

Commonwealth of Kentucky

Date: June 30, 2025

D-J Grant No. F-40, Segment 47

Period: 01 April 2024
through
31 March 2025

ANNUAL PERFORMANCE REPORT

for

Statewide Fisheries Investigation Project

Part II of III

Subsection II: Stream Fisheries Investigation



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Department of Fish and Wildlife Resources

Fisheries Division



STATE: Kentucky

GRANT NO.: F-40-47

GRANT TYPE: Research and Survey

GRANT TITLE: Statewide Fisheries Investigations

SUBSECTION II TITLE: Stream Fisheries Investigations

PERIOD COVERED: 1 April 2024 - 31 March 2025

Research and Survey Section

Subsection II

Project I: Ohio River Sport Fishery Survey

Project Objective: Develop and implement a monitoring program for selected sport fish populations and their fisheries.

A. ACTIVITY

General Sport Fish Assessments

Smithland Pool

Embayments— A total of 5.75 hours of general sport fish electrofishing was conducted during October 2024 in embayments of the Smithland Pool of the Ohio River. Five embayments were sampled: Crooked Creek (1.0 hr), Deer Creek (1.5 hr), Buck Creek (0.75 hr), Phelps Creek (1.0 hr), and Bayou Creek (1.5 hr). Bluegill, largemouth bass, and redear sunfish were the most abundant species, but catch rates varied among embayments.

Sander Surveys

Previous modeling of ORFMT data suggested that overfishing was occurring and that regulations should be implemented on the Ohio River sauger population. A 14.0-in minimum size limit with a 6-fish creel limit was passed by KDFWR and went into effect in January 2019. Illinois DNR, Indiana DNR, and Ohio DNR have all passed this same regulation on the Ohio River since then.

Six 10-minute transects were completed in the Markland Tailwater in December 2024 for a total of 1.0 hr of effort. The Cannelton and JT Myers tailwaters were not able to be sampled due to prolonged sub-freezing temperatures and high water. A total of 654 sauger and 6 walleye were collected with no saugeye present in the sample. Overall CPUE of sauger was 654.0 fish/hr, the highest since sampling resumed in 2014. While still relatively low, walleye CPUE was a record high (CPUE = 6.0 fish/hr).

Otoliths were taken from a subsample of sauger to assess age structure and growth. Length at age as calculated by the von Bertalanffy growth equation indicated excellent growth as age-1+ sauger averaged 13.7 in and age-2+ sauger average 16.1 in.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned achievement date - 31 March 2025

Work accomplished - 31 March 2025

C. SIGNIFICANT DEVIATIONS

General Sport Fish Assessments

NONE

Sander Surveys

NONE

D. REMARKS

General Sport Fish Assessments

NONE

Sander Surveys

The Cannelton and JT Myers tailwaters were unable to be sampled due to prolonged sub-freezing temperatures and high water that made sampling conditions unsafe.

E. RECOMMENDATIONS

General Sport Fish Assessments

General sport fish sampling/monitoring will continue in various pools along the Ohio River. The Meldahl and Markland pools will be sampled in 2025.

Sander Surveys

Sampling in conjunction with the ORFMT will continue.

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

Project Objectives:

1. Determine abundance (CPUE), size structure, and condition of blue catfish, channel catfish, 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.

A. ACTIVITY

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

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

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

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

The number of commercial fishers awarded trophy permits was reduced to 15 (previously 50).

There will be no more than two licensed commercial fisherman per boat. If more are present, they may only keep two limits of trophy catfish.

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

Regulations talk resurfaced once again, and KDFWR suggested the following regulations which were passed unanimously by the Commission and went into effect in summer 2024:

All commercial fishers are allowed one blue catfish ≥ 35.0 in, one flathead catfish ≥ 35.0 in, and one channel catfish ≥ 28.0 in per day on commercially fishable waters statewide. Trophy permit harvest is now only allowed on the Ohio River from Cannelton Dam downriver to the Ohio River's confluence with the Mississippi River.

Commercial fishing on several waterbodies across the state was closed permanently due to low use, low harvest, and/or low abundance of fish (identified by KDFWR sampling).

Trotlines—CPUE of blue catfish in 2024 was 5.3 fish/50 hooks. Catch rate of blue catfish had been gradually increasing since 2013 until 2023. Catch rate of trophy-size (≥ 35.0 in) blue catfish has remained consistent since 2018.

Hoop nets—Catch rate of channel catfish was 2.6 fish/net-night which is the highest since 2019. Flathead catfish CPUE was 1.0 fish/net-night, and was just below the historical average (CPUE 1.1 fish/net-night). Unseasonably low flow and below average water temperatures during the 2023 and 2024 sampling season likely had negative impacts on catch rates.

Electrofishing—Electrofishing was conducted on the Kentucky River and Green River. Catch rate of blue catfish in the Kentucky River (CPUE = 2.8 fish/hr) and Green River (CPUE = 3.2 fish/hr) were much lower than expected and compared to historical averages in the Ohio River. Flathead catfish in the Kentucky River (CPUE = 26.9 fish/hr) and Green River (CPUE = 32.4 fish/hr) were slightly lower than Ohio River averages. Additionally size structure of both blue catfish and flathead catfish in the Kentucky River and Green River were noticeably skewed towards smaller fish compared to the Ohio River.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned achievement date - 31 March 2025

Work accomplished - 31 March 2025

C. SIGNIFICANT DEVIATIONS

No electrofishing sampling occurred on the Ohio River. Instead, electrofishing and an age and growth sample were conducted on the Kentucky River and Pools 1 – 3 of the Green River.

D. REMARKS

NONE

E. RECOMMENDATIONS

Continue sampling blue catfish, channel catfish, and flathead catfish using approved methods.

Project III: Warm Water Stream Sport Fish Surveys

Project Objective: To conduct general sport fish surveys on streams and rivers to determine relative abundance, size structure, growth rates and condition of these fisheries. This information will be used to promote these fisheries while providing anglers with accurate population assessments.

A. ACTIVITY

Spring sport fish electrofishing surveys were conducted on Station Camp Creek, North Fork Kentucky River and South Fork Kentucky River when water temperatures ranged from 51 - 65°F. A total of four species of sport fish were collected on Station Camp Creek, with rock bass making up 55% of the entire sample. Rock bass received a “fair” population assessment score, and smallmouth bass received a “fair” score as well. A total of eleven species of sport fish were collected in North Fork Kentucky River, with channel catfish making up 59% of the entire sample. CPUE for smallmouth bass (9.1 fish/hr) was lower than historical average of (11.8 fish/hr) and received a “fair” population assessment score. CPUE for rock bass (4.4 fish/hr) was higher than the historical average (3.3 fish/hr) but received a “poor” population assessment score. A total of eight species of sport fish were collected in South Fork Kentucky River. Channel catfish and smallmouth bass made up 70% of the entire sample with channel catfish being 12.8 fish/hr and smallmouth bass being 12.7 fish/hr. CPUE for smallmouth bass was below the historical average (30.2 fish/hr) and received a “fair” population assessment rating. CPUE for rock bass (5.9 fish/hr) was lower than the historical average (9.7 fish/hr) and received a “poor” assessment rating.

Fall sport fish surveys were conducted in Paint Lick Creek, Old Pool 5 of the Green River and lower Dix River. A total of three species were collected at Paint Lick Creek with the most abundant species collected being rock bass at 32.0 fish/hr. Smallmouth bass were the second most abundant species collected 10.0 fish/hr. Relative weight values for rock bass were good (95) for the 4.0-5.9 in and good (89) for the 6.0 – 7.9 in length group. The removal of Lock and Dam 5 was initiated in the summer of 2021 and the majority of lock and dam 5 was removed in the summer of 2024. Old Pool 5 of Green River has drastically changed with water levels dropping exposing more gravel shoals, chunk rock banks, woody laydowns and creating harder substrate areas, which may enhance habitat complexity and influence fish distribution. A total of eleven different species were collected on Old Pool 5 of the Green River with spotted bass being the most abundant species collected (47.3 fish/hr). CPUE was the highest catch rates recorded since sampling began in 2012 and significantly higher than historical average of 15.0 fish/hr. Smallmouth bass was the second most abundant sportfish collected at a rate of 8.0 fish/hr. The 2024 sample was the highest CPUE recorded for smallmouth bass since sampling began in 2012 and drastically above the historical average of 2.6 fish/hr. The drastic improvement in the number of sportfish sampled could be due in part to significant habitat changes with the low water conditions, but further sampling will continue in order to collect more historical data for post-dam removal to better compare the effects of impounded and free-flowing streams on Old Pool 5 of Green River. A general sport fish survey was conducted at two sites on the lower Dix River where a total of five species were collected. Rainbow trout (12.0 fish/hr) were the most abundant sport fish collected. Rainbow trout were collected at a rate of 12.0 fish/hr with fish ranging in size from the 9.0-16.0 in size classes. Additional fish populations present in low densities were rock bass (2.3 fish/hr), bluegill (2.7 fish/hr), largemouth bass (1.7 fish/hr) and brown trout (0.6 fish/hr).

Twenty-one streams are currently available on the KDFWR departmental website with the most recent addition being Floyds Fork which provides detailed information on public access sites, water levels, stream mileages, interactive maps, fisheries, and photo gallery. This information provides Kentucky anglers with an increased awareness to the fishing and boating opportunities that exist in many of Kentucky’s rivers and streams. Additionally, the stream webpages will be getting updated and the newest data for these streams will be available on the webpage soon.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned achievement date- 31 March 2025

Work accomplished- 31 March 2025

C. SIGNIFICANT DEVIATIONS

NONE

D. REMARKS

New locations will be sampled annually. Sites are scheduled to be sampled on a 3-5 year rotation in an effort to develop trend data that will be beneficial for future management decisions.

E. RECOMMENDATIONS

Continue stream sampling due to the current lack of continuous sport fish data on most streams.

Project IV: Investigation of the Restoration of Native Walleye in the Upper Barren River

Project Objective: To determine if stocking native walleye fingerlings can result in the reestablishment of a self-sustaining native walleye population in the upper Barren River.

A. ACTIVITY

No field sampling was conducted. A final report was completed and submitted, and the project has concluded.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned achievement date - 31 March 2025

Work accomplished - 31 March 2025

C. SIGNIFICANT DEVIATIONS

NONE

D. REMARKS

NONE

E. RECOMMENDATIONS

NONE

Project V: Post-stocking Movement of Muskellunge in the Kentucky River

Project Objectives:

1. Determine dispersal of muskellunge, with an emphasis on age-1 and age-2 fish, stocked into pools 11 -13 of the Kentucky River.
2. Utilize results of this project to develop muskellunge stocking recommendations for the Kentucky River.

A. ACTIVITY

Four muskellunge were captured at a rate of 0.6 fish/hr in fall 2024. No clipped fish were observed in the sample. An additional 23.0 hr of electrofishing was conducted to look for stocked fish and PIT tag other captured muskellunge. Twenty-two fish were collected and implanted with PIT tags. No clipped fish were captured during this effort; however, two PIT tagged fish were observed that both exhibited downstream movement. Thus far, only two clipped fish have been collected and only downstream movement has been observed.

B. TARGET DATES FOR ACHIEVEMENT AND ACCOMPLISHMENTS

Planned achievement date - 31 March 2025

Work accomplished - 31 March 2025

C. SIGNIFICANT DEVIATIONS

No stockings occurred due to poor hatchery survival.

D. REMARKS

Recapture rate has been less than expected, but it is likely due to a missed stocking in 2020 and 2024, a historic flood two days post-stocking in 2022, as well as limited effort outside of standard sampling to collect fish due to staff shortages.

E. RECOMMENDATIONS

The project timeline has concluded. Due to missed stockings and potential hatchery rearing issues, it is recommended that this project end. Future projects should likely focus on active telemetry efforts to track movement of stocked fingerling muskellunge as well as larger muskellunge in the system.

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Project I: Ohio River Sport Fishery Survey

FINDINGS

General Sport Fish Assessments

Smithland Pool

A total of 5.75 hours of general sport fish electrofishing was conducted during October 2024 in embayments of the Smithland Pool of the Ohio River. Five embayments were sampled: Crooked Creek (1.0 hr), Deer Creek (1.5 hr), Buck Creek (0.75 hr), Phelps Creek (1.0 hr), and Bayou Creek (1.5 hr). Bluegill, largemouth bass, and redear sunfish were the most abundant species, but catch rates varied among embayments.

Total CPUE of largemouth bass was 11.0 fish/hr and ranged from 5.0 fish/hr in Phelps Creek to 16.0 fish/hr in Crooked Creek (Table 1). Lengths of largemouth bass ranged from 3.6 – 19.1 in with a mean length of 10.1 in. Spotted bass CPUE was 0.5 fish/hr, and fish were only observed in Crooked Creek (CPUE = 2.0 fish/hr) and Bayou Creek (CPUE= 0.7 fish/hr). Lengths of spotted bass ranged from 3.7 – 11.9 in with a mean length of 8.0 in. Size structure of largemouth bass and spotted bass varied between embayments, but size structure was fairly uniform overall. Catch rates for four different length groups of largemouth bass and spotted bass were examined. Although largemouth bass CPUE was low compared to other pools of the Ohio River, total CPUE and CPUE for each length group were record highs since targeted sampling began in 2018 (Table 2). Total CPUE spotted bass has decreased since 2018 and only fish in the 7.0 – 10.9 in and 11.0 – 13.9 in length group were observed in the sample. Relative weights of all length groups for both largemouth bass and spotted bass decreased were excellent with values over 100 (Table 3).

Otoliths were taken from a subsample of largemouth bass to assess age structure and growth. In this case nearly all largemouth bass sampled were kept due to low numbers. Length at age as calculated by the von Bertalanffy growth equation indicated fast growth in the McAlpine Pool with fish reaching legal size (12.0 in) at just under two years and reaching 15.0 in at just under four years (Table 4). Age structure of largemouth bass was more widely distributed than other pools of the Ohio River; however Age-0 to Age-1 largemouth still comprised the majority of the sample (58.7%; Table 5). A weighted catch curve estimated total annual mortality to be 44.4%. Low overall catch rates and low frequency of larger, older fish has been the norm for the Smithland Pool in recent years. Stockings are likely warranted in the future if catch rates remain low and hatchery production allows.

Bluegill were the most abundant fish sampled in the Smithland Pool (CPUE=43.5 fish/hr; Table 6). Catch rates ranged from 18.0 fish/hr in Bayou Creek to 75.0 fish/hr in Phelps Creek. Lengths ranged from 1.0– 8.2 in with a mean length of 4.6 in with 46.0% of those fish being quality size (≥ 6.0 in). Redear sunfish were captured at a rate of 9.7 fish/hr and ranged from 4.7 fish/ hr in Bayou Creek to 31.0 fish/hr in Phelps Creek. Lengths ranged from 3.7– 11.1 in with a mean length of 4.5 in and 82.1%% of those fish were quality size (≥ 6.0 in) and 9.0% were considered trophies in Kentucky (≥ 10.0 in). White crappie and black crappie were present but in extremely low numbers. Catch rates for two different length groups of white crappie and black crappie were also examined (Table 7). Total CPUE and for each size class were all record lows. Relative weight of white crappie (100) and black crappie (103) indicated that both species were in good condition (Table 8).

Sander Surveys

The member agencies of the Ohio River Fish Management Team (ORFMT) had traditionally completed annual surveys of sauger and walleye in the Ohio River. Due to time and budget constraints, this cooperative effort stopped in 2007; however, recent concerns of a possibly declining fishery as well as threats from the expanding Asian carp population led biologists to reinstitute these annual surveys in 2014.

KDFWR, Ohio Department of Natural Resources, West Virginia Department of Natural Resources, Indiana Department of Natural Resources, and Illinois Department of Natural Resources all agreed to sample tailwaters of the Ohio River. KDFWR was tasked with sampling the Markland and Cannelton tailwaters. In 2017, JT Myers tailwater was added. After three years of sampling in late fall, all agencies reported lower catch rates than in the past and noted a lack of age 3+ sauger. Issues with timing of sampling were discussed in a meeting in January 2017. Although a late fall sample was likely underrepresenting larger fish and females (therefore inflating mortality estimates), the decision was made to keep sampling methods the same due to the unpredictably and unstable nature of water levels on the Ohio River during the preferred months of January – March.

Previous modeling of ORFMT data suggested that overfishing was occurring and that regulations should be implemented on the Ohio River sauger population. A 14.0-in minimum size limit with a 6-fish creel limit was passed by KDFWR and went into effect in January 2019. Illinois DNR, Indiana DNR, and Ohio DNR have all passed this same regulation on the Ohio River since then.

Six 10-minutes transects were completed in the Markland Tailwater in December 2024 for a total of 1.0 hr of effort. The Cannelton and JT Myers tailwaters were unable to be sampled due to prolonged sub-freezing temperatures and high water. A total of 654 sauger and 6 walleye were collected with no saugeye present in the sample (Table 9). Overall CPUE of sauger was 654.0 fish/hr, the highest since sampling resumed in 2014 (Table 10). Lengths ranged from 7.5 – 18.1 in with a mean length of 11.8 in (Table 11). While still relatively low, walleye CPUE was a record high (CPUE = 6.0 fish/hr).

Catch rates were also calculated for four length groups of sauger (Table 12). Overall catch rates of sauger in the Markland Tailwater (CPUE=654.0 fish/hr) were the highest since sampling resumed in 2014. CPUE of all length groups examined were above their historical averages with the exception of the <8.0 in size group. Growth was extremely fast in 2024 and likely contributed to low catch rates of fish <8.0 in. Larger fish have finally started to appear in the sample. While only 8.1% of sauger were legally harvestable (≥ 14.0 in), catch rate of larger fish was near a record high.

Otoliths were taken from a subsample of sauger to assess age structure and growth. Length at age as calculated by the von Bertalanffy growth equation indicated good growth as age-1+ sauger averaged 13.7 in and age-2+ sauger average 16.1 in (Table 13). Age-0 and age-1 sauger dominated the catch as usual, comprising 98.6% of the total catch (Table 14). As in years past, very few age-2 and older fish were observed. Estimates for total annual mortality of sauger were once again high. Markland Tailwater annual mortality rate for 2024 was 86.6% (Table 13). While age-0 and age-1 fish dominated the catch, age-2 fish were captured at much higher rates than recent years. Lack of older fish in the sample could be a result of sampling bias. Sampling occurred in December and many older mature fish may not have migrated up to the tailwaters yet. It could also indicate poor year class survival from the 2019 - 2021 year classes.

Table 1. Length-frequency and CPUE (fish/hr) of black bass collected during 5.75 hrs of electrofishing in embayments in the Smithland Pool of the Ohio River during October 2024. Standard errors are in parentheses.

Embayment	Species	Inch class															Total	CPUE
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Crooked Creek	Largemouth bass			1		1	1	1	1		2	4	2	1	1	1	16	16.0 (10.7)
	Spotted bass							1		1							2	2.0 (2.0)
Deer Creek	Largemouth bass		4	2			1	1	2	1	1	3	2	1			18	12.0 (3.4)
	Spotted bass																0	0.0
Buck Creek	Largemouth bass							1		1	1	1	2				6	8.0 (8.0)
	Spotted bass																0	0.0
Phelps Creek	Largemouth bass			2		1					1			1			5	5.0 (3.0)
	Spotted bass																0	0.0
Bayou Creek	Largemouth bass			3	3			2	4	3	1			2			18	12.0 (8.3)
	Spotted bass								1								1	0.7 (0.7)
Total	Largemouth bass		4	8	3	2	2	5	7	5	6	8	6	5	1	1	63	11.0 (3.0)
	Spotted bass							1	1	1							3	0.5 (0.4)

Table 2. Fall electrofishing catch-per-unit-effort (fish/hr) for four length groups of black bass from the Smithland Pool of the Ohio River during October 2018 - 2024. Standard errors are in parentheses.

Year	Length group				Total
	<8.0 in	8.0-11.9 in	12.0-14.9 in	≥15.0 in	
Largemouth bass					
2018	2.3 (0.8)	3.0 (1.4)	3.0 (0.9)	0.7 (0.4)	9.0 (2.3)
2021	2.1 (0.8)	1.0 (0.4)	1.0 (0.4)	0.4 (0.3)	4.6 (1.0)
2024	3.0 (1.0)	3.3 (1.4)	3.5 (1.3)	1.2 (0.5)	11.0 (3.0)
Mean	2.4 (0.5)	2.4 (0.7)	2.4 (0.5)	0.8 (0.2)	8.0 (1.3)

Year	Length Group				Total
	<7.0 in	7.0-10.9 in	11.0-13.9 in	≥14.0 in	
<u>Spotted bass</u>					
2018	0.6 (0.3)	0.4 (0.3)	0.0	0.0	1.0 (0.5)
2021	0.3 (0.2)	0.4 (0.3)	0.1 (0.1)	0.0	0.7 (0.4)
2024	0.0	0.4 (0.2)	0.2 (0.2)	0.0	0.5 (0.4)
Mean	0.3 (0.1)	0.4 (0.2)	0.1 (0.1)	0.0	0.8 (0.2)

Table 3. Relative weight (Wr) estimates by length group for each species of black bass collected from the Smithland Pool in the Ohio River from 2018 - 2024.

Year	Largemouth bass relative weight (Wr)			
	length group			Overall
	8.0-11.9 in	12.0-14.9 in	≥15.0 in	
2018	99	94	92	96
2021	95	99	104	98
2024	112	109	107	110
Mean	104	101	101	102

Year	Spotted bass relative weight (Wr)			
	length group			Overall
	7.0-10.9 in	11.0-13.9 in	≥14.0 in	
2018	96			96
2021	109	112		110
2024	106	102		105
Mean	103	107		104

Table 4. Mean length (in) at age calculated with the von Bertalanffy growth equation and total annual mortality (A) based on otoliths taken from largemouth bass from the Smithland Pool the Ohio River in October 2024.

Pool	Age							
	0	1	2	3	4	5	6	7
Smithland	5.6	10.3	12.9	14.4	15.2	15.7	15.9	16.1
								A
								44.4

Table 5. Age frequency and CPUE results for largemouth bass collected in embayments of the Smithland Pool of the Ohio River in October 2024. Standard errors are in parentheses.

Pool	Age	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	%	CPUE
Smithland	0	4	8	3	2											17	27.0%	3.0 (1.0)
	1					2	5	6	5	2						20	31.7%	3.5 (1.4)
	2							1		3	3	3	1			11	17.5%	1.9 (0.6)
	3									1	4	1	3			9	14.3%	1.6 (0.5)
	4											1				1	1.6%	0.2 (0.1)
	5										1	1		1		3	4.8%	0.5 (0.3)
	6														1	1	1.6%	0.2 (0.2)
	7												1			1	1.6%	0.2 (0.1)
Total		4	8	3	2	2	5	7	5	6	8	6	5	1	1	63	100%	11.0 (3.0)

Table 6. Length-frequency and CPUE (fish/hr) of selected sunfish species collected during 5.75 hrs of electrofishing in embayments in the Smithland Pool of the Ohio River during October 2024. Standard errors are in parentheses.

Embayment	Species	Inch class												Total	CPUE	
		1	2	3	4	5	6	7	8	9	10	11	12			13
Crooked Creek	Bluegill		6	4	4	5	2								21	21.0 (2.5)
	Redear sunfish						2	1	1	1					5	5.0 (3.8)
	White crappie														0	0.0
	Black crappie														0	0.0
Deer Creek	Bluegill	11	13	19	26	23	17	3							112	74.7 (31.2)
	Redear sunfish					1	4	2			1	1			9	6.0 (2.7)
	White crappie						4	1		1					6	4.0 (1.5)
	Black crappie									2	1	2			5	3.3 (1.2)
Buck Creek	Bluegill		1		1	7	3	2	1						15	20.0 (16.2)
	Redear sunfish				1			1	1	1					4	5.3 (5.3)
	White crappie						1			1					2	2.7 (2.7)
	Black crappie														0	1.6 (1.0)
Phelps Creek	Bluegill	3	10	11	13	17	14	7							75	75.0 (5.7)
	Redear sunfish			1	8	7	2	3	4	5	1				31	31.0 (4.4)
	White crappie						1								1	1.0 (1.0)
	Black crappie					2	1								3	3.0 (1.9)
Bayou Creek	Bluegill			7	6	8	4	2							27	18.0 (7.6)
	Redear sunfish					1		2		2	2				7	4.7 (1.6)
	White crappie														0	0.0
	Black crappie								1						1	0.7 (0.7)
Total	Bluegill	14	30	41	50	60	40	14	1						250	43.5 (10.0)
	Redear sunfish			1	9	9	8	9	6	9	4	1			56	9.7 (2.5)
	White crappie						6	1		2					9	1.6 (0.6)
	Black crappie					2	1		1	2	1	2			9	1.6 (0.6)

Table 7. Fall electrofishing catch-per-unit-effort (fish/hr) estimates for four size groups of crappie from the Smithland Pool of the Ohio River from 2018-2024. Standard errors are in parentheses.

Year	Length group		Total
	<u>>8.0 in</u>	<u>>10.0 in</u>	
<u>White crappie</u>			
2018	1.3 (0.5)	0.8 (0.3)	3.4 (1.5)
2021	1.7 (0.6)	2.1 (0.5)	1.6 (1.0)
2024	0.4 (0.2)	0.5 (0.3)	1.6 (0.6)
Mean	1.3 (0.5)	0.8 (0.3)	2.2 (0.7)

Year	Length group		Total
	<u>>8.0 in</u>	<u>>10.0 in</u>	
<u>Black crappie</u>			
2018	1.8 (0.4)	1.1 (0.3)	6.1 (1.7)
2021	1.1 (0.4)	1.3 (0.4)	2.0 (0.7)
2024	1.0 (0.5)	0.5 (0.4)	1.6 (0.6)
Mean	1.8 (0.4)	1.1 (0.3)	3.3 (0.7)

Table 8. Relative weight (Wr) by length group estimates for each species of crappie collected from the Smithland Pool of the Ohio River from fall 2018 - 2024.

<u>White crappie relative weight (Wr)</u>				
Year	length group			Overall
	5.0-7.9 in	8.0-9.9 in	≥10.0 in	
2018	98	97	95	96
2021	105	90	92	95
2024	118	108		116
Mean	110	98	94	100

<u>Black crappie relative weight (Wr)</u>				
Year	length group			Overall
	5.0-7.9 in	8.0-9.9 in	≥10.0 in	
2018	112	94	94	103
2021	95	96	96	96
2024	120	108	107	112
Mean	110	98	96	103

Table 9. Electrofishing effort and CPUE (fish/hr) of *Sander spp.* collected during 1.0 hr of electrofishing in the Ohio River in November and December 2024. Standard errors are in parentheses.

	No. of transects	Effort (hr)	No. of sauger	CPUE	No. of walleye	CPUE
Tailwater						
Markland	6	1.0	654	654.0 (154.3)	6	6.0 (4.0)

Table 10. CPUE (fish/hr) of sauger, walleye, and saugeye collected during electrofishing surveys on the Ohio River from 2014 - 2024. Standard errors are in parentheses.

Year	Species		
	Sauger	Walleye	Saugeye
2014	273.5 (48.0)	1.5 (1.1)	1.5 (0.8)
2015	213.0 (22.9)	1.0 (1.0)	0.0
2016	289.5 (61.8)	1.0 (1.0)	1.5 (1.1)
2017	75.3 (12.3)	3.3 (1.6)	1.0 (1.0)
2018	140.5 (28.9)	0.5 (0.5)	0.0
2019	199.5 (43.0)	2.5 (1.1)	0.0
2020	230.7 (37.0)	0.0	0.0
2021	104.0 (30.3)	0.0	0.0
2022	308.0 (56.1)	1.3 (0.8)	0.0
2023	133.3 (16.7)	5.2 (2.1)	0.0
2024	654.0 (154.3)	6.0 (4.0)	0.0
Mean	218.0 (16.3)	2.0 (0.4)	0.4 (0.2)

Table 11. Length frequency, mean length, relative weight (Wr), and CPUE (fish/hr) of *Sander spp.* collected during 1.0 hr of electrofishing in the Ohio River in December 2024. Standard errors are in parentheses.

		Inch class																		Mean		
Tailwater	Species	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	length (in)	Wr	CPUE
Markland	Sauger				3	18	89	138	60	162	131	37	9	4	1	2			654	11.8	90	654.0 (154.3)
	Walleye									2	1			1	1			1	6	15.2	93	6.0 (4.0)

Table 12. Electrofishing catch-per-unit-effort (fish/hr) estimates for four length groups of sauger from the Ohio River from 2014 - 2024. Standard errors are in parentheses.

Markland tailwater					
length group					
Year	<8.0 in	8.0-11.9 in	12.0-14.9 in	>15.0 in	Total
2014	25.0 (5.6)	235.0 (61.5)	44.0 (15.1)	4.0 (1.2)	308.0 (78.1)
2015	47.0 (10.0)	101.0 (36.0)	39.0 (7.6)	5.0 (2.8)	192.0 (40.9)
2016	2.0 (1.2)	121.0 (25.6)	32.0 (10.2)	1.0 (1.0)	156.0 (33.1)
2017	2.0 (1.2)	63.0 (16.1)	52.0 (8.0)	7.0 (4.7)	124.0 (19.7)
2018	50.0 (23.8)	106.0 (23.0)	39.0 (13.4)	10.0 (4.5)	205.0 (39.1)
2019	4.0 (2.5)	129.0 (34.6)	41.0 (17.4)	8.0 (4.5)	182.0 (53.1)
2020	1.0 (1.0)	137.0 (23.2)	25.0 (4.1)	18.0 (7.9)	181.0 (29.7)
2021	38.0 (9.8)	48.0 (15.6)	15.0 (7.6)	3.0 (1.3)	104.0 (30.3)
2022	153.0 (43.0)	158.0 (27.0)	7.0 (4.7)	1.0 (1.0)	319.0 (60.5)
2023	70.0 (30.4)	39.0 (20.5)	15.0 (9.6)	2.0 (1.0)	126.0 (37.7)
2024	3.0 (1.3)	305.0 (71.9)	330.0 (94.9)	16.0 (6.7)	654.0 (154.3)
Mean	35.9 (7.3)	131.1 (13.8)	58.1 (13.5)	6.8 (1.3)	231.9 (25.3)

Cannelton tailwater					
length group					
	<8.0 in	8.0-11.9 in	12.0-14.9 in	>15.0 in	Total
2014	3.0 (2.0)	150.0 (32.3)	60.0 (21.4)	26.0 (11.5)	239.0 (59.9)
2015	17.0 (7.0)	178.0 (24.8)	34.0 (7.4)	5.0 (2.4)	234.0 (21.5)
2016	1.0 (1.0)	279.0 (60.6)	141.0 (37.8)	2.0 (2.0)	423.0 (93.1)
2017	4.0 (2.5)	36.0 (11.0)	22.0 (7.2)	6.0 (4.8)	68.0 (15.3)
2018	29.0 (12.7)	24.0 (5.0)	12.0 (7.3)	11.0 (3.9)	76.0 (23.3)
2019	1.0 (1.0)	166.0 (48.6)	38.0 (25.0)	12.0 (6.4)	217.0 (72.7)
2020	0.0 (0.0)	277.0 (35.8)	49.0 (7.4)	16.0 (5.6)	342.0 (31.2)
2022	200.0 (71.3)	218.0 (48.6)	69.0 (15.7)	1.0 (1.0)	488.0 (106.6)
2023	31.0 (9.0)	47.0 (10.5)	40.0 (13.0)	1.0 (1.0)	119.0 (8.2)
Mean	31.8 (11.1)	152.8 (16.7)	51.7 (7.5)	8.9 (2.0)	245.1 (26.2)

JT Myers tailwater					
length group					
	<8.0 in	8.0-11.9 in	12.0-14.9 in	>15.0 in	Total
2017	0.0	9.0 (6.0)	13.0 (4.4)	12.0 (3.4)	34.0 (11.1)
2020	24.0 (19.0)	104.0 (70.9)	37.0 (8.0)	4.0 (3.0)	169.0 (92.4)
2022	34.0 (25.4)	64.0 (32.5)	16.0 (5.2)	3.0 (2.0)	117.0 (61.3)
2023	46.0 (14.3)	99.0 (19.1)	9.0 (3.4)	1.0 (1.0)	155.0 (34.3)
Mean	26.0 (8.8)	69.0 (20.4)	18.8 (3.4)	5.0 (1.5)	118.8 (29.3)

Table 13. Mean length (in) at age calculated with the von Bertalanffy growth equation and total annual mortality (A) of sauger collected from the Markland Tailwater of the Ohio River in December 2024.

Age						
Tailwater	1	2	3	4	5	A
Markland	13.7	16.1	17.3	18.0	18.4	86.6

Table 14. Age frequency and CPUE results for sauger collected in the Markland Tailwater of the Ohio River in December 2024. Standard errors are in parentheses.

Tailwater	Age	7	8	9	10	11	12	13	14	15	16	17	18	Total	%	CPUE
Markland	0	3	18	89	138	36		13						297	45.4%	297.0 (70.6)
	1					24	162	118	37	5	1	1		348	53.2%	348.0 (94.4)
	2									4	3			7	1.1%	7.0 (2.6)
	3												1	1	0.2%	1.0 (1.0)
	4													0	0.0%	0.0
	5												1	1	0.2%	1.0 (1.0)
Total		3	18	89	138	60	162	131	37	9	4			654	100%	654.0 (154.3)

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

FINDINGS

Commercial fishing for catfish has long existed on the Ohio River; however, harvesting trophy-sized fish to sell to pay lake owners has become more prevalent while a market for flesh also remains popular. At the same time, catch and release trophy catfishing has become extremely popular for recreational anglers on the Ohio River. Different viewpoints on how the fishery should be managed has led to conflict between recreational anglers and commercial anglers. Recreational catfish anglers came to KDFWR asking for more stringent regulation for both recreational and commercial anglers, because of a perceived decline in trophy catfish numbers. KDFWR began looking at some basic population parameters of the three major catfish species (blue catfish, channel catfish, flathead 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 more effectively sample each of these species. The conflict was again brought up at a commission meeting in 2012 and it was decided that one additional year of intense sampling would be conducted before a decision on potential regulations was made. Data prior to 2013 was collected from different pools each year and lacked the consistency and standardization to effectively monitor trends of catfish populations in the Ohio River. In 2013 methods for all gear types were standardized and additional effort was put towards sampling to more accurately estimate population dynamics of blue catfish, channel catfish, and flathead catfish in the Ohio River.

A public meeting was held in October 2013 to present catfish data that had been gathered during this project and discuss potential regulations that may be put in place. Both recreational and commercial anglers were in attendance and given the opportunity to share their thoughts and suggestions. In November 2013, the following regulations designed to give some protection to trophy catfish were proposed to the Fisheries Committee:

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

The majority of commercial fishers fishing in the legal waters of the Ohio River and its tributaries will be allowed one blue catfish ≥ 35.0 in, one flathead catfish ≥ 35.0 in, and one channel catfish ≥ 28.0 in per day. However, 44 commercial fishers that harvested over 10,000 lbs of catfish in at least 2 of the last 3 years along with an additional six commercial fishers, who will be chosen by a lottery drawing, will be allowed a daily harvest of four (in aggregate) blue catfish and flathead catfish ≥ 40.0 in and channel catfish ≥ 30.0 inches in Kentucky's portion of the Ohio River and its tributaries open to commercial fishing below Cannelton Lock and Dam. Harvest of fish below their respective length limits will not be regulated.

After hearing comments from stakeholders in attendance and discussion with the Fisheries Division Director, the Fisheries Committee voted unanimously to pass the proposed regulations on to the full Commission. The regulations were passed by the full Commission at their meeting in December 2013. In June 2014, the regulation was made law; however, an injunction on the regulation was filed by commercial fishers shortly after its enactment and regulations on commercial fishers were not enforceable until December 1, 2014.

Accusations by recreational anglers that overharvest was still occurring on the Ohio River surfaced again in 2018. A working group comprised of the KDFWR Fisheries Committee, KDFWR Director of Fisheries and staff biologist, recreational anglers, commercial fishermen, and paylake owners was formed so that all parties were represented in discussions. Multiple workgroup meetings were held to work towards another compromise. Several regulations were proposed and submitted for review. At the time of this report the following regulations have been made law:

The number of commercial fishers awarded trophy permits is 15 (previously 50).

No more than two licensed commercial fisherman per boat. If more are present, they may only keep two limits of trophy catfish.

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

Regulations talk resurfaced once again, and KDFWR suggested the following regulations which were passed unanimously by the Commission in 2023 and became law in 2024:

All commercial fishers are allowed one blue catfish ≥ 35.0 in, one flathead catfish ≥ 35.0 in, and one channel catfish ≥ 28.0 in per day on commercially fishable waters statewide. Trophy permit harvest is now only allowed on the Ohio River from Cannelton Dam downriver to the Ohio River's confluence with the Mississippi River.

Commercial fishing on several waterbodies across the state was closed permanently due to low use, low harvest, and/or low abundance of fish (identified by KDFWR sampling).

A compilation of all 2024 catfish sampling activities is summarized in Table 1.

Trotline Surveys

During summer 2024 trotlines (50 hooks/line) baited with fresh cut rough fish (primarily smallmouth buffalo and silver carp) were used to sample blue catfish. KDFWR crews completed sampling in the Meldahl, Cannelton, and Smithland pools of the Ohio River, and Indiana Department of Natural Resources sampled the JT Myers Pool. One hundred twenty-one total trotlines were fished throughout those pools: 32 in Meldahl Pool, 35 in Cannelton Pool, 31 in JT Myers Pool, and 23 in Smithland Pool (Table 2). CPUE of blue catfish (CPUE=5.3 fish/hr) did not change from the previous year and was just slightly below average since changing methods in 2018 (Table 3).

Blue catfish collected with trotlines ranged from 13.1 – 47.5 in with a mean length of 28.3 in (Table 4). Trophy blue catfish were captured in all pools sampled during trotline sampling and accounted for 10.5% of the total sample (up from 8.2% in 2022 and from 9.6% in 2023). Trotline catch rates for different size groups of each species of catfish were also examined (Table 5). Due to the change in trotline methods in 2018, comparisons with previously collected data should be made with caution. All size groups examined were nearly identical to 2023 catch rates.

Trotline CPUE and size structure of blue catfish in the JT Myers and Smithland pool was once again lower than expected based on findings in the Meldahl and Cannelton pools. The Meldahl and Cannelton pools have displayed consistently higher CPUE (total and trophy fish) than the JT Myers and Smithland pools since 2017. The majority of commercial harvest occurs on the trophy permit section, and invasive carp biomass is continually increasing in this part of the river. Both of these factors could play a role in lower catch rates. Electrofishing CPUE and size structure don't follow this same trend. Differences in available habitat and behavioral tendencies (due to invasive carp) are potential causes for this difference in catchability. If results from different gear types start to align, potential changes in harvest regulations should be examined.

Hoop Net Surveys

Channel catfish hoop net surveys—Department hoop netting was conducted in the Meldahl, Cannelton, and Smithland pools to gather data from hoop net catch of channel catfish. Single nets baited with ZOTE® soap were set overnight for three consecutive net nights in the main stem of the Ohio River. Hoop nets were fished for a total of 174 net-nights: 63 in Meldahl Pool, 84 in Cannelton Pool, and 27 in Smithland Pool (Table 6). Overall catch rate of channel catfish was 2.6 fish/net-night. This is double the CPUE from 2023, but still below the historical average of 3.6 fish/net-night (Table 7).

Lengths of channel catfish ranged from 5.8 – 28.0 in with a mean length of 15.8 in (Table 8). Trophy channel catfish were only captured in the Smithland Pool and accounted for less than 1.0% of the total catch. Hoop net catch rates were also examined for different size groups of channel catfish. Channel catfish catch rates for all size groups examined higher than the record lows of 2023, but still below their historical averages (Table 9).

Flathead catfish hoop net surveys—Netting was conducted simultaneously with baited channel catfish hoop nets in the Meldahl, Cannelton, and Smithland pools. Singles nets were set overnight for three consecutive nights in the main stem of the Ohio River. Hoop nets were fished for a total of 177 net-nights: 57 in the Meldahl Pool, 90 in the Cannelton Pool, and 30 in the Smithland Pool (Table 10). Overall CPUE of flathead catfish was 1.0 fish/net-night which is slightly below average (Table 11).

Lengths of flathead catfish ranged from 16.5 – 45.3 in with a mean length of 26.3 in (Table 12). Hoop net catch rates of different size groups were also examined. CPUE for all size classes except the 20.0 – 29.9 in size group were identical to 2023 catch rates (Table 13). Trophy flathead catfish (≥ 35.0 in) were observed in all pools sampled and captured at 0.1 fish/net-night. Size structure shifted towards smaller fish compared to the 2023 sample. Trophy flathead catfish accounted for 14.5% of the total catch in 2023, but decreased to 6.0% in 2024.

Catch rates of both channel catfish and flathead catfish in hoop nets have been steadily declining over the past 4 – 7 years. Hoop net CPUE can be highly influenced by flow and temperature. Unseasonably low flow and below average water temperatures during the 2023 and 2024 sampling season likely had negative impacts on catch rates. Electrofishing catch rates of flathead catfish have been increasing since 2004 and provide a more accurate representation in years when hoop net sampling conditions are not ideal.

Electrofishing Surveys

No electrofishing sampling occurred on the Ohio River. Instead, electrofishing was conducted on two of the larger commercially fishable tributaries to the Ohio River: the Kentucky River and Pools 1 – 3 of the Green River.

Kentucky River—Low-pulse DC electrofishing was conducted in all 14 pools of the Kentucky River. A total of 24.0 hr of electrofishing effort was conducted resulting in a total catch of 67 blue catfish and 646 flathead catfish (Table 14). CPUE of blue catfish was 2.8 fish/hr, with just one fish being collected upriver of Lock and Dam 4. Flathead catfish were collected in all pools and CPUE was 26.9 fish/hr.

Blue catfish collected with electrofishing ranged from 10.9 – 27.3 in with a mean length of 14.5 in (Table 15). Electrofishing catch rates were also examined for different size groups of blue catfish (Table 16). The majority of blue catfish collected were in the 12.0 – 19.9 in size group and no fish >30.0 in were observed.

Flathead catfish lengths ranged from 4.2 – 43.2 in with a mean length of 11.5 in (Table 17). CPUE by size group decreased as size increased. Over 95.0% of the sample consisted of fish <20.0 in and the majority of fish were <12.0 in (Table 16). While size structure was heavily skewed towards smaller fish, trophy flathead catfish were observed in a few locations.

Green River—Low pulse electrofishing was conducted on the commercially fishable portion of Green River (pools 1 – 3). A total of 14.0 hr of electrofishing efforts was conducted resulting in a total catch of 45 blue catfish and 454 flathead catfish (Table 18). Blue catfish were captured in all pools sampled at a rate of 3.2 fish/hr. Flathead catfish were also captured in all pools, but at a much higher rate (CPUE = 32.4 fish/hr).

Blue catfish collected with electrofishing ranged from 3.6 – 33.7 in with a mean length of 14.5 in (Table 19). Electrofishing catch rates were also examined for different size groups of blue catfish (Table 20).

As with the Kentucky River, the majority of blue catfish collected were <20.0 in and no trophy blue catfish were observed.

Flathead catfish lengths ranged from 4.4 – 41.4 in with a mean length of 12.2 in (Table 19). CPUE by size group decreased as size increased. Over 90.0% of the sample consisted of fish <20.0 in and the majority of fish were <12.0 in (Table 20). Trophy flathead catfish were only observed in Pool 1.

Relative Weight

Ohio River—Relative weight (Wr) was also calculated for each species of catfish. Fish collected from all sampling methods used in 2024 were combined to provide a more representative estimate for the entire population of each catfish species. Overall Wr of blue catfish (N=583) in 2024 was 102 (Table 21). Flathead catfish (N=166) overall relative weight was 95, and channel catfish (N=384) overall relative weight was 97.

Kentucky River—Fish collected during electrofishing surveys were used to calculate relative weight values for blue catfish and flathead catfish. Overall Wr of blue catfish (N=56) in 2024 was 101, and overall Wr of flathead catfish was 98 (N=639) indicating that both species are in great shape. This is encouraging since the available forage base of the Kentucky River can have extreme fluctuations from year to year.

Green River—Fish collected during electrofishing surveys were used to calculate relative weight values for blue catfish and flathead catfish. Overall Wr for both blue catfish (N=23) and flathead catfish (N=322) in 2024 was excellent with a value of 107. The green river is a highly productive system, and fish should continue to exhibit good condition in future samples.

Age and Growth

In spring 2024, otoliths (up to 10 per inch class) were taken from blue catfish and flathead catfish to assess growth rates for each species in the Kentucky and Green rivers. Von Bertalanffy growth equations were calculated for each species. Growth was compared between rivers as well as with growth from fish in the Ohio River (2023 sample). Von bertalanffy growth parameters for each river can be seen in Table 22.

Blue catfish—A subsample of 57 otoliths were taken from blue catfish from the 14 pools of the Kentucky River. Ages of fish ranged from 3 - 13 years, but many year classes were not observed in the sample. The von Bertalanffy growth curved estimated that a blue catfish would take 20.5 years to reach trophy size (≥ 35.0 in; Table 23; Figure 1) in the Kentucky River. Further analysis between pools or sex was deemed invaluable due to a small sample size and was thus not conducted.

A subsample of 44 otoliths were taken from blue catfish from pools 1 – 3 of the Green River. Ages ranged from 1 – 20 years with most year classes between present in the sample. On average blue catfish in the Green River were estimated to reached trophy size (≥ 35.0 in) in 24.2 years (Table 23; Figure 1). As with the Kentucky River, no further analyses between pools or sex were conducted due to inadequate sample size.

Further analysis using ANCOVA was done to test for differences in blue catfish growth between the Kentucky and Green Rivers as well as the Ohio River. Blue catfish in the Kentucky River exhibited faster growth than those in the Green River ($F = 26.1$, $p = <0.01$); however, blue catfish achieved greater lengths in the Green River due to increased longevity. Both the Kentucky River ($F = 5.61$, $p = 0.03$) and the Green River ($F = 17.4$, $p = <0.01$) exhibited slower growth than the Ohio River.

Flathead catfish—A subsample of 168 otoliths were taken from flathead catfish from the Kentucky River. Ages ranged from 1 – 29 with nearly all year classes present. Flathead catfish reached trophy size (≥ 35.0 in) in 33.9 years based on von Bertalanffy growth estimates (Table 24; Figure 1), meaning most flathead catfish in the Kentucky River will not attain trophy status. Due to high length-at-age variance and reduced

sample sizes, reliable pool specific and sex specific von Bertalanffy estimates were not able to be calculated and further analysis was not conducted.

A subsample of 191 otoliths were taken from flathead catfish from the Green River. Ages ranged from 1 – 28 with nearly all year classes accounted for. Flathead catfish reached trophy size (≥ 35.0 in) in 23.3 years based on von Bertalanffy growth estimates (Table 24; Figure 1). As with the Kentucky River further analysis on pool specific and sex specific growth was not conducted due to reduced sample size and high variance in length at age.

Further analysis using ANCOVA was done to test for differences in flathead catfish growth between the Kentucky River and Green River as well as the Ohio River. Flathead catfish in the Green River exhibited faster growth than those in the Kentucky River ($F = 16.0$, $p = <0.01$). Flathead catfish in the Kentucky River grew slower than those in the Ohio river ($F = 5.37$, $p = 0.02$). Flathead catfish growth in the Green River was not significantly different than in the Ohio River ($F = 1.93$, $p = 0.17$).

Mortality

Total annual mortality estimates were made on all three species of catfish based off length-at-age of capture data from otoliths and paired with unaged catfish collected with multiple sampling techniques in 2023. Length frequency data from 2024 was paired with the 2022/2023 age-length key to provide mortality estimates. Using Fishery Analysis and Modeling Simulator (FAMS), a separate weighted catch-curve regression was run on each species of catfish for each sampling method to calculate a range of total annual mortality estimates. As a precautionary step, the highest mortality estimate calculated for each species is reported to avoid underestimates and potentially masking problems in the populations. ANCOVA was then used to test for differences in mortality between rivers. Mortality was not able to be compared with the Ohio River due to different gear types being used to calculate mortality.

Blue catfish—In 2024, total annual mortality for blue catfish in the Ohio River was 27.6%, which is the highest estimate since the project began (Table 25). Total annual mortality was estimated at 31.2% in the Kentucky River, and just 9.4% in the Green River. Mortality was significantly higher in the Kentucky River than the Green River ($F = 6.54$, $p = 0.02$). There was no difference in mortality rates between the Kentucky River and Ohio River ($F = 0.30$, $p = 0.59$), but the Green River had significantly lower mortality estimates than the Ohio River ($F = 29.75$, $p = <0.01$). Estimates for the Kentucky River and Green River were based on very small sample sizes so should be viewed with caution.

Channel catfish—Channel catfish total annual mortality in the Ohio River was 22.2% (Table 25) in 2024 which is slightly higher than 2023, but very close to the historical average.

Flathead catfish— In 2024, total annual mortality for flathead catfish in the Ohio River was 11.5%, which is the lowest estimate since the project began; however, this number was only able to be estimated using hoop nets which had a lower sample than electrofishing typically uses (Table 25). Total annual mortality was estimated at 19.7% in the Kentucky River, and 20.2% in the Green River. There was no statistical difference between mortality in the Kentucky River and Green River ($F = 0.19$, $p = 0.66$). Additionally, there was no statistical difference between the Kentucky River and the Ohio River ($F = 0.01$, $p = 0.92$) or between the Green River and the Ohio River ($F = 0.78$, $p = 0.38$).

Commercial Fishing Industry

Commercial fishing for catfish has long been present in the Ohio River, but concerns of potential overharvest have warranted further investigations. Harvest of blue catfish has been fairly stable since record keeping began in 1999 (Figure 2). Low points in blue catfish harvest are likely related to extended high water that did not allow gear to be effectively fished. Record harvest of blue catfish (388,274 lbs) was observed in 2021. Channel catfish harvest has been lower than blue catfish, but has followed a similar trend. Harvest of channel catfish increased from 2002 – 2011 then gradually declined from 2013 - 2023. Channel catfish harvest in 2023 was 60,371 lbs and was the lowest recorded since 2003. Flathead catfish harvest has mirrored channel catfish harvest since records began in 1999 and began

decreasing in 2013. Flathead catfish harvest in 2024 was 66,909 lbs and was among lowest on record. Unfortunately, commercial fish harvest reports do not include detailed information about gear (number of net nights, baited vs. unbaited, length of gillnet, etc.); however, the number of hooks fished for trotlines as well as number of hoop nets fished is required to be reported. Although trotline and hoop net harvest should not be considered indicative of the entire commercial catfish harvest, it is the best available method to analyze trends in commercial catfish harvest rates. Effort (number of hooks for trotlines and number of nets for hoop nets) and pounds harvested by method were examined to determine if harvest rates varied over the years. Trotlines are more effective at capturing blue catfish, while hoop nets are more effective when targeting flathead catfish according to commercial harvest data. Channel catfish appear to be captured efficiently by both trotlines and hoop nets. Each species was examined according to the most effective gear. The harvest rate of blue catfish increased gradually from 1999 – 2022; however, the previous two years have both been records highs. One low point in harvest in 2004 was likely a result of high water/poor fishing conditions (Figure 3). Recent years with decreases in total pounds of catfish harvested are likely not a result of decreased harvest rates, but rather a decrease in effort. The harvest rate remaining high in years where harvest is lower indicates that the amount of fish harvested is not solely a result of increased effort. Channel catfish trotline harvest rates has been extremely consistent since 1999 (Figure 3). Channel catfish and flathead catfish harvest in commercial nets have both typically remained between 5 – 15 pounds/net since 1999; however, a drastic spike in harvest occurred in 2012 and 2013 (Figure 4). Reasons for this extreme peak in harvest are not known, but could be a result of prolonged favorable fishing conditions or demand for fish.

Table 1. Summary of 2024 catfish sampling sites by waterbody, pool, river mileage, sampling method, species (B=blue catfish, C=channel catfish, and F=flathead catfish), date, and river conditions.

Waterbody	Pool	Location	River mile	Sampling method	Species	Date	Water temp.	Water level (USGS gauge station)	Comments
Ohio River	Meldahl	Manchester Island	392.2 - 398.0	Hoop nets	C,F	4/30/2024	60.0	18.11' @ Greenup Dam	Setting nets
Ohio River	Meldahl	Manchester Island	392.2 - 398.0	Hoop nets	C,F	5/2/2024	61.8	16.75' @ Greenup Dam	Pulling nets
Ohio River	Cannelton	Wolf Creek	667.4 - 677.1	Hoop nets	C,F	5/6/2024	65.2	16.44' @ Louisville, KY	Setting nets
Ohio River	Cannelton	Wolf Creek	667.4 - 677.1	Hoop nets	C,F	5/9/2024	66.3	29.36' @ Louisville, KY	Pulling nets
Ohio River	Meldahl	Whealersburg	344.2 - 353.0	Hoop nets	C,F	5/13/2024	65.4	19.77' @ Greenup Dam	Setting nets
Ohio River	Meldahl	Whealersburg	344.2 - 353.0	Hoop nets	C,F	5/16/2024	65.6	19.26' @ Greenup Dam	Pulling nets
Ohio River	Smithland	Birdsville	917.2 - 910.3	Hoop nets	C,F	5/20/2024	70.3	23.27' @ JT Myers Dam	Setting nets
Kentucky River	1	Big Twin Creek	17.3 - 21.6	Electrofishing	B,F	5/21/2024	71.6	10.14' @ Lock and Dam 2	Annual sample
Kentucky River	1	Gratz	28.5 - 31.0	Electrofishing	B,F	5/21/2024	71.9	10.14' @ Lock and Dam 2	Annual sample
Kentucky River	2	Monterey	35.5 - 42.0	Electrofishing	B,F	5/22/2024	70.7	9.22' @ Lock and Dam 3	Annual sample
Kentucky River	3	Elkhorn Creek	52.8 - 47.0	Electrofishing	B,F	5/22/2024	69.1	8.09' @ Lock and Dam 4	Annual sample
Kentucky River	13	Sturgeon Creek	249.0 - 245.6	Electrofishing	B,F	5/22/2024	73.8	10.17' @ Lock and Dam 14	Annual sample
Kentucky River	14	Beattyville	251.8 - 254.7	Electrofishing	B,F	5/22/2024	73.1	10.17' @ Lock and Dam 14	Annual sample
Ohio River	Smithland	Birdsville	917.2 - 910.3	Hoop nets	C,F	5/23/2024	71.5	22.90' @ JT Myers Dam	Pulling nets
Ohio River	Cannelton	Brandenburg	638.3 - 649.3	Hoop nets	C,F	5/28/2024	70.3	18.79' @ Louisville, KY	Setting nets
Ohio River	Cannelton	Brandenburg	638.3 - 649.3	Hoop nets	C,F	5/31/2024	71.0	16.12' @ Louisville, KY	Pulling nets
Ohio River	Meldahl	Dover	411.8 - 420.5	Hoop nets	C,F	6/3/2024	72.1	14.81' @ Greenup Dam	Setting nets
Kentucky River	3	Steele Branch	53.6 - 59.2	Electrofishing	B,F	6/3/2024	69.2	8.09' @ Lock and Dam 4	Annual sample
Kentucky River	4	East-West Connector	68.9 - 76.2	Electrofishing	B,F	6/3/2024	66.7	10.36' @ Lock and Dam 5	Annual sample
Kentucky River	4	Clifton	78.1 - 82.2	Electrofishing	B,F	6/3/2024	66.0	10.36' @ Lock and Dam 5	Annual sample
Kentucky River	5	Below Tyrone	82.8 - 84.9	Electrofishing	B,F	6/4/2024	69.2	11.25' @ Lock and Dam 6	Annual sample
Kentucky River	5	Above Tyrone	87.5 - 96.2	Electrofishing	B,F	6/4/2024	69.1	11.25' @ Lock and Dam 6	Annual sample
Kentucky River	11	Irvine	218.2 - 220.9	Electrofishing	B,F	6/4/2024	70.7	11.28' @ Lock and Dam 12	Annual sample
Kentucky River	12	Ravenna	224.6 - 227.4	Electrofishing	B,F	6/4/2024	71.9	12.46' @ Lock and Dam 12	Annual sample
Kentucky River	12	Lock and Dam 13 Tailwater	235.8 - 239.9	Electrofishing	B,F	6/4/2024	70.7	12.46' @ Lock and Dam 12	Annual sample
Ohio River	Meldahl	Dover	411.8 - 420.5	Hoop nets	C,F	6/6/2024	73.6	17.53' @ Greenup Dam	Pulling nets
Kentucky River	10	Otter Creek	184.4 - 190.0	Electrofishing	B,F	6/10/2024	74.7	12.04' @ Lock and Dam 11	Annual sample
Kentucky River	10	College Hill	192.8 - 201.0	Electrofishing	B,F	6/10/2024	73.2	12.04' @ Lock and Dam 11	Annual sample
Kentucky River	11	Drowning Creek	204.2 - 207.9	Electrofishing	B,F	6/10/2024	73.2	9.85' @ Lock and Dam 12	Annual sample
Kentucky River	8	Poosey Ridge	147.8 - 157.5	Electrofishing	B,F	6/11/2024	70.8	12.13' @ Lock and Dam 9	Annual sample
Kentucky River	8	John Nickell Ramp	140.5 - 145.5	Electrofishing	B,F	6/11/2024	70.5	12.13' @ Lock and Dam 9	Annual sample
Ohio River	Cannelton	Cloverport	703.0 - 710.8	Hoop nets	C,F	6/11/2024	73.6	15.29' @ Louisville, KY	Setting nets
Kentucky River	6	Oregon Road	97.1 - 103.7	Electrofishing	B,F	6/12/2024	71.8	9.91' @ Lock and Dam 7	Annual sample
Kentucky River	6	Nonesuch	106.8 - 117.0	Electrofishing	B,F	6/12/2024	70.8	9.91' @ Lock and Dam 7	Annual sample
Kentucky River	7	High Bridge	120.3 - 130.7	Electrofishing	B,F	6/12/2024	79.2	12.65' @ Lock and Dam 8	Annual sample
Kentucky River	7	Camp Nelson	135.3 - 139.9	Electrofishing	B,F	6/12/2024	74.0	12.65' @ Lock and Dam 8	Annual sample
Kentucky River	9	Boonesborough	172.0 - 176.4	Electrofishing	B,F	6/12/2024	71.8	10.64' @ Lock and Dam 10	Annual sample
Ohio River	Cannelton	Cloverport	703.0 - 710.8	Hoop nets	C,F	6/14/2024	73.5	12.41' @ Louisville, KY	Pulling nets
Green River	2	Rochester	102.9 - 108.5	Electrofishing	B,F	6/17/2024	69.7	7.94' @ Lock and Dam 4	Annual sample
Green River	3	Morgantown	140.1 - 143.9	Electrofishing	B,F	6/17/2024	73.5	7.94' @ Lock and Dam 4	Annual sample
Green River	3	Woodbury	146.5 - 149.0	Electrofishing	B,F	6/17/2024	73.4	7.94' @ Lock and Dam 4	Annual sample
Green River	2	Central City	83.1 - 89.7	Electrofishing	B,F	6/20/2024	77.6	4.12' @ Paradise, KY	Annual sample
Green River	2	Rockport	91.1 - 98.0	Electrofishing	B,F	6/20/2024	76.4	4.12' @ Paradise, KY	Annual sample

Table 1. Continued

Waterbody	Pool	Location	River mile		Species	Date	Water temp.	Water level (USGS gauge station)	Comments
Green River	1	Spottsville	10.9 - 14.2	Electrofishing	B,F	6/24/2024	78.2	11.69' @ Spottsville, KY	Annual sample
Green River	1	Hamilton Ferry	24.2 - 28.5	Electrofishing	B,F	6/24/2024	78.9	12.05' @ Lock and Dam 2	Annual sample
Green River	1	Sebree	41.5 - 46.2	Electrofishing	B,F	6/24/2024	79.8	12.05' @ Lock and Dam 2	Annual sample
Green River	1	Pond River	53.2 - 56.5	Electrofishing	B,F	6/24/2024	78.7	12.05' @ Lock and Dam 2	Annual sample
Green River	1	Rumsey	59.2 - 63.1	Electrofishing	B,F	6/24/2024	78.4	12.05' @ Lock and Dam 2	Annual sample
Green River	2	Calhoun	66.1 - 69.5	Electrofishing	B,F	6/26/2024	77.4	5.81' @ Livermore, KY	Annual sample
Green River	2	Livermore	71.4 - 74.8	Electrofishing	B,F	6/26/2024	78.5	5.81' @ Livermore, KY	Annual sample
Green River	3	Mud River	109.5 - 115.8	Electrofishing	B,F	6/26/2024	76.7	3.46' @ Rockport, KY	Annual sample
Green River	3	Highview Hill	124.0 - 129.5	Electrofishing	B,F	6/26/2024	78.4	3.46' @ Rockport, KY	Annual sample
Ohio River	Meldahl	Manchester Island	390.1 - 401.2	Trotlines	B	7/9/2024	82.4	14.06' @ Greenup Dam	Setting lines
Ohio River	Meldahl	Manchester Island	390.1 - 401.2	Trotlines	B	7/10/2024	81.5	14.21' @ Greenup Dam	Pulling lines
Ohio River	Cannelton	Brandenburg	638.3 - 649.3	Trotlines	B	7/15/2024	82.6	10.46' @ Louisville, KY	Setting lines
Ohio River	Cannelton	Brandenburg	638.3 - 649.3	Trotlines	B	7/16/2024	83.0	10.85' @ Louisville, KY	Pulling/resetting lines
Ohio River	Cannelton	Brandenburg	638.3 - 649.3	Trotlines	B	7/17/2024	82.9	10.50' @ Louisville, KY	Pulling lines
Ohio River	JT Myers	Newburgh	776.1 - 787.0	Trotlines	B	7/21/2024	85.9	12.49' @ Newburgh Dam	Setting lines (INDNR)
Ohio River	JT Myers	Newburgh	776.1 - 787.0	Trotlines	B	7/22/2024	86.0	13.75' @ Newburgh Dam	Pulling/resetting lines (INDNR)
Ohio River	Smithland	Old Shawneetown	855.0 - 863.0	Trotlines	B	7/22/2024	81.0	14.38' @ JT Myers Dam	Setting lines
Ohio River	Smithland	Old Shawneetown	855.0 - 863.0	Trotlines	B	7/23/2024	80.8	16.11' @ JT Myers Dam	Pulling lines
Ohio River	JT Myers	Newburgh	776.1 - 787.0	Trotlines	B	7/23/2024	85.0	13.77' @ Newburgh Dam	Pulling lines (INDNR)
Ohio River	Meldahl	Dover	423.3 - 412.2	Trotlines	B	7/29/2024	82.6	13.32' @ Greenup Dam	Setting lines
Ohio River	Meldahl	Dover	423.3 - 412.2	Trotlines	B	7/30/2024	80.7	13.68' @ Greenup Dam	Pulling/resetting lines
Ohio River	Meldahl	Dover	423.3 - 412.2	Trotlines	B	7/31/2024	82.7	14.34' @ Greenup Dam	Pulling lines
Ohio River	JT Myers	Mount Vernon	829.0 - 835.0	Trotlines	B	8/4/2024	85.1	14.42' @ Newburgh Dam	Setting lines (INDNR)
Ohio River	JT Myers	Mount Vernon	829.0 - 835.0	Trotlines	B	8/5/2024	86.0	14.81' @ Newburgh Dam	Pulling/resetting lines (INDNR)
Ohio River	Meldahl	Wheelersburg	342.5 - 352.6	Trotlines	B	8/5/2024	82.5	14.28' @ Greenup Dam	Setting lines
Ohio River	Meldahl	Wheelersburg	342.5 - 352.6	Trotlines	B	8/6/2024	82.6	14.51' @ Greenup Dam	Pulling lines
Ohio River	JT Myers	Mount Vernon	829.0 - 835.0	Trotlines	B	8/6/2024	87.0	14.21' @ Newburgh Dam	Pulling lines (INDNR)
Ohio River	Cannelton	Wolf Creek	671.0 - 681.2	Trotlines	B	8/8/2024	83.1	13.32' @ Louisville, KY	Setting lines
Ohio River	Cannelton	Wolf Creek	671.0 - 681.2	Trotlines	B	8/9/2024	82.8	13.74' @ Louisville, KY	Pulling lines
Ohio River	Cannelton	Cloverport	702.9 - 715.1	Trotlines	B	8/13/2024	82.8	12.73' @ Louisville, KY	Setting lines
Ohio River	Cannelton	Cloverport	702.9 - 715.1	Trotlines	B	8/14/2024	84.0	10.66' @ Louisville, KY	Pulling lines
Ohio River	Smithland	Birdsville	905.0 - 917.2	Trotlines	B	8/21/2024	79.5	13.19' @ JT Myers Dam	Setting lines
Ohio River	Smithland	Birdsville	905.0 - 917.2	Trotlines	B	8/22/2024	79.5	13.26' @ JT Myers Dam	Pulling lines

Table 2. CPUE (fish/line) of blue catfish collected during trotline surveys on the Ohio River in summer 2024. Standard errors are in parentheses.

Pool	No. of trotlines	No. of Blue Catfish	CPUE
Meldahl	32	175	5.5 (0.5)
Cannelton	35	312	8.9 (0.7)
JT Myers	31	62	2.0 (0.5)
Smithland	23	90	3.9 (0.4)
Total	121	639	5.3 (0.4)

Table 3. CPUE (fish/line) of blue catfish collected during trotline surveys on the Ohio River during summer from 2004 - 2024. Standard errors are in parentheses.

Year	CPUE
2004	1.5 (0.3)
2005	1.5 (0.4)
2006	6.6 (1.2)
2007	2.4 (0.5)
2008	5.9 (0.7)
2010	4.0 (0.4)
2011	3.9 (0.6)
2012	3.0 (0.8)
2013	1.2 (0.2)
2014	1.3 (0.1)
2015	1.6 (0.2)
2016	2.8 (0.2)
2017	2.0 (0.2)
2018*	5.2 (0.4)
2019*	5.9 (0.4)
2020*	5.4 (0.3)
2022*	7.1 (0.6)
2023*	5.3 (0.4)
2024*	5.3 (0.4)
Mean**	5.6 (0.2)

*New methods were adopted for trotlining including changes in bait and style of dropper lines.

**Mean calculated from 2018 - 2023 data after changing methods.

Table 4. Length frequency and CPUE (fish/line) of blue catfish collected during trotline surveys on Ohio River in summer 2024. Standard errors are in parentheses.

Pool	Inch class																																															Total	CPUE
	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	40	41	42	43	44	45	46	47														
Meldahl				1			1	3	2	1	3	2	8	14	13	18	23	18	21	17	5	2	9	5	2	1	1	1		2	1				1			175	5.5 (0.5)										
Cannelton			2	1	1	6	1	3	9	5	18	21	29	45	38	30	24	16	22	7	4	6	8	5	6	2	1		2									312	8.9 (0.7)										
JT Myers		1			1	1	3	7	1	5	5	1	5		2	3	4	5	5	2	1	2	3	2	2	1												62	2.0 (0.5)										
Smithland	1	2			2	3	2	3	1	4	6	3	4	9	8	10	3	3	6	4	4		2	1	4		1		1		1							90	3.9 (0.4)										
Total	1	3	2	2	4	10	7	16	13	15	32	27	46	68	61	61	54	42	54	30	14	10	22	13	14	4	3	1	3	2	2		1	1	1			639	5.3 (0.4)										

Table 5. CPUE (fish/line) by size group of blue catfish collected during trotline surveys on the Ohio River during summer from 2004 - 2023. Standard errors are in parentheses.

Year	Size group (in)					Total
	<12.0	12.0 - 19.9	20.0 - 29.9	30.0 - 34.9	≥35.0	
2004	0.0	0.3 (0.2)	0.9 (0.2)	0.3 (0.2)	0.1 (0.1)	1.5 (0.3)
2005	0.0	<0.1 (<0.1)	1.0 (0.6)	0.2 (0.1)	0.2 (0.1)	1.5 (0.4)
2006	<0.1 (<0.1)	0.8 (0.2)	5.0 (1.0)	0.6 (0.2)	0.2 (0.1)	6.6 (1.2)
2007	0.0	0.3 (0.1)	1.5 (0.4)	0.5 (0.2)	0.1 (<0.1)	2.4 (0.5)
2008	0.0	0.6 (0.2)	4.1 (0.8)	1.0 (0.1)	0.1 (0.1)	5.9 (0.7)
2010	0.0	0.2 (<0.1)	1.9 (0.3)	1.1 (0.3)	0.7 (0.2)	4.0 (0.4)
2011	0.0	0.2 (0.1)	2.7 (0.5)	0.9 (0.3)	0.3 (0.1)	3.9 (0.6)
2012	0.1 (<0.1)	0.7 (0.3)	1.7 (0.3)	0.3 (0.2)	0.2 (0.1)	3.0 (0.8)
2013	0.1 (<0.1)	0.3 (0.1)	0.6 (0.1)	0.1 (<0.1)	<0.1 (<0.1)	1.2 (0.2)
2014	<0.1 (<0.1)	0.5 (0.1)	0.5 (0.1)	0.2 (<0.1)	0.1 (0.1)	1.3 (0.1)
2015	<0.1 (<0.1)	0.5 (0.2)	0.7 (0.2)	0.3 (0.1)	0.1 (<0.1)	1.6 (0.2)
2016	<0.1 (<0.1)	0.7 (0.2)	1.5 (0.4)	0.5 (0.2)	0.1 (<0.1)	2.8 (0.2)
2017	0.0	0.3 (0.1)	1.4 (0.1)	0.2 (<0.1)	0.1 (<0.1)	2.0 (0.2)
2018*	<0.1 (<0.1)	0.3 (0.1)	3.2 (0.3)	0.9 (0.1)	0.8 (0.1)	5.2 (0.4)
2019*	<0.1 (<0.1)	0.2 (<0.1)	4.2 (0.3)	0.9 (0.1)	0.6 (0.1)	5.9 (0.4)
2020*	0.0	0.1 (<0.1)	3.9 (0.2)	0.7 (0.1)	0.7 (0.1)	5.4 (0.3)
2022*	.03 (.02)	0.3 (0.1)	5.1 (0.5)	1.1 (0.2)	0.6 (0.1)	7.1 (0.6)
2023*	<0.1 (<0.1)	0.4 (0.1)	3.3 (0.3)	1.1 (0.1)	0.5 (0.1)	5.3 (0.4)
2024*	0.0	0.2 (0.1)	3.3 (0.3)	1.2 (0.1)	0.6 (0.1)	5.3 (0.4)
Mean**	<0.1 (<0.1)	0.2 (<0.1)	3.7 (0.1)	1.0 (0.1)	0.6 (0.1)	5.6 (0.2)

*New methods were adopted for trotlining including changes in bait and style of dropper lines.

**Mean calculated from 2018 - 2023 data after changing methods.

Table 6. CPUE (fish/net-night) of channel catfish collected during baited hoop net surveys in Meldahl, Cannelton, and Smithland pools of the Ohio River in spring 2024. Standard errors are in parentheses.

Pool	Effort (net nights)	No. of channel catfish	CPUE
Meldahl	63	233	3.7 (1.4)
Cannelton	84	165	2.0 (0.6)
Smithland	27	53	2.0 (1.2)
Total	174	451	2.6 (0.6)

Table 7. CPUE (fish/net-night) of channel catfish collected during baited hoop net surveys on the Ohio River in spring 2017 - 2024. Standard errors are in parentheses.

Year	CPUE
2017	7.0 (1.0)
2018	3.8 (0.5)
2019	4.5 (0.8)
2021	2.4 (0.5)
2022	2.1 (0.4)
2023	1.3 (0.3)
2024	2.6 (0.6)
Mean	3.6 (0.3)

Table 8. Length frequency and CPUE (fish/net-night) of channel catfish collected during baited hoop net sampling in the Meldahl, Cannelton, and Smithland pools during spring 2024 on the Ohio River. Standard errors are in parentheses.

Pool	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Total	CPUE
Meldahl				1	18	9	10	14	22	29	33	19	15	26	13	10	7	2	4	1					233	3.7 (1.4)
Cannelton	1	1		4	15	5	2	8	26	28	21	18	4	5	6	4	6	4	5	2					165	2.0 (0.6)
Smithland				1	3	4	3	2	3		4		1	1		3	1	2	4	9	3	5	3	1	53	2.0 (1.2)
Total	1	1		6	36	18	15	24	51	57	58	37	20	32	19	17	14	8	13	12	3	5	3	1	451	2.6 (0.6)

Table 9. CPUE (fish/net-night) by size group of channel catfish collected during baited hoop net surveys on the Ohio River in spring 2017 - 2024. Standard errors are in parentheses.

Year	Size group (in)				Total
	<12.0	12.0 - 19.9	20.0 - 27.9	≥28.0	
2017	1.5 (0.3)	4.5 (0.7)	1.0 (0.2)	<0.1 (<0.1)	7.0 (1.0)
2018	0.7 (0.1)	2.5 (0.4)	0.6 (0.1)	<0.1 (<0.1)	3.8 (0.5)
2019	0.8 (0.2)	2.6 (0.5)	1.0 (0.3)	<0.1 (<0.1)	4.5 (0.8)
2021	0.6 (0.1)	1.3 (0.4)	0.5 (0.1)	0.0	2.4 (0.5)
2022	0.6 (0.2)	1.0 (0.2)	0.5 (0.2)	<0.1 (<0.1)	2.1 (0.4)
2023	0.3 (0.1)	0.8 (0.2)	0.1 (<0.1)	0.0	1.3 (0.3)
2024	0.4 (0.1)	1.7 (0.5)	0.4 (0.2)	<0.1 (<0.1)	2.6 (0.6)
Mean	0.7 (0.1)	2.3 (0.2)	0.6 (0.1)	<0.1 (<0.1)	3.6 (0.3)

Table 10. CPUE (fish/net-night) of flathead catfish collected during unbaited hoop net surveys in Meldahl, Cannelton, and Smithland pools of the Ohio River in spring 2024. Standard errors are in parentheses.

Pool	Effort (net nights)	No. of Flathead Catfish	CPUE
Meldahl	57	28	0.5 (0.1)
Cannelton	90	104	1.2 (0.3)
Smithland	30	36	1.2 (0.5)
Total	177	168	1.0 (0.2)

Table 11. CPUE (fish/net-night) of flathead catfish collected during unbaited hoop net surveys on the Ohio River in spring 2017 - 2024. Standard errors are in parentheses.

Year	CPUE
2019	1.8 (0.2)
2021	0.8 (0.2)
2022	1.5 (0.2)
2023	0.6 (0.1)
2024	1.0 (0.2)
Mean	1.1 (0.1)

Table 12. Length frequency and CPUE (fish/net/night) of flathead catfish collected during unbaited hoop net sampling in the Meldahl, Cannelton, and Smithland pools during spring 2024 on the Ohio River. Standard errors are in parentheses.

Pool	Inch class																														Total	CPUE	
	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	43	44	45			
Meldahl	1	1		1		1	1	4	2	3	2	1	3		2	1	1			1		2					1				28	0.5 (0.1)	
Cannelton	2	2	2	7	2	6	5	4	12	6	9	12	12	3	3	2	5	2	3		1			1			1	1			1	104	1.2 (0.3)
Smithland				2	5	1	6	1	4	4	2	3	1	1	1		3		1		1										36	1.2 (0.5)	
Total	3	3	2	10	7	8	12	9	18	13	13	16	16	4	6	3	9	2	4	1	2	2	1			1	2			1	168	1.0 (0.2)	

Table 13. CPUE (fish/net-night) by size group of flathead catfish collected during unbaited hoopnet surveys on the Ohio River in spring 2019 - 2023. Standard errors are in parentheses.

Year	Size group (in)					Total
	<12.0	12.0 - 19.9	20.0 - 29.9	30.0 - 34.9	≥35.0	
2019	0.0	0.1 (<0.1)	1.1 (0.1)	0.3 (0.1)	0.2 (0.1)	1.8 (0.2)
2021	0.0	0.1 (<0.1)	0.5 (0.2)	0.1 (0.1)	0.1 (<0.1)	0.8 (0.2)
2022	0.0	0.1 (<0.1)	0.9 (<0.1)	0.3 (0.1)	0.2 (0.1)	1.5 (0.2)
2023	0.0	0.1 (<0.1)	0.4 (0.1)	0.1 (<0.1)	0.1 (<0.1)	0.6 (0.1)
2024	0.0	0.1 (<0.1)	0.7 (0.1)	0.1 (<0.1)	0.1 (<0.1)	1.0 (0.2)
Mean	0.0	0.1 (<0.1)	0.7 (0.1)	0.2 (<0.1)	0.1 (<0.1)	1.1 (0.1)

Table 14. Effort and CPUE (fish/hr) of blue catfish and flathead catfish collected during electrofishing surveys on the Kentucky River in May and June 2024. Standard errors are in parentheses.

Pool	No. of transects	Effort (hr)	No. of Blue Catfish	CPUE	No. of Flathead	CPUE
1	8	2.0	8	4.0 (3.5)	64	32.0 (5.0)
2	4	1.0	20	20.0 (8.8)	37	37.0 (6.2)
3	8	2.0	38	19.0 (6.7)	33	16.5 (2.6)
4	8	2.0	0	0.0	19	9.5 (2.7)
5	8	2.0	0	0.0	18	9.0 (2.5)
6	8	2.0	0	0.0	19	9.5 (2.3)
7	8	2.0	0	0.0	37	18.5 (4.5)
8	8	2.0	1	0.5 (0.5)	26	13.0 (3.3)
9	4	1.0	0	0.0	8	8.0 (1.6)
10	8	2.0	0	0.0	95	47.5 (6.2)
11	8	2.0	0	0.0	75	37.5 (5.2)
12	8	2.0	0	0.0	104	52.0 (10.1)
13	4	1.0	0	0.0	66	66.0 (23.5)
14	4	1.0	0	0	45	45.0 (8.4)
Total	96	24.0	67	2.8 (0.9)	646	26.9 (2.4)

Table 15. Length frequency and CPUE (fish/hr) of blue catfish collected during electrofishing surveys in May and June 2024 on the Kentucky River. Standard errors are in parentheses.

Pool	Inch class																	Total	CPUE	Wr	
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26				27
1		2		2	1		2	1											8	4.0 (3.5)	120
2			1	6	5	2	1		1				1				1	2	20	20.0 (8.8)	105
3	1	7	7	8	6	3	5				1								38	19.0 (6.7)	95
4																			0	0.0	
5																			0	0.0	
6																			0	0.0	
7																			0	0	
8						1													1	0.5 (0.5)	96
9																			0	0.0	
10																			0	0.0	
11																			0	0.0	
12																			0	0.0	
13																			0	0.0	
14																			0	0.0	
Total	1	10	13	15	9	5	7	2			1		1			1		2	67	2.8 (0.9)	101

Table 16. CPUE (fish/hr) by size group of blue catfish and flathead catfish collected during electrofishing surveys on the Kentucky River in 2024. Standard errors are in parentheses.

Year	Size group (in)					Total
	<12.0	12.0 - 19.9	20.0 - 29.9	30.0 - 34.9	≥35.0	
Blue catfish						
2024	0.5 (0.2)	2.1 (0.7)	0.2 (0.1)	0.0	0.0	2.8 (0.9)
Flathead catfish						
2024	17.1 (1.8)	8.9 (0.9)	0.8 (0.2)	0.1 (0.1)	0.1 (0.1)	26.9 (2.4)

Table 17. Length frequency, CPUE (fish/hr), and relative weight (Wr) of flathead catfish collected during electrofishing surveys in May and June 2024 on the Kentucky River. Standard errors are in parentheses.

Pool	Inch class																																											Total	CPUE	Wr
	4	5	6	7	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	40	41	42	43						
1		2	4	3	12	17	10	4	3	2	1	1		3	1				1																						64	32.0 (5.0)	106			
2		2	1		2	3	6	4	6	6	3	2					1	1																								37	37.0 (6.2)	99		
3		3	1	1	1	5	1	5	5	6	2			2	1																											33	16.5 (2.6)	97		
4				1	1	1		1	2	4	5		1					1	1									1														19	9.5 (2.7)	92		
5					2	2	2	5	2	1	2	1									1																					18	9.0 (2.5)	97		
6					3	3	1	2		2	3	1		1	1		1						1																			19	9.5 (2.3)	94		
7			5	3	4	7	8	1	2		2			1		1	1								1									1								37	18.5 (4.5)	102		
8		1		3	1	7	5	3	3	2				1																												26	13.0 (3.3)	93		
9			1				1		2	2			1										1																			8	8.0 (1.6)	86		
10	3	3	2	13	6	12	14	12	15	7	3		1	1	2																							1	95	47.5 (6.2)	95					
11	1	5	3	6	7	10	6	15	6	6	2	3		1	1									1	1				1												75	37.5 (5.2)	96			
12	2		2	12	10	13	13	11	15	11	3	5	3			3							1																		104	52.0 (10.1)	96			
13			2	3	10	13	8	7	6	1	3	2		1	4	1	1	1	1	1											1										66	66.0 (23.5)	103			
14			1	1	3	7	9	4	1	6	6	3	3			1																									45	45.0 (8.4)	94			
Total	6	16	22	46	62	100	84	74	68	56	35	18	9	11	10	6	4	3	3	1	1		2	2	2			1	1			1		1				1	646	26.9 (2.4)	98					

Table 18. Effort and CPUE (fish/hr) of blue catfish and flathead catfish collected during electrofishing surveys on the Green River in June 2024. Standard errors are in parentheses.

Pool	No. of transects	Effort (hr)	No. of Blue Catfish	CPUE	No. of Flathead	CPUE
1	20	5.0	35	7.0 (1.8)	183	36.6 (4.0)
2	20	5.0	3	0.6 (0.4)	126	25.2 (2.8)
3	16	4.0	7	1.8 (0.7)	145	36.3 (4.8)
Total	56	14.0	45	3.2 (0.8)	454	32.4 (2.3)

Table 19. Length frequency and CPUE (fish/hr) of blue catfish and flathead catfish collected during electrofishing surveys in June 2024 on the Green River. Standard errors are in parentheses.

Pool	Species	Inch class																																									Total	CPUE	Wr
		3	4	5	6	7	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	40	41					
1	Blue catfish			2	1	3	6	2	5	1	2		1	3	1			2	1	1	2				1		1														35	7.0 (1.8)	110		
	Flathead catfish	1	1	14	18	17	20	31	16	9	6	5	6			4	3	2	3	1	2	2	3	4	2	2	3		2	1	1	1					1			2	183	36.6 (4.0)	101		
2	Blue catfish	1						1			1																														3	0.6 (0.4)	117		
	Flathead catfish		1	1	7	2	18	16	11	17	10	13	4	4	2	3	1	2	2	2	3			2	1	3		1														126	25.2 (2.8)	106	
3	Blue catfish																2				1	1			1							1	1								7	1.8 (0.7)	100		
	Flathead catfish	1	9	5	14	15	14	24	13	21	11	4	5	2	1			1	2	1			1		1																	145	36.3 (4.8)	109	
Total	Blue catfish	1		2	1	3	6	3	5	1	3		1	3	1		2	2	1	1	3	1			2		1					1	1									45	3.2 (0.8)	107	
	Flathead catfish		3	11	26	34	50	50	66	46	40	30	13	15	4	8	4	5	7	4	5	2	6	5	6	2	4		2	1	1	1				1			2	454	32.4 (2.3)	107			

Table 20. CPUE (fish/hr) by size group of blue catfish and flathead catfish collected during electrofishing surveys on the Green River in 2024. Standard errors are in parentheses.

Year	Size group (in)					Total
	<12.0	12.0 - 19.9	20.0 - 29.9	30.0 - 34.9	≥35.0	
	<u>Blue catfish</u>					
2024	1.6 (0.5)	0.9 (0.3)	0.6 (0.3)	0.1 (0.1)	0.0	3.2 (0.8)
	<u>Flathead catfish</u>					
2024	20.4 (2.1)	8.5 (1.0)	2.9 (0.5)	0.4 (0.2)	0.2 (0.1)	32.4 (2.3)

Table 21. Relative weight (Wr) of blue catfish, channel catfish, and flathead catfish collected from the Ohio River using trotlines, hoop nets, electrofishing and catfish tournaments from 2013 - 2024.

Year	Species		
	Blue catfish	Channel catfish	Flathead catfish
2013	112	100	99
2014	105	97	92
2015	109	100	98
2016	107	97	106
2017	106	89	107
2018	104	90	101
2019	99	86	99
2020	107		107
2021	112	87	114
2022	103	89	95
2023	106	84	101
2024	102	97	95
Mean	106	92	102

Table 22. von Bertalanffy growth parameters used to estimate length-at age for blue catfish and flathead catfish collected from the Ohio River in 2022/2023 and the Kentucky River and Green River in 2024 where L_{∞} = theoretical maximum length, K =body growth coefficient, and t_0 =time coefficient.

Parameter	Blue catfish			Flathead catfish		
	Ohio River	Kentucky River	Green River	Ohio River	Kentucky River	Green River
L_{∞} (in)	55.0	45.2	48.5	55.0	44.2	52.1
K	0.055	0.067	0.049	0.043	0.043	0.046
t_0	-1.622	-1.668	-1.876	-3.113	-2.622	-0.989

Table 23. Mean length (in) at age calculated with the von Bertalanffy growth equation based on otoliths taken from blue catfish from the Ohio River in spring and summer of 2022/2023 and the Kentucky River and Green River in 2024.

River	Age																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Ohio River	7.4	10.0	12.4	14.7	16.8	18.9	20.8	22.6	24.4	26.0	27.6	29.1	30.5	31.8	33.0	34.2	35.3	36.4	37.4	38.3	39.2	40.1	40.9	41.7	42.4	43.1	43.7	44.3	44.9
Kentucky River	7.4	9.8	12.1	14.3	16.3	18.2	19.9	21.5	23.1	24.5	25.9	27.1	28.3																
Green River	6.4	8.4	10.3	12.1	13.9	15.5	17.1	18.6	20.1	21.4	22.7	23.9	25.1	26.2	27.3	28.3	29.3	30.2	31.1	31.9									

Table 24. Mean length (in) at age calculated with von Bertalanffy growth equation based on otoliths taken from flathead catfish from the Ohio River in spring and summer of 2022/2023 and the Kentucky River and Green River in 2024.

Pool	Age																																	
	1	2	3	4	5	6	7	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
Ohio River	8.9	10.9	12.7	14.5	16.2	17.9	19.4	20.9	22.4	23.8	25.1	26.3	27.6	28.7	29.8	30.9	31.9	32.9	33.8	34.7	35.6	36.4	37.2	37.9	38.7	39.4	40.0	40.7	41.3	41.8	42.4	42.9	43.5	43.9
Kentucky River	6.4	8.0	9.5	11.0	12.4	13.7	15.0	16.2	17.4	18.5	19.6	20.6	21.6	22.6	23.5	24.4	25.2	26.0	26.8	27.5	28.2	28.9	29.5	30.1	30.7	31.3	31.8	32.4	32.9					
Green River	4.6	6.7	8.7	10.7	12.6	14.3	16.0	17.7	19.2	20.7	22.1	23.4	24.7	26.0	27.1	28.3	29.3	30.4	31.3	32.3	33.2	34.0	34.8	35.6	36.4	37.1	37.7	38.4						

Table 25. Maximum total annual mortality rates of blue catfish, channel catfish, and flathead catfish collected from the Ohio River using trotlines, hoopnets, and electrofishing from 2013 - 2024.

Year	Species		
	Blue catfish	Channel catfish	Flathead catfish
2013	18.7	32.2	18.8
2014	24.7	26.8	18.7
2015	20.0	20.6	15.9
2016	17.4	16.8	16.0
2017	18.9	27.9	18.2
2018	19.8	28.0	18.0
2019	17.3	23.3	17.1
2020	26.6		19.5
2021	23.7	20.7	19.8
2022	26.4	15.8	17.6
2023	16.8	21.7	18.2
2024	27.6	22.2	11.5
Mean	21.5	23.3	17.4

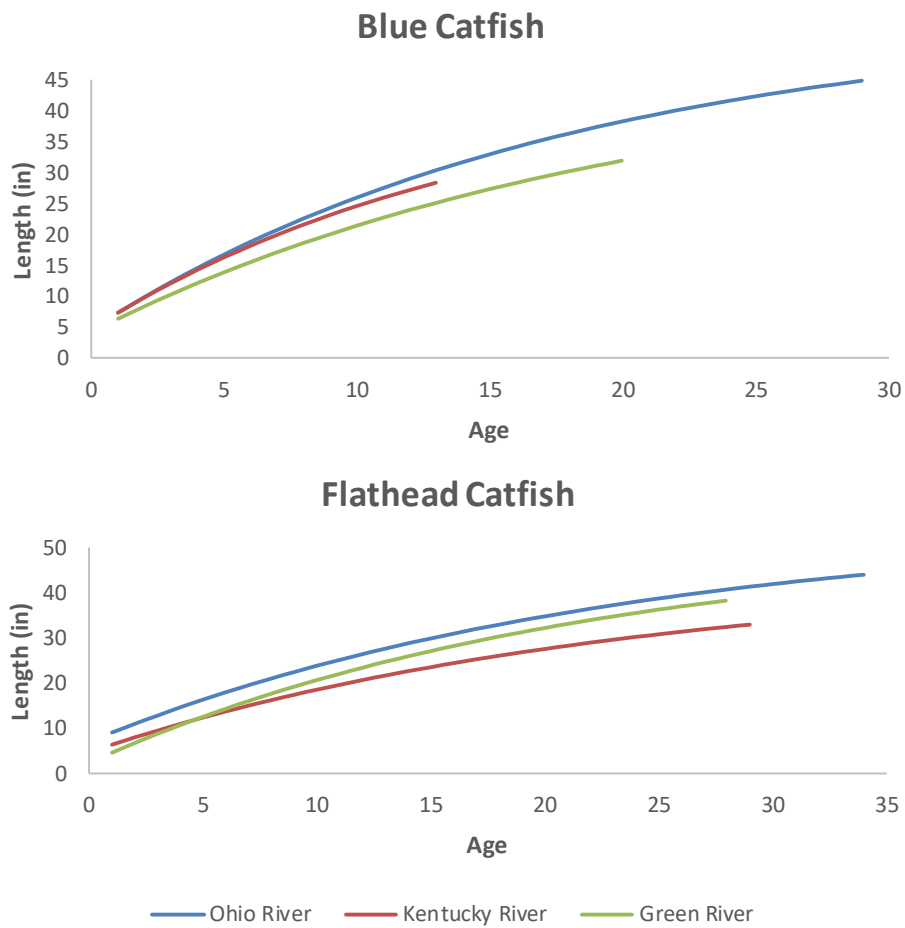


Figure 1. Comparison of von Bertalanffy growth curves for blue catfish, channel catfish, and flathead catfish by pool from age and growth samples collected from the Ohio River in 2022/2023 and the Kentucky River and Green River in 2024.

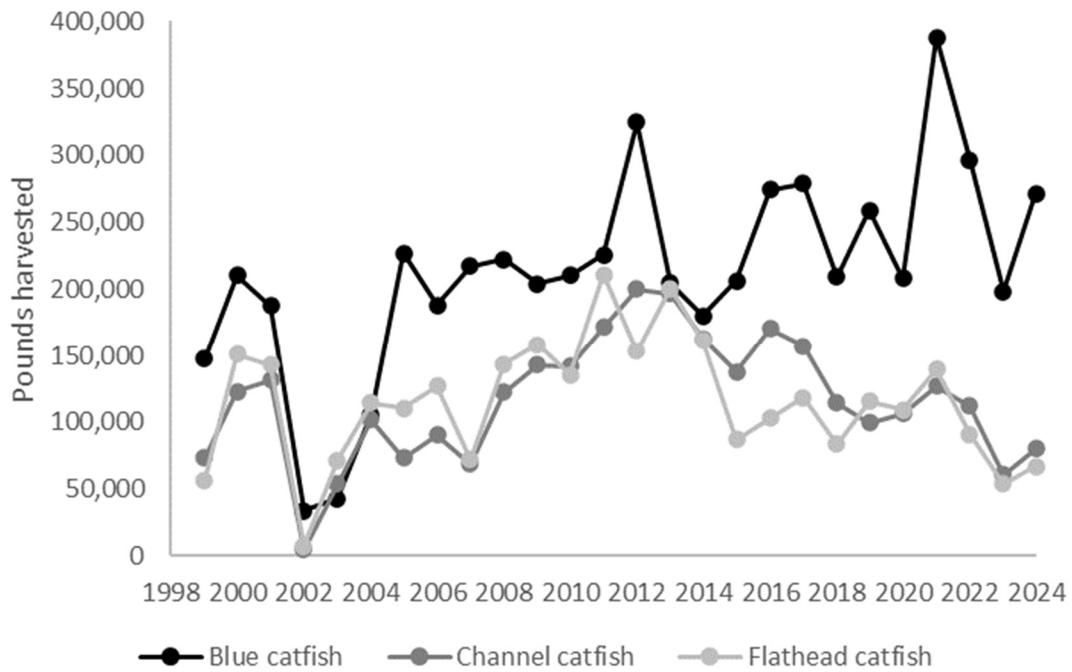


Figure 2. Total pounds of blue catfish, channel catfish, and flathead catfish harvested by commercial fishermen from the Ohio River from 2004 – 2024.

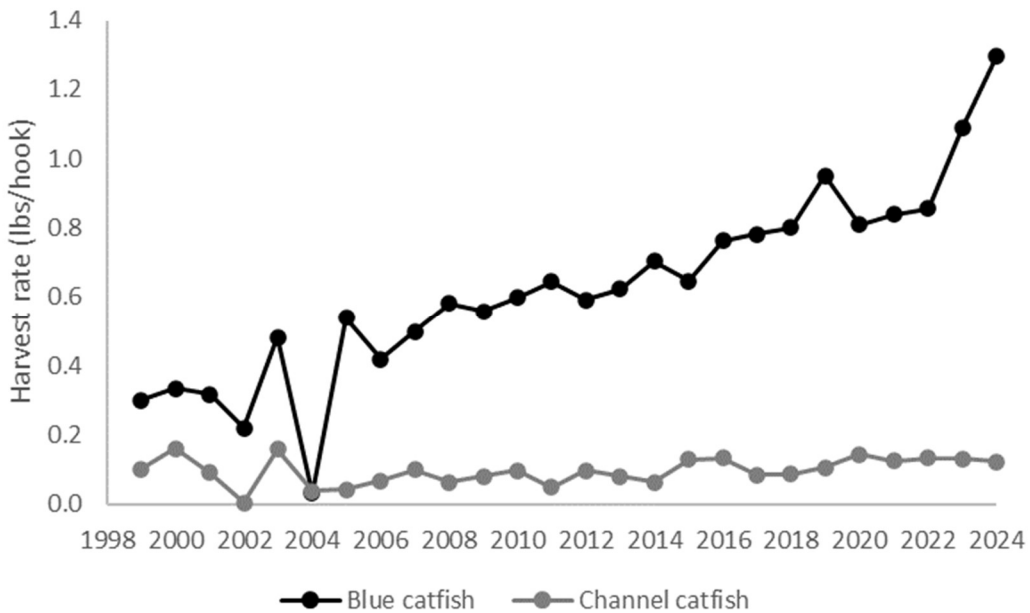


Figure 3. Harvest rate (lbs/hook) of blue catfish and channel catfish harvested with trotlines by commercial fishermen from the Ohio River from 2004 – 2024.

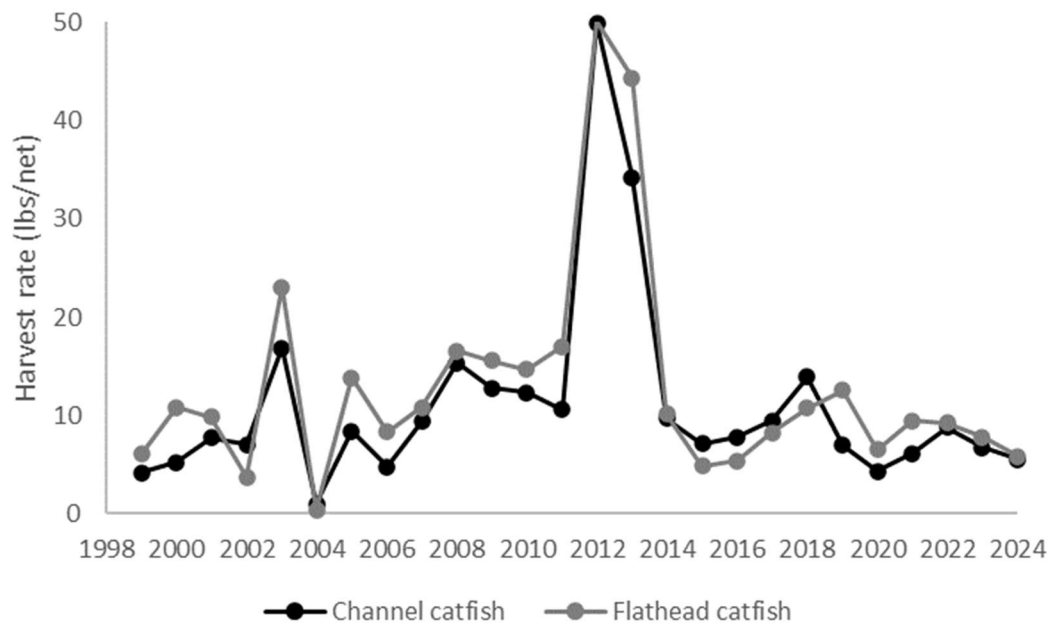


Figure 4. Harvest rate (lbs/net) of channel catfish and flathead catfish harvested with hoop nets by commercial fishermen from the Ohio River from 2004 – 2024.

Project III: Warm Water Stream Sport Fish Surveys

FINDINGS

Warm water stream sport fish surveys were completed on various streams during 2024. Species collected during general sport fish surveys include largemouth bass, smallmouth bass, spotted bass, rock bass, bluegill, redear sunfish, rainbow trout, brown trout, muskellunge, walleye, sauger, channel catfish, flathead catfish and blue catfish. Sampling seasons and sites for each stream are kept consistent in an effort to standardize the data for comparative purposes. River and stream sampling sites and conditions are summarized in Table 1 and Figure 1.

Station Camp Creek

A general sport fish survey was conducted on Station Camp Creek during April 2024 at two sites using boat-mounted electrofishing for a total effort of 1.5 hrs. Rock bass (14.7 fish/hr) were the most abundant sport fish collected followed by smallmouth bass (8.0 fish/hr), channel catfish (3.3 fish/hr) and flathead catfish (0.7 fish/hr; Table 2). Rock bass ranged in size from the 2.0 to 6.0 in classes. The rock bass in Station Camp Creek received an assessment score of 8, representing a “fair” rating (Table 3).

Smallmouth bass were the second most abundant species collected at a rate of 8.0 fish/hr. Smallmouth bass ranged in size from the 3.0 - 11.0 in size classes (Table 2). The smallmouth bass in Station Camp Creek received an assessment score of 9, representing a “fair” rating (Table 4).

Although at lower densities, channel catfish were sampled in Station Camp Creek ranging from the 17.0-20.0 in size classes (Table 2). CPUE for channel catfish was (3.3 fish/hr) even though at lower densities there were quality sized channel catfish collected.

An additional sport fish species collected in Station Camp Creek was flathead catfish (0.7 fish/hr; Table 2). This was the first sample we have had on Station Camp Creek to collect baseline data on sportfish, numbers overall and species composition was lower than expected which could have been contributed to higher water flow and fluctuating water temperatures during the sample.

North Fork Kentucky River

A general sport fish survey was conducted on North Fork Kentucky River during April 2024 at four sites using boat-mounted electrofishing gear for a total effort of 4.5 hrs. A total of eleven species of sport fish were collected with the most abundant species being channel catfish (43.6 fish/hr) followed by smallmouth bass (9.1 fish/hr) and spotted bass (7.4 fish/hr) (Table 5). Although no trophy size (≥ 28.0 in) channel catfish were present in the North Fork Kentucky River sample, there were exceptionally good numbers of channel catfish ranging from the 6.0 – 24.0 in size class with 73% being ≥ 14.0 in (Table 5).

Smallmouth bass were the second most abundant species collected at a rate of (9.1 fish/hr) (Table 5). Smallmouth bass collected ranged from the 3.0 – 17.0 in class and CPUE was the second highest recorded in the four years it has been sampled (Table 6) but below the historical average (11.8 fish/hr; Table 6). The smallmouth bass in North Fork Kentucky River received an assessment score of 8, representing a “fair” rating (Table 7).

Spotted bass were the third most abundant species collected at a rate of (7.4 fish/hr; Table 5). CPUE of spotted bass was higher than the 2020 sample but below the historical average of 13.9 fish/hr (Table 8). Spotted bass size ranged from the 4.0 – 11.0 in class with 63% being ≥ 8.0 in size class (Table 5).

Walleye were collected at a rate of (6.1 fish/hr) and ranged in size from the 14.0 – 19.0 in class. There is a protective slot limit on North Fork Kentucky River for walleye which ranges from 18.0 – 26.0 in class and only one fish collected in the sample would have been in the protective slot limit.

Rock bass were collected at a rate (4.4 fish/hr) and ranged in size from the 2.0 – 8.0 in size class (Table 5). CPUE was higher than the 2020 sample and above the historical average (3.3 fish/hr; Table 9). The rock bass in North Fork Kentucky River received an assessment score of 4, representing a “poor” rating (Table 10).

Additional sport fish species were collected in North Fork Kentucky River but were found in consistently lower densities than the species mentioned above. Walleye (6.1 fish/hr), bluegill (0.8 fish/hr), flathead catfish (0.6 fish/hr), muskellunge (0.6 fish/hr), redear sunfish (0.4 fish/hr), largemouth bass (0.2 fish/hr), followed by sauger at (0.2 fish/hr) (Table 5).

South Fork Kentucky River

A general sport fish survey was conducted on South Fork Kentucky River during April 2024 at six sites using boat-mounted electrofishing for a total effort of 7.5 hrs (15-minute transects). Channel catfish (12.8 fish/hr) were the most abundant sport fish collected followed by smallmouth bass (12.7 fish/hr) and rock bass (5.9 fish/hr; Table 11). Although no trophy size (≥ 28.0 in) channel catfish were present in the South Fork Kentucky River sample, there were exceptionally good numbers of channel catfish ranging from the 11.0 – 22.0 in size class with 70% being ≥ 14.0 in (Table 11).

Smallmouth bass were the second most abundant species collected at a rate of (12.7 fish/hr; Table 11). Smallmouth bass collected ranged from the 4.0 – 17.0 in class. CPUE was the lowest recorded in the three years it has been sampled (Table 11) and below the historical average (30.2 fish/hr; Table 12). The smallmouth bass in South Fork Kentucky River received an assessment score of 8, representing a “fair” rating (Table 13).

Rock bass were collected from the 3.0-8.0 in size classes, with 68% of the sample consisting of quality size (≥ 6.0) fish and 5 % of the sample ≥ 8.0 in (preferred size; Table 11). The rock bass fishery in South Fork Kentucky River received an assessment score of 4, representing a “poor” rating (Table 14). CPUE of rock bass (5.9 fish/hr; Table 11) were lower than the previous sample in 2020 and below the historical average (9.7 fish/hr; Table 14).

Additional sport fish species were present in South Fork Kentucky River but found in lower densities. Spotted bass ranged from the 5.0-11.0 in size classes and received a population assessment score of 6, representing a “poor” rating (Table 16). CPUE of spotted bass was lower than the 2020 sample and the historical average (4.3 fish/hr; Table 17). CPUE for walleye was (2.1 fish/hr) and were sampled up to the 21.0 in size class. Native strain walleye has been stocked at three locations on South Fork Kentucky River since 2015. Muskellunge (0.9 fish/hr.), flathead catfish (0.4 fish/hr.) followed by bluegill (0.4 fish/hr; Table 11).

Paint Lick Creek

In September 2024, a general sport fish survey was conducted on Paint Lick Creek at three sites using an electrofishing tote barge for a total effort of 1.0 hrs. (7.5 min transects). Convenient access and water depth are the two main factors taken into consideration when looking for sampling sites usable for the tote barge. The tote barge is relatively heavy for movement purposes which is the reason for convenient access sites. Depth can dictate what’s wadeable in a stream which in turn limits the amount of transects that are obtainable in any give section of stream.

A total of three species were collected from Paint Lick Creek with rock bass being the most abundant species collected at 32.0 fish/hr (Table 18). Rock bass ranged in size from the 3.0 – 8.0 in class with 47% being ≥ 6.0 in class. Rocky habitat was scattered throughout Paint Lick Creek which is a preferred

habitat for rock bass. Relative weight values for rock bass were good (95) for the 4.0-5.9 in and good (89) for the 6.0 – 7.9 in length group (Table 19). The overall condition (91) for this population was good (Table 19).

Smallmouth bass were the second most abundant species collected 10.0 fish/hr and ranged in size from the 4.0 – 10 in class (Table 18). Although in low numbers, relative weight values for smallmouth bass were fair (84) 7.0 – 10.9 in size class (Table 19). Additionally, largemouth bass were collected at 1.0 fish/hr (Table 18).

Green River

The removal of Lock and Dam 6 on the Green River was initiated in late March/ early April 2017 due to a breach that formed in the dam in late November 2016 causing the structure to become a major safety hazard. As a result, Lock and Dam 6 was completely removed in the several months following initiation of the project. Removal of Lock and Dam 5 was initiated in summer 2021 and the majority of the dam was removed during the summer of 2024. Annual fall sampling to collect general sport fish will continue in Pool 5 for up to five years post dam removal.

Pool 5

A general sport fish survey using boat-mounted electrofishing was conducted on Old Pool 5 of the Green River. Eleven different species were collected during 3.0 hrs (15-minute transects) of electrofishing. Old Pool 5 of Green River has drastically changed with water levels dropping exposing more gravel shoals, chunk rock banks, woody laydowns and creating harder substrates, which may enhance habitat complexity and influence fish distribution. Spotted bass were the most abundant species collected (47.3 fish/hr) and ranged from the 1.0 - 12.0 in size classes (Table 20). CPUE was the highest catch rates recorded since sampling began in 2012 and significantly higher than historical average of 15.0 fish/hr (Table 21). The high catch rates could be contributed to the majority of Lock and Dam 5 being removed and a lot of the habitats reverting back to its natural state which would be more favorable to black bass and rock bass. Relative weight values were good for the 7.0-10.9 in (96) and 11.0-13.9 in (94) size groups. Overall condition of these fish was good (Wr= 95; Table 22).

Smallmouth bass were collected at a rate of 8.0 fish/hr ranging from the 5.0 – 16.0 in size classes (Table 20). Sampling for smallmouth bass in Pool 5 of the Green River has never been highly productive but the 2024 sample was the highest CPUE recorded since sampling began in 2012 and above the historical average of 2.6 fish/hr (Table 23). With the majority of Lock and Dam 5 being removed the river is starting to revert back to a free-flowing stream which is preferred by smallmouth bass. Even though there was a small sample size, relative weights for smallmouth bass were good with an overall condition (Wr=79; Table 22)

Largemouth bass were collected at a rate of 1.3 fish/hr ranging from the 12.0-14.0 in size classes (Table 20). CPUE of largemouth bass continues to be low and was below the historical average 4.3 fish/hr (Table 24). Even though there was a small sample size relative weights for largemouth bass were good for the 12.0 – 14.9 (85) size group (Table 22).

Rock bass were collected from the 3.0-8.0 in size classes, with 66% of the sample consisting of quality size (≥ 6.0) fish (Table 20). CPUE was the highest recorded at 6.0 fish/hr (Table 19) and drastically higher than the historical average (1.6 fish/hr; Table 25).

Flathead catfish were collected at a rate of (15.0 fish/hr) and the size ranged from 6.0 – 39.0 in class. The size for a trophy flathead catfish is 35.0 in class and one flathead collected in the sample was considered a trophy.

Additional sport fish species were collected in Pool 5 of the Green River but found in consistently lower densities. Bluegill (4.0 fish/hr), channel catfish (4.7 fish/hr), blue catfish (0.3 fish/hr), Muskellunge (0.3

fish/hr), redear sunfish (0.3 fish/hr) and sauger (0.3 fish/hr Table 20). Channel catfish were collected up to the 28 in. class which are considered trophy catfish.

Lower Dix River

A general sport fish survey was conducted at two sites on the lower Dix River using boat-mounted electrofishing during October 2024 for a total of 1.75 hrs. Rainbow trout (12.0 fish/hr) were the most abundant sport fish collected (Table 25). Rainbow trout were collected at a rate of 12.0 fish/hr with fish ranging in size from the 9.0-16.0 in size classes (Table 26). With the clear and cooler water temperatures the lower Dix River has the potential to hold trout year around. Some of the rainbow trout collected were from the 2024 trout stocking but the river has the potential to have hold over rainbow trout from previous stocking years.

Additional fish populations present in low densities were rock bass (2.3 fish/hr), bluegill (2.7 fish/hr), largemouth bass (1.7 fish/hr) and brown trout (0.6 fish/hr; Table 26).

Table 1. Summary of 2024 boat (B) and tote-barge (TB) electrofishing sampling sites by waterbody, river mile, date, and conditions.

Waterbody	Sampling method	River mile	Species	Date	Water temp.	Water level (USGS gauge station)	Secchi (inches)	Comments
Station Camp Creek - Irvine Ramp	B	1.8 - 2.7	Sport fish	4/1/2024	59.1	No Gauge		
Station Camp Creek - Wagersville Road	B	20.2 - 21.5	Sport fish	4/4/2024	51.7	No Gauge	30	
North Fork Ky River - Campbell Bend	B	85.4 - 86.6	Sport fish	4/8/2024	57.9	4.59 ft, 349 cfs @ Hazard, KY	44	low level
North Fork Ky River - Perry County Park	B	97.3 - 99.7	Sport fish	4/8/2024	58.9	4.59 ft, 349 cfs @ Hazard, KY	44	low level
North Fork Ky River - Douthitt Park	B	44.1 - 45.4	Sport fish	4/8/2024	62.1	2.45 ft, 751 cfs @ Jackson, KY	44	good level
North Fork Ky River - Roy Spencer Ramp	B	33.8 - 36.6	Sport fish	4/23/2024	59.2	2.47 ft, 765 @ Jackson, KY	40	good level
South Fork Ky River - Oneida Ramp	B	42.2 - 44.8	Sport fish	4/18/2024	63.5	5.84 ft, 843 cfs @ Booneville, KY	64	good level
South Fork Ky River - Cedar Valley Ford	B	34.4 - 35.4	Sport fish	4/22/2024	58.9	5.28 ft, 550 cfs @ Booneville, KY	80	low level
South Fork Ky River - Bishop Bend	B	29.7 - 32.6	Sport fish	4/23/2024	60.8	5.08ft, 464 cfs @ Booneville, KY	56	low level
South Fork Ky River - Hacker Branch	B	26.4 - 28.8	Sport fish	4/25/2024	61.9	4.88 ft, 383 cfs @ Booneville, KY	80	low level
South Fork Ky River - Wolf Creek Ramp	B	23.4 - 23.9	Sport fish	4/18/2024	65.9	5.84 ft, 843 cfs @ Booneville, KY		good level
South Fork Ky River - Fish Creek Ramp	B	9.9 - 11.9	Sport fish	4/22/2024	60.9	5.25ft, 536 cfs @ Booneville, KY	52	low level
Paint Lick Creek - Broadus Spur Ford	TB	20.2 - 20.3	Sport fish	9/19/2024		No Gauge		
Paint Lick Creek - Dry Branch Road	TB	7.6	Sport fish	9/19/2024		No Gauge		
Paint Lick Creek - Hustickle Branch Road	TB	3.7 - 3.8	Sport fish	9/19/2024		No Gauge		
Green River Pool 5 - Brownsville	B	168.9 - 182.2	Sport fish	9/23/2024	74.9	8.55 ft, 285 cfs @ Mammoth Cave	20	good level
Lower Dix River - High Bridge Ramp	B	0.9 - 2.3	Sport fish	10/9/2024	60.5	4.80 ft, 122 cfs @ Burgin, KY	96	good level
Lower Dix River - Tailwater Ramp	B	2.6 - 3.0	Sport fish	10/10/2024	57.4	4.80 ft, 122 cfs @ Burgin, KY	96	good level

Table 2. Length-frequency and CPUE (fish/hr) of sport fish collected during 1.5 hrs of electrofishing (15-minute transects) at two sites on Station Camp Creek during April 2024; standard errors are in parentheses.

Species	Inch class													Total	CPUE
	2	3	4	5	6	7	8	9	11		17	19	20		
Channel catfish											2	2	1	5	3.3 (2.2)
Flathead catfish						1								1	0.7 (0.7)
Rock bass	1	1	4	8	8									22	14.7 (5.2)
Smallmouth bass		1	1	2	1	1	1	3	2					12	8.0 (4.4)

Table 3. Population assessment of rock bass collected from Station Camp Creek in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	1.3	3
Intermediate density (CPUE 4.0-5.9 in)	8.0	3
Quality density (CPUE ≥6.0 in)	5.3	2
Preferred density (CPUE ≥8.0 in)	0.0	0
Total score		8
Assessment rating		Fair

Table 4. Population assessment of smallmouth bass collected from Station Camp Creek in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	0.7	1
Intermediate density (CPUE 4.0-8.9 in)	4.0	2
Adult density (CPUE ≥9.0 in)	3.3	4
Quality density (CPUE ≥12.0 in)	6.7	2
Preferred density (CPUE ≥14.0 in)	0.0	0
Total score		9
Assessment rating		Fair

Table 5. Length-frequency and CPUE (fish/hr) of sport fish collected during 4.5 hrs of electrofishing (15-minute transects) at four sites on North Fork Kentucky River during April 2024; standard errors are in parentheses.

Species	Inch class																												Total	CPUE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		30		46			
Channel catfish					2	1	2	2	3	8	18	20	22	27	31	27	17	12	7	4	1	1	2					207	43.6 (15.8)	
Flathead catfish											1		1									1						3	0.6 (0.3)	
Muskellunge													1												1		1	3	0.6 (0.3)	
Rock bass	1	1	1	3	8	6	1																					21	4.4 (1.0)	
Bluegill					1	3																						4	0.8 (0.4)	
Redear sunfish						1		1																				2	0.4 (0.4)	
Smallmouth bass		4	2	2	2	6	4	5	5	9	2	1				1												43	9.1 (1.5)	
Spotted bass			1		4	8	6	11	4	1																		35	7.4 (1.6)	
Largemouth bass						1																						1	0.2 (0.2)	
Sauger																		1										1	0.2 (0.2)	
Walleye													4	7	4	6	5	3										29	6.1 (1.6)	

Table 6. Smallmouth bass electrofishing CPUE (fish/hr) from each length group collected during sampling on North Fork Kentucky River in 2015, 2018, 2020 and 2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)					Total
	<4.0	4.0-8.9	9.0-11.9	12.0-13.9	≥14.0	
2015	3.0	7.8	5.0	1.7	1.7	19.2 (2.4)
2018	0.0	2.1	2.2	0.6	0.6	5.6 (1.2)
2020	0.0	1.5	2.6	0.5	1.2	5.9 (1.8)
2024	0.8	3.4	4.0	0.6	0.2	9.1 (1.5)
Mean	1.4	4.5	3.7	1	1.1	11.8 (1.3)

Table 7. Population assessment of smallmouth bass collected from North Fork Kentucky River in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	0.8	2
Intermediate density (CPUE 4.0-8.9 in)	3.4	2
Adult density (CPUE ≥9.0 in)	4.8	2
Quality density (CPUE ≥12.0 in)	0.8	1
Preferred density (CPUE ≥14.0 in)	0.2	1
Total score		8
Assessment rating		Fair

Table 8. Spotted bass electrofishing CPUE (fish/hr) from each length group collected during sampling on North Fork Kentucky River in 2015, 2018, 2020 and 2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)					Total
	<4.0	4.0-7.9	8.0-10.9	11.0-12.9	≥13.0	
2015	4.6	6.9	9.6	3.4	0.8	25.3 (3.0)
2018	0.0	1.8	2.1	0.5	0.0	4.3 (0.8)
2020	0.2	1.9	3.7	0.5	0.0	6.2 (1.2)
2024	0.0	2.7	4.4	0.2	0.0	7.4 (1.6)
Mean	1.9	4.1	5.9	1.6	0.3	13.9 (1.6)

Table 9. Rock bass electrofishing CPUE (fish/hr) from each length group collected during sampling on North Fork Kentucky River in 2015, 2018, 2020 and 2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)				Total
	<4.0	4.0-5.9	6.0-7.9	≥8.0	
2015	0.5	0.7	2.7	1.6	5.6 (0.9)
2018	0.0	0.0	0.5	0.5	1.0 (0.6)
2020	0.0	0.0	0.2	0.2	0.3 (0.2)
2024	0.4	0.8	3.0	0.2	4.4 (1.0)
Mean	0.3	0.4	1.7	0.8	3.3 (0.5)

Table 10. Population assessment of rock bass collected from North Fork Kentucky River in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	0.4	1
Intermediate density (CPUE 4.0-5.9 in)	0.8	1
Quality density (CPUE ≥6.0 in)	3.0	1
Preferred density (CPUE ≥8.0 in)	0.2	1
Total score		4
Assessment rating		Poor

Table 11. Length-frequency and CPUE (fish/hr) of selected sport fish collected during 7.5 hrs of electrofishing (15-minute transects) at six sites on South Fork Kentucky River during April 2024; standard errors are in parentheses.

Species	Inch Class																											Total	CPUE
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		27		30		39			
Channel catfish										2	4	3	6	13	14	15	20	9	8	1	1						96	12.8 (2.6)	
Flathead catfish											1			1	1												3	0.4 (0.2)	
Muskellunge											1		2	1									1		1		1	7	0.9 (0.3)
Rock bass	2	4		8	18	10	2																				44	5.9 (1.3)	
Bluegill				1		2																					3	0.4 (0.2)	
Smallmouth bass		3	3	6	4	8	19	17	17	9	4	1	2		2												95	12.7 (2.0)	
Spotted bass			1	1		2		2	2																		8	1.1 (0.3)	
Walleye												3	3	3	1	1		3	2								16	2.1 (0.7)	

Table 12. Smallmouth bass electrofishing CPUE (fish/hr) from each length group collected during spring sampling on South Fork Kentucky River from 2016, 2020 and 2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)					Total
	<4.0	4.0-8.9	9.0-11.9	12.0-13.9	≥14.0	
2016	2.5	19.4	13.4	4.4	2.7	42.3 (5.2)
2020	1.3	16.9	9.7	2.9	3.8	34.6 (4.3)
2024	0.0	3.2	7.1	1.7	0.7	12.7 (2.0)
Mean	1.3	13.4	10.1	3.0	2.4	30.2 (2.7)

Table 13. Population assessment of smallmouth bass collected from South Fork Kentucky River in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	0.0	0
Intermediate density (CPUE 4.0-8.9 in)	3.2	2
Adult density (CPUE ≥9.0 in)	9.5	3
Quality density (CPUE ≥12.0 in)	2.4	2
Preferred density (CPUE ≥14.0 in)	0.7	1
Total score		8
Assessment rating		Fair

Table 14. Population assessment of rock bass collected from South Fork Kentucky River in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	0.3	1
Intermediate density (CPUE 4.0-5.9 in)	1.6	1
Quality density (CPUE ≥6.0 in)	4.0	1
Preferred density (CPUE ≥8.0 in)	0.3	1
Total score		4
Assessment rating		Poor

Table 15. Rock bass electrofishing CPUE (fish/hr) from each length group collected during spring sampling on South Fork Kentucky River from 2016, 2020 and 2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)				Total
	<4.0	4.0-5.9	6.0-7.9	≥8.0	
2016	0.1	0.7	6.6	3.5	10.8 (1.8)
2020	0.4	2.2	8.1	1.4	12.1 (2.3)
2024	0.3	1.6	3.7	0.3	5.9 (1.3)
Mean	0.3	1.5	6.2	1.7	9.7 (1.1)

Table 16. Population assessment of spotted bass collected from South Fork Kentucky River in April 2024.

Parameter	Actual value	Assessment score
Recruitment (CPUE <4.0 in)	0.0	0
Intermediate density (CPUE 4.0-7.9 in)	0.3	1
Adult density (CPUE ≥8.0 in)	0.8	1
Quality density (CPUE ≥11.0 in)	0.3	1
Preferred density (CPUE ≥13.0 in)	0.0	0
Total score		3
Assessment rating		Poor

Table 17. Spotted bass electrofishing CPUE (fish/hr) from each length group collected during spring sampling on South Fork Kentucky River from 2016 and 2020. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)					Total
	<4.0	4.0-7.9	8.0-10.9	11.0-12.9	≥13.0	
2016	1.2	3.1	2.5	0.5	0.0	7.2 (1.8)
2020	0.2	2.7	1.4	0.1	0.0	4.5 (1.0)
2024	0.0	0.3	0.5	0.3	0.0	1.1 (0.3)
Mean	0.5	2.1	1.5	0.3	0.0	4.3 (0.7)

Table 18. Length-frequency and CPUE (fish/hr) of selected sport fish collected during 1.00 hrs of electrofishing (7.5 min transects) at three sites on Paint Lick Creek during September 2024; standard errors are in parentheses.

Species	Inch class								Total	CPUE
	3	4	5	6	7	8	9	10		
Rock bass	1	6	10	8	6	1			32	32.0 (9.7)
Smallmouth bass		2	1	1	2	1	1	2	10	10.0 (4.5)
Largemouth bass		1							1	1.0 (1.0)

Table 19. Number of fish and the relative weight (Wr) for each length group of smallmouth bass and rock bass collected in Paint Lick Creek during September 2024.

Species	Length group (in)						Total	
	7.0-10.9		11.0-13.9		≥14.0			
	No.	Wr	No.	Wr	No.	Wr	No.	Wr
Smallmouth bass	6	84	0	0	0	0	6	84

Rock bass	4.0-5.9		6.0-7.9		≥8.0		Total	
	No.	Wr	No.	Wr	No.	Wr		
	16	95	14	89	1	89	31	91

Table 20. Length-frequency and CPUE (fish/hr) of selected sport fish collected during 3.0 hrs of electrofishing (15-minute transects) on former Pool 5 of the Green River during September 2024; standard errors are in parentheses.

September 2024; standard errors are in parentheses.																																						
Species	Inch class																																	Total	CPUE			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	20	22	23	25	26	27	28	...	34	...	39									
Blue catfish																						1									1	0.3 (0.3)						
Channel catfish																	2	1	3	1	1	2	2	1	1						14	4.7 (1.7)						
Flathead catfish						1	1	4	4	8	7	6	5	2	1	1			1		1		1					1		1	45	15.0 (3.9)						
Muskellunge																					1										1	0.3 (0.3)						
Rock bass			2	1	3	5	6	1																							18	6.0 (1.5)						
Bluegill		1	6	1	3		1																								12	4.0 (1.8)						
Redear sunfish							1																								1	0.3 (0.3)						
Smallmouth bass					4	2		5	4		5		1	1	2																24	8.0 (2.3)						
Spotted bass	1	5	3	15	15	17	30	24	13	15	3	1																			142	47.3 (6.9)						
Largemouth bass												1	2	1																	4	1.3 (0.8)						
Sauger																			1												1	0.3 (0.3)						

Table 21. Spotted bass electrofishing CPUE (fish/hr) from each length group collected during sampling on former Pool 5 of the Green River from 2012-2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)					Total
	<4.0	4.0-7.9	8.0-10.9	11.0-12.9	≥13.0	
2012	2.3	7.3	11.7	2.0	0.0	23.3 (3.3)
2013	0.3	3.3	9.0	0.7	0.3	13.7 (3.1)
2014	2.7	2.7	7.7	1.0	0.3	14.3 (3.6)
2015	0.3	1.0	6.0	3.0	0.0	10.3 (3.1)
2016	0.2	0.8	0.9	0.4	0.0	2.3 (0.5)
2017	1.3	4.3	2.7	0.3	0.0	8.7 (2.4)
2018	0.3	1.3	2.0	1.0	0.0	4.7 (1.8)
2019	0.0	7.7	5.0	0.7	0.3	13.7 (3.7)
2020	0.3	1.7	2.7	0.3	0.7	5.7 (1.7)
2021	0.3	5.3	4.0	2.3	0.3	12.3 (3.3)
2022	0.7	4.5	2.7	0.3	0.0	8.3 (2.7)
2023	1.0	13.3	8.0	1.0	0.0	23.3 (4.2)
2024**	3.0	25.7	17.3	1.3	0.0	47.3 (6.9)
Mean	1.0	6.3	6.3	1.2	0.2	15.0 (1.3)

** Indicates the years sampled post dam removal

Table 22. Number of fish and the relative weight (Wr) for each length group of black bass collected in former Pool 5 of the Green River during September 2024.

Species	Length group (in)						Total	
	8.0-11.9		12.0-14.9		≥15.0			
	No.	Wr	No.	Wr	No.	Wr	No.	Wr
Largemouth bass	0	0	4	85	0	0	4	85
Smallmouth bass	7.0-10.9		11.0-13.9		≥14.0		Total	
	No.	Wr	No.	Wr	No.	Wr	No.	Wr
	9	85	6	81	3	72	18	79
Spotted bass	7.0-10.9		11.0-13.9		≥14.0		Total	
	No.	Wr	No.	Wr	No.	Wr	No.	Wr
	82	96	4	94	0	0	86	95

Table 23. Smallmouth bass electrofishing CPUE (fish/hr) from each length group collected during sampling on former Pool 5 of the Green River from 2012-2024. Number of sites and effort have varied across years; standard errors are in

Year	Length group (in)					Total
	<4.0	4.0-8.9	9.0-11.9	12.0-13.9	≥14.0	
2012	1	1.3	0.3	0.0	0.0	2.7 (0.9)
2013	0.3	1.3	0.3	0.0	0.0	2.0 (0.9)
2014	0.0	0.7	0.3	0.0	0.0	1.0 (0.7)
2015	1.0	0.7	0.3	0.0	0.0	2.0 (1.4)
2016	0.0	0.5	0.1	0.2	0.0	0.8 (0.4)
2017	0.0	0.7	0.3	0.0	0.0	1.0 (0.7)
2018	0.3	0.7	0.3	0.0	0.0	1.3 (1.0)
2019	4.0	0.0	0.0	0.0	0.0	4.0 (1.2)
2020	0.0	1.0	0.0	0.3	0.0	1.3 (0.9)
2021	0.0	0.7	0.0	0.0	0.3	1.0 (0.7)
2022	0.3	0.0	1.0	0.3	0.0	1.7 (1.0)
2023	0.7	1.7	1.0	0.3	1.0	4.7 (2.3)
2024**	0.0	3.7	3.0	0.3	1.0	8.0 (2.3)
Mean	0.6	1.1	0.6	0.2	0.2	2.6 (0.4)

** Indicates the years sampled post dam removal

Table 24. Largemouth bass electrofishing CPUE (fish/hr) from each length group collected during sampling on former Pool 5 of the Green River from 2012-2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)				Total
	<8.0	8.0-11.9	12.0-14.9	≥15.0	
2012	1.7	4.3	2	0.3	8.3 (2.1)
2013	2	4.7	3.3	0.7	10.7 (3.9)
2014	0.3	3.3	0.0	0.7	4.3 (1.3)
2015	0.7	3.7	4.0	1.3	9.7 (4.5)
2016	0.2	0.6	0.4	0.1	1.6 (0.5)
2017	1.7	0.7	1.0	0.7	4.0 (1.2)
2018	0.0	0.0	0.0	0.0	0.0
2019	3.7	0.3	0.0	0.7	4.7 (1.1)
2020	1.7	1.0	1.0	0.3	4.0 (2.0)
2021	0.3	0.0	0.3	0.7	1.3 (0.6)
2022	0.3	0.0	0.7	0.0	1.0 (0.7)
2023	0.3	0.0	0.0	0.7	1.0 (0.5)
2024**	0.0	0.0	1.3	0.0	1.3 (0.8)
Mean	1.0	1.6	1.2	0.5	4.3 (0.6)

** Indicates the years sampled post dam removal

Table 25. Rock bass electrofishing CPUE (fish/hr) from each length group collected during sampling on former Pool 5 of the Green River from 2012-2024. Number of sites and effort have varied across years; standard errors are in parentheses.

Year	Length group (in)				Total
	<4.0	4.0-5.9	6.0-7.9	≥8.0	
2012	0.0	0.0	1.3	0.7	2.0 (1.1)
2013	0.0	0.7	0.3	0.3	1.3 (0.9)
2014	0.7	0.0	1.3	0.3	2.3 (1.3)
2015	0.0	0.0	0.3	0.0	0.3 (0.3)
2016	0.0	0.0	0.3	0.0	0.3 (0.2)
2017	0.0	0.0	0.3	0.3	0.7 (0.7)
2018	0.0	0.0	0.0	0.0	0.0 (0.0)
2019	0.7	0.3	1.7	0.7	3.3 (3.3)
2020	0.0	0.0	0.7	0.0	0.7 (0.5)
2021	0.3	0.0	0.7	0.3	1.3 (0.9)
2022	0.0	0.3	0.0	0.0	0.3 (0.3)
2023	0.0	0.3	0.7	0.0	1.0 (0.7)
2024	0.7	1.3	3.7	0.3	6.0 (1.5)
Mean	0.2	0.2	0.9	0.2	1.6 (0.4)

** Indicates the years sampled post dam removal

Table 26. Length-frequency and CPUE (fish/hr) of selected sport fish collected during 1.75 hrs of electrofishing (15-minute transects) at two sites on lower Dix River during October 2024; standard errors are in parentheses.

Species	Inch class															Total	CPUE
	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
Rainbow trout							1	3	5	2	4	2	3	1		21	12.0 (5.2)
Brown trout							1									1	0.6 (0.6)
Rock bass	1		3													4	2.3 (1.7)
Bluegill	5															5	2.7 (1.7)
Largemouth	2				1											3	1.7 (1.2)

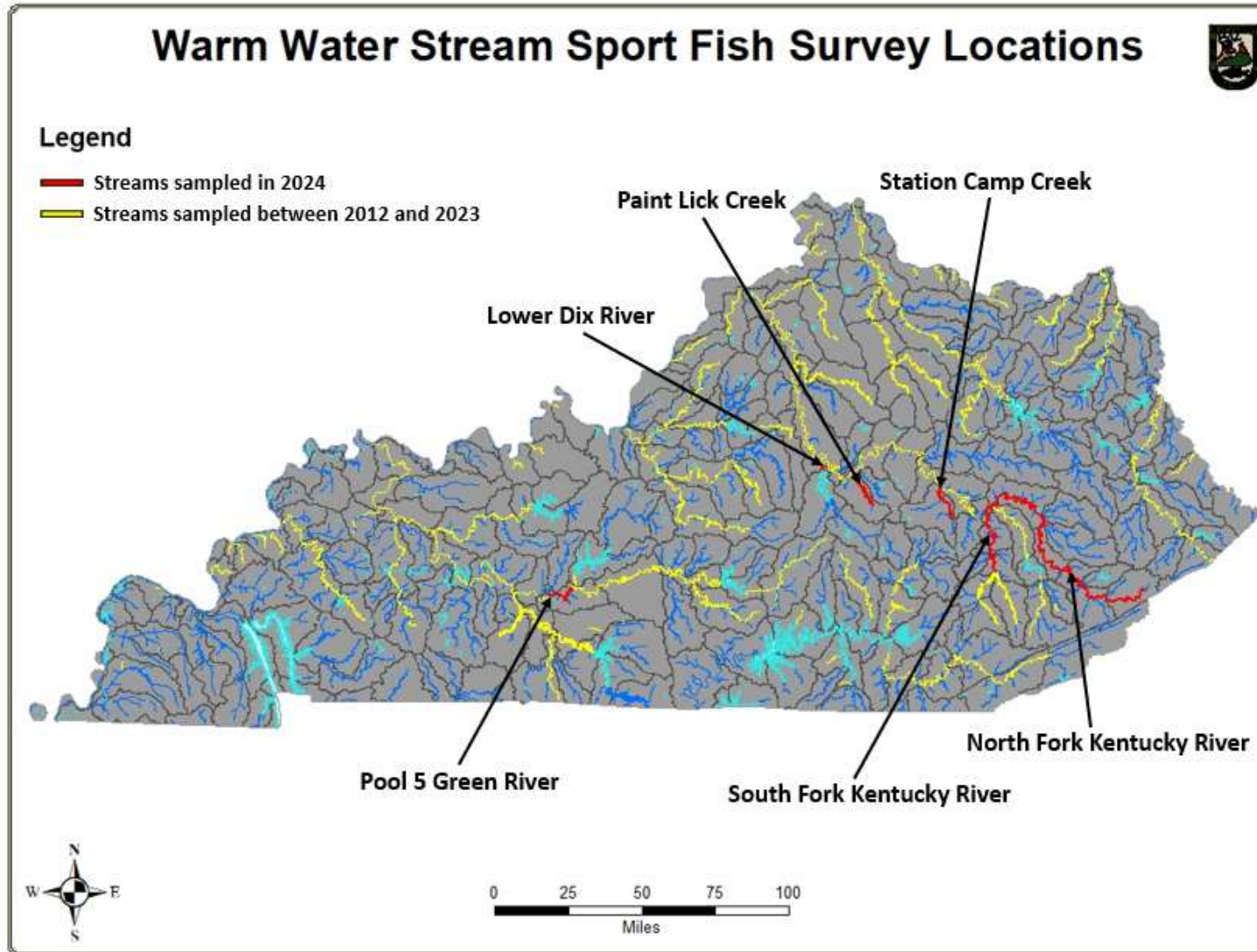


Figure 1. Map depicting warm water stream sport fish survey locations conducted by the Streams Investigation Branch and assisting crews for the current year (red outline/labeled) and previously sampled years from 2012 through 2023 (yellow outline).

Project V: Post-stocking Movement of Muskellunge in the Kentucky River

FINDINGS

Previous stockings of muskellunge throughout Kentucky have resulted in some of the state's premier fisheries such as Cave Run Lake and Green River Lake. On the Kentucky River, muskellunge stockings have historically been infrequent and at low numbers (typically ≤ 15 fish/mile)—only occurring when hatcheries have excess production.

From 2014 - 2017, increased stockings of 9.0 in and 13.0 in muskellunge were assessed in Pools 2 and 3 of the Kentucky River. CPUE of muskellunge were consistently low, and very few fished stocked during that study were present in spring and fall samples. Throughout that study, multiple cases of downriver movement were documented where fish traveled over 100 miles from their stocking site. Movement of stocked fish can play a critical role in stocking success making this evaluation of post-stocking dispersal critical in determining future stocking strategies for lotic waters in Kentucky. This project aims to determine dispersal of stocked muskellunge with an emphasis on age-1 and age-2 fish. Results can then be used to help develop muskellunge stocking recommendations for the Kentucky River and similar waterbodies in Kentucky.

No muskellunge fingerlings were stocked into the study site in 2020 due to COVID-19 workplace restrictions that prevented hatchery culture. Historic flooding occurred in the upper Kentucky River drainage two days following stocking and likely decreased survival in 2022. Fish were stocked at normal rates in 2023; however, poor hatchery survival did not allow for stocking in 2024. Since the project began in 2019, 3,840 total fish have been stocked into the study area.

Standardized spring sampling was abandoned for the project in 2021 since many of the ramps become unuseable due to high water depositing mud and silt on most ramps. Standardized fall sampling was conducted in October 2024 with additional effort being made throughout the year (Table 1). Twenty-five 15-minute electrofishing transects were completed for a total of 6.25 hours of effort in pools 8 – 13 (Table 2). Four muskellunge were captured at a rate of 0.6 fish/hr (Table 2). No clipped fish were observed in the sample and all fish observed were >30 in (Table 3).

Additional effort (February – October) was made to collect stocked and PIT tagged fish (Table 4). A total of 23.0 hr of effort was expended (8.0 hr within the study pools and 15.0 hr below the study pools). Twenty-two fish were collected and implanted with PIT tags. No clipped fish were captured during this effort; however, two PIT tagged fish were recaptured. Both fish exhibited downstream movement of over 23 miles between captures. Thus far, only two clipped fish have been collected and have traveled an average of 51.6 miles downstream (Table 5). No upstream movement of fish has been observed thus far.

Table 1. Summary of 2024 muskellunge electrofishing sampling sites on the Kentucky River by pool, river mileage, date, and river conditions.

Pool	Location	River mile	Date	Water temp.	Water level (USGS gauge station)	Comments
4	Benson Creek	65.8	2/13/2024	49.1	17.93' @ Lock and Dam 5	Additional pedal time
13	Sturgeon Creek	248.1 - 249.0	3/19/2024	52.7	10.97' @ Lock and Dam 14	Additional pedal time
12	Lock and Dam 13 Dam Tailwater	239.0 - 237.1	3/19/2024	53.9	12.28' @ Lock and Dam 13	Additional pedal time
11	Irvine	218.2 - 220.9	3/20/2024	53.2	10.47' A Lock and Dam 12	Additional pedal time
10	College Hill	198.5 - 201.0	3/20/2024	53.2	13.04' @ Lock and Dam 11	Additional pedal time
9	Fort Boonesboro State Park	175.5 - 176.4	3/21/2024	51.7	11.84' @ Lock and Dam 10	Additional pedal time
8	John Nickell Boat Ramp	157.0 - 157.5	3/21/2024	52.1	13.03' @ Lock and Dam 9	Additional pedal time
11	Irvine	220.2 - 220.9	3/27/2024	52.6	10.93' @ Lock and Dam 12	Additional pedal time
10	College Hill	200.2 - 201.0	3/27/2024	53.8	13.27' @ Lock and Dam 11	Additional pedal time
1	Gratz	30.5 - 31.0	3/28/2024	51.2	10.26' @ Lock and Dam 2	Additional pedal time
11	Irvine	218.2 - 220.9	4/1/2024	59.2	10.02' @ Lock and Dam 12	Additional pedal time
5	Tyrone	95.5 - 96.2	5/1/2024	67.8	10.73' @ Lock and Dam 6	Additional pedal time
4	Clifton	80.0 - 82.2	5/7/2024	70.0	7.65' @ Lock and Dam 5	Additional pedal time
11	Irvine	220.2 - 220.9	6/4/2024	78.9	11.27' @ Lock and Dam 12	Additional pedal time
3	Frankfort Wastewater Plant	63.9 - 65.0	7/8/2024	82.5	7.02' @ Lock and Dam 4	Additional pedal time
4	Benson Creek	65.8	7/8/2024	82.1	9.22' @ Lock and Dam 5	Additional pedal time
1	Gratz	30.0 - 31.0	7/12/2024	83.3	8.49' @ Lock and Dam 2	Additional pedal time
4	Clifton	80.0 - 82.2	7/19/2024	83.0	9.01' @ Lock and Dam 5	Additional pedal time
2	Monterey	41.0 - 42.0	7/24/2024	82.3	8.02' @ Lock and Dam 3	Additional pedal time
2	Monterey	39.5 - 42.0	8/1/2024	82.0	8.83' @ Lock and Dam 3	Additional pedal time
4	Clifton	80.0 - 82.2	8/7/2024	82.6	10.28' @ Lock and Dam 5	Additional pedal time
2	Monterey	41.9 - 42.0	8/12/2024	81.7	7.58' @ Lock and Dam 3	Additional pedal time
1	Big Twin Creek	17.4 - 21.0	9/9/2024	77.7	8.37' @ Lock and Dam 2	Additional pedal time
2	Lockport	31.9 - 35.8	9/9/2024	77.6	7.24' @ Lock and Dam 3	Additional pedal time
8	John Nickell Boat Ramp	157.0 - 157.5	9/16/2024	74.7	10.46' @ Lock and Dam 9	Additional pedal time
3	Frankfort Wastewater Plant	63.9 - 65.0	9/18/2024	76.2	6.75' @ Lock and Dam 4	Additional pedal time
3	Strohmeier's Campground	48.4 - 51.9	9/18/2024	72.1	6.75' @ Lock and Dam 4	Additional pedal time
4	Benson Creek	65.8	9/18/2024	78.0	9.03' @ Lock and Dam 5	Additional pedal time
7	High Bridge	118.2	10/9/2024	60.5	11.92' @ Lock and Dam 8	Additional pedal time
7	Herrington Dam/Dix River	118.2	10/10/2024	57.4	11.86' @ Lock and Dam 8	Additional pedal time
1	Big Twin Creek	17.4 - 21.0	10/14/2024	62.5	8.53' @ Lock and Dam 2	Additional pedal time
2	Lockport	31.9 - 35.8	10/14/2024	66.7	7.43' @ Lock and Dam 3	Additional pedal time
8	John Nickell Boat Ramp	142.7 - 157.5	10/21/2024	61.7	10.90' @ Lock and Dam 9	Fall Sample
12	Ravenna	226.0 - 225.6	10/21/2024	63.3	10.80' @ Lock and Dam 13	Fall Sample
13	Sturgeon Creek	248.1 - 249.0	10/21/2024	56.7	9.51' @ Lock and Dam 14	Fall Sample
9	Fort Boonesboro State Park	175.8 - 176.4	10/23/2024	62.9	9.97' @ Lock and Dam 10	Fall Sample
11	Irvine	218.2 - 220.9	10/23/2024	61.7	9.71' @ Lock and Dam 12	Fall Sample
11	Drowning Creek	205.2	10/23/2024	61.7	9.71' @ Lock and Dam 12	Fall Sample
10	College Hill	190.9 - 201.0	10/24/2024	62.5	11.00' @ Lock and Dam 11	Fall Sample
10	Otter Creek	177.3 - 187.1	10/28/2002	60.1	11.19' @ Lock and Dam 11	Fall Sample

Table 2. Effort and CPUE (fish/hr) of muskellunge captured during electrofishing surveys in the Kentucky River in October 2024. Standard errors are in parentheses.

Pool	No. of transects	Effort (hr)	No. of muskellunge	CPUE
8	5	1.25	1	0.8 (0.8)
9	2	0.50	0	0.0
10	9	2.25	2	0.9 (0.6)
11	4	1.00	0	0.0
12	2	0.50	1	2.0 (2.0)
13	3	0.75	0	0.0
Total	25	6.25	4	0.6 (0.3)

Table 3. Length frequency, CPUE (fish/hr), and mean length of muskellunge collected from pools 8 - 13 of the Kentucky River in October 2024. Standard errors are in parentheses.

Pool	Inch class								Total	Mean	
	34	35	36	37	38	39	40	41		length (in)	CPUE
8								1	1	41.4	0.8 (0.8)
9									0		0.0
10			1				1		2	38.7	0.9 (0.6)
11									0		0.0
12	1								1	34.3	2.0 (2.0)
13									0		0.0
Total	1		1				1	1	4	38.3	0.6 (0.3)

Table 4. Additional effort, fish observed/recaptured during supplemental sampling efforts on the Kentucky River in February - October 2024.

Pool	Effort (hr)	No. of muskellunge	Recaptures	
			Clipped	PIT tagged
1	3.00	4	0	0
2	2.75	0	0	0
3	2.00	0	0	0
4	4.50	1	0	0
5	1.00	0	0	0
7	1.75	0	0	0
8	1.25	1	0	1
9	0.75	1	0	0
10	1.25	8	0	1
11	3.25	4	0	0
12	1.00	2	0	0
13	0.50	1	0	0
Total	23.00	22	0	2

Table 5. Number of clipped muskellunge sampled from each stocking site and average distance from stocking site captured in Pools 11 - 13 of the Kentucky River.

Stocking site	No. of Individuals sampled from stocking site	Average distance from stocking site (mi)*
Pool 11	0	N/A
Pool 12	2	-51.6
Pool 13	0	N/A

*Positive values indicate upriver movements, and negative values indicate downriver movement.