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Assessment of a Newly Established Blue Catfish Population in Taylorsville Lake

by: David Baker

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Abstract

Taylorsville Lake has been stocked with blue catfish from 2002-2014 in an effort to develop a quality fishery with trophy potential. In March 2011, a 15 fish daily creel limit (blue and channel catfish combined) and 1 fish ≥25.0 in size limit was implemented. Angler attitude surveys supported increased management for trophy potential. Growth rates have remained at acceptable levels from 2006-2013 with fish reaching 30.0 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 ≥30.0 in in excellent condition. Winter gill netting proved to be an important tool at sampling fish ≥30.0 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.

Introduction

Blue catfish, *Ictalurus furcatus*, the largest member of the catfish family are native to Kentucky and are primarily found in larger river systems including the Mississippi, Ohio, lower Cumberland, lower Tennessee, Green, Licking and Kentucky rivers (Graham 1999; Burr and Warren 1986). These fisheries provide valuable sport fish and commercial opportunities throughout the state (Graham 1999). In Kentucky, catfish angling ranks second in popularity only behind largemouth bass, creating a demand for quality catfishing opportunities throughout the state (USDI 2001). Historically, the Kentucky Department of Fish and Wildlife Resources (KDFWR) has stocked channel catfish into many of the Commonwealth's lakes and reservoirs (Kinman 1995). In more recent years, KDFWR has selected several lakes to stock with blue catfish due to their increasing popularity amongst anglers and for their trophy potential.

Growth rates of blue catfish in reservoirs is dependent on a number of variables such as length of the growing season and water temperature commonly observed over the different latitudes (Graham 1999). Dynamics such at inter and intra-specific competition, lake fertility and available forage base may be the driving forces behind blue catfish growth in Kentucky. When adequate densities of forage are available, primarily shad species, the growth rates of blue catfish in reservoirs can rival those found in the large river systems (Jenkins 1956; White and Lamprecht 1990). Blue catfish eat a variety of foods including invertebrates, crustaceans and fish; however, growth rates increase significantly once blue catfish become primarily piscivorous.

In Kentucky, the utility of blue catfish stockings into public lakes and reservoirs for developing quality fisheries with trophy potential is not well known. The purpose of this study is to collect critical population statistics on the blue catfish stocked into Taylorsville Lake to determine suitable management options for obtaining a high quality fishery while providing trophy-size fish.

Study Area

Taylorsville Lake is a 3,050 acre flood control lake completed in 1983 by the U.S. Army Corp of Engineers (USACE). This lake was created by impounding the Salt River near Taylorsville, KY for the primary purpose of flood control and secondarily providing opportunities for water storage, outdoor recreation and fish and wildlife activities. The Taylorsville Lake drainage covers 2,920 square miles and 15 counties. The other major tributaries incorporated into Taylorsville Lake drainage include: Ashes Creek, Jacks Creek, Beech Creek, Little Beech Creek and several other smaller tributaries. These drainages are largely comprised of phosphatic limestone soils and agricultural operations which provide high levels of phosphorus input into the streams that feed Taylorsville Lake. These conditions create a hyper-eutrophic environment that benefits shad production and growth rates; however, these conditions also create water quality issues with low oxygen levels, increased abundance of blue-green algae and reduced average life expectancy of fish.

Methods

Blue catfish stocking began in 2007 at Taylorsville Lake at a standardized rate of 7.7 fish/acre (23,500 total fish) with equal numbers stocked in the upper (Van Buren Ramp) and lower (Possum Ridge Ramp) portions of the lake. Blue catfish are stocked annually during August after the completion of summer electrofishing to aide in the detection of naturally spawned age 1 fish. Blue catfish raised at the Peter W. Pfeiffer Fish Hatchery in Frankfort, KY are stocked at age 1+ and typically average 7.0-14.0 in.

Each July during the study period, once the thermocline was established, the blue catfish population was sampled using low-pulse DC (15 pulses/sec and 3-5 amps) electrofishing equipment. Six, 15-minute transects, were sampled in both the upper and lower portions of the lake. Sampling consisted of one boat shocking and an additional chase boat aiding in fish collection. All fish collected were measured to the nearest 0.1 in with that data used to determine abundance and size structure of the population. Otoliths were removed from 10 fish per inch class during 2006, 2009, and 2013 to determine and compare age, growth, and estimate total mortality throughout the stocking period from 2007-2014. Sagittal otoliths were cross sectioned and aged following the methods of Buckmeier et al. (2002).

During the fall, low-pulse DC (15 pulses/sec and 3-5 amps) electrofishing was conducted in an effort to collect fish for relative weight calculations. All fish collected were measured to the nearest 0.1 in and weighed to the nearest 0.01 lbs. Catch rate data was not collected in the fall.

An exploitation study was conducted during 2008 in an effort to determine what portion of total annual mortality was from angler harvest. During July 2008, approximately 1,000 fish were tagged using Carlin Dangler tags attached with stainless steel wire posterior to the first dorsal spine and between the pterygiophores (Marshall et al 2009). Tags were numbered in sequential order with a 4-digit identifier so that tags could be reported by phone. Data collected from all tagged fish included length, weight, and area released. The goal was to evenly distribute the tags from the 10.0-30.0+ in size class throughout the entire lake. An award system was used to encourage anglers to remove and report tagged fish during this 12 month study. Anglers received a pewter catfish pin for each tag reported with that tag number included in a monthly drawing for 9 cash prizes ranging from $10-$100 (1-$100, 1-$50, 2-$25 and 5-$10). Tags remained in the drawing until either that tag was drawn or until the conclusion of the study. A corrected exploitation was then calculated addressing tag loss, nonreporting and tagging mortality. Tag loss estimate for Carlin Dangler tags is reported from 0.0% (Graham 1999; Travnichek 2004) up to 15.7% (Sullivan and Vining 2011) in catfish. Nonreporting estimates ranged from 8.0-33.3% (Balsman 2014; Dreves 2009; Dreves 2010; Dreves 2011). These values were based upon previous exploitation studies conducted across several years, on multiple lakes and four different species in Kentucky. These nonreporting estimates were from exploitation studies that implemented the same reward system as used at Taylorsville Lake and are representative of the rate at which Kentucky's anglers report tagged fish. Tagging mortality was reported from 0.0% (Balsman 2014) up to 3.0% (Zack Ford, personal communication).

Creel surveys were completed at Taylorsville Lake in 2003, 2006, and 2009 providing information on catch rates, fishing pressure, harvest, and gear preferences of blue catfish anglers. At the same time, an angler attitude survey was completed for each angler to determine their satisfaction with the blue catfish fishery and if anglers would be receptive to alternative management actions (i.e., creel limits and/or size limits).

Gill nets were evaluated during the winter 2014-2015 as a means of targeting blue catfish ≥30.0 in providing additional information on this fishery. Six gill nets measuring 20' x 200' with 5.0 in bar mesh were fished in both the upper and lower sections of the lake for 24 hr sets. All catfish collected were measured to the nearest 0.1 in and weighed to the nearest 0.01 lbs. Data collected provided catch rates, abundance, size structure and winter relative weights.

At the completion of the study, data collected was analyzed using KDFWR's KFAS and KSLO software operating under SAS v. 9.2 (SAS 2007; Cary, NC). CPUE, size/age structure, relative weight, year class strength, and angler pressure data was used to determine the success of these stockings.

Results

Blue catfish have been stocked into Taylorsville Lake since 2002 with the stocking rates varying from 5.5 fish/acre to 29.0 fish/acre until 2007 when a standardize stocking rate was set at 7.7 fish/acre (Table 1). Since 2002, 363,097 fish have been stocked that ranged from 4.0-16.0 in, distributed equally in both the upper (Van Buren Ramp) and lower (Possum Ridge Ramp) portions of the lake.

Summertime sampling during 2007 recorded the highest catch rate throughout this project. Fish were collected at 236.0 fish/hr, ranging from the 9.0-28.0 in size class (Table 2). Sampling was not conducted during 2009 due to extremely high lake levels. During the next three years catch rates, continually decreased through 2011 when catch rates dropped to 27.1 fish/hr. Due to this dramatic drop in catch rates and angler input, a new regulation went into effect March 2011 that allowed anglers to only keep 1 blue catfish ≥25.0 and set a daily creel limit of 15 catfish (blue and channel catfish combined). Since the implementation of this regulation, catch rates have improved. Catch rates in 2012 rebounded to 104.0 fish/hr with fish present up to the 39.0 in size class. Catch rates fell to 60.0 fish/hr in 2013, but increased to 167.1 fish/hr in 2014, making it the second highest catch rate recorded during this project. From 2007-2014, except for 2013, catch rates on the lower half of the lake were consistently higher than those observed in the upper half of the lake.

Additional length break downs show catch rates of the 12.0-19.9 in size class followed the same pattern as total catch rates. However, the 20.0-24.9 in size class catch rates, post-regulation, have remained lower than the 8 year average of 10.0 fish/hr for three of the past four years (Table 3). The reason this size class has not rebounded is probably a result of the increased harvest this size range receives due to the new regulation. Blue catfish catch rates of the 25.0-29.9 in size class have remained relatively stable from 2010-2014; remaining above the 8 year average of 3.2 fish/hr. Fish ≥30.0 in have continued to increase each year with catch rates improving from 0.0 fish/hr in 2007 to 5.2 fish/hr in 2014.

Age and growth data was collected from otoliths in 2006, 2009, and 2013. During 2006, data was collected after stocking resulting in age 1 fish being present in the sample. However, in the 2009 and 2013 samples, data was collected prior to stocking, resulting in no age 1 fish being present in the sample, which indicates that no reproduction is occurring at this time. In all three samples, blue catfish reached the 20.0 in size class by age 5 (Tables 4-6). According to 2013 growth data, fish reach the 25.0 in size class at age 7 and the 30.0 in size class at age 10 (Table 6). Average growth rates ranged from 1.6 in/yr (2009) - 3.5 in/yr (2006). In 2013, growth averaged 2.4 in/yr; however, growth increased once the fish reached the 23.0 in size class. Growth from age 7 (23.2 in) to age 12 (36.5 in) averaged 3.3 in/yr compared to the 2.1 in/yr for age 2 (12.9 in) to age 6 (21.3 in). Total annual mortality was 0.23 in 2006 increasing to 0.34 in 2014.

During the fall, catfish were collected for relative weight (Wr) calculations. Overall, the condition of the blue catfish population was good, averaging 93 from 2007-2014 (Table 7). Wr ranged from 89 (2007) to 97 (2013) indicating Taylorsville Lake is adequately supporting this new fishery. Relative weights were good across all size groups, with the ≥30.0 in size group being in excellent condition, averaging 102 throughout this project.

During the 12 month exploitation study, 119 tagged blue catfish were reported with 81.5% of the reported tagged fish being harvested (Table 8). Anglers reported harvesting blue catfish ≥12.0 in; however, 94.8% of the harvested fish were ≥15.0 in. Blue catfish reported averaged 19.0 in, while fish harvested averaged 19.6 in. The 22 tagged blue catfish that were released ranged from the 10.0- 20.0 in size class and averaged 13.8 in. The uncorrected 12 month exploitation was 9.6%; however, after compensating for estimated tag loss, nonreporting and tag induced mortality, the corrected 12 month exploitation ranged from 8.6-14.0% (Table 8). Based on this range of exploitation, fishing mortality comprised 25.3- 41.2% of total mortality while natural mortality comprised 58.8- 74.7% of total mortality.

Gill netting was conducted during January and February 2015 in the upper and lower portions of the lake to target fish ≥30.0 in. A total of 42 blue catfish were collected in the lower lake in 10 net-nights ranging from 19.0-46.0 in. One hundred and thirty-three fish were collected in the upper lake in 6 net-nights ranging from 16.0-42.0 in. Overall, 175 fish were collected at a rate of 11.0 fish/nn (Table 9). Seventy-six percent of the sample consisted of fish ≥30.0 in, with 23.4% of the sample consisting of fish ≥35.0 in (trophy size).

Weights were recorded from all the blue catfish collected in gill nets in 2015 to evaluate winter relative weight values. Both the 20.0-29.9 in and ≥30.0 in size groups were in excellent condition with Wr values of 121 (Table 10). The 20.0-29.9 in size group condition improved from the Wr collected during the summer (95), while the ≥30.0 in size group Wr remained at 121.

Creel surveys conducted in 2003, 2006, and 2009 derived that the number of blue catfish caught per acre increased from 511.8 fish in 2003 to 12,153.8 fish in 2009 (Crosby 2004; Crosby 2010). This dramatic increase is also apparent in the pounds of blue catfish harvested which increased from 679.0 lbs in 2003 to 19,182.4 lbs in 2009. Across all three creel surveys, anglers harvested blue catfish that averaged 16.9 in and weighed 1.8 lbs. Blue catfish angler harvest was the lowest in 2006 at 79.5% and the highest during 2009 (98.3%). The rate of harvest has increase from 0.002 fish/hr in 2003 to 0.090 fish/hr in 2009. These trends represent the increased popularity and opportunity this fishery provides.

Angler attitude surveys indicate that on average about 34.0% of anglers fish for catfish at Taylorsville Lake. In 2009, 4.1% of Taylorsville Lake anglers specifically targeted blue catfish (Crosby 2010). Eighty percent of blue catfish anglers indicated that they were satisfied with the blue catfish fishery as opposed to 11.9% that were dissatisfied mainly due to the size of the fish available. When anglers were asked in 2009 if they would support or oppose restrictions on the number and size of blue catfish that could be harvested, 84.8% of anglers supported restrictions with no opposition. This was consistent with the 71.1% of catfish anglers in 2003 that were in favor of creating a trophy blue catfish fishery at Taylorsville Lake.

Discussion

Growth rates reported during this study were good when compared to other well-known blue catfish fisheries, such as Santee-Cooper Reservoir in South Carolina, Lake Texoma in Oklahoma and the Rappahannock River in Virginia. During 2009, blue catfish at Taylorsville Lake average 30.0 in at age 10. This is better than Lake Texoma which averages 23.0 in at age 10 (Boxrucker and Kuklinski 2005) and the Rappahannock River in Virginia which averages 24.0 in at age 10 (Greenlee 2011). Taylorsville Lake’s average growth is more similar to Santee-Cooper Reservoir which reports a 31.5 in average at age 10 (Lamprechet and White 2006). As the blue catfish population at Taylorsville Lake ages, growth will need to be continually monitored along with abundance and size structure in an effort to maintain current growth rates. Both, Lake Texoma and Rappahannock River blue catfish populations have slow, undesirable growth rates while reporting extraordinarily high catch rates. Catch rates at Lake Texoma were approaching 700 fish/hr (Boxrucker and Kuklinski 2005) while Rappahannock River catch rates were 4,698 fish/hr (Greenlee 2006). Electrofishing catch rates at Taylorsville were the highest during 2007 at 236.0 fish/hr and densities should be managed so not to negatively impact growth and reduce the trophy potential of this population as seen in Lake Texoma and the Rappahannock River.

Age frequency data imported into Fisheries Analysis and Simulation Tools (FAST) calculated the total annual mortality at Taylorsville Lake in 2014 at 34%. However, this estimate may be biased due to underestimation of large blue catfish collected in low-frequency electrofishing samples as reported in Virginia (Greenlee 2006). Buckmeier and Schlechte (2009) reported that blue catfish are only fully vulnerable to low-frequency electrofishing between 250- 855mm (9.8- 33.7 in). Based on these findings, winter gill netting was conducted during 2014-2015 to determine if these larger blue catfish were not represented in summer electrofishing data. Only

8 blue catfish were collected ≥35.0 in from 2007-2014 electrofishing data with fish represented up to the 39.0 in size class, while one year of winter gill netting resulted in 41 fish being collected ≥35.0 in with fish present up to the 46.0 in size class. This revealed the importance of implementing a variety of sampling methods to capture a representative sample of the entire population in order to effectively manage this fishery.

Corrected exploitation of blue catfish ranged from 8.6-14.0% after accounting for tag loss, nonreporting and tag induced mortality. Exploitation at Taylorsville Lake is at a level acceptable to fisheries managers. Marshall et al. (2009) explains that length limits made no differences in yield when exploitation is less than 7.0%; however, greater yields can be achieved at exploitation rates of 10.0- 20.0%. Managing exploitation can be more important than length limits at regulating length distribution, but high maximum size limits will help maintain a greater portion of the large blue catfish in the population. Daily creel limits and maximum size limits are a valuable tool since most catfish anglers do not practice catch and release. Eighty-one percent of all blue catfish caught at Taylorsville Lake were harvested, which is comparable to 87.0% of tagged fish that were harvested from Lake Wilson (Marshall et al 2009).

As this population continues to age and more fish reach trophy size, managers will need to evaluate management strategies that will focus on protecting size classes and manipulating overall abundance to benefit this resource. Taylorsville Lake is currently managed with a 1 fish ≥25.0 in and a 15 fish daily creel (channel and blue catfish combined). Other agencies have implemented blue catfish regulations that limit daily harvest, limit harvest of certain size classes (slot limit), maximum size limits, no harvest and unlimited harvest to meet the goals of the fishery. The Taylorsville Lake blue catfish fishery needs continued monitoring with the ability to change management strategies to meet the goals of providing a quality fishery with trophy fish.

Management Recommendation

Blue catfish stocking at Taylorsville Lake has been very successful at creating a put-grow-take fishery. Size structure, abundance, growth rates, and relative weights have remained at acceptable levels throughout the study period. It appears that the current special regulation implemented in March 2011 has created a balance of stabilizing the fishery for consumptive anglers while effectively protecting fish to maximize trophy potential.

It is recommended that:

1) Blue catfish stockings at Taylorsville Lake continue annually at 7.7 fish/acre (23,500 fish/year), noting that reproduction is not occurring at this time.
2) The population be managed with a 15 fish daily creel (blue catfish and channel catfish combined) with only 1 fish ≥30.0 in allowed which would not have a negative impact on the fishery while creating a better trophy opportunity for anglers.
3) Age and growth estimates are needed every 5 years to verify that blue catfish average at least 25.0 in at age 7 and 30.0 at age 10. If growth rates decrease below this level, catfish densities need to be manipulated.

4) Creel survey data and angler attitude surveys are needed with questions directed towards the management and satisfaction with the blue catfish fishery.

These parameters will be essential for making future management decision.

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References

Balsman, D. 2014. Statewide fisheries investigation project. Subsection IV: Urban fishing program. Kentucky Dept. of Fish and Wildlife Resources. Annual Report 2014.

Boxrucker, J. and K. Kuklinski. 2005. Abundance, growth, and mortality of selected Oklahoma blue catfish populations: Implications for management of trophy fisheries. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 62:149-153.

Buckmeier, D.L., E.R. Irwin, R.K. Betsill, and J.A. Prentice. 2002. Validity of otoliths and pectoral spines for estimating ages of channel catfish. North American Journal of Fisheries Management 22:934-942.

Buckmeier, D.L. and J.W. Schlechte. 2009. Capture efficiency and size selectivity of channel catfish and blue catfish sampling gears. North American Journal of Fisheries Management 29:404-416.

Burr, B.M., and M.L. Warren Jr. 1986. A distributional atlas of Kentucky fishes. Kentucky Nature Preserves Commission Scientific and Technical Series 4.

Crosby, J. 2004. District fisheries management. Project 1: Lake and tailwater fishery surveys. Kentucky Dept. of Fish and Wildlife Resources. Annual Report 2004.

Crosby, J. 2010. District fisheries management. Project 1: Lake and tailwater fishery surveys. Kentucky Dept. of Fish and Wildlife Resources. Annual Report 2010.

Dreves, D. 2009. Statewide fisheries investigation project. Subsection I: Lake fisheries investigation. Kentucky Dept. of Fish and Wildlife Resources. Annual Report 2009.

Dreves, D. 2010. Statewide fisheries investigation project. Subsection I: Lake fisheries investigation. Kentucky Dept. of Fish and Wildlife Resources. Annual Report 2010.

Dreves, D. 2011. Statewide fisheries investigation project. Subsection I: Lake fisheries investigation. Kentucky Dept. of Fish and Wildlife Resources. Annual Report 2011.

Greenlee, B. 2006. Catfish management activities: Rappahannock River Bullets 2006. Virginia Department of Game and Inland Fisheries. Williamsburg.

Greenlee, B. 2011. Tidal river blue catfish 2011. Virginia Department of Game and Inland Fisheries. Williamsburg.

Graham, K. 1999. A review of the biology and management of blue catfish. Pages 37-49 *in* E.R. Irwin, W.A. Hubert, C.F. Rabeni, H.L Schramm, Jr., and T. Coon, eds. Catfish 2000: proceedings of the international ictalurid symposium. American Fisheries Society Symposium 24.

Jenkins, R.M. 1956. Growth of blue catfish (*Ictalurus furcatus*) in Lake Texoma. The Southwest Naturalist 1(4):166-173.

Kinman, B. 1995. Use of cultured fish for put-grow-and-take fisheries in Kentucky impoundments. Pages 518-526 *in* H.L. Schramm, Jr. and R.G. Piper, eds. Uses and effects of cultured fishes in aquatic ecosystems. American Fisheries Society, Symposium 15, Bethesda, Maryland.

Lamprechet, S.D. and M.G. White III. 2006. Fisheries investigations in lakes and streams. South Carolina Department of Natural Resources. Study Completion Report F63-1-4.

Marshall, M.D., M.P. Holley, and M.J. Maceina. 2009. Assessment of the flathead catfish population in a lightly exploited fishery in Lake Wilson, Alabama. North American Journal of Fisheries Management 29:869-875.

Sullivan, K.P. and I.W. Vining. 2011. Assessing angler exploitation of blue catfish and flathead catfish in a Missouri reservoir using reward tags. American Fisheries Society Symposium 77:199-207.

Travnichek, V.H. 2004. Movement of flathead catfish in the Missouri River: examining opportunities for managing river segments for different fishery goals. Fisheries Management and Ecology 11:89-96.

USDI. 2001. 2001 National survey of fishing, hunting, and wildlife-associated recreation: Kentucky. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Washington D.C.

White, M.G., III, and S.D. Lamprecht. 1990. Fishing mortality of large catfish in lakes Marion and Moultrie, relative to type of fishing. South Carolina Wildlife and Marine Resources Department. South Carolina Federal Aid to Fish Restoration, Project F-16-20. Completion Report, Columbia.

Table 1. Total number, length (in), and density (fish/acre) of blue catfish stocked into Taylorsville Lake from 2002 through 2014. All fish were stocked at age 1+.

Year	Number stocked	Length (in)	Density (fish/acre)
2002	25,435	10.0-14.0	8.3
2003	88,298	4.0-12.0	29.0
2004	24,710	6.0-12.0	8.1
2005	22,568	6.0-14.0	7.4
2006	16,780	8.0-14.0	5.5
2007	25,116	8.0-11.0	8.2
2008	19,190	10.0-16.0	6.3
2009	23,500	8.0-15.0	7.7
2010	23,500	8.0-14.0	7.7
2011	23,500	8.0-16.0	7.7
2012	23,500	8.0-15.0	7.7
2013	23,500	7.0-14.0	7.7
2014	23,500	6.0-12.0	7.7
Total	363,097		
Average	27,931	4.0-16.0	9.2

Table 2. Length frequency and CPUE (fish/hour) of blue catfish collected at Taylorsville Lake during summer electrofishing in 2007 and 2009 - 2014; standard error is in parentheses.

	Inch class																																	
Area	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	Total	CPUE
Lower																																		
2007			17	27	33	39	46	49	26	18	17	5	6	3	2	2	1	0	0	3	1												295	236.0 (56.4)
2009			4	19	66	84	25	12	5	9	15	7	10	8	3	2	3	3															275	148.7 (38.7)
2010		5	23	38	27	32	25	23	18	13	6	2	3	1	3	2	2	0	0	1	3	2	0	0	1								230	129.9 (34.8)
2011			1	0	2	9	5	3	1	1	0	1	2	5	3	3	2	3	0	2	0	0	1										44	31.5 (11.6)
2012	2	13	25	26	30	27	25	12	11	9	5	7	9	1	2	3	5	1	2	3	1	0	1	0	2	0	0	1	1	0	0	1	225	150.0 (34.4)
2013				1	2	3	2	7	4	8	5	6	2	4	5	4	0	1	2	0	0	0	3	0	1								60	40.0 (10.3)
2014		3	30	55	61	83	65	34	10	9	4	4	3	3	1	3		1		1	1	1	2		1	1	1		1				378	216.0 (34.8)
Upper																																		
2007		1	6	31	32	50	37	32	36	21	23	8	12	2	2	1	1																295	236.0 (53.1)
2009					2	6	24	14	17	17	15	18	8	2	4	3	3	0	1	1													135	82.2 (14.6)
2010		1	2	10	4	7	7	11	10	16	7	13	9	5	5	2	4	3	2	1	1	0	0	0	0	0	1						121	96.8 (15.7)
2011			2	8	6	7	5	3	1	1	1	1	0	1	0	0	0	1	0	1	0	0	1	0	0	0	1						40	26.3 (7.8)
2012		2	8	9	9	11	12	5	6	2	2	2	1	2	2	7	1	2	0	2	1	0	0	1									87	58.0 (16.3)
2013		1	4	6	36	25	7	3	7	4	5	2	1	0	2	1	1	1	4	3	1	1	0	1	1	0	0	2	1				120	80.0 (5.3)
2014			1	12	9	25	40	30	4	5	3	2	7	3		3		1	2	3	2	2	3	2	3	1	1	1					165	110.0 (32.0)
Total																																		
2007		1	23	58	65	89	83	81	62	39	40	13	18	5	4	3	2	0	0	3	1												590	236.0 (36.5)
2009			4	19	68	90	49	26	22	26	30	25	18	10	7	5	6	3	1	1													410	119.1 (24.3)
2010		6	25	48	31	39	32	34	28	29	13	15	12	6	8	4	6	3	2	2	4	2	0	0	1	0	1						351	116.1 (21.2)
2011			3	8	8	16	10	6	2	2	1	2	2	6	3	3	2	4	0	3	0	0	2	0	0	0	1						84	27.1 (6.0)
2012	2	15	33	35	39	38	37	17	17	11	7	9	10	3	4	10	6	3	2	5	2	0	1	1	2	0	0	1	1	0	0	1	312	104.0 (22.8)
2013		1	4	7	38	28	9	10	11	12	10	8	3	4	7	5	1	2	6	3	1	1	3	1	2	0	0	2	1				180	60.0 (8.2)
2014		3	31	67	70	108	105	64	14	14	7	6	10	6	1	6	0	2	2	4	3	3	5	2	4	2	2	1	1				543	167.1 (27.5)

Table 3. The total number (N) and catch-per-unit-effort (CPUE) for different size-classes of blue catfish sampled during summer low pulse DC electrofishing at Taylorsville Lake in 2007 and 2009-2014; standard error is in parentheses.

	Size class (in)																	
	< 12.0			12.0 - 19.9			20.0- 24.9			25.0 - 29.9			≥ 30.0			Total		
Year	N	CPUE	% of sample	N	CPUE	% of sample	N	CPUE	% of sample	N	CPUE	% of sample	N	CPUE	% of sample	N	CPUE	% of sample
2007	82	32.8 (10.9)	13.9%	472	188.8 (25.8)	80.0%	32	12.8 (4.3)	5.4%	4	1.6 (1.6)	0.7%	0	0.0	0.0%	590	236.0 (36.5)	100.0%
2009	23	6.8 (3.1)	5.6%	336	96.1 (19.9)	82.0%	46	14.6 (4.2)	11.2%	5	1.7 (0.9)	1.2%	0	0.0	0.0%	410	119.1 (24.3)	100.0%
2010	79	25.9 (12.2)	22.5%	221	73.4 (13.5)	63.0%	36	11.9 (2.9)	10.3%	13	4.3 (1.6)	3.7%	2	0.7 (0.4)	0.6%	351	116.1 (21.2)	100.0%
2011	11	3.9 (3.1)	13.1%	47	14.0 (2.9)	56.0%	16	5.6 (3.6)	19.0%	7	2.5 (1.5)	8.3%	3	1.1 (0.6)	3.6%	84	27.1 (5.9)	100.0%
2012	85	28.3 (9.1)	27.2%	175	58.3 (15.7)	56.1%	33	11.0 (4.5)	10.6%	12	4.0 (1.1)	3.8%	7	2.3 (1.2)	2.2%	312	104.0 (22.8)	100.0%
2013	12	4.0 (1.6)	6.7%	126	42.0 (6.5)	70.0%	20	6.7 (2.9)	11.1%	13	4.3 (1.0)	7.2%	9	3.0 (0.9)	5.0%	180	60.0 (8.2)	100.0%
2014	101	31.1 (11.3)	18.6%	388	119.4 (21.1)	71.5%	23	7.1 (1.8)	4.2%	14	4.3 (1.5)	2.6%	17	5.2 (1.7)	3.1%	543	167.1 (27.5)	100.0%
Average	56.1	19.0	15.4%	252.1	84.6	68.3%	29.4	10.0	10.3%	9.7	3.2	3.9%	5.4	1.7	2.1%	352.9	118.5	100.0%

Table 4. Length-at-age frequency for blue catfish collected at Taylorsville Lake on 29 August 2006.

	Inch class																							
Age	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total	%	Mean length at age (in)
1	1		8	9	6	3	3	1			1											32	24.4%	10.2
2					1	6	2	1	1	1	2											14	10.7%	12.9
3							3	2	1	3	2	1	2		1							15	11.5%	15.6
4							1	3	5	7	2	7	6	9	2	3	3	3	1	1	1	54	41.2%	18.4
5											1				2	1	2	2	4	3	1	16	12.2%	23.3
Total	1		8	9	7	9	9	7	7	11	8	8	8	9	5	4	5	5	5	4	2	131	100%	16.1

Table 5. Length-at-age frequency results for blue catfish collected at Taylorsville Lake on 08 July 2009.

	Inch class																				
Age	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Total	%	Mean length at age (in)
1																			0	0.0%	
2	4	19	45	45	9	3													125	30.3%	12.9
3			23	38	31	10													102	24.8%	13.8
4				8	9	8	7	6	6		2								46	11.2%	16.0
5						3	12	10	9	11	6	2							53	12.9%	18.2
6						3	2	10	12	7	2	4	5	5	6	2	1	1	60	14.6%	20.4
7									3	7	8	4	2			1		1	26	6.3%	20.8
Total	4	19	68	91	49	27	21	26	30	25	18	10	7	5	6	3	1	2	412	100%	17.0

Table 6. Length-at-age frequency results for blue catfish collected at Taylorsville Lake during July 2014 using 2013 age data.

	Inch class																													
Age	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	Total	%	Mean length at age (in)
1																													0	0.0%	
2	3	31	67	50	108		43	5	2																				309	57.1%	12.9
3				20		79	11	5	8	4																			127	23.5%	14.7
4						26	11	5	4	2	4	2																	54	10.0%	15.9
5										2	2	6			1														11	2.0%	20.2
6												2	6																8	1.5%	21.3
7														1	2														3	0.6%	23.2
8															2	1					3								6	1.1%	26.7
10																			4	3		3	2	2			1		15	2.8%	30.0
11																	1	1				3		2					7	1.3%	29.8
12																												1	1	0.2%	36.5
Total	3	31	67	70	108	79	54	10	14	8	6	10	6	1	5	1	1	1	4	3	3	6	2	4	0	0	1	0	541	100.0%	23.1

Table 7. Relative weight (Wr) values of each size-class of blue catfish collected from 2007-2014 at Taylorsville Lake.

	7.0 - 11.9 in		12.0 - 19.9 in		20.0 - 29.9 in		> 30.0 in		Total	
Year	N	Wr	N	Wr	N	Wr	N	Wr	N	Wr
2007	17	93	323	88	29	95	1	119	370	89
2008	5	104	257	94	40	94	0		302	94
2009	1	90	103	91	32	90	1	89	137	91
2010	41	97	139	94	46	93	2	100	228	95
2011	62	98	79	89	28	95	2	95	171	93
2012	113	100	157	92	66	92	6	95	342	95
2013	18	105	177	97	29	90	3	98	227	97
2014	58	97	117	89	24	95	5	121	204	93
Total	315	98	1352	92	294	93	20	102	1981	93

Table 8: Statistics of a blue catfish exploitation study conducted at Taylorsville Lake from July 2008- June 2009.

	Number	Mean length (in)
Total fish tagged	1006	16.8
Total returned	119	19.0
Total kept	97	19.6
Total released	22	13.8
Uncorrected 12 month exploitation	9.6%	
Tag loss estimate	0.0-15.7%	
Nonreporting estimate	8.0-33.3%	
Tag induced mortality estimate	0.0-3.0%	
Corrected 12 month exploitation	8.6-14.0%	

Table 9. Length frequency and CPUE (fish/nn) of blue catfish collected in 16 gill net-nights at Taylorsville Lake during January and February 2015; standard error is in parentheses.

	Inch class																												
Area	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	46	Total	CPUE
Upper	2		1	2	1			3	2	4	5	6	3	5	19	14	14	14	7	5	9	7	3	2	2	2	1		133	22.2 (8.0)
Lower				1	1	1				1	1	2		1	1	8	3	9	3	5	1	2	1					1	42	4.2 (1.1)
Total	2		1	3	2	1		3	2	5	6	8	3	6	20	22	17	23	10	10	10	9	4	2	2	2	1	1	175	11.0 (3.7)

Table 10. Number of fish and relative weight (Wr) values of each length group of blue catfish collected in gill nets at Taylorsille Lake during January and February 2015.

Size class					
20.0 - 29.9 in		> 30.0 in		Total	
N	Wr	N	Wr	N	Wr
33	121	133	121	167	121