most successful during summer pre-spawn (9.3 fish/net-night) and fall (7.2 fish/net-night) and primarily captured Channel Catfish (95.3% of catch). Hoopnet catch rates were lower in spring (1.2 fish/net-night) and late summer (4.1 fish/net-night). Trotlines were most successful in fall (4.6 fish/line-night) and spring (3.5 fish/line-night). Trotline catch rates were substantially lower in early summer (2.3 fish/line-night) and late summer (0.9 fish/line-night). Trotlines also primarily captured Channel Catfish, but Flathead Catfish represented a higher proportion of the catch in trotlines compared to hoopnets (15.4% of catch in trotlines; 4.6% of catch in hoopnets). Trotline catch also varied dependent hook and bait type. While lines baited with live shad and cut shad captured similar numbers of catfish, both of these bait types captured over 2 times as many catfish each compared to lines baited with nightcrawlers. Additionally, 5/0 and 3/0 circle hooks caught similar numbers of catfish, but both hook types caught over 3.5 times as many catfish each when compared to 2/0 J hooks.

During 2019, we focused sampling efforts to spring and fall for trotlines and summer-pre-spawn for baited hoopnets based on 2018 results. Additionally, all four pools in the WV section of the Monongahela River (Point Marion, Morgantown, Hildebrand, and Opekiska) were sampled. Low frequency electrofishing was not conducted due to poor success in 2018. Methods for trotlines and hoopnets were similar to 2018 with some modifications. Hoopnets were again baited with 2 whole bars of Zote soap each and fished for 48 hours. However, effort was doubled in 2019 with 10 hoop nets set per pool per sample event. For trotline surveys, only 5/0 circle hooks were used with 10 lines per pool baited with live Gizzard Shad and five lines baited with cut Gizzard Shad.

In total, 1446 catfish were collected, in which 1228 were Channel Catfish and 218 were Flathead Catfish. Length, weight, sex, and age data were obtained from collected individuals. Otoliths were removed from a sub-sample of catfish to obtain age data. Total lengths of collected individuals ranged from 189 – 795 mm for Channel Catfish and 215 – 1055 mm for Flathead Catfish. Ages of collected individuals currently range from 2 – 32 years for Channel Catfish and 4 – 40 years for Flathead Catfish.

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

Project Name: 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 and Flathead Catfish populations within the Robert C. Byrd Pool of Ohio and Kanawha Rivers.
2. Determine population management units for Blue 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 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 and Flathead Catfish populations in the Robert C. Byrd Pool of the Ohio River (61 km) and lower Kanawha River (51 km).

During spring 2019, low frequency boat electrofishing surveys were conducted at 10 locations within, using a Smith Root GPP 5.0 running at a DC output of 200V, pulling 2–3 amps at 15 Hz run downstream approximately 10 m from the bank. A chase boat, equipped with a netter, was used to assist with collection. Surveys were conducted whenever water temperature was approximately 25° C. Site locations were categorized by habitat, which included: revetment, outside bends, creek mouths, ledge, point and tailwaters.

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. 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 collected fish were identified to species, sex was determined based on external features, and total length was recorded. All individuals were scanned for PIT tags and checked for external tags from previous WVDNR work. Non-recaptured individuals greater than 200 mm were injected with PIT tags, and individuals larger than 450 mm were marked with external dart tags.

All Blue Catfish and a subset of 4 randomly selected Flathead Catfish from each transect were sacrificed during spring electrofishing surveys for age and growth analyses. Additionally, Blue Catfish collected during trotline surveys were sacrificed to reach sample size objectives. In addition to otoliths, stomach contents and ovaries (if applicable) were collected from all sacrificed fish. 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.

Catch per unit effort (CPUE) for spring electrofishing surveys was calculated as fish/hour for each species at each transect. CPUE was evaluated utilizing sub-stock, stock, quality, memorable, and trophy size classifications. CPUE was also compared across locations and different habitat types. For trotline catch analyses, CPUE was calculated as fish per line. Confidence intervals (95%) were calculated for each estimate as two times the standard error.

During trotline surveys, Blue and Flathead Catfish were selected to be incorporated into the movement portion of the study for implantation of acoustic transmitters (Vemco V16), and length, sampling location, species, and sex were all considered during fish selection. 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.

Electrofishing has been significantly more efficient at capturing Flathead Catfish (mean CPUE 35.1±6.35 fish/hour) than Blue Catfish (2.3±0.9 fish/hour). Catches represented all size classes for Flatheads, with sub-stock individuals comprising 48.5% of the total Flathead catch. Memorable-sized fish have been collected every year, and trophy individuals were collected in 2016, 2017 and 2019 surveys. Blue Catfish size distributions were highly variable between years, with stock and quality fish being most common, comprising 70% of the total catch. Memorable fish

were collected in 2017 and 2019 but no trophy Blue Catfish have been collected so far using this gear. During the 2019 electrofishing survey, otoliths and stomach contents were collected from 154 Flatheads, and 31 Blue Catfish.

Trotline catch rates of Flathead and Blue Catfish have been similar, averaging 1.01±0.68 and 1.35±0.41 fish/line, respectively. Winter 2020 Trotlines saw a marked decrease in Flathead Catfish catch rates (0.14 fish/line), while Blue Catfish CPUE's averaged (1.56 fish/line). Water temperatures were not significantly different from previous years, but the survey began later into winter than previous years. Otoliths and stomach contents were collected from 59 Blue Catfish during this survey.

Trotlines are selecting larger fish of both species. All Flathead Catfish collected during trotline surveys have been quality size or larger, with an average of 46% being preferred size. A total of 97% of Blue Catfish hooked have been over stock size, with quality Blues averaging 55% of the yearly catch for this species. Trophy Flatheads and Blue Catfish were not common, averaging 4.4% and 2.2% of the yearly catch, respectively.

Field work, data collection, movement analyses, and report writing are all ongoing. Data collected will enhance management decisions relating to Ohio River catfish populations and other riverine catfish populations in West Virginia.

Project Name: Ohio River Catfish Population Assessment

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Objective: Assess 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 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 all catfish species (Blue, Channel and Flathead Catfish).

Hoop nets, trot lines and shore-line low-frequency electrofishing (DC output ~200V, 2 amps, 15 pulse/second) surveys were conducted in the Belleville, Hannibal and R.C. Byrd pools of the Ohio River from May to August 2019. 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 fished for three consecutive nights. Trotlines (25 hooks (38.1 m) or 50 hooks (76.2 m)) were set in the same sections of the Belleville and Hannibal pools. Trotline length depended on river conditions, ensuring 250 hooks per location. Hooks were baited with cut rough fish, set in the evening and fished overnight. Lines were pulled and reset for a second night. Low-frequency electrofishing surveys were also conducted along the same sections of the Belleville and Hannibal pools. Surveys consisted of 15-min transects along outside bends and employed a chase boat. All catfish collected were measured to the nearest millimeter and otoliths were taken from a subset of Channel Catfish (n = 139) from the Hannibal Pool for age and growth analysis. The trot line and low-frequency electrofishing surveys in the R.C. Byrd Pool were conducted as part of the Blue Catfish assessment project; details can be found in that project description.

In the second year of this new sampling protocol, results continue to suggest that this methodology effectively samples all species of catfish. Flathead Catfish CPUE via BTEF surveys ranged from 36.6 ± 12.7 in the Hannibal Pool to 63.6 ± 16.04 in the Belleville Pool. Catch rates for Channel Catfish in hoop nets varied by pool, from 1.53/net night in the Hannibal pool to 4.25/net night in the Belleville pool. Similar to 2018, hoop nets continued to capture trophy-sized Flathead Catfish (N = 14) more readily than electrofishing surveys (N = 1). Trotline catch rates were lower than in 2018, despite fishing more hooks in 2019. This may be due in part to the time of year that this sampling occurred; due to personnel and time constraints, this sampling continued until the beginning of August. Water temperature and catfish behavior (nesting) may have decreased catch rates using this method. Blue Catfish continue to be rarely collected in the more upstream reaches, but evidence of reproduction has been noted as far

upstream as Parkersburg, WV (Belleville pool). Age and growth analysis is ongoing. Statistics for all gear types are summarized below in Table 1.

Table 1. Summary statistics for three gear types targeting catfish in three Ohio River pools in 2019.

Belleville Pool						
Gear Type	**Effort**	**Species**	**CPUE**	**Size Range**	**N**	**PSD**
HONT	135 Net Nights	Channel	4.25 (1.59)	241-652	628	58.3
		Flathead	0.56 (0.13)	326-1195	74	94.7
		Blue	-	-	-	-
BTEF	5 Hours (20 transects)	Channel	25 (8.09)	85-530	125	26.4
		Flathead	63.6 (16.04)	86-1132	318	50.5
		Blue	3.4 (2.7)	135-435	17	0
TROT	20 Lines 900 Hooks	Channel	0.06 (0.02)	384-855	53	98.1
		Flathead	0.002 (0.003)	684-952	2	100
		Blue	0.004 (0.004)	522-819	4	100
R.C. Byrd Pool						
Gear Type	**Effort**	**Species**	**CPUE**	**Size Range**	**N**	**PSD**
HONT	126 Net Nights	Channel	3.5 (0.5)	102-711	563	41.9
		Flathead	0.38 (0.09)	382-1151	62	88.5
		Blue	0.04 (0.01)	229-986	5	60
BTEF	10 Hours (40 Transects)	Channel	16.1	86-545	161	
		Flathead	41.3	69-1080	413	
		Blue	3.1	265-1008	31	
TROT	50 Lines (1000 Hooks)	Channel	*	*	*	*
		Flathead	*	*	*	*
		Blue	*	*	*	*
Hannibal Pool						

Gear Type	Effort	Species	CPUE	Size Range	N	PSD
HONT	135 Net Nights	Channel	1.53 (0.69)	231-688	206	69.5
		Flathead	0.93 (0.2)	371-1168	126	93.7
		Blue	0.01 (0.01)	458-473	2	0
BTEF	5 Hours (20 transects)	Channel	10.6 (5.5)	103-512	53	24.5
		Flathead	36.6 (12.7)	92-1090	183	57.8
		Blue	-	-	-	-
TROT	49 Lines (1225 Hooks)	Channel	0.06 (0.02)	382-758	69	94
		Flathead	0.011 (0.006)	516-942	14	100
		Blue	0.009 (0.006)	486-727	10	72.7

* Trot lines in R.C. Byrd pool were set in January 2020, and data is currently being evaluated.