



Big Creek 2019 Fisheries Survey Report
Roscommon County, MI
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Introduction

Big Creek is located in the northcentral Lower Peninsula of Michigan and is in the Muskegon River watershed, in Lyon Township of Roscommon County. The stream originates from wetlands on state-owned land approximately 1/4 mile west of US-127. From there, the stream flows generally east for approximately two miles until it enters Higgins Lake. Higgins Lake is a large, deep inland lake (the 11th largest in Michigan, at approximately 9,600 acres, and the 5th deepest, at 135 feet). Since it is a deep, cold water lake, Higgins Lake is annually stocked by MDNR (Michigan Department of Natural Resources) with Lake Trout, Rainbow Trout, and Brown Trout. Land ownership in the Big Creek subwatershed consists of both privately-owned land and public land administered by MDNR. Land use in the subwatershed is primarily forest, wetlands, and developed land near Higgins Lake. Over its short course, Big Creek drops approximately 27 feet, for a gradient of approximately 13.5 ft/mi.

File information (Cadillac MDNR office) regarding Big Creek is very limited. An initial investigation by MDOC (Michigan Department of Conservation, the precursor to the MDNR of today) in 1927 reports the presence of Brook Trout. Other than that cursory investigation, Big Creek has never been previously sampled or surveyed by any scientific agency. Correspondence from 1957 discusses a project in which riparian landowners in the lower 200 feet of the stream dug out the stream channel because they “wanted the dirt for fill on their property, and also thought that by opening the mouth of the stream it would give the trout a better opportunity to get up the stream to spawn”. At that time, there were no environmental laws that would have made such an action illegal.

Big Creek was first stocked in 1905, with 6,000 Brook Trout fry. The only other known stocking record for Big Creek was in 1934, when 1,210 Brook Trout fingerlings were stocked.

Big Creek a Designated Trout Stream and is regulated by Michigan Department of Natural Resources (MDNR) Fisheries Division as a Type 1 stream, meaning it is open to all gear types and open to fishing from the last Saturday in April through September 30. The minimum size limits are 7” for Brook Trout, 8” for Brown Trout, and 10” for Rainbow Trout. No more than three trout over 15 inches may be kept.

Methods

The MDNR Fisheries Division survey of Big Creek was conducted on July 3, 2019. Sampling was conducted using one Wisconsin battery-powered 12-volt backpack shocker with one probe. One location was sampled.

Results

The sampling station ran for 958 feet upstream from Higgins Lake to the Dewey Road crossing. Salmonids caught in the survey consisted of 30 Rainbow Trout from 3 to 7 inches, 2 Brown Trout from 6 to 7 inches, and 13 Brook Trout from 2 to 8 inches (Table 1). Other abundant species caught included Brook Stickleback and Central Mudminnow. The station averaged 12.5 feet wide and 3 inches deep, with the maximum depth being 1.5 feet. Substrates were 80% sand, 10% silt, 8% gravel, 1% cobble, and 1% boulder. The stream channel morphology consisted of 90% run, 5% riffle, and 5% pool. In this area, the stream flowed through a residential neighborhood, but the stream was well-buffered with mature forest, with white pine and northern hardwoods being the primary cover types. Tag alder was present along the streambanks. The surveyed reach is mostly sandy, overly wide and shallow, with very little depth or



habitat. It is very low gradient. Wherever there was even a little depth or cover, salmonids were caught. At 9:25 am, the stream temperature was 54.0°F.

Discussion

Big Creek is clearly a high-quality coldwater stream, as evidenced by the presence of three different salmonid species. The Brook Trout in Big Creek are naturally reproducing and self-sustaining, since they have not been stocked in many decades. However, the Brown and Rainbow Trout caught in the 2019 survey appeared to be hatchery-produced fish that had been stocked several months earlier into Higgins Lake and run upstream into Big Creek for temperature refuge. The Brown Trout and Rainbow Trout are stocked at the West Higgins Lake Boat Launch located approximately 1.2 miles south of the Big Creek outlet and at North Higgins State Park located approximately 1.3 miles north of the outlet. There was one 3-inch Rainbow Trout that was too small to have been stocked and was likely a product of natural reproduction. The diminutive size of the stream, lack of depth, and lack of cover likely limits the presence of larger fish.

We also investigated the stream at the West Higgins Lake Dr., Old US 27, and CR 301 crossings. None of the culverts appeared to be perched, and the stream was not noticeably different than the survey station. At CR 301, the stream was somewhat more tannin stained and was noticeably warmer (62°F compared to 54°F at the mouth). We also took a two track just south of the CR 301 crossing 1/4 mile upstream to a large beaver impoundment. There is evidence of fishing here. The Heideman Road crossing also is somewhat impounded, likely by beavers. Overall, this stream has very low gradient and its headwaters seem to be slow, swampy, and beaver impacted.

Recommendations

Big Creek hosts a robust, self-sustaining population of Brook Trout. However, habitat for larger trout was very limited. Much of the stream was overly wide and shallow, with very little depth (which is necessary to hold larger trout). The instream habitat in Big Creek could be improved with a minimum of effort, using hand-placed wood to narrow and deepen the stream channel, as well as providing overhead cover, which is also preferred by larger trout. In addition, the Dewey Road crossing should be replaced with a structure that at least spans the base-channel width of Big Creek and is placed in a hydrologically correct fashion that does not back up water or create a fish passage barrier.

A final recommendation would be to investigate the beaver dam on the upper reaches of Big Creek. Too many beaver dams in a small watershed like Big Creek typically result in warmer than normal water temperatures that have negative effects on trout populations. If it is determined that beaver dams are negatively affecting the stream, trappers can be hired to remove the beavers, and then the dams can be removed by hand and the stream restored.



Table 1. Number, weight, and length of fish collected from Big Creek, Roscommon County, by backpack electrofishing on July 3, 2019.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches) ¹	Average length	Percent legal size ²
Bluntnose Minnow	14	6.5	0.1	2.4	1-2	2	
Brook Trout	13	6.0	1.3	31.7	2-8	6.1	15 (7")
Brown Trout	2	0.9	0.3	7.3	6-7	7.0	0 (8")
Central Mudminnow	26	12.1	0.3	7.3	2-3	3.1	
Creek Chub	2	0.9	0.0	0.0	2-2	2.5	
Brook Stickleback	104	48.4	0.0	0.0	1-2	1.6	
Iowa Darter	10	4.7	0.0	0.0	1-2	1.6	
Johnny Darter	3	1.4	0.0	0.0	1-2	2.2	
Mottled Sculpin	1	0.5	0.0	0.0	2-2	2.5	
Northern Redbelly Dace	6	2.8	0	0.0	1-2	2.2	
Rainbow Trout	30	14.0	1.9	46.3	3-7	5.6	0 (8")
Rock Bass	4	1.9	0.2	4.9	3-4	4.3	0 (6")
Total	215	100	4.1	100			

¹Note some fish were measured to 0.1 inch, others to inch group: e.g., "5"=5.0 to 5.9 inches, 12=12.0 to 12.9 inches; etc.

²Percent legal size or acceptable size for angling. Legal size or acceptable size for angling is given in parentheses.