Big Bradford Lake

Otsego and Crawford Counties, T28-29N, R03W, Sec.6, 29, 31, &32
Au Sable River Watershed, last surveyed 2016

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Environment

Big Bradford Lake is a 226-acre lake within the headwaters of the Au Sable River watershed. Most of the lake is in southern Otsego County, but a small portion of the lake extends down into Crawford County (Figure 1). The lake has a perimeter of 4.06 miles and a catchment area of 3,767 acres. Maximum depth is 106 feet (Figure 2). There is an inlet on the north side which comes from Little Bradford Lake; the lake's only outlet is to Bradford Creek on the south end of the lake where there is a lake level control structure. The control structure is operated and maintained by the Otsego County Road Commission at a legal lake level of 1247.0 feet. Bradford Creek joins Kolke Creek to the south to form the mainstem Au Sable River. A boating access site is located on the southeast shoreline of the lake, operated by the Michigan Department of Natural Resources (MDNR) Parks and Recreation Division.

History

Fisheries Management in Big Bradford Lake began in 1968, when Rainbow Trout were first stocked there (Table 1). Rainbow Trout were stocked annually until 1971, again in 1973 and then each year from 1978 through 1981. During this period, about 5,000 to 15,000 yearling Rainbow Trout were stocked each year, except in 1971, when about 15,000 fall fingerlings were stocked as well (Table 1). Approximately 3,000 Rainbow Trout yearlings were stocked each year from 1999-2001.

Big Bradford Lake was first surveyed in May 1970, with the survey consisting of 12 experimental gill-net lifts. An excellent Yellow Perch population was noted. Other species captured include Northern Pike, Walleye, Green Sunfish, Pumpkinseed, Rock Bass, Common White Sucker, and Yellow Bullhead. Yellow Perch were growing slightly above statewide average growth rates, while Northern Pike, Rock Bass, and Pumpkinseed were growing below statewide average.

A gillnet survey was done again in August 1972; this time, nets were straight-run gill nets as follows: 300 feet of 1.5-inch mesh, 300 feet of 2.0-inch mesh, and 900 feet of 2.5-inch mesh. These were all fished for one night. Yellow Perch were abundant, with a mean length of 8.3 inches. The catch also included Rainbow Trout, Northern Pike, Smallmouth Bass, Bluegill, Rock Bass, and Common White Sucker. Rainbow Trout, Yellow Perch, and Bluegill all had above average growth rates, while Smallmouth Bass growth was poor. Of note was Northern Pike growth, which improved from below statewide average in 1970 to averaging 1.3 inches larger than the statewide average length at age in 1972. The pike likely were taking advantage of the stocked Rainbow Trout as a prey item.

Rainbow Trout stocking resumed in 1978, as noted above. A number of property owners were in opposition to trout stocking, but the potential benefit to the general public was considered to be substantial enough to warrant resumption. The compromise was to stock Rainbow Trout at a lower rate than had previously been stocked. A winter creel survey of Big Bradford Lake was done during

the winter of 1978-79. A total of 7,600 angler hours was estimated for January, February, and March on Big Bradford Lake. During this time period, a total of 17,014 fish were harvested, of which Yellow Perch comprised almost 91% of the harvest (Ryckman and Lockwood 1985). Only 32 Rainbow Trout were caught for the season. An estimate of boat angler hours was also done for the months of May-September in 1982 from airplane counts. Boat anglers fished for an estimated 15,239 hours over that time period (Ryckman and Lockwood 1985). This ranked as number eight in term of boating angler hours out of 40 lakes estimated that year in that region of the state.

The next fisheries survey of Big Bradford Lake took place in October 1979. Effort consisted of 12 experimental gill-net lifts. No Rainbow Trout were collected, and it was noted that the stocking effort had failed, and no fishery had developed. Northern Pike were abundant, and the Yellow Perch population was noted to be excellent. A follow-up survey using trap nets and fyke nets to evaluate the warmwater fish population was recommended.

Two surveys were done on Big Bradford Lake in the 1980s. The July 1980 survey consisted of six experimental gill-net lifts and was done to sample the perch population. Yellow Perch were reportedly abundant and of good size. The Rainbow Trout were growing well but were not very abundant. The next year, 1981, the survey purpose was to check on the trout population. Effort consisted of eight experimental gill-net lifts. No trout were collected, but Yellow Perch growth was excellent, with perch averaging 2.5 inches larger than the statewide average. The Northern Pike population had a good size distribution, with individuals large enough to negatively impact the success of the trout stocking program.

The two fisheries surveys done on this lake in the 1990s consisted of a hook-and-line survey and a gill net survey; water temperatures and dissolved oxygen were also measured later in the decade. The hook-and-line survey was done in August 1991 and found both Bluegill and Yellow Perch growth to be below statewide average. The netting survey was done in November 1993, with effort consisting of six experimental gill-net lifts. This survey found that the Northern Pike population had increased significantly, but Yellow Perch numbers were down. Anglers had been complaining about the difficulty in catching perch, and overfishing of perch in recent years was identified as likely a major factor in the decline. Multiple sources reported that large numbers of perch had been harvested over a 2-3-year period. The increased pike population combined with angling harvest were factors reducing the number of preferred sized perch. Temperature and dissolved oxygen were measured along a profile in 106-feet of water in July 1997 and showed a good amount of coldwater habitat. A thermocline formed below 17 feet in depth, with good dissolved oxygen (DO) levels (>8.0 ppm) down to 45 feet in depth. DO dropped below 3 ppm below 75 feet in depth, and to 0.0 ppm at 90 feet.

The first survey of Big Bradford Lake in the next decade took place in August 2000 and was a hook-and-line survey. The survey purpose was to evaluate trout plants, and effort consisted of four anglers fishing for two hours. Unfortunately, no fish were caught.

A netting survey was done in November 2001. Effort consisted of six experimental gill-net lifts for the purpose of evaluating the Rainbow Trout stocking. Northern Pike were the most abundant species in the catch, which also included the wamwater and coolwater fish species common to previous surveys. No Rainbow Trout were caught in the nets, and anglers also reported catching none. The Rainbow Trout stocking program for Bradford Lake was discontinued.

Two netting surveys were done in Big Bradford Lake in 2007: an April survey at ice-out to mark Northern Pike for a population estimate (PE); and a Status and Trends survey done one month later, which also served as the recapture effort for the pike PE. Pike were being evaluated due to angler reports of a diminished Northern Pike fishery, and to get a status of the population, including size structure and growth rates. Survey effort included fyke and trap nets and resulted in 119 individual Northern Pike being captured and marked with a right ventral (RV) fin clip. The population was estimated using the Chapman-Petersen method. The survey estimated 610 adult Northern Pike in Big Bradford Lake, or 2.7 per acre. The estimate of legal (greater than 24-in total length) was 443 pike, or 1.96 per acre. Mean length of Northern Pike in the survey was 24.4 inches, with age classes I-XI represented.

The May 2007 survey effort was a Status and Trends survey in addition to being a recapture phase for the pike PE. Status and Trends is a survey protocol developed by Fisheries Division that standardizes gear and effort statewide based on lake size (Wehrly et al. In Press). Status and Trends allows for spatial and temporal comparisons of catch data. Survey effort for this part of the survey consisted of trap nets, large-mesh fyke nets, small-mesh fyke nets, and experimental gill nets. Overall, the 2007 survey showed a good population of Northern Pike, as well as good numbers of Bluegill and Yellow Perch. The panfish population size structure was comprised of mostly small fish, with overall low predator densities.

Anglers and members of the lake association contacted Northern Lake Huron Management Unit with concerns over increasing numbers of small Bluegill and Rock Bass, and a substantial decrease in the numbers of large yellow perch. In response, Walleye have been stocked in Big Bradford Lake on an alternate year basis since 2012 to help improve the size structure of the panfish populations, as well as to provide a popular fishery.

A boat electrofishing survey was done in September 2012 to evaluate the first year of Walleye stocking in the lake. A total of 12,280 spring fingerling Walleye were stocked in June of that year, averaging 1.54 inches in total length. The fall Walleye evaluation found that the stocked Walleye survived and exhibited excellent growth. The Walleye averaged 1.3 inches longer than the statewide average length-at-age for that species. The initial stocking of Walleye in Big Bradford Lake was successful.

The Bradford Lakes Association annually treats portions of the lake for Eurasian Watermilfoil (EWM), an aquatic invasive plant species. EWM was considered a problem in Big Bradford Lake since 2010, with the first treatment occurring in 2011. An aquatic vegetation survey of the lake was done in 2013 by personnel from the Michigan Department of Environmental Quality (predecessor to the Department of Environment, Great Lakes, and Energy). The survey found 25 species of aquatic plants, with the most common being Chara (R. Crouch, EGLE, personal communication). Initial treatments targeted approximately 8 acres in the lake, while the more recent treatments have been smaller. A total of 4.28 acres were treated in 2019 as spot treatments, mostly around the five-foot depth contour using 2,4-D and triclopyr.

Current Status

2016 Fall Walleye Evaluation

This nighttime boat electrofishing survey was conducted on September 14, 2016, to evaluate the success of the current year planting of approximately 10,000 spring fingerling Walleye. The entire shoreline was surveyed with effort totaling 4.2 miles of shoreline distance over 1.39 hours of shocking time.

A total of 9 age-0 Walleye, ranging in size from 6.9-8.1 inches (Tables 2 and 3), were collected. This corresponds to a catch rate of 2.14 per mile, or 6.5 per hour, which is slightly lower compared to the 2012 results (Table 4). These fish were growing well, with fish appearing in good condition and averaging 0.6 inches longer than the statewide average length-at-age for Walleye. Growth had slowed somewhat from the previous fall Walleye evaluation done in 2012, but they were still growing above statewide average. Other species observed during the survey include Yellow Perch, Smallmouth Bass, Northern Pike, Largemouth Bass, Bluegill, Pumpkinseed Sunfish, Central Mudminnow, and Rock Bass. Rusty crayfish and zebra mussels were also observed during the survey.

Reports from anglers and lake residents from 2017-2020 indicate that Walleye fishing can be good, with fish greater than 20-inches not uncommon The panfish populations appear to have a better size structure subsequent to the Walleye stocking, perhaps due to the predation pressure it provides, with good fishing for Yellow Perch and Bluegill reported.

Analysis and Discussion

Although Walleye catch rates were somewhat low in the 2016 fall Walleye survey, they were still acceptable. The Walleye stocked in Big Bradford Lake in spring 2016 survived and were growing well. Angler catch reports indicate that the Walleye stocking has been successful, and fish are surviving to large sizes. Walleye stocking should be kept at a low level (40 per acre) to ensure that the predator population does not become too large and suppress the panfish population.

Management Direction

1. Continue stocking spring fingerling Walleye into Big Bradford Lake on an alternate-year basis, at a rate of 40 fish per acre.

2. A fish community survey of Big Bradford Lake should be done within the next five years to evaluate the status of the Yellow Perch and Northern Pike populations following about 10 years of Walleye stocking in the lake.

References

Ryckman, J.R., and R.N. Lockwood. 1985. On-site creel surveys in Michigan 1975-82. Michigan Department of Natural Resources, Fisheries Research Report No. 1922, Lansing.

Wehrly, K.E., G.S. Carter, and J.E. Breck. In press. Standardized sampling methods for inland lakes status and trends program. Michigan Department of Natural Resources, Fisheries Special Report, Ann Arbor.

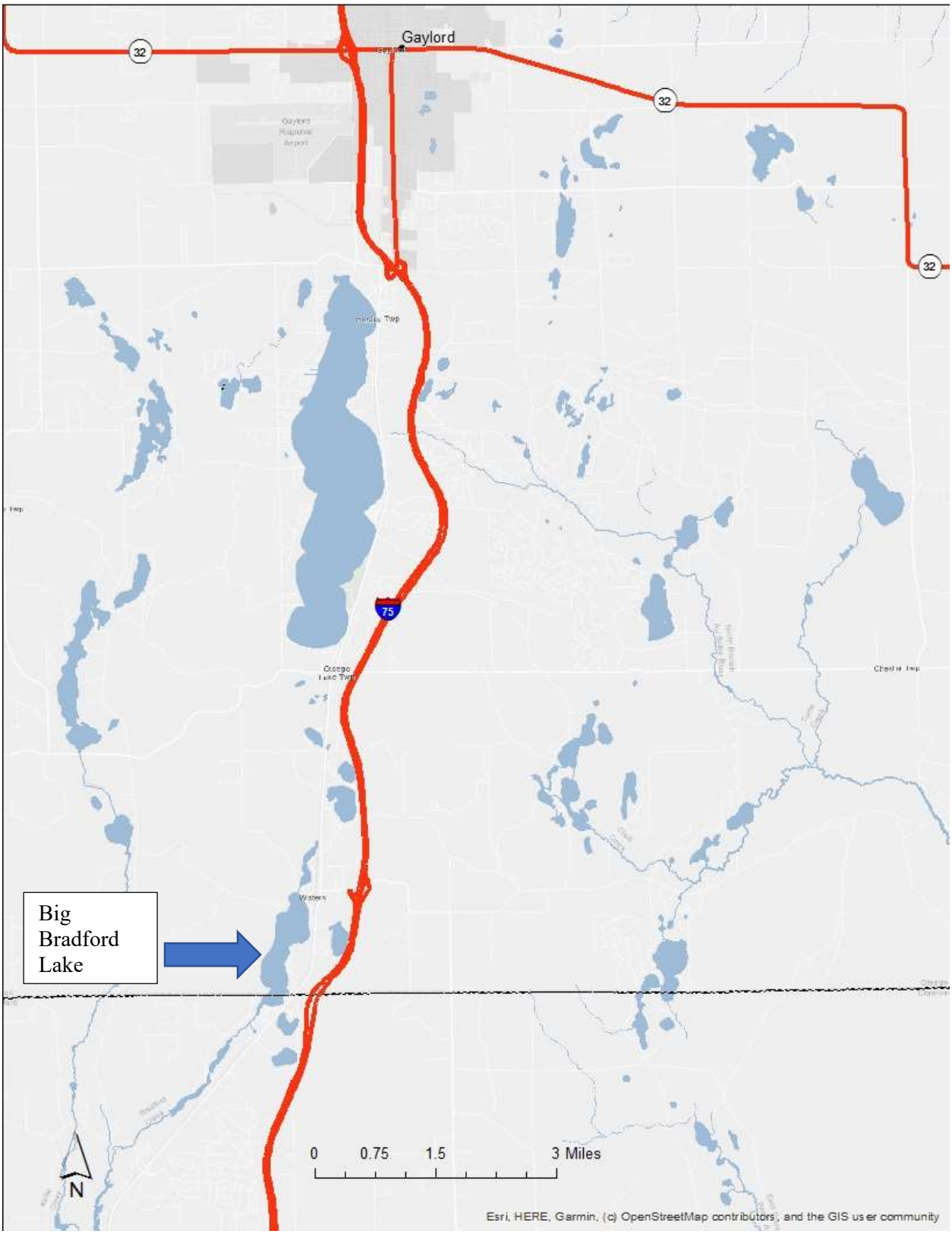

Figure 1. Locator map for Big Bradford Lake, Otsego and Crawford Counties.

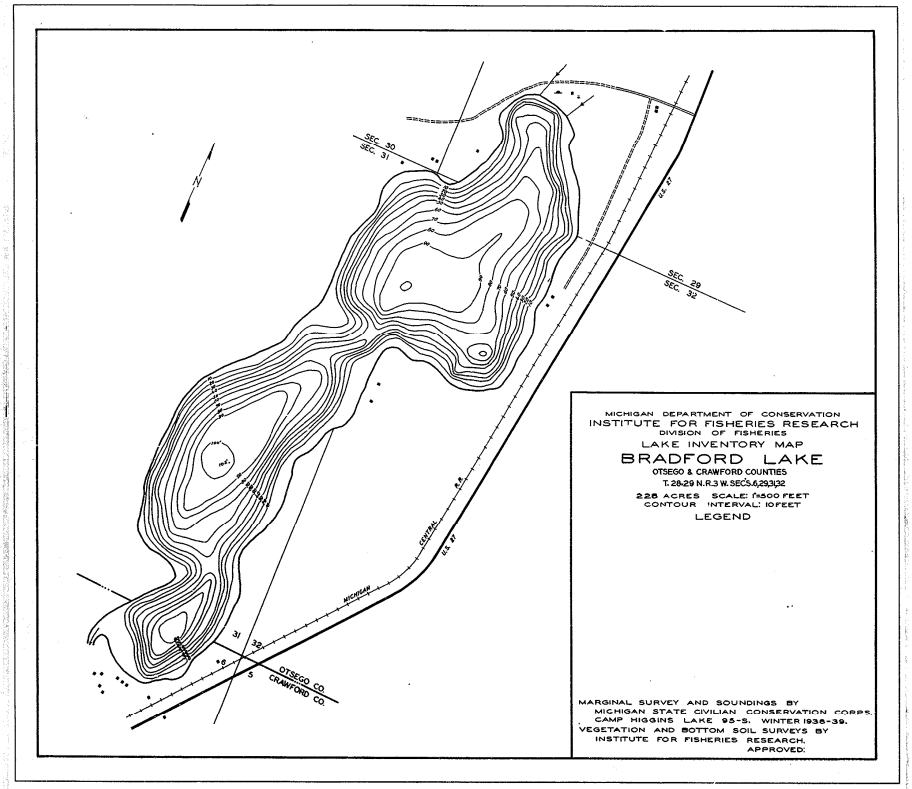

Figure 2. Depth map for Big Bradford Lake, Otsego and Crawford Counties. Contour interval is 10 feet.

Table 1. Stocking history for Big Bradford Lake, Otsego and Crawford Counties.

Year	Species	Strain (if known)	Number stocked	Life stage or average size at stocking (in.)
1968	Rainbow Trout		5,000	Yearling
1969	Rainbow Trout		5,000	Yearling
1970	Rainbow Trout		15,032	Yearling
1971	Rainbow Trout		14,803	Yearling
1971	Rainbow Trout		15,003	Fall Fingerling
1972	--		--	--
1973	Rainbow Trout		15,000	Yearling
1978	Rainbow Trout		5,000	Yearling
1979	Rainbow Trout	Steelhead	5,000	6.16
1980	Rainbow Trout		5,000	7.76
1981	Rainbow Trout	Harrietta	5,000	6.36
1999	Rainbow Trout	Eagle Lake	2,900	6.48
2000	Rainbow Trout	Shasta	3,000	6.72
2001	Rainbow Trout	Eagle Lake	3,000	6.88
2012	Walleye		12,280	1.56
2014	Walleye		9,033	1.62
2016	Walleye		10,230	1.46
2018	Walleye		20,000	1.20

Table 2. Weighted mean length and age composition of Walleye captured during the September 2016 Walleye evaluation of Big Bradford Lake. *Mean growth index is a comparison to statewide average length at age.

Age	No. aged	Length range (in.)	State avg. length (in.)	Weighted mean length (in.)	Mean growth index*
0	9	6.90-8.10	7.1	7.65	+0.6

Table 3. Length-frequency of Walleye captured during the September 2016 Walleye evaluation of Big Bradford Lake.

Inch Group	Number of Walleye Caught
6	1
7	5
8	3

Table 4. Number of age-0 Walleye and catch rates during fall Walleye evaluations at Big Bradford Lake.

Month/Year	Distance shocked (mi)	Time shocked (hrs.)	No. age-0	No./mile	No./hr.
Sept 2012	4.3	1.83	17	3.95	9.3
Sept 2016	4.2	1.39	9	2.14	6.5