

Crooked Creek Lake

Armstrong County

Spring 2017 Channel Catfish Survey



Aerial photo of Crooked Creek Lake, courtesy of google earth.

Crooked Creek Lake is a 350-acre (summer pool) U.S. Army Corps of Engineers (USACE) owned impoundment located approximately seven miles south of Ford City, Armstrong County. Crooked Creek Lake was constructed in the 1940's primarily for flood control but also provides opportunities for fishing and boating activities. The lake contains a wide variety of fish species that offer diverse year-round angling opportunities. Other recreational opportunities at Crooked Creek Lake include picnicking, camping, hiking, swimming, horseback riding and a playground area. Despite the lakes size, boaters should be advised that boats used on the Lake are restricted to 10 horsepower motors and/or minimum wake operation only. The lake contains one boat launch with ample parking. For more information on recreational opportunities around Crooked Creek Lake please visit the Army Corps of Engineers website at <https://www.lrp.usace.army.mil/Missions/Recreation/Lakes/Crooked-Creek-Lake/>.

The Pennsylvania Fish and Boat Commission (PFBC) manages Crooked Creek Lake’s warmwater fish populations under [conventional statewide angling regulations](#) and stocks it annually with Channel Catfish fingerlings. The PBFC manages Channel Catfish populations in many of its lakes and ponds across the commonwealth through judicious stocking. The objectives of the 2017 survey were to evaluate the overall abundance and size structure of the Channel Catfish population in Crooked Creek Lake and to determine if the lake is meeting the minimum requirements for producing a high-quality fishery as outlined in the PFBC’s [Catfish Management Plan](#). A routine inventory of the other game and panfish species was also conducted during this survey.

Trap Net & Gill Net Sampling:

Biologists from the PFBC Fisheries Management Area 2 and USACE office in Pittsburgh sampled fish populations at Crooked Creek Lake targeting Channel Catfish during the week of May 15th. Twenty-two total Pennsylvania style trap net sets and six-panel experiment gill nets were deployed in water depths ranging from 4 to 12 feet deep and were fished overnight (approximately 24 hours). Results of these survey efforts yielded the capture of 4,285 total fish in 421.83 hours of effort representing 17 different species (Table 1). Captured fish were measured for total length and a sub-sample (10 fish from each 1-inch size grouping) was weighed to the nearest gram. Relative abundance, or catch rate, of fish collected was expressed as catch-per-unit-effort (CPUE); or number of targeted fish collected per unit of time gear was deployed or “fishing”.

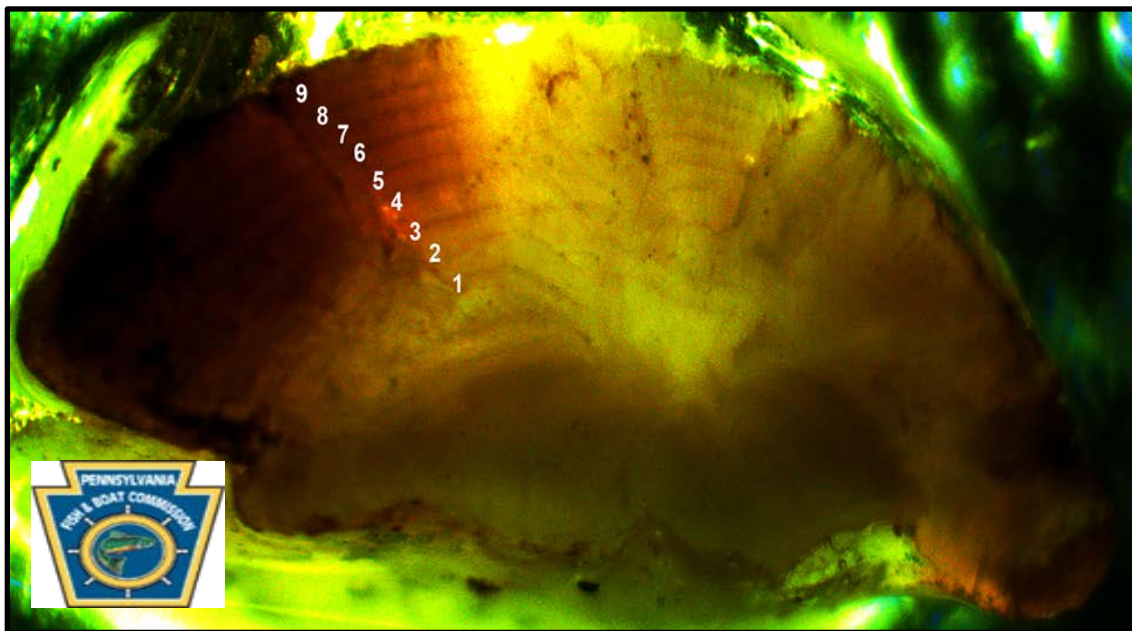
Table 1. Abundance and size ranges of fish collected during spring trap net and gill net sampling at Crooked Creek Lake during the week of May 15th, 2017.

Species	Number	Size Range (inches)	Comments
Channel Catfish	208	4 - 28	74% > 15 inch
Largemouth Bass	9	8 - 15	22% ≥ 15 inch *MSL
Smallmouth Bass	1	9	N/A
White Crappie	879	1 – 16	56% ≥ 9 inch
Bluegill	340	3 - 7	66% ≥ 7 inch
Black Crappie	40	5 - 12	16% ≥ 9 inch
Pumpkinseed	1	7	100% ≥ 7 inch
Yellow Perch	1	10	100% ≥ 7 inch
Brown Bullhead	55	9 - 14	78% ≥ 12 inch
Yellow Bullhead	18	8 - 11	6% ≥ 12 inch
Flathead Catfish	1	18	N/A
Golden Redhorse	36	9 - 19	N/A

Common Carp	117	7 - 32	N/A
White Sucker	31	9 – 16	N/A
Northern Hog Sucker	2	8 – 9	N/A
Golden Shiner	3	7 – 9	N/A
Gizzard Shad	2,543	Did not measure	N/A
Total	4,285		

Note: *MSL = Minimum Size Limit

Results from the May trap net and gill net sampling were impressive, yielding a total catch of 208 Channel Catfish. Of the 208 fish captured, 148 or 74% were greater than 15 inches in length with the largest fish measuring 27 inches and weighing 10.5 pounds. The calculated catch rate of 0.48 fish/hr was well above (10X) the maximum statewide objective of 0.045 fish/hr established for all Channel Catfish lakes described as having a high-quality Channel Catfish fishery. To quantify growth a representative number of Channel Catfish were retained for age measurement. Typically, biologists collect scales from fish to determine fish age. However, Catfish are unique in that they don't contain scales and thus age is typically measured using otoliths, which are also known as "ear stones". Each catfish contains two large calcified otolith structures that are extracted from the head region, dried and cleaned, fixed onto a microscope slide, sanded down (sectioned) to the nucleus, with age measured by counting annual marks using a light microscope.



Example of a 9-year old Channel Catfish otolith illuminated under a light microscope.



Former FBA Nickolas Yaroszewski and USACE Water Quality Biologist Amy Nelson with a pair of quality sized Channel Catfish.

Crooked Creek Lake's Channel Catfish population continues to improve with each successive survey. Good numbers of both juveniles and adults were captured of which multiple year classes were represented. Of the total 208 fish caught, half (50%) were greater than 18 inches in length. Surveys targeting young-of-the-year (YOY), prior to stocking events, will be scheduled in future years to assess the level of natural reproduction, if any.

The PFBC began stocking Channel Catfish fingerlings in Crooked Creek Lake in the late 1970's with the primary goal to provide enhanced recreational fishing opportunities and create a more targeted fishery. The lake typically receives a minimum of 3,500 fingerling, but the number of fingerlings stocked has been higher in recent years due to the availability of extra fingerlings produced through our hatchery system. For example, at the request of the Fish Management Division, the lake was stocked with 7,000 surplus fingerlings during the years of 2015 and 2016.



A pair of juvenile Channel Catfish captured in our trap nets in Crooked Creek Lake.

In addition to a high-quality Channel Catfish population, Crooked Creek Lake also provides anglers with good fishing opportunities for a variety of panfish. The predominant panfish species collected was White Crappie followed by Bluegill and Black Crappie, all of which were collected in record high numbers. Of the 879 White Crappie sampled 56% were greater than 9 inches including several fish up to 16 inches in length. Good numbers of Bluegill (340) were also sampled with 66% ≥ 7 inches. Fair numbers of Black Crappie were present, but few individuals were of quality size (≥ 9 inches). The Brown and Yellow Bullhead populations are also providing anglers a quality, sustainable recreational fishery.

Gizzard Shad, an invasive species, were first documented as present in Crooked Creek Lake in 1992. While Gizzard Shad can serve as an important diet component for larger predators such as Largemouth Bass, Smallmouth Bass and Channel Catfish, they may also have negative ecological consequences with respect to panfish and other game species. [Gizzard Shad](#) are known as “prolific spawners”, meaning they can spawn multiple times for several months producing up to 400,000 eggs per female and can over-populate a lake in a short amount of time. Young Gizzard Shad often out-compete panfish species and some game species for food resources such as zooplankton, which can lead to reduced survival of young and reduced growth rates especially in Bluegill, crappie and young bass where food preferences overlap. Although Gizzard Shad were abundant in our net catches, we have not documented a decrease in the size distribution of the lakes panfish population. We are hopeful that increased predation and competition by game species, including Channel Catfish, will reduce the overall abundance of Gizzard Shad over time and that over the long term the lake’s panfish and gamefish populations will not be adversely affected. Concern stems from experiences in other Pennsylvania lakes where Gizzard Shad have been introduced with crappie populations transitioning

to a truncated size structure, thus far not experienced at this Lake.

Hoop Net Sampling:

Staff returned in the fall to further assess the Channel Catfish population by setting hoop nets during the weeks of September 11th, 2017 and September 18th, 2017. This technique is designed to specifically target catfish. A total of 12 hoop net sets, four nets in “tandem” (three nets connected in a series), were set daily in water depths ranging from 4 to 12 feet and fished for a 72-hour period (three consecutive overnight sets). Each hoop net was subsequently baited with cheese logs consisting of pressed cheese, soybeans molasses, peanuts and soy that were placed in mesh bags and attached near the cod or “tail” end of the net. Our hoop net sampling effort consisted of 882.32 hours in which an additional 101 Channel Catfish were captured. Results of this survey are detailed in Table 2. Captured Channel Catfish ranged in size from 13 to 33 inches with the largest measuring 33.8 inches and weighing 15.4 pounds.

Table 2. Abundance and size ranges of fish collected during fall hoop net sampling at Crooked Creek Lake during the week of September 11th, 2017.

Species	Number	Size Range (inches)	Comments
Channel Catfish	101	13 - 33	88% ≥ 15 inch
Largemouth Bass	5	11 - 17	80% ≥ 12 inch (MSL)
Smallmouth Bass	4	11 - 19	50% ≥ 12 inch (MSL)
Black Crappie	4	7 - 9	25% ≥ 9 inch
Bluegill	15	6 - 7	93% ≥ 7 inch
Pumpkinseed	1	7	100% ≥ 7 inch
White Crappie	153	8 - 14	91% ≥ 9 inch
Flathead Catfish	1	20	100% ≥ 15 inch
Brown Bullhead	21	11 - 12	29% were 12 inches
Yellow Bullhead	1	11	N/A
Golden Redhorse	61	12 - 19	N/A
Northern Hog Sucker	1	13	N/A
White Sucker	7	14 - 16	N/A
Common Carp	30	12 - 24	N/A
Gizzard Shad	1	Counted Only	N/A
Total	406		

Note: *MSL = Minimum Size Limit



USACE Water Quality Biologist Carl Nim and FBA Nick Yaroszewski with several quality-size White Crappies.

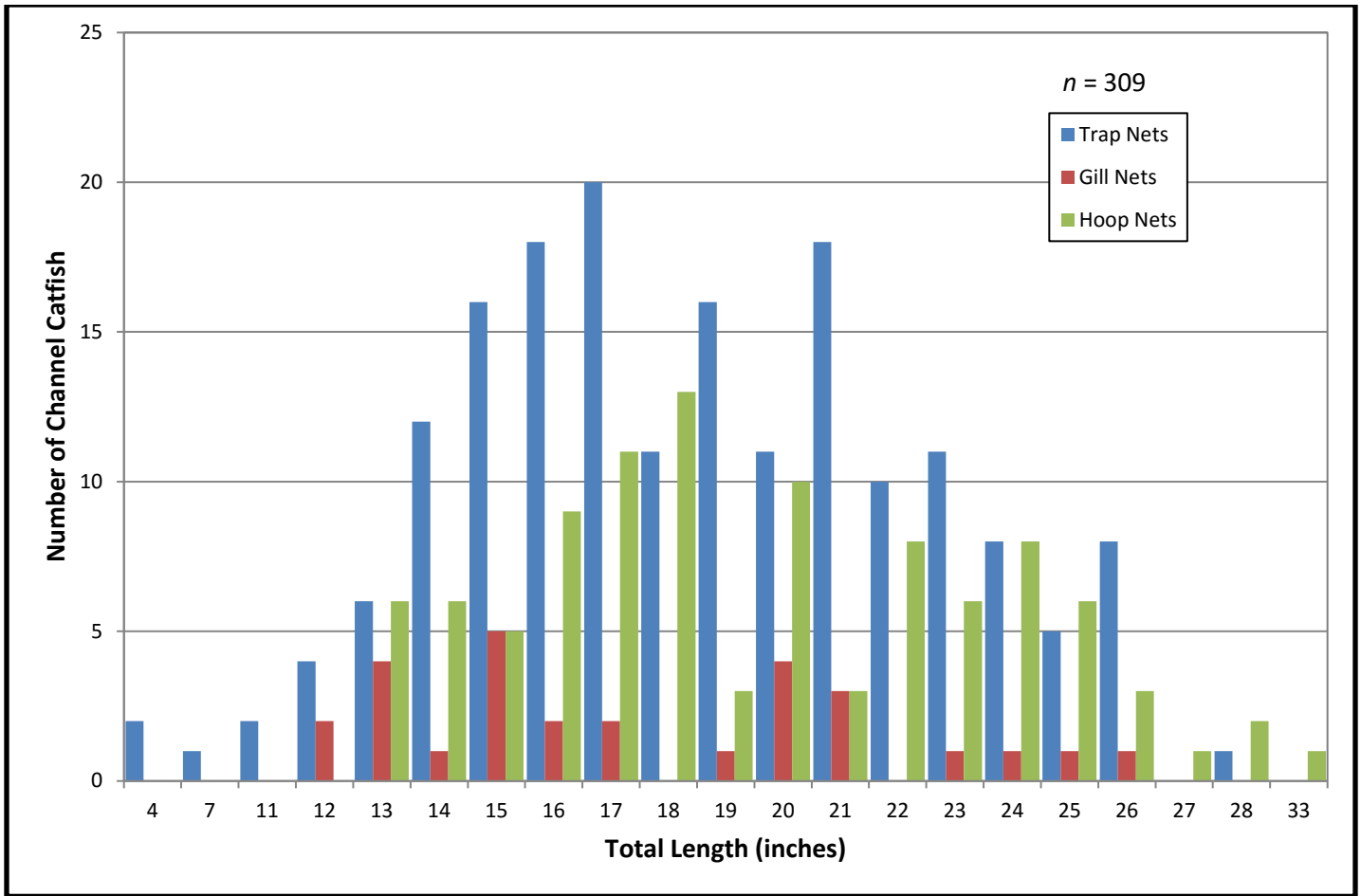


Figure 1. Graph showing length frequency distribution of Channel Catfish caught in trap nets, gill nets and hoop nets combined at Crooked Creek Lake in 2017.

Overall, we describe the Channel Catfish population as excellent. Anglers interested in great Channel Catfishing fishing opportunities with abundant numbers and quality sizes of individuals should plan to visit Crooked Creek Lake. Many anglers who fish Crooked Creek Lake often take advantage of the low fishing pressure compared to other higher-profile lakes and continue to catch consistent numbers of quality sized Largemouth Bass with fair numbers of trophy bass also present. In future assessments we will assess the Largemouth Bass population. Our results were further reinforced when several local anglers stopped by to express their opinions about the good angling opportunities that Crooked Creek Lake provides, especially for White Crappie and Largemouth Bass. The PFBC would like to extend our thanks to the Crooked Creek Lake State Park staff and USACE Pittsburgh District Water Quality biologists for their assistance with these surveys.

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