



Muskegon River below Croton Dam 2007-2022 Trout Survey Report
Newaygo County, MI
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Introduction

The Muskegon River is located in the north-central Lower Peninsula of Michigan and is one of the largest watersheds in the Lower Peninsula. The Muskegon River watershed is approximately 212 miles in length, with an elevation drop of 575 feet over that distance (O'Neal 1997). The Muskegon River has three large hydropower dams on it, including Rogers, Hardy, and Croton Dams. All three dams are owned and operated by Consumers Energy. Croton Dam is the furthest downstream of the three dams and is an upstream barrier for all migratory fish from Lake Michigan. There is no fish passage of any kind at Croton Dam. For approximately 14 miles below Croton Dam, the Muskegon River has water temperatures that are conducive to year-round trout management. Below the City of Newaygo, the river warms and cannot support trout year-round. This report pertains to the reach of the Muskegon River from Croton Dam downstream to the City of Newaygo.

Land ownership in this reach of the Muskegon River consists of mostly privately-owned land, although there is some state forest land interspersed. There are access points with boat launches located at Kimble County Park (just downstream of Croton Dam), off Pine St., off Thornapple Avenue, at Henning Park (just upstream of Newaygo), and off Bridge Street (just downstream of Newaygo). The Kimble and Henning Park access sites are administered by Newaygo County, while the other sites are administered by the Michigan Department of Natural Resources (MDNR).

The reach of the Muskegon River from Croton Dam to Newaygo sees extremely heavy fishing pressure and is economically very important to the area. At least several dozen commercial fishing guides ply this reach on a regular basis, and there are several fishing-oriented businesses in the City of Newaygo. In angler creel census studies conducted between 1999 and 2005, the reach between Croton Dam and Newaygo generated approximately 250,000 angler hours per year (O'Neal and Kolb 2015). This reach has been intensively managed for resident Brown and Rainbow Trout for many years. It is heavily stocked with both species on an annual basis. In addition, this reach sees heavy runs of Steelhead and Chinook Salmon. Although Steelhead are heavily stocked, there is some natural reproduction as well. The vast majority of the Chinook Salmon in the lower Muskegon River are naturally reproduced. The lower Muskegon River also sees a very heavy Walleye run in the spring, and it serves as a source of broodstock for statewide MDNR Walleye stocking operations. Other species commonly caught by anglers on this reach include Smallmouth Bass and Northern Pike.

Methods

The most recent MDNR Fisheries Division survey of the Muskegon River below Croton Dam was conducted on March 28, 2022. Sampling was conducted using an electrofishing boat, with passes conducted along both banks of the river. The survey was conducted in conjunction with a reconnaissance mission aimed at verifying the presence and ripeness of Walleye in preparation for the upcoming Walleye egg take. Similar surveys were conducted in 2007-2008, 2010-2019, and 2022 (Table 1).

Results

Totals of 41 Brown Trout and 41 Rainbow Trout were caught in the 2022 survey. The Brown Trout ranged from 9 to 20 inches in length, while the Rainbow Trout ranged from 6 to 14 inches. Multiple adult Steelhead (some with adipose fin clips, some without) were noted as well. The water temperature was 35.6°F, while the air temperature was 17.0°F. Age and growth analysis (Table 2) indicated that the



majority of the Brown Trout caught in the survey were ages 2 and 3, meaning they would have been stocked in 2020 and 2021, respectively. The majority of the Rainbow Trout were age 3, meaning they would have been stocked in 2020.

Discussion

Although the Muskegon River below Croton Dam can support trout year-round, it is far from an ideal environment for trout. In particular, the reach routinely sees summer temperatures reaching the mid- or even upper 70- degree range, which is near lethal for trout. However, there are small tributaries and spring seeps that do provide cold groundwater to the river, and these refuge areas are critical to the survival of trout in the reach. In addition to dramatically warming the water, Croton Dam is also responsible for wide ranges in flow that can also threaten the survival the stocked trout, in addition to any naturally reproduced trout that might be present. Due to these factors, survival of stocked cohorts is variable, as can be seen in the age and growth analysis of the 2022 catch (Table 2). Despite these challenges, the Muskegon River continues to be renowned as an outstanding destination for trout anglers.

Recommendations

Although some habitat challenges exist below Croton Dam, the Muskegon River continues to provide an excellent fishery for the stocked Brown and Rainbow Trout, in addition to migratory Steelhead and Chinook Salmon, and native species like Smallmouth Bass, Walleye, and Northern Pike. Therefore, the reach should continue to receive large numbers of stocked trout. In 2020 the recommendation is to continue to annually stock 85,000 (180/acre) Rainbow Trout (Eagle Lake strain) at five different locations, including Croton Dam, the Pine Street access site, the Thornapple Ave. access site, Henning Park, and the Bridge St. public access site. In addition, 70,000 Brown Trout (147/acre) will be stocked at the same five access sites. Steelhead and Coho Salmon are also stocked into the Muskegon River below Croton Dam.

Temperature regimes and flow rates influenced by Croton Dam continue to be the biggest issues facing the lower Muskegon River. At the behest of several natural resource agencies (including MDNR), in 2008-2009, Consumers Energy installed a bubbler/diffuser system in the deepest portion of Croton Pond. This was an attempt to upwell cooler water off the bottom of the impoundment and send it downstream through the turbines. Because Croton Pond is not particularly deep and the supply of cold water is very limited, the bubbler system has had only shown marginal improvements in summer water temperature below the dam. Because temperature and flow regimes are likely the biggest limiting factors for the fishery in this reach, natural resource agencies and anglers should continue to work with Consumers Energy to find ways to improve the temperature and flow regimes coming out of Croton Dam.

References:

O'Neal, R. P. 1997. Muskegon River Watershed Assessment. Special Report 19, Michigan Department of Natural Resources, Fisheries Division, Lansing.

O'Neal, R. P. and T. Kolb. 2015. Muskegon River Angler Survey Report, 1985 - 2005 Croton Dam to Muskegon Lake, With Summaries of Lakes, Impoundments and Other River Sections. Michigan Department of Natural Resources, Fisheries Division, Lansing.



Table 1. Catch results from MDNR spring trout surveys on the Muskegon River, between Croton Dam and the Pine Street access site. Sampling was conducted with an electrofishing boat.

Year	Date	Brown Trout		Rainbow Trout		Flow, CFS
		Number	Length Range	Number	Length Range	
2007	04/02/2007	7	9-15"	48	8-13"	
2008	03/31/2008	3	10-17"	27	9-16"	
2010	03/22/2010	15	10-14"	59	4-15"	
2011	03/29/2011	61	9-13"	67	4-15"	
2012	03/19/2012	26	9-16"	82	7-14"	5200
2013	03/25/2013	118	9-19"	104	5-17"	2450
2014	03/21/2014	13	12-17"	33	12-18"	3940
2015	03/26/2015	4	12-18"	10	5-23"	2380
2016	03/18/2016	23	8-13"	49	5-16"	5000
2017	03/20/2017	32	8-18"	65	3-19"	2800
2018	03/27/2018	38	9-19"	59	4-16"	2200
2019	04/01/2019	23	10-17"	12	11-12"	5500
2022	03/28/2022	41	9-20"	41	6-14"	3500

Table 2. Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from the Muskegon River between Croton Dam and the Pine Street access site by electrofishing. Number of fish aged is given in parenthesis. At least five individuals from any given age group must be caught to make statistical inferences regarding growth.

Year	Month	Species	Age					Mean Growth Index
			I	II	III	IV	V	
2022	March	Rainbow Trout	6.5 (1)	10.3 (1)	12.6 (25)	14.5 (1)		+2.8
		Brown Trout		11.7 (26)	13.3 (5)	14.0 (2)	18.2 (2)	+3.8