Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Arkansas

Name of Representative to Technical Committee: Jason Olive

Date Submitted: January 2016

Project Name or Description: Catfish Management Plan Revision and Sampling Protocol Development

Contact Information:

Name: Jason Olive

Co-Authors: Ben Batten, Jeff Quinn, Jason Miller, Jimmy Barnett

Email: Jason.olive@agfc.ar.gov

Phone: 877-836-4612

Objective: To revise and update AGFC's catfish management plan and develop standard sampling protocols for use by regional biologists.

Current Status: Complete

Abbreviated abstract:

The first statewide catfish management plan for Arkansas was developed in 2008. It was more of a stocking allocation plan than a management plan. Catfish management in Arkansas is still limited, but a large turnover in agency personnel has led to more interest in catfish sampling and management. The revised plan lays out goals and objectives for data collection and other management efforts. A standard sampling protocol is included in the new plan as an appendix. The protocols were primarily based on information from Bodine et al. 2013 as well as existing protocols from surrounding states.

State Reporting: Arkansas

Name of Representative to Technical Committee: Jason Olive

Date Submitted: January 2016

Project Name or Description: Tandem-baited hoop-net sampling evaluation

Contact Information:

Name: Phillip Malone (Arkansas Tech University)

Co-Authors: Dr. John Jackson

Email: pmsu08@live.com

Phone:

Objective: To determine optimal sampling protocols for Channel Catfish in medium to large reservoirs using tandem-baited hoop-nets, with particular emphasis on information gaps identified by Bodine et al. 2013.

Current Status: Two years of data collection complete

Abbreviated abstract:

Sampling in 2015 was conducted on one large, highland reservoir (Greers Ferry- 12,500 ha) during May to examine sample size requirements for using tandem-baited hoop-nets to sample Channel Catfish. A lowland reservoir was selected for sampling as well, but major flooding during the sample period prevented samples from being conducted. Analyses have not been completed.

State Reporting: Arkansas

Name of Representative to Technical Committee: Jason Olive

Date Submitted: January 2016

Project Name or Description: Channel Catfish sampling

Contact Information:

Name: Jason Olive

Co-Authors:

Email: Jason.olive@agfc.ar.gov

Phone: 877-836-4612

Objective: To collect baseline data on Channel Catfish populations in small impoundments in Arkansas and to determine relationships between tandem-baited hoop-net catch and stocking rate.

Current Status: Ongoing

Abbreviated abstract:

16 lakes were sampled during May-June 2015. Median CPUE was 11 fish/net-night (range 0-490). Relationships between CPUE and stocking rate are still being evaluated. AGFC stocks approximately 400,000 catchable size Channel Catfish per year, and this program has never been evaluated. Population parameter criteria are being developed on which to base stocking decisions.

State Reporting: Arkansas

Name of Representative to Technical Committee: Jason Olive

Date Submitted: January 2016

Project Name or Description: Low-frequency electrofishing sampling evaluation

Contact Information:

Name: Zach Moran (Arkansas Tech University)

Co-Authors: Dr. Joe Stoeckl

Email: zmoran@atu.edu

Phone:

Objective: To determine optimal sampling protocols for sampling Blue Catfish on large rivers using low-frequency electrofishing, with particular emphasis on information gaps identified by Bodine et al. 2013.

Current Status: One year of data collection complete

State Reporting: Arkansas

Name of Representative to Technical Committee: Jason Olive

Date Submitted: January 2016

Project Name or Description: An Evaluation of Trotline Sampling Methods in Reservoirs

Contact Information:

Name: Eric Brinkman

Co-Authors: Blake Friedrich

Email: eric.brinkman@agfc.ar.gov

Phone: 870-777-5580

Objective: Determine if a representative sample of Blue and/or Flathead Catfish populations can be efficiently collected using trotline sampling methods.

Current Status: First Sampling Season Complete

Abbreviated abstract: Trotline sampling has shown to be less size biased than low frequency electrofishing for flathead catfish in lotic systems (Stauffer and Koenen, 1999), but caught fewer fish. Millwood Lake (29,200 acres) and Lake Greeson (7,260 acres) in southwest Arkansas were sampled in August and September 2015 to evaluate if this trend is consistent in lentic systems. Each reservoir was sampled with four trotlines of 50 hooks for two consecutive nights each month, checked daily. Sites were chosen randomly from all possible locations excluding areas with depths over 6.1 m (20 ft.). Mustad® straight shank 3/0 hooks were baited with Goldfish, daily. Low Frequency electrofishing samples were conducted within 7 days of the trotline samples, using AGFC standard sampling protocols for catfish in lentic waters. Weights (g) and total length (mm) were measured from all captured catfish. Five Blue and Flathead Catfish from each 25-mm length group were sacrificed for age and growth per lake. Otoliths and spines were collected for age determinations, because studies comparing the two structures have suggested that spines are only accurate to Age-17 (Nash and Irwin 1999; Olive et al. 2011). We anticipated older fish in our sample. Data analyses of 2015 efforts are currently incomplete. Sampling will continue in 2016.

State Reporting: Florida

Name of Representative to Technical Committee: Andy Strickland

Date Submitted: 1/19/16

Project Name or Description: NA

Contact Information:

Name: Andy Strickland

Co-Authors:

Email: andy.strickland@myfwc.com

Phone: 850-717-8740

Objective:

Current Status:

Abbreviated abstract: No management or research activities related to catfish species since our last meeting. There was a new state record blue catfish caught in May of 2015. The fish weighed 69.50 lbs and was caught in the Choctawhatchee River in Washington County.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Georgia

Name of Representative to Technical Committee: Tim Bonvechio

Date Submitted: 1/16/2016

Project Name or Description: Flathead catfish removal on the Satilla River, Georgia.

Contact Information:

Name: Tim Bonvechio

Co-Authors: Jason Mitchell

Email: Tim.Bonvechio@dnr.state.ga.us

Phone: 912-285-6484

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* might be an avenue for native species recovery. Flatheads were illegally introduced into the Satilla River resulting in negative impacts on native fishes. In an effort to aid in the restoration of native fishes, the Georgia Department of Natural Resources initiated an intensive electrofishing removal effort. From 2007 to 2015, 56,134 flatheads totaling 50,445 kg were removed from roughly a 150 km stretch of the Satilla River. The size structure changed substantially from containing many large individuals (≥510mm TL) in 2007 to mainly small fish (≤250 mm TL) by 2013. Total biomass per effort has declined from 57.05 kg/hr in 2007 to 14.4 kg/hr in 2013, but increased to 44.5 kg/hr in 2014 and declined to 36.3 kg/hr in 2015. Average size fish removed dropped from 2.64 kg in 2007, down to 1.0 kg in 2015. The age structure was also truncated, but there was 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 ranged from 37-63%, for the past 8 years (2007-2014). Considering the life history of the flathead catfish, being a long-lived species that presumably cannot withstand excessive rates of exploitation (i.e., greater than 25% U), our results indicate that an electrofishing removal program is a reasonable management option for state agencies where this apex predator has been introduced, but continual removal will be required to maintain low biomass levels. The native redbreast sunfish fishery in the Satilla rebounded in 2013 and 2014 with a large number of anglers catching limits of large “Rooster Reds”.

State Reporting: Georgia & South Carolina

Name of Representative to Technical Committee: Tim Bonvechio

Date Submitted: 1/16/2016

Project Name or Description: Population Dynamics of Introduced Flathead Catfish in 2 Atlantic Coastal Plain Rivers Under Differing Management Strategies

Contact Information:

Name: Tim Bonvechio

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Phone: 912-285-6484

Name: Jason Marsik

Email: MarsikJ@dnr.sc.gov

Phone: 843-209-1875

Name: Carl Bussels

Email: bussellsc@dnr.sc.gov

Phone: 803-622-4159

Objective: Study the Population Dynamics of Flathead Catfish in 2 Atlantic Coastal Plain Rivers

Current Status: Manuscript accepted December 3, 2015 in the Journal of the Southeastern Association of Fish and Wildlife Agencies. In press.

Abbreviated abstract: We described and compared population dynamics of introduced flathead catfish (Pylodictis olivaris) between the Satilla River, Georgia, and the Little Pee Dee River, South Carolina. Both of these Atlantic coastal plain rivers are blackwater, low productivity systems that historically supported popular redbreast sunfish (Lepomis auritus) fisheries. Flathead catfish have been established in the Little Pee Dee River since the late 1970s or early 1980s; whereas, the species was introduced into the Satilla River in the mid 1990s. Both populations are managed differently by their respective state fisheries agencies, with an intensive annual flathead catfish removal program on the Satilla River beginning in 1996 and a more recent, less intensive removal program on the Little Pee Dee River that began in 2011. Results from this study indicate the Satilla River flathead catfish population was characterized as having high relative abundance, high mortality, fast growth rates and a truncated size and age structure containing mostly younger fish with a maximum age of 12. The Little Pee Dee River population of flathead catfish was also characterized as having a high relative abundance, but with slow growth rates and a more balanced size and age structure, containing fish up to age 26. This study expands our population dynamics knowledge of introduced flathead catfish populations along the Atlantic coastal plain and provides a few examples of how agencies in the southeastern U.S. have met the challenge of managing an introduced apex predator.

State Reporting: Georgia

Name of Representative to Technical Committee: Tim Bonvechio

Date Submitted: 1/16/2015

Project Name or Description: Altamaha River Standardized Sampling

Contact Information:

Name: Don Harrison

Email: Don.Harrison@dnr.state.ga.us

Phone: 912-285-6483

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

Current Status: On-going

Abbreviated abstract: Blue catfish were first documented in the Altamaha River in 2005 during a recreational creel survey and then collected the following summer during standardized ictalurid electrofishing samples. Since 2006, the CPUE of blue catfish had been steadily increasing through 2014. Catfish rates were essentially stable from 2014-2015 and were 62.1 and 61.1 blue catfish/hr, respectively. Blue catfish were the second most abundant catfish species present in the Altamaha this year following flathead catfish (CPUE=102.3 fish/hr). Invasive species (flathead & blue catfish) were the two most abundant catfish species in the Altamaha River in 2014.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

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State Report Format

State Reporting: Kentucky

Name of Representative to Technical Committee: Dane Balsman

Date Submitted: January 2016

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

Contact Information:

Name: Jay Herrala

Email: jason.herrala@ky.gov

Phone: (502) 564-7109 x.4468

Objective:

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.
3. Model the catfish populations and estimate the impacts of harvest (predict how varying length limits may affect the population given the current amount of harvest).

Current Status: Ongoing

Abbreviated abstract:

Commercial fishing for catfish in the Ohio River has recently switched from harvest for flesh to harvesting trophy sized fish to sell to pay lake owners. At the same time, a high quality, primarily catch and release trophy catfish fishery has developed for recreational anglers in the Ohio River. This has led to conflict between recreational anglers and commercial fishermen. Because of this, the Kentucky Department of Fish and Wildlife Resources (KDFWR) began looking at some basic population parameters of the three major catfish species (channel, flathead, and blue catfish) in the Ohio River beginning in 2004. The study was initiated to obtain baseline information on length frequency, weight, and age profiles of these three species and determine methods to catch each of these species.

A public meeting was held in October 2013 to present data that had been gathered during this project and discuss potential regulations that may be put in place. After discussion between the committee members, the fisheries director, and the general public, the committee voted unanimously to pass the proposed regulations on to the full commission meeting in December 2013. In June 2014, the regulation was made law; however, an injunction on the regulation was filed by commercial fishermen shortly after its enactment and regulations on commercial fishermen were not enforceable until December 1, 2014. The regulation is as follows:

> Recreational fishermen on the main-stem Ohio River will be allowed 1 blue catfish ≥35.0in, 1 flathead catfish ≥35.0 in, and one channel catfish ≥28.0 in. Harvest of fish below their respective length limits will not be regulated.
>
> The majority of commercial fishermen fishing in the Ohio River and its tributaries where commercial fishing is allowed will be allowed 1 blue catfish ≥35.0 in, 1 flathead catfish ≥35.0 in, and one channel catfish ≥28.0 in per day. However, 44 commercial fisherman that harvested over 10,000 lbs of catfish in at least 2 of the last 3 years along with an additional 6 commercial fishermen who will be chosen by a lottery drawing will be

allowed to harvest 4 (in aggregate) blue 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 will not be regulated.

Trotlines, hoop nets/commercial ride-alongs, low-pulse electrofishing, and recreational catfish tournaments were all used to sample catfish in the Ohio River in 2015. Although average length and weight were higher in 2015 overall catch rates were very similar to those in 2013 and 2014 suggesting that the population may be stable; however, yearly data since 2004 indicates that catch rates and size structure of catfish has continued to trend downward. Catfish are a long-live species, and significant changes in the populations due to new regulations will likely take a five or more years to manifest.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Kentucky

Name of Representative to Technical Committee: Dane Balsman

Date Submitted: January 2016

Project Name or Description: Monitoring of a Newly Established Blue Catfish Population in Taylorsville Lake and Evaluation of 15 Fish Creel Limit with a 1-Over-25 in Length Limit

Contact Information:

Name: David Baker

Email: david.baker@ky.gov

Phone: (502) 564-7109 x. 4451

Objective: To determine the relative abundance, size structure, growth, mortality, and exploitation of blue catfish in Taylorsville Lake to evaluate the status of this new catfish fishery and to reveal management options that would result in a sustainable high quality fishery with trophy potential.

Current Status: Complete

Abbreviated abstract:

Taylorsville Lake has been stocked with blue catfish from 2002-2015 in effort to develop a quality fishery with trophy potential. In March 2011, a 1 fish ≥25 in with a 15 fish daily limit (blue and channel catfish combined) was implemented. Angler attitude surveys supported increased management for trophy potential. Growth rates have remained at acceptable levels from 2006-2013 with fish reaching 30 in at age 10. An exploitation study in 2008 revealed that 81.5% of blue catfish that are caught are harvested; however, exploitation rates remained low ranging from 8.6- 14.0%. Relative weights on average were good with fish ≥30 in in excellent condition. Winter gill netting proved to be an important tool at sampling fish ≥30 in, which are underrepresented in electrofishing samples. It is recommended to continue stocking age 1+ blue catfish at 7.7 fish/acre. Continued sampling (electrofishing and gill netting) is essential to evaluate the effect current regulations have on this relatively young fishery.

SDAFS – Catfish Management Technical Committee

State Report - Missouri

State Reporting: Missouri

Name of Representative to Technical Committee: Joe McMullen

Contact Information:

Name: Joe McMullen

Email: joseph.mcmullen@mdc.mo.gov

Phone: 636-451-3512 x6048

Date Submitted: 29 January 2016

State Reporting: Missouri

Project Name or Description: Missouri State Record Fish Program

Link: http://huntfish.mdc.mo.gov/fishing/trophies-certificates/state-record-fish-list

Contact Information:

Name: Andrew Branson

Email: andrew.branson@mdc.mo.gov

Phone: 573-522-4115 x3501

Objectives: To acknowledge and honor anglers who have caught the largest recorded fish from a list of recognized species found in Missouri waters.

Current Status:

- Burr Edde III of Malta Bend - The new "alternative method" record blue catfish was caught on the Missouri River in Saline County, by trotline on March 21, 2015 and weighed **120 lbs, 8 oz**., with a length of 55 and 1/8 inches and a girth of 45 inches. *Note: Pole & Line Record Blue Catfish – 130 lbs. 0 oz.*

- Mathew McConkey of Kansas City - The new "alternative method" record flathead catfish was caught on the Missouri River, by trotline on Sept. 19, 2015 and weighed **100 lbs.** with a length of 57 inches. *Note: Pole & Line Record Flathead Catfish – 77 lbs. 8 oz.*

State Reporting: Missouri

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

Link: https://youtu.be/DFUYXFSNrps (Proper Catfish Handling for Anglers)

Contact Information:

Name: Paul Michaletz

Co-Authors: Ross Dames

Email: paul.michaletz@mdc.mo.gov

Phone: 573-815-7901, x3921

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.

Current Status: In the spring of 2015, 543 blue catfish ≥15 inches long were tagged with Carlin dangler reward tags. To date, 76 reward tags have been returned by anglers from the 2014 (399 fish tagged) and 2015 tagging.

Abbreviated Abstract: Blue catfish provide a popular sport fishery in Mark Twain Lake but little is known about the population or angler exploitation. The goal of this study is to acquire information on population demographics and angler harvest to determine if fishing regulations should be modified in an effort to improve the size structure of blue catfish. Growth is slow with age-5 blue catfish averaging only 16 inches long. Growth is also quite variable among individuals. For example, age-9 blue catfish range in length from 21.6 to 32 inches long. Exploitation of blue catfish by anglers will be estimated using reward tags. Tagging was conducted during springs of 2014 and 2015 and will continue in 2016. Population demographics coupled with angler exploitation data will be used to model the effectiveness of various harvest restrictions in improving size structure of the blue catfish population.

State Reporting: Missouri

Project Name or Description: 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, x3921

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.

Current Status: Small fingerling (50 mm total length) hybrid striped bass have been stocked at 250 fish/ha in 2014 and 2015 in the nine treatment lakes and flathead catfish (200-281 mm total length) have been stocked at 40 fish/ha in 2014 and 2015 in four of the lakes stocked with hybrid striped bass. Hybrid striped bass will be stocked each year throughout the study but no more flathead catfish stockings are planned. Fish communities will be sampled annually for the next four years to assess the effects of the predator stockings.

Abbreviated Abstract: Small impoundments provide close-to-home fishing opportunities for many Missourians, but many do not produce quality sport fisheries for one or more species. In particular, many small impoundments contain populations of slow-growing bluegills and crappies that exhibit poor size structure. Although there may be several reasons for these poor quality panfish populations, the presence of gizzard shad and common carp are known to negatively influence these populations. We proposed to introduce hybrid striped bass and flathead catfish into some lakes to determine if predation by these species can reduce the abundances of gizzard shad and common carp. Our experimental design consists of two treatments-impoundments stocked with hybrid striped bass and impoundments stocked with both hybrid striped bass and flathead catfish. We also have reference impoundments with no predator stockings to serve as controls. Both hybrid striped bass and flathead catfish are known to prey on gizzard shad and flathead catfish also prey on common carp. Both predator species may also consume panfish which may also be beneficial because impoundments with poor panfish populations typically contain an overabundance of these fishes. If abundances of these two deleterious species and panfish are reduced, panfish populations may respond with improved growth and size structure. Predator stockings may be a cost-effective strategy to improve panfish populations and create diverse angling opportunities. Other potential strategies such as mechanical or chemical removal of gizzard shad and common carp may provide short-term improvements in the panfish populations but these methods are costly and do not provide a long-term solution because gizzard shad and common carp typically quickly rebound to pre-treatment levels.

State Reporting: Missouri

Project Name or Description: Truman Reservoir and Lake of the Ozarks Blue Catfish Management

Contact Information:

Name: Mike Bayless (Missouri Department of Conservation)

Co-Authors: Greg Stoner and Zach Ford (Missouri Department of Conservation)

Email: Mike.Bayless@mdc.mo.gov

Phone: 660-885-8179 x253

Objective: Implement and evaluate a regulation change for blue catfish at Truman Reservoir and Lake of the Ozarks to improve the quality of a declined fishery.

Current Status: Pectoral spines were collected from blue catfish in 2011 and 2012 and ages were assigned independently by four readers using digital images. Consensus ages among readers were completed in 2015 for *n*=290 and *n*=381 spines collected at Truman Reservoir and Lake of the Ozarks, respectively.

Abbreviated abstract: On March 1, 2014, new regulations went into effect for blue catfish at Truman Reservoir, Lake of the Ozarks and their tributaries that established the following:

- 10 Blue Catfish daily
- A protected slot-length limit of 26-34 inches
- No more than 2 blue catfish larger than 34 inches within the daily limit of 10

The new regulations were put in place based on concern from anglers and MDC staff of declining numbers of larger blue catfish in both reservoirs and are intended to increase harvest of smaller blue catfish below the protected slot by doubling the daily limit (from 5 to 10 fish) with the goal of improving growth across the population and maintaining angler support. Three years (2010-2012) of pre-regulation sampling using jug lines confirmed these concerns. Blue catfish sampled in Truman Reservoir showed that an average of 82% of fish were below the protected slot, 16% within the protected slot, and 2% above the protected slot. Lake of the Ozarks sampling showed similar results with 83% below, 15% within, and 2% above the protected slot. Based on the sub-sample of aged fish, growth is slow with age-10 fish averaging 21.4 inches and 22.4 inches in Truman Reservoir and Lake of the Ozarks, respectively, and growth is quite variable among fish. For example, age-10 fish in Truman Reservoir range in length from 17.0 to 27.8 inches long and from 15.3 to 33.3 inches long in Lake of the Ozarks. In general, the regulations have been well received with some complaints. MDC will evaluate the regulation

with three additional years of sampling once it has been given time to show a detectible change (no sooner than 8 years after implementation).

State Reporting: Missouri

Project Name or Description: Determining Electrofishing Immobilization Thresholds of Smallmouth Bass, Blue Catfish and Flathead Catfish: A Critical Step to Develop a Standardized Sampling Protocol

Contact Information:

Name: Zach Ford (Missouri Department of Conservation)

Co-Authors: Dr. Craig Paukert (University of Missouri-Columbia) and Andy Turner (Missouri Department of Conservation)

Email: Zach.Ford@mdc.mo.gov

Phone: 660-885-8179 x236

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.

Current Status: This project is funded and will be conducted during a 5-year period with the first (of two) graduate students beginning field work in early 2016. Objectives 1 and 2 will be the focus of the initial phase of this project.

Abbreviated Abstract: Standardization of electrofishing output will minimize bias, reduce variation in catch, and allow for more valid spatial and temporal comparisons of sample data, regardless of the electrofishing control box used. Biologists need to know how conductivity of the water relates to the effective conductivity of Smallmouth Bass, Blue Catfish (BLC) and Flathead Catfish (FHC) in order to develop standardized electrofishing output goals that are species specific and maintain a desired capture-prone fish response (e.g., taxis or immobilization) across a range of water conductivities, water temperatures, and fish sizes. Previous work reported high sample variation (e.g., CV > 50%) using existing boat electrofishing methods to sample FHC in the lower Missouri River and tributary rivers in MO.

Despite being the most commonly used gear, the unique behavioral response of BLC and FHC to electrofishing is not well understood and it is unclear what level of electrofishing power (threshold power) or most efficient electrical waveform is necessary to consistently achieve a capture-prone response at varying water conductivities and water temperatures, and to collect a representative sample of all fish sizes.

State Reporting: 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: Joe McMullen

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Phone: 636-451-3512 x6048

Name: Kyle Winders

Email: kyle.winders@mdc.mo.gov

Phone: 660-646-3140 x1377

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.

Current Status: Ongoing

Abbreviated Abstract: Blue Catfish and Flathead Catfish are native to the Missouri and Mississippi rivers which support some of the most important recreational and commercial fisheries in Missouri; however large river catfish populations have not been intensively managed in the past. An assessment of Blue Catfish and Flathead Catfish populations in the Missouri and Mississippi rivers will provide information needed to better manage these fisheries. Primary data needs include an estimate of exploitation by commercial and recreational fishers and population demographic information, including size structure, age and growth and total annual mortality for each fishery. Catfish are collected using low-frequency electrofishing; once captured the information necessary to estimate population demographics is collected. Reward tags are affixed to catfish prior to their release and reports from recreational and commercial fishers will be used

to estimate exploitation levels. Information collected during this study will provide the necessary inputs to evaluate current and prospective harvest regulations. 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.

- Spring 2015 - Blue Catfish
  - Reward Tags - 850
    - 55 reward tags returned as of 1 January 2016
  - Ageing Structures - 952
- Fall 2015 - Flathead Catfish
  - Reward Tags - 727
    - 21 reward tags returned as of 1 January 2016
  - Ageing Structures - 921

State Reporting: Missouri

Project Name or Description: Hatchery Program

Literature Available: *2014 Missouri Department of Conservation Warm Water Hatcheries Production Report*

Contact Information:

Name: James Civiello

Email: james.civiello@mdc.mo.gov

Phone: 573-815-7901, x3921

Objectives: Provide the numbers, sizes and species of fish requested for various regional and statewide programs and providing assistance for the management of Missouri's public waters and assist in the recovery of rare and endangered aquatic species.

Current Status: On-going

Abbreviated Abstract: Report documenting the number and species of fish produced at and stocked from each hatchery, with a cost analysis. Missouri Department of Conservation warm-water hatcheries (Chesapeake, Hunnewell, and Lost Valley) produced approximately 170,000 channel catfish (8-12") and 2,500 blue catfish (8-12"). Channel Catfish are age-0 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 2015, a fleet of 14 stocking trucks were used to stock over 300 public lakes, over a 4 day period.

State Reporting: Missouri

Project Name or Description: Commercial Fishing Program

Literature Available: *Missouri Commercial Fish Harvest 2014*

Contact Information:

Name: Joe McMullen

Email: joseph.mcmullen@mdc.mo.gov

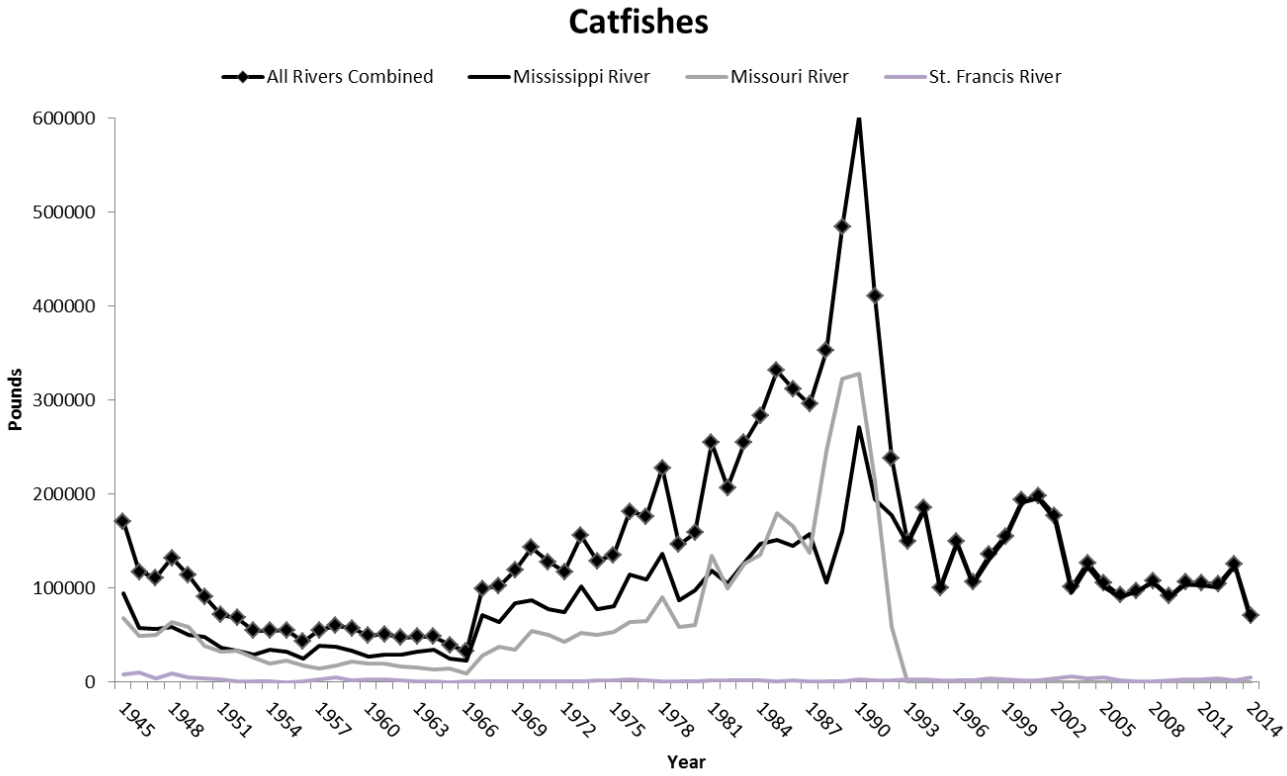
Phone: 636-451-3512 x6048

Objectives: Document and summarize Missouri's commercial fishery data for 2014 and annual harvest trends since 1945.

Current Status: Complete

Abbreviated Abstract: Blue catfish, channel catfish, and flathead catfish are considered commercial fish on the Mississippi River and that portion of the St. Francis River that forms a boundary between Missouri and Arkansas. Commercial harvest of blue catfish, channel catfish and flathead catfish from the Missouri River has been prohibited since 1992. Bullhead catfishes are considered commercial fish on all commercial waters.

Catfish were the second most harvested species group statewide, behind buffalofish, and accounted for 32% of the total harvest in 2014. Catfish harvest decreased considerably from 125,149 lbs. in 2013 to 70,672 lbs. in 2014, the lowest catfish harvest since 1966. The majority (94%) of the 2014 catfish harvest was from the Mississippi River. Blue catfish accounted for the largest proportion (48%) of the total catfish harvest; however harvest decreased dramatically from 67,260 lbs. in 2013 to 33,590 lbs. in 2014, the lowest harvest in five years. Mississippi River harvest was focused on the open portions of the river, downstream of St. Louis, MO. Flathead catfish accounted for 36% of the total catfish harvest, decreasing from 37,433 lbs. in 2013 to 25,414 lbs. in 2014. Flathead catfish harvest is highest on the pooled portion of the Mississippi River, upstream of St. Louis, MO.; however significant harvest also occurs on the lower Mississippi River (LMR) downstream of the Ohio River Confluence. Channel catfish accounted for 16% of the overall catfish harvest, decreasing from 20,174 lbs. in 2013 to 11,203 in 2014. Channel catfish harvest was highest on the UMR. Bullhead catfish harvest is minimal, increasing from 282 lbs. in 2013 to 465 lbs. in 2014. The majority of the 2014 bullhead catfish harvest was reported from the UMR.



Pounds of catfishes commercially harvested by Missouri fishers, by river and from all rivers combined, from 1945 to 2014.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Mississippi

Name of Representative to Technical Committee: Jerry Brown

Date Submitted: January 2016

Project Name or Description: Pearl River Catfish Assessment

Contact Information:

Name: Jerry Brown

Co-Authors: Trevor Knight and Dustin Rodgers

Email: jerryb@mdwfp.state.ms.us

Phone: 601-432-2200

Objective: To monitor the catfish population of the Pearl River and estimate abundance, size structure, and condition.

Current Status: Completed

Abbreviated abstract: Low-frequency electrofishing was used during July and August 2015 to sample Flathead Catfish and Blue Catfish populations in the Pearl River (Table 1). Sampling occurred below the Ross Barnett Reservoir at sites near Jackson, Georgetown, and Monticello. The Pearl River is approximately 490 miles long and extends from north central Mississippi to the Gulf Coast. An initial assessment was made during 2010 along this stretch; however, a chase boat was not used. During 2015, a total of 288 Blue Catfish ranging from 80 mm to 803 mm TL and a total of 480 Flathead Catfish ranging from 71 mm to 981 mm TL were collected. A chase boat was employed and catch rates were higher, but we are unable to say if this reflects changes in abundance or if it was a result of using a chase boat. Population characteristics for Flathead Catfish were similar in both years, while more and smaller Blue Catfish were collected in 2015. Relative weight (Wr) for both species was consistent to 2010.

Table 1. Low-frequency electrofishing results for Flathead Catfish and Blue Catfish collected from the Pearl River. Catch per mile (CPM) is for all fish and relative weight (Wr) are for fish $\geq$ stock.

	Flathead Catfish			Blue Catfish		
Year	CPM	PSD	Wr	CPM	PSD	Wr
2015	20	55	91	20	29	86
2010	17	59	91	5	44	88

State Reporting: Mississippi

Name of Representative to Technical Committee: Jerry Brown

Date Submitted: January 2016

Project Name or Description: Flathead Catfish stock assessment of the Coldwater River.

Contact Information:

Name: Nathan Aycock

Co-Authors: Chad Washington, Donta Reed

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Phone: 601-432-2200

Objective: To assess the Flathead Catfish population in the Coldwater River in Mississippi

Current Status: Sampling completed, pectoral spine aging and data analysis ongoing

Abbreviated abstract: The Coldwater River rises in Marshall County, Mississippi, and flows south approximately 220 miles where it joins the Tallahatchie River. Low-frequency electrofishing was used to assess the Flathead Catfish (*Pylodictis olivaris*) population in the Coldwater River to determine population characteristics. From July 2015 to August 2015 we sampled 19 different 1-mile reaches of the Coldwater River, and a total of 460 Flathead Catfish were collected. Pectoral spines were removed from 149 fish (10 fish per inch group) for age and growth analysis. Total length ranged from 61 mm to 742 mm. CPUE for all fish was 24 fish per mile, and CPUE for fish $\geq$ stock size was 4 fish per mile. PSD was 34 and RSD-P was 1. Pectoral spines are currently being sectioned with a low-speed saw for age determination, and growth and mortality rates for the population will be determined once sectioning and aging is complete. This data will then be used to compare the flathead catfish population in the Coldwater River with both historical data and recent sampling of other rivers in Mississippi.

State Reporting: Mississippi

Name of Representative to Technical Committee: Jerry Brown

Date Submitted: January 2016

Project Name or Description: Pascagoula River Flathead Catfish Stock Assessment

Contact Information:

Name: Stephen Brown

Co-Authors: Jeremy McCain and Samantha Stelmack

Email: stephenb@mdwfp.state.ms.us

Phone: (601) 582-7721

Objective: Determine baseline population of Flathead Catfish in primary channel of the Pascagoula River.

Current Status: Complete

Abbreviated abstract: Low-frequency electrofishing was conducted on the Pascagoula River during the late summer of 2015 to access a baseline for the Flathead Catfish (Pylodictus olivaris) population characteristics. The Pascagoula River is a saltwater influenced freshwater river that originates with the confluence of the Leaf River and the Chickasawhay River in Merrill, MS. It flows from George County through Jackson County before emptying into the Pascagoula River marsh. A total of 123 Flathead Catfish were collected during sampling, a total of 85 of those fish being ≥ stock size. Total length ranged from 51 mm to 959 mm with a mean of 452.9 mm. Overall CPUE was found to be 43.75/km with a CPUE of 31.25/km of fish ≥ stock size. A PSD of 58 with a RSD-P of 12 was found. Blue Catfish (Ictalurus furcatus) were also encountered and recorded with a total of 93 fish collected and a total of 54 being ≥ stock size. Total length ranged from 64 mm to 756 mm with a mean of 374.9 mm. CPUE was 35/km with a CPUE of 20/km ≥ stock size. A PSD of 44 was found.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: North Carolina

Name of Representative to Technical Committee:

Date Submitted: 2/3/2016

Project Name or Description: Assessment of Neuse River Catfish Populations

Contact Information:

Name: Kyle T. Rachels

Co-Authors: Ben R. Ricks

Email: kyle.rachels@ncwildlife.org

Phone: 252-548-4938

Objective: To elucidate abundance, size-structure, and mortality for catfish species in the Neuse River

Current Status: Agency final report. Rachels, K.T., and B.R. Ricks. 2015. Assessment of Neuse River Catfish Populations. North Carolina Wildlife Resources Commission. Federal Aid in Sport Fish Restoration, Project F-108, Final Report, Raleigh.
Available: http://www.ncwildlife.org/Fishing/LearnResources/MonitoringSurveys.aspx

Abbreviated abstract: Ictalurids in the Neuse River were surveyed via boat-electrofishing in summer 2014. Field staff collected 263 Blue Catfish *Ictalurus furcatus*, 124 Channel Catfish *I. punctatus*, and 299 Flathead Catfish *Pylodictis olivaris* from 26 sample sites. No native ictalurids were collected or observed during sampling. High frequency electrofishing yielded a Blue Catfish mean (SD) relative abundance (CPUE; fish/h) of 23.5 (19) and a Channel Catfish CPUE of 14.4 (13). Flathead Catfish CPUE was 20.8 (12) using low frequency electrofishing. Differences in gear selectivity prohibit examination of relative abundance among the species collected. Length-frequency distributions indicated a variety of size-classes present, with the exception of 375–500 mm Blue Catfish. Total annual mortality (*A*) was calculated using length-converted catch-curves, indicating Channel Catfish *A* = 35% and Flathead Catfish *A* = 16%. Blue Catfish mortality was not calculated due to the polymodal length-frequency distribution. Relative weights (W_r) for all species indicated overall good condition, with few individuals displaying W_r less than 80. Results of this survey indicate significant impacts on native ictalurid populations, likely due to the robust Flathead Catfish population that has become established over the previous 30 years. Additionally, Flathead Catfish mortality is quite low despite the popularity of catfish angling in the Neuse River. Low Flathead Catfish exploitation, as inferred by mortality analysis, indicates restrictive harvest regulations are not warranted. Future surveys should investigate the current distribution of native ictalurids in the Neuse River and continue to explore the impacts of nonnative catfish on resident fish communities.

State Reporting: North Carolina

Name of Representative to Technical Committee:

Date Submitted: 2/3/2016

Project Name or Description: Characteristics of Recreationally Important Fish Populations of the White Oak River

Contact Information:

Name: Kyle T. Rachels

Co-Authors: Ben R. Ricks

Email: kyle.rachels@ncwildlife.org

Phone: 252-548-4938

Objective: Status of Ictalurid and Sport Fish Communities in White Oak River, North Carolina

Current Status: Agency Technical Report – In Press

Abbreviated abstract: Surveys were conducted August 2015 in the White Oak River to assess the state of the ictalurid community and to monitor changes in sport fish population characteristics following the impacts of Hurricane Irene in 2011. Low (15 Hz) and high (120 Hz) frequency electrofishing and hoop netting in August collected 120 White Catfish *Ameiurus catus*; no other ictalurids were observed. Electrofishing for sport fish in September resulted in a mean (SE) Largemouth Bass *Micropterus salmoides* CPUE of 11.6 (2.4) fish/h. Largemouth Bass catch rates and size-structure were similar to surveys conducted in 2012. Mean Bluegill *Lepomis macrochirus* CPUE was 15.5 (2.8) fish/h, a 67% reduction from fall 2012. Few other fish of recreational angling importance were collected. Overall, the White Oak River ictalurid community may be unique among coastal NC rivers due to the lack of an established nonnative catfish population. However, the Largemouth Bass and sunfish populations have not demonstrated improvement since surveys conducted in 2012. Future surveys should analyze age-structure and habitat availability for centrarchid populations, while a recreational angler creel survey should be conducted to analyze angling effort and harvest characteristics.

State Reporting: North Carolina

Name of Representative to Technical Committee:

Date Submitted: 2/3/2016

Project Name or Description: Blue Catfish State Record Broken Twice – Same Angler in less than 24 hours! See News Release Above

Current Status: New Record of 105 pounds caught from Lake Gaston by angler Zakk Royce

Contact Information:

Name: Evan Cartabiano

Co-Authors: Ben R. Ricks

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Phone: 919-340-1620

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Blue Catfish State Record Broken — Twice in Less than 24 Hours By the Same Angler

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LITTLETON, N.C. (Jan. 8, 2016) — If Zakk Royce's experiences are any indication, Lake Gaston holds some monster blue catfish.

The Murfreesboro angler caught not one but two state record blue catfishes in a 24-hour period last month.

The first fish, caught on Dec. 20, weighed 91 pounds and measured 53 inches in length. On Dec. 21, Royce landed his second state record, a 105-pound blue, measuring 55.75 inches in length. He caught both fish using cut bait.

Both fish were weighed on certified scales at Ace Hardware in Littleton and examined and identified by District 3 Assistant Fisheries Biologist Evan Cartabiano. After the fish were weighed Royce released them back into the lake.

The previous blue catfish state record was set back in 2006 by Eric Fincher of Mount Pleasant, who caught a blue catfish weighing 89 pounds from Badin Lake on Nov. 25. He, too, released the fish back into Badin Lake after it was certified as the state record.

To qualify for a N.C. Freshwater Fish State Record, anglers must have caught the fish by rod and reel or cane pole, have the fish weighed on a scale certified by the N.C. Department of Agriculture, witnessed by one observer, have the fish identified by a fisheries biologist from the Commission, and submit an application with a full, side-view photo of the fish.

For anglers who catch a blue catfish that doesn't quite measure up to this latest record-breaker but is 41 inches or longer or weighs 30 pounds or more, the Commission has a blue catfish classification for its North Carolina Angler Recognition Program. NCARP officially recognizes anglers who catch trophy-sized freshwater fish that do not qualify for a state record with a certificate featuring color reproductions of fish artwork by renowned wildlife artist and former Commission fisheries biologist Duane Raver.

For a list of all freshwater fish state records in North Carolina or more information on the State Record Fish Program, click here. For more information on fishing in public, inland waters, the fishing page or call the Inland Fisheries Division, (919) 707-0220.

Zakk Royce, of Murfreesboro, broke the blue catfish state record twice in less than 24 hours with a 91-pounder (top photo) and a 105-pound catfish on Dec. 20 and 21.

Media Contact: Jodie B. Owen
919-707-0187
jodie.owen@ncwildlife.org

Download high-resolutions of the photos above. Please credit Zakk Royce

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Commission Meeting Webcast

Report Website Issue

State Reporting: North Carolina

Name of Representative to Technical Committee:

Date Submitted: 2/3/2016

Project Name or Description: Evaluation of recreational hand-crank electrofishing on catfish and sport fish communities in the Black, Cape Fear, Lumber, and Waccamaw rivers

Contact Information:

Name: Michael Fisk

Co-Authors:

Email: michael.fisk@ncwildlife.org

Phone: 919-758-9024

Objective: Assess species composition, density, age structure, and growth rates of all catfish and several sport fish and compare areas where hand-cranking is and is not permissible.

Current Status: Ongoing

Abbreviated abstract:

We have started a project in the Cape Fear, Black, Lumber, and Waccamaw rivers looking at the direct effects of hand-cranking on the catfish communities in these rivers and indirect effects on the fish community as a whole. We would like to determine any effects hand-cranking has on invasive flathead and blue catfish which was the primary reason hand-cranking got started in the district. We are looking at species composition, density, age structure, and growth rates of all catfish and several sport fish and compare these to reaches where hand-cranking is and is not permissible. We completed the first field season in June-July 2015 and will hopefully complete the 2nd field season this June-July.

State Reporting: North Carolina

Name of Representative to Technical Committee:

Date Submitted: 2/4/2016

Project Name or Description: Using Angler Diaries to Provide Cost-Effective Information on an Emerging Blue Catfish Fishery in Lake Wylie, North Carolina

Contact Information:

Name: David Goodfred

Email: David.Goodfred@ncwildlife.org

Phone: 828-659-3324 ext. 227

Objective: Collect and describe baseline population dynamics information on domestic Blue Catfish and Channel Catfish fisheries in Lake Wylie, NC using historical and contemporary angler diaries and tournament catch data.

Current Status: Carolina Catfish Club Oral Presentation, May 2015, Belmont, NC; 2015 SEAFWA Annual Conference Oral Presentation, Asheville, NC; 2016 NCAFS Annual Meeting Oral Presentation, Danville, VA; NC Sportsman Magazine Article, 2016 January Cover Story.

Abbreviated abstract: Blue Catfish (*Ictalurus furcatus*) fisheries management has increased in importance for numerous natural resource agencies; however, methods to collect beneficial population information on ictalurids often have been obscured by gear selectivity, seasonal variability in catch rates, and low precision of estimates of population metrics. Additionally, effective collection methods (e.g., gill nets) often require increased staff effort and multi-day sampling approaches, and mortality of target and non-target species often is high. In 2010–2011, North Carolina Wildlife Resources Commission (NCWRC) biologists conducted electrofishing and trot line surveys in response to increasing angler interest in an emerging Blue Catfish fishery in Lake Wylie, North Carolina. Survey results were poor, as one Blue Catfish was collected using all gear types. As an alternate approach, in 2012–2014, NCWRC biologists distributed angler diaries to provide baseline Blue Catfish and Channel Catfish (*I. punctatus*) population information and bolster communication lines with stakeholders. Although numbers of angler diary participants were low, 418 Blue Catfish and 864 Channel Catfish were caught, measured, weighed, and released during the survey period, thus providing beneficial stock assessment information with minimal effort.

State Reporting: North Carolina

Name of Representative to Technical Committee:

Date Submitted: 2/15/2016

Project Name or Description: Modification to Harvest Regulations for Blue Catfish at Lake Tillery, Lake Wylie, and Mountain Island Reservoir

Contact Information:

Name: Lawrence Dorsey

Email: lawrence.dorsey@ncwildlife.org

Phone: 704-986-6109

Objective: Establish an exception to the general statewide regulation for Blue Catfish in Lake Tillery, Lake Wylie, and Mountain Island Reservoir by allowing only one fish greater than 32 inches to be possessed in the daily creel.

Status: NC Wildlife Resources Commission approved proposed regulation on February 12, 2016. Effective date for regulation will be August 1, 2016.

Abstract: Interest in catfish angling is growing rapidly, and anglers seeking large catfish target the Blue Catfish populations in Lake Tillery, Lake Wylie, and Mountain Island Reservoir. Commission data indicate that Blue Catfish greater than 32 inches are rare in these populations and that it takes on average between 12 and 20 years for Blue Catfish to reach this size. This size limit will restrict harvest of large Blue Catfish to help maintain quality fisheries in these reservoirs. Harvest of fish less than 32 inches remains unrestricted. This regulation is consistent with catfish regulations on Badin and Norman lakes.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Oklahoma

Name of Representative to Technical Committee: Brad Johnston

Date Submitted: 1/20/2016

Project Name or Description: A stocking evaluation of grow-out channel catfish in Oklahoma's small impoundments

Contact Information:

Name: Chas Patterson

Email: chas.patterson@odwc.ok.gov

Phone: 580-474-2668

Objective: Determine catch rates, length frequencies, condition, and age structure on nine small lakes before and after experimental stocking rate manipulations. Calculate angler catch rates and satisfaction before and after stocking rate manipulations on nine small lakes.

Current Status: completed

Summary: Channel catfish *Ictalurus punctatus* are stocked in small impoundments throughout Oklahoma as put-grow-take or put-take fisheries. These stockings are necessary to sustain an acceptable sport fishery as natural recruitment of channel catfish in small impoundments is often low. Many small impoundments are stocked annually with grow-out (228 mm) channel catfish at rates as high as 99 fish/ha. Tandem hoop nets were used to evaluate channel catfish populations on nine small impoundments annually from 2010 through 2014. In 2011 stocking rates were adjusted based on abundance and growth data. In addition, a catfish angler survey was conducted on these impoundments in 2011. Lakes were stocked at an experimental rate (13, 99, or 150 fish/ha) through 2014 in an attempt to improve size distribution and angler satisfaction. An angler survey was conducted in 2014 to determine satisfaction after three years of manipulated stocking rates.

Conclusions/Recommendations

- Relative abundance, as measured by tandem hoop nets, was highly variable among lakes and between years although it was significantly affected by stocking rate.
- Lakes with reduced stocking rates exhibited reduced CPUE compounded with increased mean length, improved length frequencies and growth suggests these lakes exhibited a density dependent response to the lower stocking rate.
- The control lake that maintained the same stocking rates had population parameters that remained similar throughout the study.
- Lakes with increased stocking rates also exhibited a density dependent response with increased CPUE and decreased growth although length frequencies remained similar.
- Relative weights (Wr) throughout the study were not associated with growth. Other factors such as environmental conditions or baited nets may be influencing body condition.
- Angler catch rates decreased significantly at lakes with reduced stocking although no difference were seen at the control lakes or lakes with an increased stocking rate.
- No differences were seen in the satisfaction for number of channel catfish caught for any of the three stocking rates (treatment groups) although significant differences were seen in relative abundance and angler catch rates.
- No differences were seen in the satisfaction for the size of channel catfish caught for any of the treatment groups although increases in mean length, length frequencies, and PSD's were observed at lakes with decreased stocking.
- Results indicate stocking rates affected channel catfish population parameters, therefore these populations can be manipulated through stocking. However, stocking rates had no effect on angler satisfaction for number or length of channel catfish caught as measured by the methods in this study.
- Future studies should focus on ways to identify and calculate satisfaction from anglers with more accuracy and precision and how it relates to catfish populations.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: South Carolina

Name of Representative to Technical Committee:

Date Submitted: 1/19/2016

Project Name or Description: Santee Cooper Catfish Population Monitoring

Contact Information:

Name: Scott Lamprecht

Co-Authors: Carl Bussells

Email: Lamprechts@dnr.sc.gov

Phone: 843 825-3387

Objective: Document population changes through time.

Current Status: On-going

Abbreviated abstract: New Santee Cooper Reservoir (SCR) blue catfish (BCF) harvest restrictions took effect on April 15, 2015 and limited the daily bag limit to 25 fish per person regardless of license or gear type (3 year sunset). It also limited the take of fish greater than 32" to two per day. It was anticipated that this would impact commercial harvest substantially more than recreational anglers and this appears to be the case. Improvements in BCF recruitment have been observed following above average spring water flow in 2013 & 14, following a 10 year drought. The incomplete 2015-16 winter gillnet catch substantially exceeds the 2014-15 catch of juvenile BCF (<500mm). Channel catfish recruitment also jumped last year, undermining previously held theory of its independence from the system's hydrologic fluctuations (at least in SCR). The effects of this fall and winter's record flooding have yet to be realized. Flood gates remained open for months, allowing for substantial immigration from upstream reservoirs as well as downstream emigration into the Santee River.

A relatively warm early winter, high turbidity levels, and past control measures appear to have affected the number of wintering Double Crested Cormorants (DCCO) on SCR. This is relevant to catfish management because of the potential for DCCO predation on juvenile catfish. Following waterfowl hunting season in the late winters of 2014 & 2015, DCCO control programs were conducted on SCR and accounted for the removal of approximately 11,000 and

14,000 birds respectively. At the time of this writing, another DCCO control season has been proposed for SCR for February 2016, but still faces several hurdles.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Tennessee

Name of Representative to Technical Committee: Eric Ganus

Date Submitted: December 21, 2015

Project Name or Description: Investigation of Channel Catfish and Blue Catfish population dynamics in three Tennessee River reservoirs

Contact Information:

Name: Cole Harty

Co-Authors: Phil Bettoli

Email: charty@tntech.edu; pbettoli@tntech.edu

Phone: 931-372-3086

Objective: The objectives of this study are to (1) develop unbiased catfish sampling protocols for the use of trotlines, low-frequency electrofishing, tandem hoop nets, or a combination of these three approaches; (2) assemble a statewide database on commercial and recreational harvest of catfish species and examine historical trends in terms of yield; (3) mathematically model the response of catfish populations to different management scenarios; and (4) assess the potential for growth and recruitment overfishing in Tennessee reservoirs.

Current Status: Field sampling complete. Analysis ongoing.

Abbreviated abstract: Catfish are important components of sport and commercial fisheries in several Tennessee reservoirs. In 2011, catfish were the second most pursued recreational species in the state behind black bass and accounted for nearly five million days of fishing. Sport fishing effort directed at catfish accounted for approximately 16% of all fishing pressure in Chickamauga Lake in 2014, when more than 165,000 Blue Catfish *Ictalurus furcatus* and Channel Catfish *I. punctatus* were harvested. In a pilot study during the summer of 2014, tandem

hoop nets were deployed in Kentucky Lake (24 series), Chickamauga Lake (16 series), and Fort Loudoun Lake (16 series) and over 450 Channel Catfish were collected. Sampling effort was nearly tripled (160 series) in 2015 and more than 3,400 Channel Catfish were collected across several seasons. Additionally, length, weight, and age data has been collected from over 400 Blue Catfish.

SDAFS – Catfish Management Technical Committee

State Report

State Reporting: Texas

Name of Representative to Technical Committee: Kris Bodine

Date Submitted: January 25, 2016

Project Name or Description: Statewide Catfish Management Prospectus

Contact Information:

Name: David Buckmeier

Coauthors: Numerous

Email: David.Buckmeier@tpwd.texas.gov

Phone: 830-866-3356

Objective: Publish a 10-15 page document for the general public stating our plan to manage catfish in Texas.

Current Status: Completed, Fall 2016

Abbreviated Abstract: A draft document was completed and an online survey was conducted to acquire public input. Approximately 900 anglers completed the survey. Support for more restrictive regulations (31.2% of respondents) and the importance of trophy fish (16.8% of respondents) were the two most common comments by anglers. After incorporating public input, the document was finalized and is currently being printed for distribution. The final

product is about 10-15 pages and states our vision, objectives, and general plan to manage catfish in TX waters. This document will guide future actions of the Inland Fisheries Division regarding catfish management.

Project Name or Description: Population Dynamics, Hand Fishing, and the Modeled Effect of Exploitation on a Flathead Catfish Population in East Texas

Contact Information:

Name: Kris Bodine

Coauthors: Richard Ott, Daniel Bennett, Jake Norman, Warren Schlechte

Email: Kris.Bodine@tpwd.texas.gov

Phone: 830-866-3356 x 213

Objectives: 1) Quantify population metrics (i.e., mortality [fishing and natural], growth, and population density, 2) use the estimated metrics to model the effects of exploitation (emphasizing harvest of large fish by hand fishers) on Flathead Catfish (i.e., yield, trophy fish abundance, recruitment, and longevity).

Current Status: Manuscript in progress

Abbreviated Abstract: Recent legalization of hand fishing in Texas has prompted concern for the potential over harvest of catfish. Large (> 600 mm) Flathead Catfish *Pylodictis olivaris* are thought to be most vulnerable to this angling method, and the potential effects of harvesting large fish are not well understood. Therefore, in April 2013 we quantified size- and gear-specific exploitation for Flathead Catfish in Lake Palestine, Texas by tagging 255 fish within three size groups (457–599 mm; 600–761 mm; > 762 mm) with reward tags. We also quantified abundance, mortality (total and natural), and growth to simulate the effects of exploitation (emphasizing trophy size groups targeted by hand fishing) on the Flathead Catfish population. Exploitation was low (3.2%) and size-specific harvest was less than 5% for all size groups. Trot lines and hand fishing accounted for 100% of the harvest (50% for each gear). Harvest by trot lines was evenly spread across all size groups tagged; however, hand fishers only harvested trophy fish (> 762 mm). Our models indicated maximum sustainable yield (MSY) would be achieved at 10 to 15% exploitation. Recruitment and growth overfishing was evident at about 15 to 20% exploitation. When simulating increased exploitation by hand fishers only (achieved by increasing exploitation of fish > 762 mm), MSY was achieved at exploitation greater than 25%; recruitment overfishing was not evident until 55% exploitation and growth overfishing never occurred. These results indicate that the current low harvest by hand fishers will have little impact on yield or size structure of Flathead Catfish, and in most scenarios, the current 457-mm

minimum length limit can maintain a sustainable fishery. Undoubtedly any additional harvest of trophy fish will reduce trophy-fish abundance; however, exploitation of trophy fish (alone) would need to exceed 55% before populations become unsustainable.

Project Name or Description: Surveys of Texas Hand Fishers

Contact Information:

Name: Daniel L. Bennett

Coauthors: Kris Bodine, Richard Ott, Jake Norman, Warren Schlechte

Email: dan.bennett@tpwd.texas.gov

Phone: 903-786-2389

Objectives: 1) Characterize the demographics (e.g., age and gender), angling practices (e.g., harvest tendencies and amount of angling activity), and opinions of hand fishing anglers in Texas.

Current Status: Manuscript in progress

Abbreviated Abstract: In 2011, the Texas state legislature legalized hand fishing as a harvest method for catfish in Texas. Angler surveys conducted prior to the legalization of hand fishing do not include input by hand fishers therefore, we administered statewide surveys to characterize hand fisher demographics and angling behaviors. About 44% of hand fishers surveyed (N = 49) considered hand fishing their most important fishing activity, but only 5.6% exclusively hand fished; most hand fishers use other gear types to fish for catfish. Hand fishers indicated they fish an average of 21.7 days per year primarily associated with seasonal spawning periods. Hand fishers caught 3 to 5 flathead catfish per trip, yet harvested only 1 to 2 fish per day (about 18 to 40 flathead catfish annually). Anglers reported their average catch size was 783 mm and average harvest size was 706 mm. The maximum size flathead catfish hand fishers suggested they would keep was 852 mm, and reported trophy size of flathead catfish was 1,057 mm. Results suggest hand fishers prefer catching fewer large fish, and may selectively release some larger catfish.

Project Name or Description: Effective Catfish Harvest Regulations for Achieving Fishery Objectives

Contact Information:

Name: Kris Bodine

Coauthors: Warren Schlechte, Nate Smith, Dan Shoup

Email: kris.bodine@tpwd.texas.gov

Phone: 830-866-3356

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

Current Status: Project initiated Fall 2015.

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 are modeling a subset of catfish regulations (14 regulations) commonly used in Texas to identify conditions when each regulation will effectively accomplish management goals.

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: Rick Ott, Tom Hungerford

Email: John.Tibbs@tpwd.texas.gov

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 jugline attitude and opinions, as well as economic impact, before and after the regulation is enacted, 3) Measure pole-and-line angler attitude and opinions, 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 2016.

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 or Description: Channel and Blue Catfish Recruitment Variability in Colorado River Reservoirs, Texas

Contact Information:

Name: David Buckmeier

Coauthors: Nate Smith, Dan Daugherty

Email: David.Buckmeier@tpwd.texas.gov

Phone: 830-866-3356 x 219

Objective: 1) evaluate the consistency of recruitment patterns of each species across reservoirs, 2) estimate the magnitude of recruitment variability and identify possible effects of hydrologic variability, and 3) explore relationships between annual recruitment variability (i.e. year class strength) and possible explanatory variables at regional and local spatial scales.

Current Status: On-going. Data collection is complete; analysis and manuscript are in progress.

Abbreviated Abstract: Recruitment of both channel and blue catfish was mostly synchronous across Colorado River reservoirs, Texas and generally declined over the last decade (which has experienced extensive drought). Recruitment has been highly variable in several reservoirs and the magnitude of recruitment variability was positively related to hydrologic variability (CV reservoir water level, volume, and pelagic area) for channel catfish. Similar to recruitment variability, independent variables related to year class strength of channel and blue catfish were also related to reservoir hydrology. Few relations were found in our most hydrologically stable reservoir, whereas many were identified for reservoirs that experienced substantial hydrologic variability. Hydrologic conditions during spawn and postspawn seasons most often produced significant relations. As water demands in Texas continue to increase for a growing human population, managers should anticipate greater annual variation in recruitment of catfishes in reservoirs that are allowed to fluctuate. When combined with changing climatic conditions, including prolonged droughts and more extreme weather patterns, sustaining quality fisheries in these systems will be challenging. However, by understanding the effects of changing hydrology on recruitment patterns of important sport fish species with different life history strategies, managers may find some opportunities. Unlike short-lived species (e.g. white crappie) that typically develop “boom or bust” type fisheries in these systems, long-lived species (including catfishes) appear capable of supporting sustainable, high quality type fisheries so long as strong year classes are produced at least every five years.

Project Name or Description: Temporal Patterns of Angler Use and Abundance of Stocked 229-mm Channel Catfish in Twenty Small Texas Impoundments

Contact Information:

Name: Charlie Munger

Coauthors: Numerous

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Objectives: 1) Assess survival of 9" Channel Catfish (CCF) stocked into Community Fishing Lakes, 2) assess angler use of stocked CCF.

Current Status: In press; SEAFWA

Abbreviated Abstract: Sub-adult channel catfish (Ictalurus punctatus) are stocked into community fishing lakes in Texas to provide anglers with the opportunity to catch fish close to home. Survival of these stocked fish is unknown, and this study was initiated to provide some information and guidance for Texas' channel catfish stocking program. This study was conducted on 20 Texas lakes between 0.4 and 4.0 ha, with 10 located in urban environments and 10 in rural locations. Lakes were stocked once with adipose fin-clipped channel catfish and surveyed monthly with baited hoop nets for 6 months. Angler effort was estimated using game cameras. Urban angling effort was significantly higher than rural angling effort. Winter had the lowest angling effort in rural and urban lakes, and angling effort declined significantly two weeks following stocking in both types of lakes. Hoop-net catch rate was similar between urban and rural lakes. Hoop-net sampling in five lakes yielded no recaptures of stocked channel catfish and stocked fish essentially disappeared within four months of stocking in five other lakes. Angling effort was lowest on lakes where stocked fish survived all six months (survival lakes); fishing effort was highest on lakes where stocked fish disappeared within the 6-month target period (partial-survival lakes), indicating anglers may be removing these fish from the population. Angling effort on lakes where no channel catfish survived was intermediate and similar to effort in the survival- and partial-survival Lakes. The 229-mm channel catfish stocking program provided angler opportunity for at least 6 months in 50% of the stocked lakes in Texas and for less than 6 months in another 25%. Based on our results, all lakes in the channel catfish stocking program are now evaluated for stocking success, and those characterized by consistently high stocking mortality will be removed from the program.

Project Name or Description: Angler Characteristics, Catch, and Harvest for Neighborhood Fishin' Program Lakes

Contact Information:

Name: Robert Mauk

Coauthors: Numerous

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Phone: 940-766-2383

Objectives: 1) Determine if the Neighborhood Fishing Program (NFP) is meeting stated goals in terms of percentage of children participating, and creation of new anglers. 2) Examine NFP angling participation, catch, and harvest throughout the year, to determine if fish stocking schedules and rates can be altered to better meet temporal demand/expectations. 3) Examine angler catch using percent-of-success as an index. 4) Determine angler expectations in terms of catch and harvest of stocked fish.

Current Status: Final report is complete/available

Abbreviated Abstract: The Texas Parks and Wildlife Neighborhood Fishin' Program (NFP) began in 2003. This program aims to increase fishing opportunity in urban areas and increase participation in fishing by people living in urban areas. Since the NFP's inception, periodic evaluations led to modifications of the program, and the program has been expanded to new communities. A comprehensive examination of the program was undertaken in 2012. This was a year-long study examining participation, fishing effort, catch, harvest, and angler demographics and opinions. Overall, the 14 current NFP sites were well utilized with an estimated 81,269 different anglers together expending 275,632 hours of angling effort. "New anglers", defined as those under 17 years of age or those having fished in fewer than three of the past five years, comprised 45.6% of program participants. The percentage of anglers who caught fish during their trip averaged 44.0% during the warm months of the catfish season, and 28.4% during the fall-winter trout season. Overall, 88.6% of anglers reported they did not need to catch a fish to enjoy their trip and 99.1% stated they would fish the NFP site again. Overall, 32.6% said they fished only at the NFP site and nearly half of all anglers stated they had fished the same NFP site during the previous year. Two-thirds of respondents claimed knowledge about the NFP; one-third heard about the program through word-of-mouth. Various internet media were also popular ways to find out about the program and participating sites. Kiosks and signage, proved effective at sites that had them.

Project Name or Description: Comparison of catfish catch and harvest among three angling gear types at Choke Canyon Reservoir

Contact Information:

Name: John Findeisen

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Phone: 361-547-9712

Objective: To determine differences in catch per unit effort (CPUE), catch per unit hook effort (CPUHE), total harvest, and size structure for catfish among three angling gear types at Choke Canyon Reservoir.

Current Status: On-going. Data collection has been completed.

Abbreviated Abstract: Size range of harvested fish was greatest for juglines followed by trotlines and active gear anglers. However, active gear anglers were more numerous and thus harvesting more fish. Currently collecting boat ramp use information via game cameras (since July 2010). There has been some nighttime, but much less than during daylight.

Project Name or Description: Use of copper sulfate for management of columnaris disease in Channel Catfish and filamentous algae in low-alkalinity hatchery ponds

Contact Information:

Name: Neil Pugliese

Coauthors: Reese Sparrow

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Objectives: 1) Determine sensitivity of catfish to copper, 2) determine minimum efficacy level of copper for columnaris and algal treatment in catfish ponds.

Current Status: Previously postponed because of low Channel Catfish production. Project will resume this year providing increase catfish production.

Abbreviated Abstract: Phase 1 of the project will determine sensitivity of Catfish to copper (i.e. determination of the LC50 and No-effect level of copper to Channel and Blue Catfish). Phase 2 will determine the minimum efficacy level of copper for columnaris treatment. Phase 3 will define the minimum efficacy level of copper for algal treatment.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee: Aaron Bunch

Date Submitted: 1/29/2016

Project Name or Description: Movement Ecology of Blue Catfish in Two Tidal Rivers in Virginia

Contact Information:

Name: Aaron Bunch

Co-Authors: Greg Reger

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Phone: 757-293-8334

Objective: Track Blue Catfish movements in the Rappahannock and Pamunkey rivers

Current Status: Monitoring phase.

Abbreviated abstract:

Over several decades, the non-native Blue Catfish *Ictalurus furcatus* has spread to many waterways within the Chesapeake Bay watershed. Natural dispersal from mobile individuals contributed to population expansion. Evaluating movement patterns of Blue Catfish specific to tidal rivers will help managers and researchers understand home range size, seasonality of movements, and environmental variables that may cue fish to move. Our objective was to tag and track Blue Catfish in the Pamunkey and Rappahannock rivers in order to evaluate movement patterns. Acoustic tags were surgically implanted into Blue Catfish (size range = 356–1152 mm total length; n = 30 per river) in July 2015. To track tagged fish we used a combination of active and passive tracking techniques. We supplemented existing stationary receiver arrays with additional strategically placed VR2W receivers. The receiver arrays provided continuous

detection throughout the time period. Active tracking was conducted each month with a VR100 mobile receiver. Preliminary data suggests that a large portion of tagged fish showed high site fidelity, but large movements occurred in others, especially in a downstream direction. Exploring what factors influence spatiotemporal movement patterns (i.e., tide cycles, salinity, flow, and seasonality) will be an important next step in this study. We will continue this study through the end of the tag life duration; batteries are expected to expire during the summer of 2017.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee: Aaron Bunch

Date Submitted: 1/29/16

Project Name or Description: Abundance estimation of Blue Catfish in Powell Creek, Pamunkey River, and Rappahannock River based on mark-recapture

Contact Information:

Name: Aaron Bunch

Co-Authors: Bob Greenlee, Dr. Yan Jiao, Corbin Hilling

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Phone: 757-293-8334

Objective: Estimate Blue Catfish abundance in discrete tidal river sections

Current Status: Analysis phase

Abbreviated abstract:

Virginia Department of Game and Inland Fisheries biologists have been collecting standardized long-term monitoring data on catch-per-unit-effort and age/growth on Virginia's tidal rivers since the early 2000s. Despite this long-term dataset allowing for determination of status and trends, a major data gap with regards to Blue Catfish monitoring is the lack of available population size estimates. Focused effort to estimate population size in Powell Creek, a small

tidal tributary to the lower James River was conducted in the summer of 2007, 2014 and more recently in 2015. Additionally in 2015, mark-recapture studies were expanded to sections within the tidal Rappahannock (12 km section) and Pamunkey (6 km section) rivers. Approximately 35,000 marks total were applied across rivers by large (20+) field crews over the course of a three week period. Population sizes are currently in the process of being estimated using a Bayesian framework. Acoustic telemetry supported the use of closed population models for Powell Creek, however the open sections of the Rappahannock and Pamunkey rivers will likely require an open model approach.

Catfish Management Technical Committee
American Fisheries Society - Southern Division

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee:

Date Submitted:

Project Name or Description: Channel catfish spawning boxes

Contact Information:

Name: Steve Owens

Co-Authors: Jeff Williams

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Objective:

Current Status:

Abbreviated abstract: Forty-two channel catfish spawning boxes were built from hemlock boards to the specifications recommended in literature published by the Pennsylvania Fish and Boat Commission and placed in two DGIF managed lakes during the late spring of 2015. Twenty-two boxes were deployed at Hungry Mother Lake, located in Hungry Mother State Park, Virginia. Twenty boxes were deployed in Keokee Lake, located in Lee County, Virginia. Spawning boxes were monitored every few weeks with an Aquavue underwater video camera

during the summer to evaluate channel catfish usage. Hungry Mother Lake spawning boxes were found to have channel catfish occupying three boxes within the first two weeks. Several boxes were found to have channel catfish guarding egg masses throughout the summer. Hungry Mother Lake spawning boxes averaged a 12% occupancy rate during the monitoring period. Keokee Lake was more turbid throughout the summer, which made it challenging to inventory the boxes without pulling the boxes. No channel catfish were found in the boxes at Keokee Lake. This could be a result of monitoring challenges or an abundance of cavities already found in the lake, but adequate data is not available to determine the efficacy of the boxes in this impoundment. Channel catfish spawning boxes will continue to be monitored during the summer of 2016. Future work will focus on evaluating potential contribution of naturally spawned and recruited channel catfish to heavily fished populations that have traditionally relied on annual stockings of 10-12" catfish.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee: Aaron Bunch

Date Submitted: January 13, 2016

Project Name or Description: Yellowfin Madtom (*Noturus flavipinnis*) Reintroduction in the North Fork Holston River

Contact Information:

Name: Mike Pinder

Co-Authors:

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Objective: Establish as self-sustaining Yellowfin Madtom population in the North Fork Holston River

Current Status: Federally Threatened

Abbreviated abstract: The Yellowfin Madtom is a small catfish endemic to the Upper Tennessee Drainage of Tennessee and Virginia. The species is federally threatened and is extant in only four rivers within the drainage. Even though it was first discovered in the North Fork Holston River (NFHR), Virginia, no Yellowfin Madtom has been found for over 100 years in this system. The NFHR is designated as a Nonessential Experimental (NEP) by the U.S. Fish and Wildlife Service, which allows for the species reintroduction without regulations and protections brought by the U.S Endangered Species Act. Since 2010, studies have found suitable habitat in the NFHR and a large, viable source population in a nearby river to collect eggs and raise individuals. We plan to release individuals at two NFHR locations in the summer of 2016. Releases will occur for a minimum of five years. Monitoring will be conducted for ten years.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee: Aaron Bunch

Date Submitted: 01/28/2016

Project Name or Description: Life-history characteristics of invasive blue catfish in Virginia.

Contact Information:

Name: Vaskar Nepal KC

Co-Authors: Dr. Mary Fabrizio

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Objective: To investigate key life-history characteristics that may contribute to the success of invasive blue catfish. Specifically, we will study the following aspects of blue catfish biology: growth, reproductive biology, energy content, salinity tolerance, metabolism, and consumption rates.

Current Status: We are currently collecting samples to study growth and reproductive biology of blue catfish. In 2015, ~250 ovary samples were collected. A total of ~600 fish were sampled, and the otoliths are currently being processed.

Abbreviated abstract: In the Chesapeake Bay region, introduced blue catfish *Ictalurus furcatus* have spread from freshwater habitats into brackish and saline waters, and population abundance has increased dramatically. As an abundant top predator in a novel environment, blue catfish may negatively affect native fishes of the Chesapeake Bay system. However, biological and ecological factors that may limit further range expansion of this species are largely unexplored. We will investigate key life-history characteristics that contribute to the success of invasive blue catfish in the Chesapeake Bay region. We will use a combination of laboratory- and field-based observations, and quantitative modeling techniques to address these objectives. First, we will characterize the reproductive biology, energetic requirements, and salinity tolerance of blue catfish. Together with data from the literature, we will develop a spatially-explicit model to identify potential distribution pathways for blue catfish populations in Chesapeake Bay subestuaries. Specifically, we will use a bioenergetics modeling approach to identify habitats where blue catfish are likely to be more successful (in terms of growth, reproduction, and survival).

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee: Aaron Bunch

Date Submitted: January 27, 2015

Project Name or Description: Dynamics and Role of Blue Catfish *Ictalurus furcatus* in Tidal Rivers of Virginia funded by Federal Aid in Sport Fish Restoration, VDGIF

Contact Information:

Name: Donald J. Orth

Co-Authors: Yan Jiao, Man Tang, Joseph Schmitt, Jason Emmel, Corbin Hilling, Mary Fabrizio, Bob Greenlee

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Objectives:

Part 1. Quantify the diet of blue catfish in terms of relative importance of diet items:
a. quantify the diet of blue catfish in terms of relative importance of diet items
b. compare the diet composition among size groups, sample time, and river /location.
c. estimate the trophic level and omnivory index for different sized blue catfish;
d. evaluate the extent of opportunistic and selective feeding on fish and crabs; and
e. estimate the production : biomass ratio (P:B), and the consumption : biomass ratio (Q:B), to use in linking blue catfish demographic model to potential predatory demand.

Part 2. Development of hierarchical models juvenile abundance commercial harvest (VMRC), and electrofishing CPUE surveys to estimate demographic trends and important drivers

a. estimate the spatial and temporal variation of life history traits which include growth (individual), mortality and recruitment, by developing Bayesian hierarchical models;
b. explore the temporal and spatial population growth variation through a Bayesian population growth model;
c. explore possible impact factors by linking them to the trends of the variation of the life history traits and population growth
d. construct hierarchical demographic models to evaluate population trend under different alternative management options

Current Status: We are on schedule to complete a final report in Fall 2017, but have submitted additional proposal to do a management strategy evaluation. With additional support from Virginia Sea Grant we are also reporting findings in a blog on www.chesapeakecatfish.com and establishing a network of information users and stakeholders.

We have completed a three-year effort to collect Blue Catfish stomach samples in all seasons and salinity zones. We have also opportunistically collected White Catfish and Flathead Catfish. This data set will provide the basis for several analyses that examine spatial and temporal factors driving opportunism in Blue Catfish feeding. We have identified many unidentifiable fish in stomachs with DNA barcoding. This methodology is described in "Effectiveness of DNA barcoding for identifying piscine prey items in stomach contents of piscivorous catfishes (Environmental Biology of Fishes, 2015). The spring portion diet sampling from the James River during the spring Alosine migration is described in a draft report (available to interested parties); we are in the process of revising and improving this for eventual publication. Joseph Schmitt will present these findings to the Catfish Technical Committee at the SD AFS meeting.

Examination of all available size at age data via a Bayesian hierarchical model analysis, supports a conclusion that stream system, the year that the data were collected (year), and the year that the fish was born (cohort) are each significant influences on growth of blue Catfish. Mortality estimation will be done via either catch curve analysis or age/size structured models. Survey data on Blue Catfish relative abundance will continue to be used to determine an appropriate modeling framework for mortality estimation. Harvest data from both Maryland and Virginia will also be incorporated in fitting a size-based model for Blue Catfish.

Abbreviated abstracts

Hierarchical Bayesian approach to standardize catch rates of Blue Catfish in tidal rivers of Virginia from multiple surveys using multiple gears. Submitted to *Fisheries Research*

Blue Catfish, a large-river fish species introduced into tidal waters of Virginia from 1970s to mid-1980s, have rapidly expanded into many major tributaries in the Chesapeake Bay watershed. This expansion necessitates the need for monitoring abundance of the Blue Catfish. A hierarchical Bayesian delta model was applied to examine the relative influence of environmental, spatial and temporal factors on Blue Catfish catches from annual surveys conducted in tidal rivers of Virginia because of the high percentage of zero observations and sparse data. The analyses were based on three datasets, collected from a bottom-trawl survey by the Virginia Institute of Marine Science (VIMS) and low- and high-frequency electrofishing surveys by the Virginia Department of Game and Inland Fisheries (VDGIF). Three indices were used to summarize the relative population abundance, two for young Blue Catfish (<300 mm) and one for older Blue Catfish (>300 mm). Data collected from multiple tributaries by the same type of survey were treated as hierarchically structured. In this study, the catch rates of Blue Catfish in the trawl survey were significantly influenced by the salinity, temperature, season and site locations. Latitude, longitude, salinity and temperature significantly influenced the catch rates in the high-frequency electrofishing survey; the latitude and temperature affected the catch rates significantly in the low-frequency electrofishing survey and conductivity also significantly influenced the proportion of positive catches.

Standardized catch rates were highly variable and increased over time significantly in the trawl survey and the low-frequency electrofishing survey, indicating that the abundance of Blue Catfish increased across years. We recommend continued monitoring in these and other tidal rivers to permit evaluation of control strategies of Blue Catfish

Moran, Z. et al. 2015. Effectiveness of DNA barcoding for identifying piscine prey items in stomach contents of piscivorous catfishes *Environmental Biology of Fishes* 99:161-167

While traditional morphological identification led to species-level identification of 65 % of fish prey items, addition of DNA barcoding resulted in identification to species of 88 % of fish prey items overall. Diet items identified by DNA markers included anadromous Striped Bass *Morone saxatilis* and herrings and shads *Alosa* spp. that are the focus of fishery restoration programs in these rivers. We found DNA barcoding to be an efficient and cost-effective addition to diet studies of non-native predators.

Schmitt, J.D., and D.J.Orth. 2015. First Record of Pughead Deformity in Blue Catfish. *Transactions of the American Fisheries Society* 144:1111-1116.

Pugheaded fish exhibit anomalous bone structure, often characterized by a steep, bulging forehead and incomplete closure of the mouth. While the pughead deformity has been observed in many species of fish, thescientific literature contains no documented instances of pugheadedness in Blue Catfish *Ictalurus furcatus*. Pugheadedness is rare, particularly in tidal systems, and most recorded instances have been based on single specimens. We captured several pugheaded Blue Catfish (N = 18) in the tidal Rappahannock River in eastern Virginia, a tributary of the Chesapeake Bay. While Blue Catfish sampling was extensive in the James, Pamunkey, and Mattaponi rivers (N = 4,357 fish at 163 sites), pugheaded specimens were encountered at

only six sampling sites within the upper tidal zone of the Rappahannock River, an area known to be susceptible to summertime hypoxia. We encountered pugheaded individuals at a higher rate than reported in most published studies, ranging between 1.89% and 3.68%, much higher than rates detected in other tidal systems. Pugheaded specimens had significantly lower relative weights than nonpugheaded specimens, indicating that this deformity may affect their ability to forage. Hypoxia, pollutants, and genetic anomalies are all explored as potential drivers of high deformity rates within the Rappahannock River.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: Virginia

Name of Representative to Technical Committee: Aaron Bunch

Date Submitted: 1/22/16

Project Name or Description: Predation of Alosa species by non-native catfish in an Atlantic slope drainage

Contact Information

Name: Joseph D. Schmitt

Co-Authors: A. Bunch, E. Hallerman, Z. Moran, D. Orth

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Objective: To understand the potential impacts of non-native blue and flathead catfish on imperiled alewife, blueback herring, and American shad in the Chesapeake Bay

Current Status:

Abbreviated abstract: Native to the Midwest, blue catfish *Ictalurus furcatus* and flathead catfish *Pylodictis olivaris* have been widely introduced into many Atlantic slope rivers, and are now found in several drainages of the Chesapeake Bay. As large, long-lived species, fisheries managers are concerned that these catfish are preying upon depleted anadromous species such as American shad, blueback herring, and alewife. We assessed spatiotemporal variability and

selectivity in the diets of both blue and flathead catfish during the spring spawning migration of Alosa species. Diets were extracted from 2,495 catfish, which included hundreds of specimens > 600 mm TL (N=947). DNA barcoding was used to identify degraded fish prey, and allowed us to identify some 30 taxa that would have otherwise gone undetected. Blue catfish had broad, omnivorous diets while flathead catfish fed solely on other fish. Alosa species were found in less than 5% of blue catfish stomachs while they occurred in nearly 17% of flathead catfish stomachs. Flathead catfish selected heavily for American shad and river herring, while blue catfish only slightly selected for American shad (Chesson's selectivity index). Alosa species were consumed more frequently in tidal fresh areas, particularly near Bosher Dam, and predation of Alosa species peaked in April (logistic regression; $P<0.01$). Given this information, flathead catfish are likely to have a greater per capita impact on depleted Alosa species. Furthermore, dams still act as major obstacles to anadromous fish passage and may increase their vulnerability to predation.

SDAFS – Catfish Management Technical Committee

State Report Format

State Reporting: West Virginia

Name of Representative to Technical Committee: David Wellman

Date Submitted: 11 January 2016

Project Name or Description: Assess population characteristics of catfish in the lower Little Kanawha River in WV

Contact Information:

Name: Katie Zipfel

Co-Authors:

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Objective: Assess population characteristics of catfish in the lower Little Kanawha River in WV with the premise that the populations of channel and flathead catfish would be related to that of the Ohio River. Assess sampling bias with an addition of an exclusion device to prevent large flathead catfish and snapping turtles in the hoop nets.

Current Status: ongoing

Abbreviated abstract:

Beginning in 2008, the catfish (channel and flathead catfish) population has been surveyed in the lower Little Kanawha River (mouth upstream to Leachtown Dam and Wells Lock upstream to Palestine Riffle) employing both baited hoop nets and low-frequency (DC output of 200s, 2-3amps and 15 Hz pulse rate) electrofishing. This project was started under the presumption the catfish populations, especially the flathead catfish population, would be associated with that of the Ohio River, whether similar to or potentially represent a nursery population. Surveys were conducted in the late spring-summer. All catfish collected were measured for total length. Channel catfish were tagged with a T-bar tag and flathead catfish ≥ 250mm were tagged with a T-bar tag and implanted with a PIT tag. Hoop net catch rates for channel catfish are variable and highly dependent upon river flow; increasing up to 300% during an increasing flow event. The addition of an exclusion device (177mm copper ring affixed to first throat of the hoopnet) proves to negatively affect both catch rates and sampled length frequencies of channel catfish. More research on this will be conducted in the future as well as an evaluation of possible escapement allowed by the exclusion ring. The low-frequency electrofishing has proved to be less effective for collecting flathead catfish in the Little Kanawha River (Mean CPUE 21.12 fish/hr), likely due to the amount of bottom cover and potential cavities and was discontinued in 2012. Length frequency analyses of flathead catfish indicate a wide distribution of sizes, not associating with nursery habitats. Angler returns suggest moderate fishing pressure in the Little Kanawha River with limited harvest. Data suggest the Little Kanawha River to be more of a channel catfish fishery and less of a flathead catfish fishery indicating little association with the flathead catfish fishery of the Ohio River.

Project Name or Description: Channel Catfish Population Abundance and Growth Characteristics in the South Branch of the Potomac River

Contact Information:

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Objective: Assess the channel catfish population in the South Branch (SBR) of the Potomac River. Due to increased angler interest, channel catfish in the SBR is becoming a more popular game fish. There is a lack of population information for this species in the SBR. Effort will be employed to better understand the population dynamics of this species needed for an assessment of alternative management opportunities.

Current Status: ongoing

Abbreviated abstract: A number of pools, possessing a variety of habitats and colonized by channel catfish, will be assessed longitudinally throughout the SBR. Essential population characteristics such as abundance, growth, condition, size distribution and movement/site fidelity will be assessed. Growth modeling will be achieved through the aging of structures in order to better understand the rate and variability of growth characterizing this population. Insight into fishing harvest and pressure will be sought through angler reporting of tagged fish.

Effort will be devoted to a single pool, and thus a single river stretch, per sampling season. Pools possessing critical habitats will be selected to cover a variety of stream regions with differing physical, chemical and biotic influences. Baited hoop nets will be deployed during four different samples conducted within a single pool during four summer months of the sampling season. Each survey period includes an initial day for net deployment followed by three subsequent two day sampling periods, after which nets are tended and catch is evaluated. Nets will be re-baited as needed. Catch per effort will be reported as # of fish/net/night. This sampling design will also allow the utilization of both Jolly-Seber (seasonal) and Schnabel (weekly) multiple census mark-recapture estimators where possible. All channel catfish total lengths will be measured to the nearest millimeter, determined to be male or female through the examination of urogenital structures, and all fish will be weighed to the nearest gram. A T-bar anchor tag will be applied to indicate individual fish. Additionally, anchor tags will provide opportunities for the reporting of recreational pressure by anglers. Because tags can be removed for angler reporting, additional marks in the form of fin clips will be made to assign recaptures to prior capture history for long-term mark-recapture estimators. Proportional (PSD) and residual stock densities (RSD) will be calculated and length-frequency histograms will be generated for pooled catches to better understand the size structure of the population. Individuals to be sacrificed for the obtaining of aging structures will be randomly selected during the late summer-fall portion of the sampling season. Fish retaining tags from prior captures will not be sacrificed. Examination of lapillar otoliths will provide ages to be used in the development of a Von bertalanffy growth curve for the population. Separate Von bertalanffy curves will also be constructed for male and female fish in order to assess the utility of a sex based age key for this population. Pectoral spines will be collected from sacrificed fish and cross-sectioned to provide an additional age quantification. Comparisons between lapillar otoliths and pectoral spines will be made in order to determine if the latter non-lethal structure is a viable alternative for generating age estimates for this riverine population.