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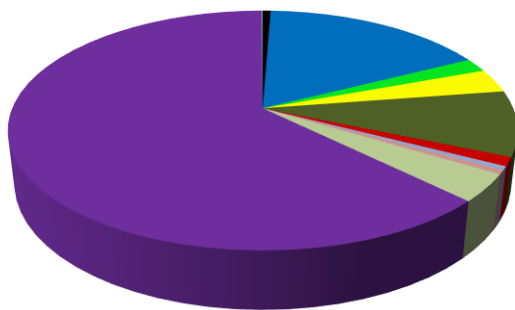
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Robin Jennison, Secretary

Sam Brownback, Governor

Fall River/Toronto Fisheries District Newsletter

Fall River/Toronto Fisheries District Fish Sample Composition in 2015



| | | |
|-----------------------|-----------------------|-----------------------|
| ■ black crappie 67 | ■ bluegill 1,864 | ■ channel catfish 205 |
| ■ gizzard shad 354 | ■ largemouth bass 971 | ■ redear sunfish 129 |
| ■ saugeye 55 | ■ spotted bass 60 | ■ white bass 407 |
| ■ white crappie 6,897 | ■ wiper 8 | |

The 2015 spring electrofishing, fall trap and gill netting sampling results have been completed and analyzed. There are 17 fisheries biologists in Kansas, and they electrofished 95 lakes and 16 reservoirs, and trap and gill netted 75 lakes and 25 reservoirs. I sampled 11,017 sport fish and gizzard shad in 2015. That does not include carp, buffalo, gar, or drum. I sampled 9,986 fish from the nets, and 1,031 black bass with the electrofishing boat. You can read the complete results of the 2016 Fishing Forecast on the KDWPT web site at this address: <http://ksoutdoors.com/Fishing/Fishing-Forecast>.

Lyon State Fishing Lake Fishing Forecast

Lyon State Fishing Lake (SFL) ranked highly among waters in the rest of the state. Here's how the fish populations in Lyon SFL looked. But first, here's a little background history about the lake.

Lyon SFL is situated on the eastern edge of the Flint Hills in Kansas. The lake is located 13 miles north of Emporia on Hwy 99 and two miles east on County Road 270. The 135-acre lake is surrounded by 442 acres of state-owned public wildlife area. Fourteen-hundred acres

of native tallgrass prairie comprise most of the lake's drainage basin and contribute greatly to its average 66 inches of water clarity. The maximum depth is 34 feet. The average depth is 14 feet. The volume of the lake goes over the spillway on average every 788 days.



Bottom of Lyon SFL during renovation 2001.

Kansas acquired the lake property in 1931. The Works Progress Administration and Civilian Conservation Corps were responsible for much of the construction. Their craftsmanship is still visible in the native limestone guard posts and inlaid rip-rap on the face of the dam and spillway. The limestone shelter house was constructed in 1951. Other improvements at the lake include a concrete boat ramp, boat loading dock, seven rip-rapped fishing piers, three rip-rapped islands, two outhouses, a shelter house, picnic tables, and camping sites. The lake was renovated in 2000 to restore a desirable fish population.

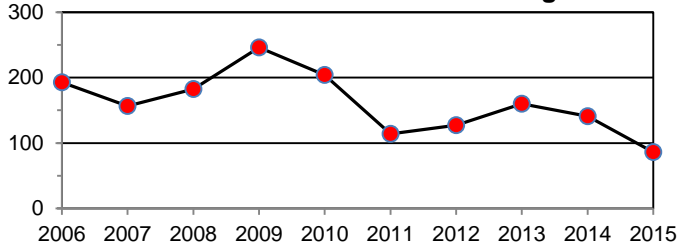
According to the 2007 creel survey, an estimated 6,944 anglers fished at Lyon SFL from March through October. Of these anglers, 31 percent (2,183) fished from a boat, and 69 percent (4,761) fished from shore. The total estimated number of hours anglers spent fishing at the lake was 22,588 (167 hours per acre). That was 74 hours per acre (55.5 percent) more fishing pressure per acre than the 1997 creel survey prior to renovation.

Lyon SFL contributed significantly to the state and local economy. A 2010 Kansas Department of Commerce report showed that tourism brought in \$5.46-billion to the state's economy; tourism was the third largest industry in Kansas; and it generated 27.4 percent

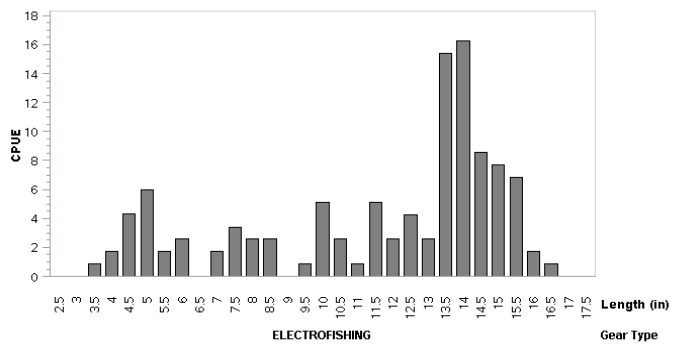
of all state and local tax revenue. The economic impact of the 6,944 fishing trips (2007 creel census) to Lyon SFL, at \$69.65 per trip (U.S. Fish & Wildlife Service 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation), was \$483,650.

Largemouth Bass Analysis: Lyon SFL ranked No. 20 for density of largemouth bass over 12 inches in Kansas. Lyon SFL historically had an over-abundant bass population. However, 2015 marked the first year since renovation that it had an ideal density bass population. Stock catch per hour of electrofishing was 86, which is within the objective density range of 80-100.

Lyon SFL Largemouth Bass Stock Catch Per Hour of Electrofishing

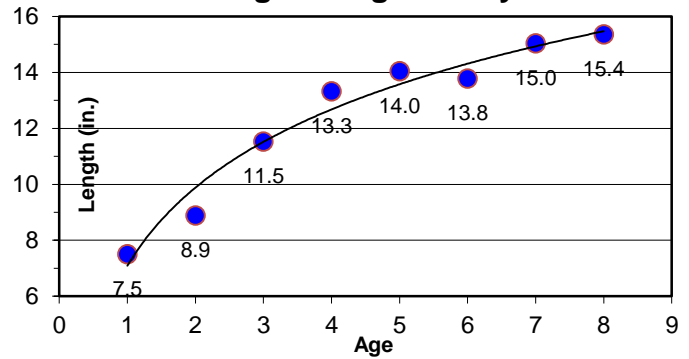


Recruitment was adequate. The bass population size structure was not balanced. It was skewed toward larger bass. Small bass may have been cannibalized. However, 18 percent of bass were over 15 inches, which was within the management objective range 10-30 percent for the first time in six years. Improved bass size structure was likely due to reduced competition for food resulting from lower population density.



The bass forage base consisted of bluegill, redear, green sunfish, golden shiner, crappie, other bass, and invertebrates. Age analysis from scale samples showed that mean lengths at ages one through eight were 7.5, 8.9, 11.5, 13.3, 14.0, 13.8, 15.0, and 15.4 inches, respectively. Most bass died by age eight and reached a maximum length of 16.5 inches and weighed 1.9 pounds. Fish condition declined with size. There was a lack of properly sized food for larger bass.

Lyon SFL Largemouth Bass Mean Length at Age in May 2015



In the past nine years, the catch rate exceeded the objective density, which limited growth. There were too many mouths to feed. To increase growth, northern pike were stocked to prey upon largemouth bass and their density. Consideration should be given to stocking gizzard shad to provide an additional forage base. However, stocking gizzard shad could significantly reduce zooplankton necessary for sport fish recruitment.

Northern Pike Analysis: In a Nebraska study, northern pike were reported to reduce bass density despite over abundant sunfish in western Nebraska lakes. In 2014, 6,750 northern pike fry (50 per acre) were stocked in Lyon SFL to grow and prey upon largemouth bass. Northern pike have historically not recruited populations in Kansas, except at Kingman SFL, which had a cool-water spring and abundant aquatic vegetation. It is not likely that northern pike will recruit and therefore establish a breeding population in Lyon SFL, allowing the population density to be controlled by stocking. After just two summers in Lyon SFL, northern pike reached quality size (21-28"). Fish condition was very high at 104 percent, indicating abundant forage for northern pike. Although few fish were sampled, personal communication with anglers reported several catches of similar-sized pike.



Northern pike from Lyon SFL.

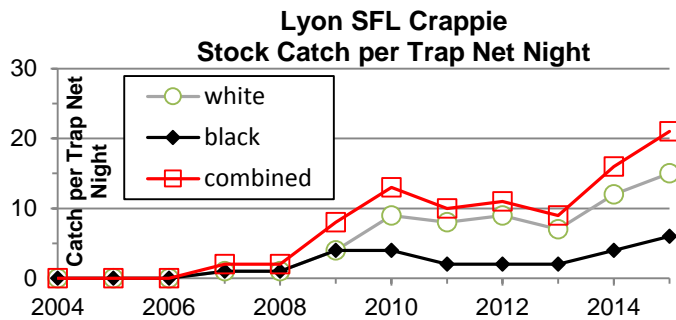
It appeared that recruitment from the initial northern pike fry stocking was quite low. Nevertheless, 2015 marked the first year since renovation with an ideal density largemouth bass population. It is unknown how much northern pike contributed to reduced bass density. Sago pond weed density was significantly reduced by grass carp in 2015, reducing hiding and likely resulting in increased predation on small largemouth bass.



Sago pond weed at Lyon SFL

Crappie Analysis: Lyon SFL has both black and white crappie. The lake had the third largest white crappie, 1.79 pounds, sampled from Kansas lakes. It had the fifth highest catch rate of black crappie over 15 inches, and ranked No. 11 for highest catch rate of black crappie over 10 inches. This was the seventh year white crappie were sampled in the lake since the introductory stocking of 171 adults in 2003.

An average of 21 crappie were sampled per trap net night, which was within the objective density range of 20-25 fish. Recruitment was kept in check due to abundant largemouth bass predation. The population size structure was balanced. Twenty-six percent of crappie were over ten inches, which was within the objective range of 10 to 40. Fourteen percent of crappie were over 12 inches, and two percent were over 15 inches. Crappie were in good condition. Mean weights



were within the objective range of 80 to 100 percent. As with largemouth bass, consideration should be given to stocking gizzard shad to provide an additional forage base. However, stocking gizzard shad could significantly reduce zooplankton necessary for sport fish recruitment.

Sunfish Analysis: Although not a lot of anglers are interested in catching sunfish, Lyon SFL had the highest density of bluegill among all Kansas lakes. It had the second largest redear sunfish (0.84 lbs.), and fifth highest density of redears over nine inches sampled by biologists. Small sunfish provided a major prey supply for predators in Lyon SFL and therefore, the health and size structure of their population was vitally important to the overall balance of the lake's fish population.

Sunfish were in excellent condition. Mean weight of stock size bluegill was 107 percent, and redear average

weights ranged from 98-101 percent. Sunfish are creatures of clean clear water. The water transparency during electrofishing in May was 68 inches. High water clarity resulted from abundant littoral vegetation.



Bluegill feeding on fish food at Lyon SFL.

Water willow was planted in 2006 to enhance littoral fish habitat (especially bluegill) and reduce shoreline erosion. The objective of these plantings was to establish water willow over the entire shoreline. The water willow was in good condition and was beginning to spread. In 2009 additional water willow was planted in areas with thin coverage. If the water willow becomes too dense, it could provide too much hiding cover for bluegill, resulting in increased bluegill density and subsequent decline in condition and growth. If this occurs, water level management might be used to draw bluegill out of the ring of water willow and subject them to predation in the open water.

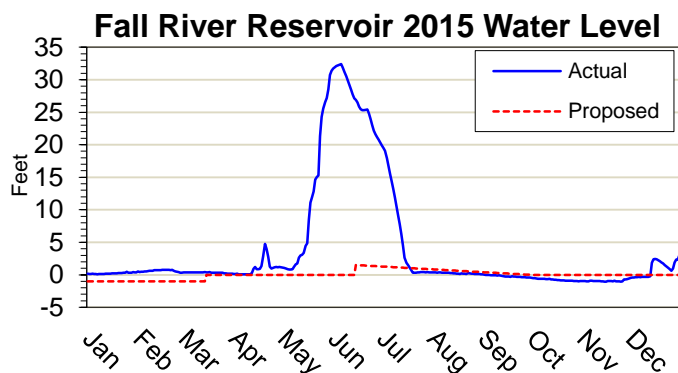


Lyon SFL water willow (above water) and American pond weed (floating)

Four-hundred-and-nine (3/acre) triploid grass carp were stocked in 2011 to reduce over abundant sago pond weed. Sago pond weed clogged the water out to a depth of 10 feet. It significantly impaired bank angling. However, sago pond weed density was significantly reduced by 2015. Reduced hiding cover in sago pond

weed should result in a reduced bluegill density and subsequently increased growth.

Fall River Reservoir Fishing Forecast



Bluegill Analysis: Fall River Reservoir had an extraordinarily high density population of bluegill sunfish due to an extended period (May thru July) of flooded terrestrial vegetation. This resulted in unusually clear water (>2 feet) and resulted in excellent reproduction. Stock catch in trap nets was an all-time high at 364 fish. This goes to show how quickly bluegill will take advantage of newly flooded habitat when it becomes available.

White Crappie Analysis: Fall River Reservoir is known for its white crappie population. The extended period of flooded terrestrial vegetation resulted in the highest reproduction in over ten years. The young of the year catch rate averaged 131 fish per trap net. If these young fish survive the winter, there will be a very strong year class. As was explained in the last newsletter about flood index, as long as there is a significant rise in water level, there will be sufficient nutrient inflow to feed the massive year class. Remember that the volume of the reservoir flows through the spillway nearly 16 times per year, so the odds are good. Nevertheless, we just came out of a four-year drought 2010-2013, which slowed growth but caused fish to live longer.

The white crappie population was recovering nicely from the drought years. The stock catch per trap net night was 18 fish, which was just below the objective range of 20-25. The population size structure was not balanced. It was skewed toward large fish due to four years of low reproduction. Forty-three percent of fish were over 10 inches. Twelve percent of fish were over 12 inches. Fall River Reservoir had the third largest crappie netted from Kansas reservoirs at 15 inches and 1.84 pounds. The reservoir had the third highest catch of crappie over 12 inches, and fifth highest catch over 10 inches among Kansas reservoirs.



Fish were in good to excellent condition due to massive inflow of flood-water nutrients. Fish condition increased with size. Larger crappie gape size resulted in more prey availability, predominately gizzard shad. Mean fish condition for 10- to 15-inch crappie exceeded 100 percent. High water level in June resulted in a high density gizzard shad spawn which was reflected in high relative weights of crappie.

White Bass Analysis: The lack of spring floods during the white bass spawning season from mid-March through early April, throughout the drought years severely impacted the white bass population density. The floods came too late in 2014 and 2015 for white bass to pull off really good spawns. As most Fall River anglers know, the white bass make a spawning migration run out of the reservoir and stage in deep holes in the river. The spawn is triggered by rising water level over gravel riffles.



Narrows between Fall River (left) and Otter Creek (right)

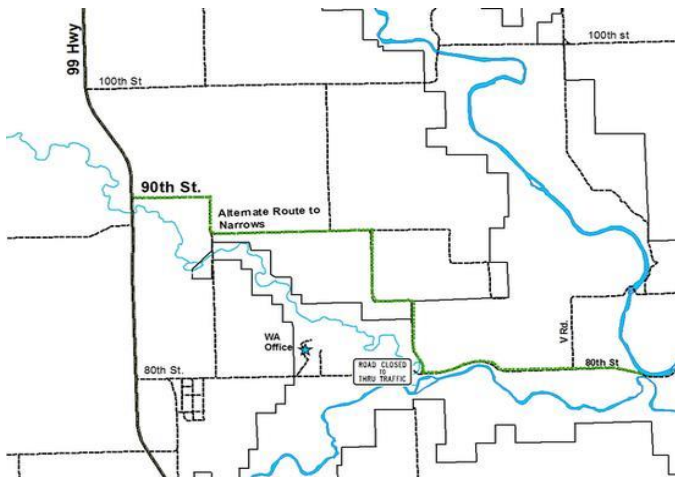
Traditional spawning riffles are at the confluence of Otter Creek and Fall River, just below the narrows in Fall River, and just above the narrows in Otter Creek. This is also the ghost town site of Twin Falls. You can still see many building foundations there. During good white bass runs, there will be so many vehicles crammed along the sides of the road, there is scarcely anywhere to turn around. One of my good college friends tells the story of his best fishing trip ever near the narrows. He caught

345 white bass in one day. He was using a double jig rig and caught two fish at a time, most casts. He said his arms and shoulders burned from reeling in all those fish, but he couldn't stop fishing.



Closed Honey Creek Bridge.

Unfortunately, access to traditional white bass spawning grounds just got severely restricted. Greenwood County had to close both bridges leading to the narrows and finally, the narrows road itself. The county no longer has sufficient tax revenue to maintain these bridges. Greenwood County was once the highest oil-producing county in Kansas. At its peak, oil production was more than 4,500 barrels a day. It produced 851 barrels per day in 2015. The Otter Creek Bridge and Honey Creek Bridge are now closed and anglers will have to drive six miles in opposite directions to access the other side of the creeks.



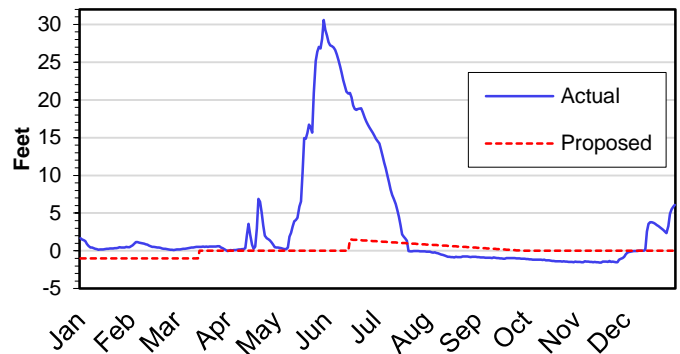
Alternate route to narrows.

Historically, Fall River had a high-density white bass population. The current population density is moderate at eight fish per gill net night, which is within the objective density of five to ten. The population size structure is not balanced, skewed toward large fish due to low recruitment. Forty-three percent of fish were over 12 inches, and 11 percent were over 15 inches. Fish condition was exceptional and exceeded 100 percent. High water levels in June resulted in a high density gizzard shad spawn which resulted in excellent white bass relative weights.

Toronto Reservoir Fishing Forecast

Toronto Reservoir contributes significantly to the state and local economy. A 2010 Kansas Department of Commerce report showed that tourism brought in \$5.46 billion to the state's economy; tourism was the third largest industry in Kansas; and it generated 27.4 percent of all state and local tax revenue. The economic impact of the 8,723 fishing trips (2002 creel census) at \$69.65 per trip (U.S. Fish & Wildlife Service 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation) was \$607,557. The economic impact of the 24,685 hunting trips at \$131.13 per trip was \$3,236,944. The economic impact of 249,634 trips to the State Park in 2012 at \$2.13 per trip was \$531,720. The total recreational economic impact of Toronto Reservoir is approximately \$4.4 million per year. The total recreational economic impact of the Kansas Department of Wildlife, Parks, and Tourism at Fall River Reservoir is approximately \$5.3 million per year.

Toronto Reservoir 2015 Water Level



Bluegill Analysis: Conditions at Toronto Reservoir were similar to Fall River, only better. The extended period of flooded terrestrial vegetation resulted in unprecedented clear water, which exceeded two-foot visibility and resulted in excellent bluegill reproduction. Small young-of-the-year gizzard shad were the primary forage in Toronto Reservoir. However, they frequently grew so fast that they become too large by fall for all but the largest fish to consume. Bluegill, on the other hand, won't grow too large to be consumed for more than a year and remain vulnerable to predation.

The bluegill catch rate was at an all-time high. There were 229 bluegills sampled in trap nets, which would be a good catch rate in a small weedy clear lake, but was uncharacteristic of the usually turbid Toronto Reservoir devoid of aquatic vegetation. The population size structure was not balanced. It was skewed toward small fish (a good thing for predators like crappie and bass). Ninety-six percent of bluegill were less than six inches because they had not had time to grow. Although bluegill typically maintained a low density, they quickly took advantage of newly flooded habitat when it became available.

Largemouth Bass Analysis: Toronto Reservoir contained a low-density largemouth bass population, compared to clear weedy lakes with ideal bass habitat. Stock catch per hour of electrofishing was 25 bass, which was below the objective range of 80-100 fish per hour of electrofishing. More recruitment is needed. Water level fluctuations within the reservoir limited littoral aquatic vegetation necessary for bass reproduction and habitat. The bass electrofishing sample in May occurred before the big flood, so its effects won't be measured until next season.

Nevertheless, the bass population in Toronto Reservoir ranked fourth, third, and second best for 12-, 15-, and 20-inch bass, respectively, among Kansas reservoirs. It also had the fourth largest bass at 4.52 pounds, which doesn't sound that large, except that the third and second largest bass sampled were also less than 5 pounds. Only the heated water power plant at La Cygne Reservoir had a bass over 5 pounds this year; which, coincidentally, I sampled with the Fisheries Section Chief, Doug Nygren (pictured below).

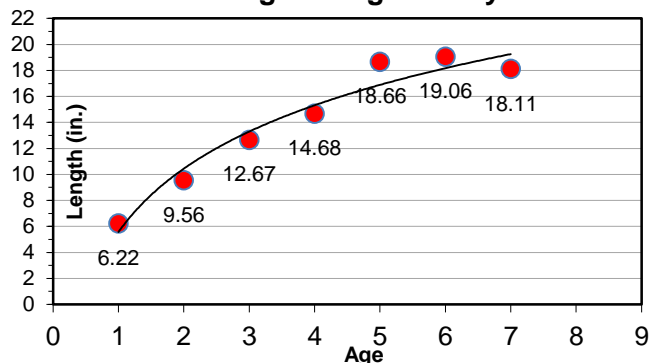


6.14 lbs. largemouth bass at La Cygne Reservoir

The Toronto Reservoir largemouth bass population size structure was balanced. Thirty-eight percent of bass were over 15 inches. Ample food was available resulting in fish that were in good condition. Mean relative weight was 95 percent and was within the objective range of 80 to 100. Age analysis from scale samples showed that mean lengths of ages one through seven in May were 6.2, 9.6, 12.7, 14.7, 18.7, 19.1, and 18.1 inches, respectively. Most bass died by age seven and reached a maximum length of 19.1 inches.

Recruitment and population density was greater in years with high spring floods. It seemed likely that bass were washed out of upstream impoundments during floods and took up residence in backwater section of Toronto Reservoir.

Toronto Reservoir Largemouth Bass Mean Length at Age in May 2015



White Crappie Analysis: Toronto Reservoir had the second highest density of white crappie in Kansas reservoirs for fish over eight, ten, and 12 inches. The largest white crappie netted in the state this year was also in Toronto. It was 15-inches long and weighed 2.03 pounds. Four 15-inch crappie were sampled this year at Toronto. Prolonged spring flood water resulted in record reproduction. There were 3,425 crappie sampled in trap nets. Most were young of the year. The stock catch per trap net night was 27 fish, which slightly exceeded the management objective range of 20-25.



White crappie from Toronto Reservoir

The population size structure was not balanced. It was skewed toward large fish due to inadequate recruitment during drought years. Sixty-seven percent of crappie were over ten inches, which exceeded the objective range of 10 to 40. Twelve percent of crappie were over 12 inches, which exceeded the objective range of one to ten.

Fish were in excellent condition. Mean relative weight was 105 percent. Fish condition generally increased with size. Larger white crappie gape size resulted in more prey availability. If threadfin shad would survive the harsh Kansas winters, they wouldn't grow too big to be eaten by smaller crappie, making them ideal prey. High water levels in June resulted in a successful gizzard shad spawn, which was reflected in extraordinarily plump crappie.

Although cold Kansas winters kill threadfin shad and many young of the year gizzard shad, that's not necessarily a bad thing. In warmer southern climates, shad populations become too dense. They eat all the plankton, leaving sport fish fry to starve. Due to proper

predator fish management in the Fall River/Toronto fisheries district, shad populations are kept in check.

The water level in Toronto Reservoir was one-foot low during fall test netting. While setting trap nets in Mann's Cove, I discovered this old cast iron bathtub with a hole cut out on one end and is used to illegally capture flathead catfish. Someone went to a lot of work to put it there, because they weigh about 300 pounds. It is legal to handfish (noodle) for flathead catfish in Kansas reservoirs during the handfishing season, but placing man-made objects to attract fish is not legal. Needless to say, after contacting the Toronto Reservoir conservation officer, this tub will no longer be used for poaching.



Cast iron bathtub in Toronto Reservoir

White Bass Analysis: Toronto Reservoir had a high-density white bass population due to an extended period of flooded terrestrial vegetation. This resulted in unusually clear water (>2 feet) and resulted in excellent reproduction. There were 320 white bass netted in 2015, which was an all-time record. The stock catch per core-panel gill net night was 25 fish, which was above the management objective range of five to ten. Recruitment was high.

The population size structure was not balanced. It was skewed toward small fish because fish had not had time to grow to larger sizes. Thirteen percent of fish were longer than 12 inches, which was within the management objective range of 10 to 40. Two percent of fish were longer than 15 inches, which was within the management objective range of one to ten. The second largest white bass netted by biologists in 2015 was from Toronto. It was 18 inches long and weighed 3.02 pounds.

Fish were in excellent condition. Mean relative weight was 105 percent and exceeded the objective range of 80 to 100. High water levels in June also resulted in a high density gizzard shad spawn which was reflected in high relative weights of white bass.

list. If you have any questions, comments, or story ideas, feel free to send them.

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Kansas Department of Wildlife, Parks and Tourism

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