Big Creek Impoundment
Crawford County, T28N R01W Sec. 25
Au Sable River Watershed, last surveyed 2018

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Environment

Big Creek Impoundment is a small, 97-acre impoundment in northeastern Crawford County. It is located on the Middle Branch Big Creek approximately 4 miles downstream from its origin at the outlet of West Twin Lake (Figures 1 and 2). Middle Branch Big Creek is a State Designated Natural River within the Au Sable River watershed. The land around the impoundment is entirely within state ownership, and the structure is owned by DNR Fisheries Division.

History

The dam was constructed in 1964 and is maintained by Fisheries Division. The dam has a hydraulic height of 24.5 feet and includes a bottom draw for coldwater discharge with the hopes of providing a trout fishery downstream of the impoundment.

The dam was built to provide greater angling opportunities in the area, and management was initially directed at stocking trout. Legal-sized Brook Trout were stocked in 1965, along with Walleye fry (Table 1). The stocking failed to produce a trout fishery due to the lack of cold water and a developing cool- and warmwater fish community of Largemouth and Smallmouth Bass, Northern Pike, Bluegill, sunfish, and White Sucker. The impoundment soon became a popular year-round fishery. Camping within a quarter mile of the impoundment was banned by Director's order.

The first fisheries data for this location are from a chemical reclamation (complete kill) in September 1964 in the portion of the Middle Branch Big Creek that would affect the proposed Big Creek Impoundment. A total of 1,430 fish were sampled, the majority of which were Redbelly Dace, followed by Mudminnows, Common Shiners, Brook Sticklebacks, Northern Creek Chubs, bullheads, Blacknose Dace, White Suckers, Golden Shiners, and nine Brook Trout.

The next survey was done in 1968 using gill nets. Reported catch included only 15 Chubs, one Yellow Perch, and two Rainbow Trout. Another gillnet survey was conducted through the ice in December 1969, accompanied by hook-and-line sampling. Species captured included Brook Trout (10), Rainbow Trout (13), suckers (14), Chubs (1), Golden Shiners (28), Pumpkinseed (3), Yellow Perch (15), Common Shiners (3), and Largemouth Bass (3). Trout were noted to be very thin and small for their age. Another chemical reclamation was recommended.

The impoundment was first drawn down in April 1970. Fish species captured during the drawdown included perch, suckers, Rainbow Trout, Brook Trout, Brown Trout, and sunfish. The survey was done using electrofishing gear. Another survey was done in August of 1970 using electrofishing gear, which found 11 species of fish, the most numerous being sunfish and suckers. The August survey was conducted to evaluate success of the spring drawdown, chemical treatment, and subsequent plants of

Rainbow Trout and Walleyes. The survey report states that it "looks like a flop to start", since suckers and sunfish remained abundant following the drawdown and chemical reclamation.

A 1972 boat electrofishing survey was done to again evaluate the success of the drawdown and subsequent stocking with Walleyes and Brown Trout. Browns were reportedly doing fair (four were captured during the survey) while the Walleyes were not doing well. The drawdown was done primarily to kill off unwanted fish species. The survey report includes the comment "this impoundment presents a very difficult management situation due to rough fish reinfestation from an untreatable marsh in [the] headwaters."

The next survey was done in 1979, with the purpose being a general fish population survey. A typical coolwater fish community was observed, with Bluegill, Yellow Perch, Pumpkinseed, Largemouth Bass, Northern Pike, and some nongame species such as White Sucker, Brown Bullhead, and Golden Shiner present. Walleye were also captured, which were unexpected, and were thought to have come from fingerling plants in East Twin Lake.

The Impoundment has been managed as a cool- and warm-water fishery since the mid-1970s after trout stocking failed to produce a fishery. Walleye have been stocked in Big Creek Impoundment every two to six years since 1988 (Table 2). Fall Walleye evaluations were done in 1990, 2004, and 2017 (Table 3) using nighttime boat electrofishing. Catch rates ranged from 3.1 age-0 Walleye per hour to 9.3 per hour indicating modest survival of stocked fish. The 1990 survey noted that the Walleye captured (up to 19 inches) were growing slowly and averaged. 1.5 inches smaller than statewide average lengths at age. Some natural reproduction of Walleye was suspected. It should be noted that the 2017 survey was to document survival of the fish stocked following refilling of the impoundment.

Big Creek Dam is owned by Fisheries Division and is regulated under Part 315 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. As a regulated dam, periodic safety inspections by a licensed engineer are required. Over the years, most of the inspections suggested minor repairs, such as mowing or removing woody vegetation from the earthen dam. Other concerns required partial drawdowns, such as seepage through the embankment or erosion along the upstream face of the earthen embankment.

A required dam safety inspection done in 2013 identified some structural concerns with the dam, and an emergency drawdown was ordered. At the time, the impoundment was providing popular fisheries for walleye, pike, and bluegill, and was unique because it could be fished from boat or from shore. Also, given the bottom-draw of the dam, it did not warm the river downstream. For these reasons, Northern Lake Huron Management Unit sought to have the dam repaired rather than removed.

Dam Management Grant funding was sought and awarded in both 2014 and 2015 for the project. Engineering was completed, and the repairs/construction were completed in the fall of 2016. Funding was also received from interested citizens and partners. The 2016 repairs included removal of the existing corrugated steel pipe outlet and end section and construction of a new 48-inch reinforced concrete outlet pipe and end section, flowable fill cradle and seepage collar, filter diaphragm, channel excavation, rip rap, and restoration. Boards were put in place and the impoundment was brought to full pool by spring of 2017. An inspection in the fall of 2016 showed areas near the outlet pipe end

section where water was flowing from either the banks or creek bottom or beside the outlet end section. The engineer for the project said that, based on improvements done in 1968, the flowing water is from the toe drains installed at the time, and that they are functioning as intended. "The flowing water appears to be a result of the constructed downstream toe drains and outlet pipes" (P. Repaski, Wade Trim, letter in Fisheries Division files). Walleye fry were stocked in spring 2017, and a fall Walleye survey was done that year. Walleye were captured during the fall survey (Table 3), indicating that some of the stocked Walleye had survived although the catch rate was low.

For the 2014 Dam Management Grant application, recent angler activity on the impoundment was estimated through anecdotal observations of those familiar with the impoundment and its fishery (approximate number of anglers on the water or ice per day). This rough estimate of angler use indicated that the waterbody received approximately 3600 angler days per year, which may have been an overestimate. The USFWS (2016) estimates an angler-day of freshwater fishing to be worth approximately $30. A rough annual estimate of the economic value of Big Creek Impoundment fishing is $108,000 (2016 dollars). This is angling activity only and doesn't account for waterfowl hunters or other general recreational use.

Current Status

A discretionary survey of Big Creek Impoundment was done on September 24, 2018 to assess the overall status of the fish community. This survey was intended to give a brief look at the fish community composition (species presence) and a general idea of size ranges of fish observed. To accomplish this, the entire shoreline distance of 2.1 miles was surveyed using nighttime electrofishing over a period of 0.94 hours total boomshocking time. Water temperature was 63°F and water clarity was fair to poor.

A total of six (6) species were observed during this survey: Common White Sucker, Northern Pike, Bluegill, Largemouth Bass, Yellow Perch, and Pumpkinseed (Table 2). Bluegill and Yellow Perch were noted to be abundant, with Bluegill ranging in size from 2-8 inches and Yellow Perch ranging from 3-10 inches.

Analysis and Discussion

Overall, the fish community appears to be re-establishing well after the impoundment drawdown and refill. There is a good mix of predators, panfish, and prey species. Game fish appear to be present in some good sizes. Although Walleye were not captured during this fall survey, the Walleye stocking plan for this lake should continue. Angler reports indicate the walleye fishery is popular, and the Walleye also help improve the size structure of the panfish population.

Management Direction

1. Continue to stock 5,000 spring fingerling walleye in Big Creek Impoundment on an alternate-year basis. Monitor to determine if Walleye are performing adequately and not inhibiting panfish fishery.

2. Monitor the fishery using a game camera or postcard creel survey.

3. Monitor amount and condition of outflow to determine suitability for trout below the impoundment.

References

USFWS. 2016. U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

Table 1. Stocking history for Big Creek Impoundment (Crawford County).

Year	Species	Life Stage	Number stocked
1965	Brook Trout	Legal Size	20,785
1965	Walleye	Fry	400,000
1967	Rainbow Trout	Yearling	4,840
1968	Rainbow Trout	Yearling	5,000
1969	Rainbow Trout	Yearling	4,000
1970	Brown Trout	Adult	1,500
1970	Rainbow Trout	Yearling	5,000
1970	Walleye	Fry	294,000
1971	Brown Trout	Yearling	2,500
1972	Brown Trout	Yearling	2,250
1988	Walleye	Spring fingerling	4,500
1990	Walleye	Spring fingerling	4,594
1992	Walleye	Spring fingerling	4,712
1995	Walleye	Spring fingerling	8,981
1999	Walleye	Spring fingerling	9,004
2004	Walleye	Spring fingerling	12,000
2006	Walleye	Spring fingerling	15,100
2012	Walleye	Spring fingerling	6,840
2017	Walleye	Fry	194,000
2019	Walleye	Spring fingerling	7,253

Table 2. List of species observed during the September 24, 2018 survey of Big Creek Impoundment.

Species
Bluegill
Largemouth Bass
Northern Pike
Pumpkinseed
Yellow Perch
White Sucker

Table 3. Effort and catch rates for age-0 Walleye in Fall Walleye Evaluations of Big Creek Impoundment.

Date	Effort (Hours)	Effort (Miles)	# Age-0 Walleye	Age-0 WAE/Hr.	Age-0 WAE/Mi
10/19/1990	3.0	--	20	6.7	--
8/31/2004	1.18	1.9	11	9.3	5.8
9/20/2017	0.96	2.5	3	3.1	1.2

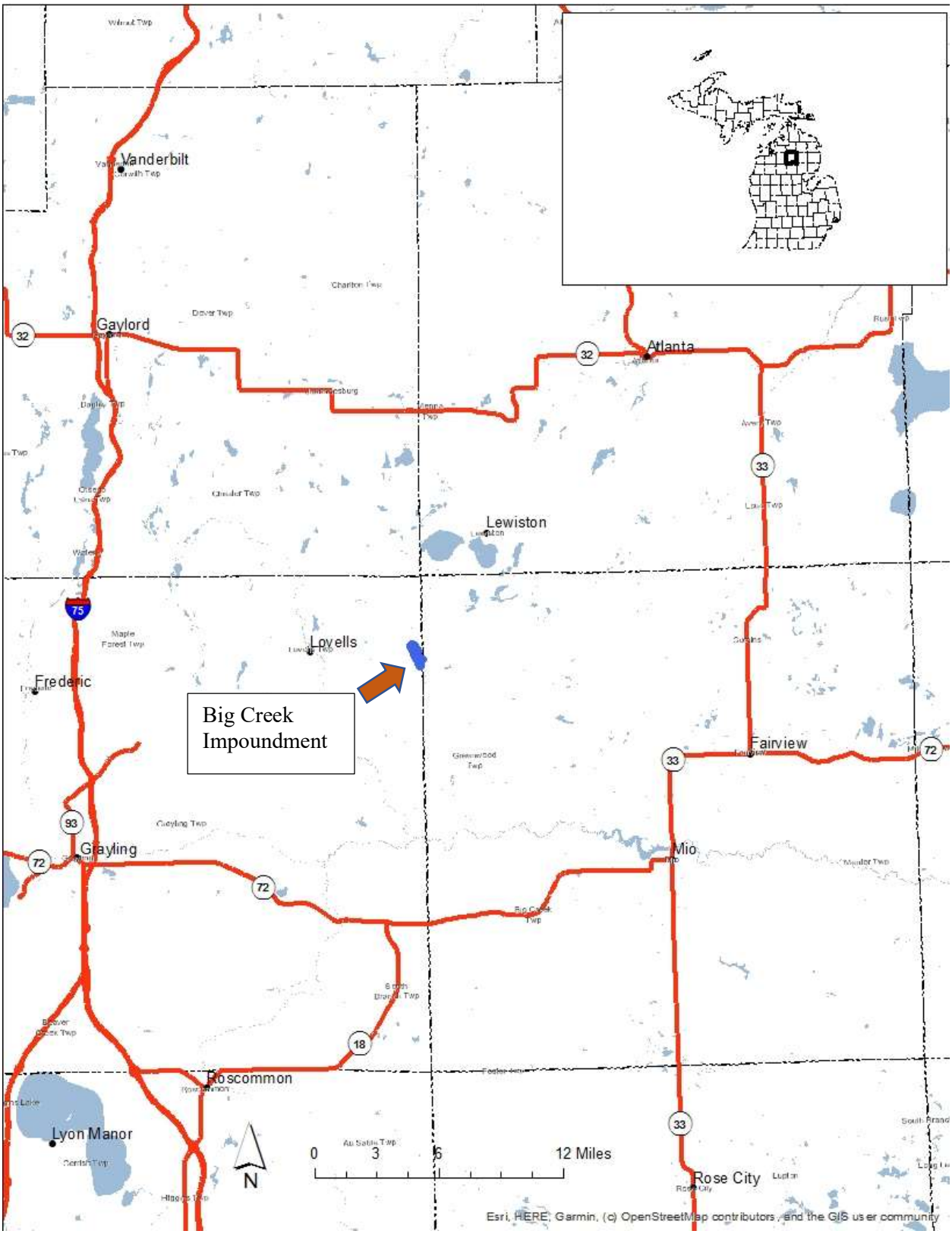

Figure 1. Locator Map for Big Creek Impoundment, Crawford County.

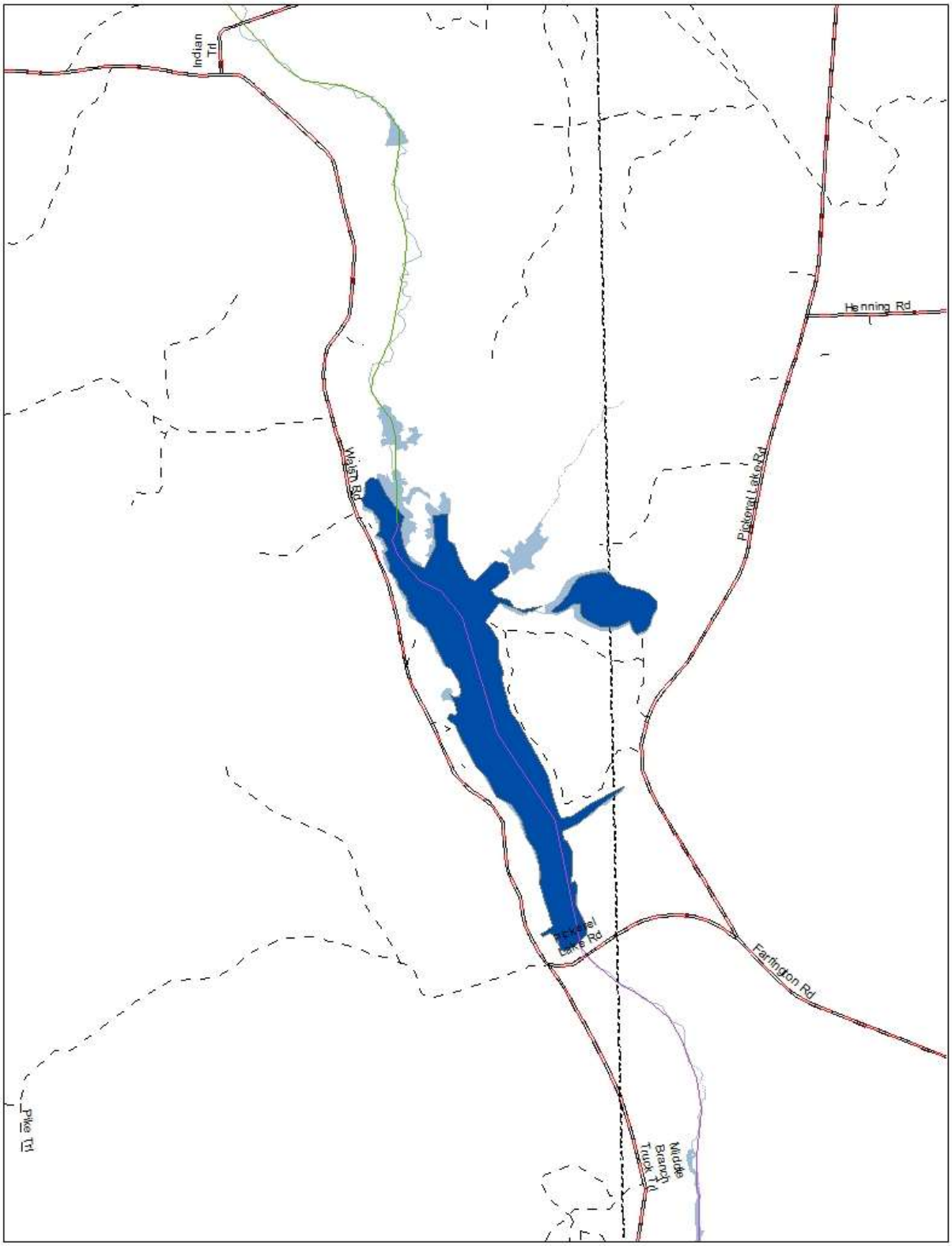

Figure 2. Big Creek Impoundment, Crawford County.

Received May 16, 2022; published July 15, 2022

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Tim Cwalinski, SFR Facilitator

Randall M. Claramunt, Desktop Publisher and Approval