High Banks Lake
Chippewa County, T46N R05W, Sec. 24
Pine River watershed, last surveyed 2023

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Environment

High Banks Lake is a small, natural glacial lake located in western Chippewa County, approximately 5 miles east of Strongs Corners (Figure 1). The lake has a surface area of 14 acres and a maximum depth of 42 feet. It is a seepage lake, and thus has no connecting streams or other waters. The catchment area for the lake is 65 acres, with 67% being forested, 15% urban, 10% grass/shrub, and 6% wetland (Figures 2 and 3). Surficial geology of the watershed is 100% coarse textured ice-contact outwash/alluvium (MDNR 2024).

The lake thermally stratifies, with a thermocline forming between 14 and 22 feet of depth in 2020 (Table 1). Dissolved oxygen was supersaturated near the thermocline but drops to below 8 mg/L deeper than 20 feet. High levels of dissolved oxygen provide good summer habitat for trout. Suitable trout habitat occurred between the depths of 16 and 20 feet where temperatures were below 68F and DO was above 8 mg/L. Dissolved oxygen and temperature were measured again during March 2023 to see if there were any concerns about low oxygen levels due to ice and snow cover. Oxygen levels were above 5 mg/L down to 18 feet of depth. Fisheries Division is collecting data at other lakes in the region so that winter oxygen levels may be compared to other trout lakes. There is general agreement that optimal dissolved oxygen concentrations for trout are about 6 or 7 mg/L or higher depending on water temperature (e.g., Raleigh 1982, Dexter and O'Neal 2004, Michigan Water Quality Standards Rule 64 of Part 4 of Act 451). Low dissolved oxygen levels can be lethal to coldwater species such as Rainbow Trout, with studies showing waters are only suitable for trout with dissolved oxygen greater than 4.3 mg/L (Embody 1927) or greater than 5 mg/L (Mills 1971). Saarie et al. (2018) listed a median toxicity value of 2.26 mg/L of dissolved oxygen for coldwater fish. Observed oxygen concentrations at High Banks are not likely affecting overwinter survival of trout but will provide a basis for comparison to other lakes.

The lake has a carry-in access site on the northern end of the lake, maintained by the U.S. Forest Service. About half the lake shoreline is Hiawatha National Forest land, with the other half in private ownership. The shoreline remains relatively natural, with little armoring or development. High Banks Lake is a Designated Trout Lake with Type A trout lake fishing regulations. An important component of Type A regulations is that minnows cannot be used as bait. The purpose of that restriction is to minimize the possibility of introducing a species that may compete with trout.

History

High Banks Lake has a long history of fisheries management, beginning with a survey in 1949 and trout stocking efforts and habitat improvements in the early 1950s. The 1949 survey noted the presence of Yellow Perch (abundant, up to 12 inches in length), Bluegill, and Pumpkinseed Sunfish.

Fishing for bass, Bluegill, and Yellow Perch was reported as fair in 1950. Due to public pressure in Chippewa County for more trout fishing lakes, an experimental stocking of 500 legal-sized Brook Trout

was approved. Chemical reclamation of the lake using rotenone was not supported at that time by the Michigan Department of Conservation and the U.S. Forest Service, but reasons for the opposition were not documented. Rainbow Trout and Brook Trout were stocked throughout the 1950s, and the lake was designated as a trout lake in 1958. At that time, a regulation was put in place to not allow the use of minnows for bait. The purpose of that regulation is to reduce the likelihood of introducing a fish species that would compete with trout.

A total of 51 brush shelters were installed in 1951 to improve fish habitat. A follow-up snorkel survey 10 years later to evaluate the habitat structures found that Rainbow Trout were using the brush shelters.

Notes from throughout the 1950s and 60s indicate good fishing at times for Rainbow and Brook Trout, Rainbow Smelt, Yellow Perch, and bass. The lake received fairly high fishing pressure during that time period. A 1954 ice fishing survey found Brook Trout and Yellow Perch. The lake was chemically reclaimed in 1956, and notes indicate that Yellow Perch, Bluegill, and Largemouth Bass were abundant in the lake prior to the treatment. Numbers and weight of fish collected from the treatment were not recorded, nor was the effectiveness of the treatment described. Fishing for trout likely improved, however, as a conservation officer estimated 100-125 fisherman on High Banks Lake on opening day of trout season in 1962, indicative of the high angling pressure the lake received.

A winter fish kill was reported in April of 1960 by a lake resident. An inspection of the lake the following day by Fisheries Division personnel found 75 dead Rainbow Trout and noted the water to be clean and free of ice. Although lake level was about 18 inches below normal, notes indicate that winter kill was doubtful, due to the deep nature of the lake and that none had been reported previously. No other speculation as to the cause of the death were made. Rapid warmups this time of year, however, can often lead to fish kills.

A gill net survey by MDNR (Michigan Department of Natural Resources) personnel of High Banks Lake in 1966 found Brown Trout (up to 28 inches), Rainbow Trout, and Rainbow Smelt. Catches of large Brown Trout were reported several times in the 1960s, although there is no record of them being stocked there.

Rainbow Trout, White Sucker, and Spottail Shiners were documented in a 1970 survey of the lake by MDNR. Water level was noted to be very high, and the Rainbow Trout were in excellent condition, foraging on Rainbow Smelt and aquatic insects.

Splake, Atlantic Salmon, and several different strains of Rainbow Trout were stocked annually in the 1970s through the 1990s.

Observations throughout 1971 indicated that Rainbow Trout and smelt fishing were fair through the ice. Rainbow Trout fishing improved through the summer, with good catches of fish in the 12-16 inch size category. A ten-pound Brown Trout was caught in January 1971. A 1975 survey found Brook Trout, Rainbow Trout, Yellow Perch, and sucker species. The lake was mapped in 1979.

Rainbow Smelt were by far the most abundant species in a 1980 stocking evaluation survey of High Banks Lake, along with Yellow Perch, sucker species, and Spottail Shiners. The survey writeup recommended a species management change to stocking Splake in 1981 to utilize the Rainbow Smelt

forage base. It was also noted that Rainbow Trout survival in the prior three years had been very poor perhaps due to the presence of competing species.

In addition to stocked Splake and Rainbow Trout, a 1985 survey by MDNR using fyke nets and gill nets found numerous non-trout species, including Pumpkinseed Sunfish, Yellow Perch, sucker species, Common Shiners, and smelt. The 1985 fisheries prescription called for a total chemical reclamation of the lake due to abundant perch and smelt populations in the lake and poor trout survival. Following the reclamation in 1986, the prescription also indicated that 2,800 yearling Rainbow Trout (100/acre) should be stocked annually.

A 1988 gill net survey documented poor Rainbow Trout survival. The survey found three Rainbow Trout and numerous Yellow Perch. Reports of buckets of Rainbow Trout being caught illegally during the prior winter were received. Increased law enforcement for the lake, along with improved signage, were recommended.

A 1993 gill net survey found only Yellow Perch and White Sucker. To improve conditions for trout, a chemical reclamation of the lake was scheduled for 1994. High Banks Lake has been chemically reclaimed three times to remove species competing with trout. The most recent reclamation was in 1994. Other reclamations were done in 1986 and 1956.

A survey by MDNR in 1999 using fyke nets and a shoreline seine haul found Brown Bullheads, White Suckers, and Fathead Minnows in addition to Rainbow Trout. Kamloops strain Rainbow Trout were stocked in 1999, because they had done well in other lakes in the presence of bullhead. Since 2000, stocking has included Eagle Lake strain Rainbow Trout (Table 2).

The fisheries management plan in 2007 called for a reduced stocking to 1,000 yearling Rainbow Trout per year for 2007 and 2008, after which it would return to the prior level of 1,620 trout per year (90/acre).

A netting survey of High Banks Lake was conducted May 29 - June 1, 2007, to evaluate the success of annual Rainbow Trout stocking efforts. MDNR sampling effort consisted of 12 large-mesh fyke-net lifts, and 2 mini-fyke-net lifts. A total of 45 Rainbow Trout were collected during the survey, ranging in size from 7.4 - 19.6 inches in total length. The only other species encountered was Fathead Minnow, of which 72 were caught. Survival and carry-over of stocked Rainbow Trout appeared to be good, with all age groups up to age-IV represented in the catch. Rainbow Trout numbers were well distributed across inch groups, with the proportion of fish caught over 12 inches decreasing, indicating that many of the legal-sized fish were being harvested. Trout growth was good compared to statewide average.

Current Status

A survey of High Banks Lake was conducted in October 2023 by the MDNR Fisheries Division. The survey was done in response to angler complaints about the appearance of small panfish in this lake that has traditionally been managed as a trout lake. Angler complaints indicated that they could not catch trout because the panfish were biting before trout had the opportunity. Survey effort consisted of 2 experimental gill-net lifts, 1 large-mesh fyke-net lift, 2 small-mesh fyke-net lifts, and 2 straight-run gill-net lifts (one 2.5-inch mesh net and one 3-inch mesh net).

During the 2023 survey of High Banks Lake, a total of 231 fish were captured representing five species (Table 3). Pumpkinseed dominated the catch numerically, but Rainbow Trout were dominant in biomass and weight (Table 3). The Pumpkinseed catch consisted of small individuals, from 2-5 inches in total length, up to age-5. Rainbow Trout were present from 10-16 inches in total length, representing three age classes (ages 1-3) (Table 4).

Analysis and Discussion

Angler reports were verified that panfish (Pumpkinseed) are indeed present in the lake. These panfish may be the result of someone disposing of bait containing Pumpkinseed, or someone intentionally stocking them. Since there are no inlets or outlets to this lake, the natural introduction of this species to the lake is unlikely. The use of bait is not allowed in this lake, as it has Type A trout regulations. Regardless of the source of the Pumpkinseed introduction, it may interfere with the trout management in the lake and with the trout fishing experience.

The Rainbow Trout population appears to be healthy. Three age classes (ages 1, 2, and 3) were collected, indicating there continues to be summer holdover/overwinter survival. Despite the short duration of the survey and minimal gear deployed, numbers of trout captured were acceptable. Not enough fish from each age class were collected to calculate a growth index, but the Rainbow Trout were generally around statewide average lengths-at-age, with a few fish above and below average. The previous stocking evaluation, done in 2007, also included an age-4 fish in the catch, but that survey had more effort. It is difficult to compare the present survey to prior surveys, however, due to the short duration of this survey and the different gear types used.

Pumpkinseed were abundant in small sizes. All Pumpkinseed were in the 2-5 inch range, with most of them in the 2-inch group. These were growing below the statewide average lengths-at-age for this species. No Pumpkinseed of acceptable size to most anglers were captured. Conditions in this trout lake allow for Pumpkinseed to survive and reproduce, but they do not grow well. Although the lake has been chemically reclaimed in the past, that is not a currently viable option due to high cost of treatment and the limited number of staff available.

Management Direction

1. Continue to stock Rainbow Trout in High Banks Lake at the levels identified in the stocking request. This level is 1,620 yearling Rainbow Trout per year, or 90/acre. The fish are surviving well and have traditionally provided a popular fishery.
2. Pursue changing to Type B Trout Lake regulations. This would allow for year-round fishing, increasing angling opportunities. A primary reason for the Type A regulations was to not allow live bait, limiting the potential for other species to be introduced. Based on this survey, there are already other species present in the lake so that risk is not as relevant.
3. The unimproved ramp/access site should be improved. At the time of the survey, there was considerable rutting/erosion occurring at the site, making it difficult to launch a small craft.

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Table 1. Temperature and dissolved oxygen measurements in High Banks Lake (Chippewa County) on August 8, 2020.

Depth (ft)	Temperature (F)	Dissolved Oxygen (mg/L)
0	72.7	8.6
2	72.7	8.6
4	72.7	8.6
6	72.7	8.6
8	72.5	8.7
10	72.2	8.5
12	71.8	8.5
14	70.8	8.8
16	65.8	11.6
18	61.7	11.7
20	57.7	8.1
22	55.3	4.8
24	53.7	2.6
26	52.6	1.1
28	51.5	0.3
30	50.6	0.1
32	49.8	0.1
34	48.9	0.1
36	48.1	0.1
38	47.7	0.1
40	47.3	0.1
42	47.1	0.1

Table 2. Recent stocking history of High Banks Lake, Chippewa County. All Rainbow Trout stocked were yearlings.

Date	Species - Strain	Number	Avg. Length (in)
04/25/2001	Rainbow Trout – Eagle Lake	1,500	7.2
05/02/2001	Rainbow Trout – Eagle Lake	900	6.8
05/01/2002	Rainbow Trout – Eagle Lake	2,400	7.4
05/05/2003	Rainbow Trout – Eagle Lake	2,300	7.4
04/22/2004	Rainbow Trout – Eagle Lake	2,250	6.1
05/06/2004	Rainbow Trout – Eagle Lake	150	6.1
05/02/2005	Rainbow Trout – Eagle Lake	2,640	6.4
04/24/2006	Rainbow Trout – Eagle Lake	1,900	6.5
05/09/2007	Rainbow Trout – Eagle Lake	1,000	6.5
05/12/2008	Rainbow Trout – Eagle Lake	1,000	8.4
04/30/2009	Rainbow Trout – Eagle Lake	1,900	7.1
11/02/2009	Brook Trout – Assinica	1,998	6.4
04/22/2010	Rainbow Trout – Eagle Lake	1,849	6.4
05/06/2011	Rainbow Trout – Eagle Lake	1,900	6.8
05/03/2012	Rainbow Trout – Eagle Lake	1,700	6.6
05/23/2013	Rainbow Trout – Eagle Lake	1,458	7.2
06/04/2014	Rainbow Trout – Eagle Lake	1,564	7.9
04/30/2015	Rainbow Trout – Eagle Lake	1,782	6.6
05/10/2016	Rainbow Trout – Eagle Lake	1,620	6.2
05/17/2017	Rainbow Trout – Eagle Lake	1,604	7.5
05/22/2018	Rainbow Trout – Eagle Lake	1,620	7.5
05/21/2019	Rainbow Trout – Eagle Lake	1,782	7.8
05/11/2020	Rainbow Trout – Eagle Lake	1,300	7.9
05/06/2021	Rainbow Trout – Eagle Lake	1,458	8.4
05/16/2022	Rainbow Trout – Eagle Lake	1,458	8.1
5/11/2023	Rainbow Trout – Eagle Lake	1,500	7.8

Table 3. Number, weight, and length by species of fish captured during the October 2023 survey of High Banks Lake, Chippewa County.

Species	Number	Percent by Number	Weight (lb.)	Percent by Weight	Length Range (in.)	Average Length (in.)
Pumpkinseed	147	63.6	2.8	11.9	2-5	3.7
Bluntnose Minnow	36	15.6	0.3	1.2	1-3	2.6
Rainbow Trout	29	12.6	20.5	86.1	10-16	12.6
Common Shiner	11	4.8	0.1	0.3	2-3	2.6
Northern Redbelly Dace	8	3.5	0.1	0.5	2-4	3.1

Table 4. Length-frequency of Rainbow Trout and Pumpkinseed collected during the October 2023 survey of High Banks Lake, Chippewa County. Ages are in parentheses.

Inch Group	Rainbow Trout	Pumpkinseed
2		112
3		25
4		7 (III)
5		3 (IV)
6		
7		
8		
9		
10	4 (I)	
11	8 (I, II)	
12	11 (I, II)	
13	1 (II)	
14	2 (II)	
15	2 (II)	
16	1 (III)	

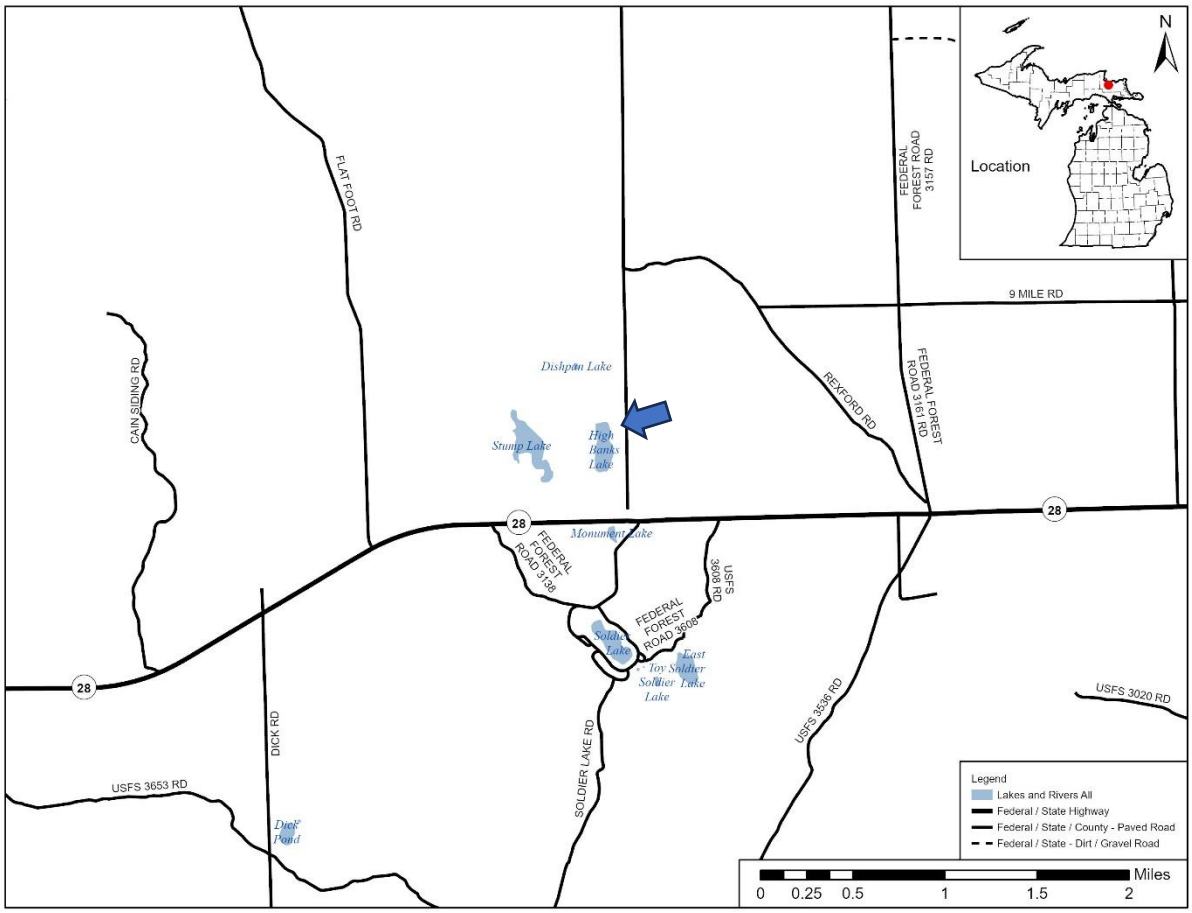

Figure 1. Locator map for High Banks Lake, Chippewa County.

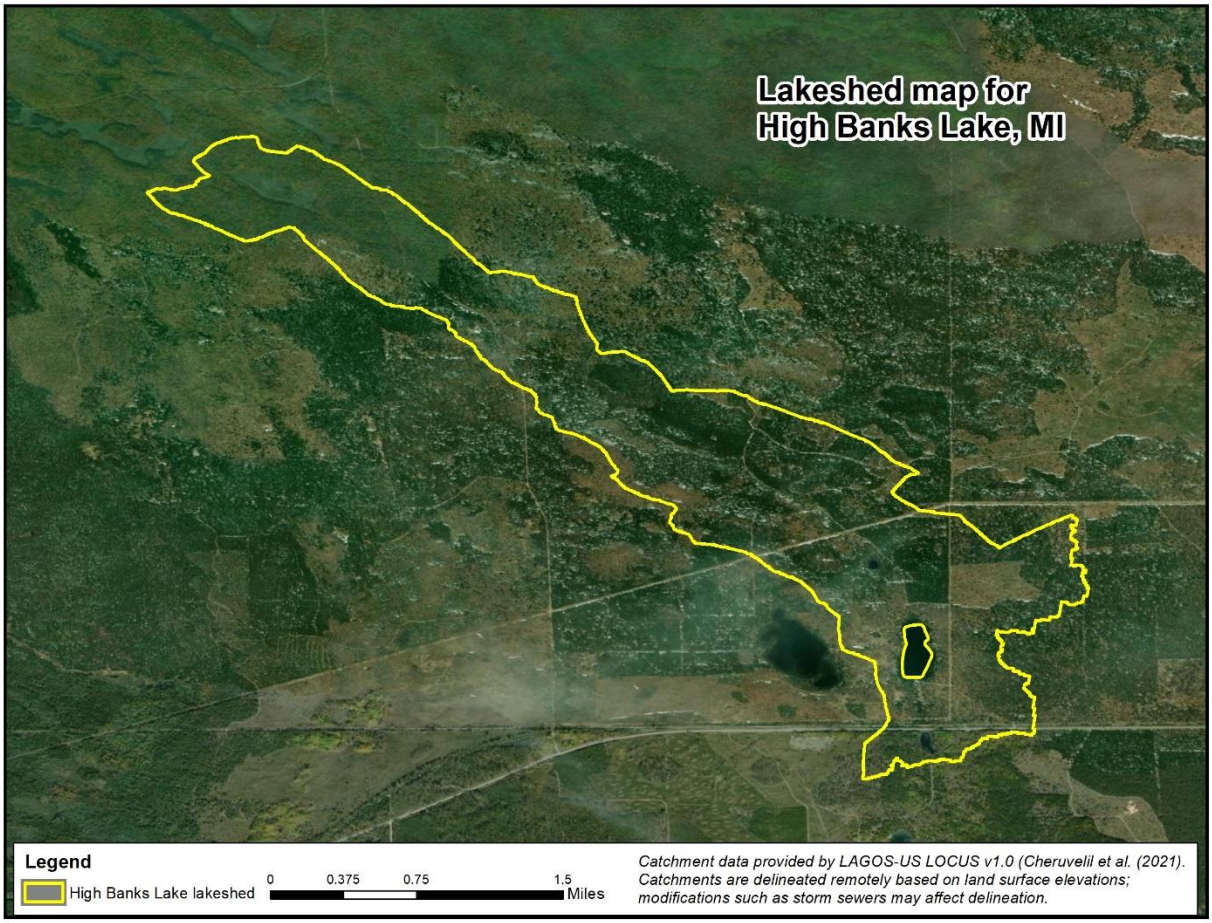

Figure 2. Map of High Banks Lake catchment (Cheruvelil et al. 2021).

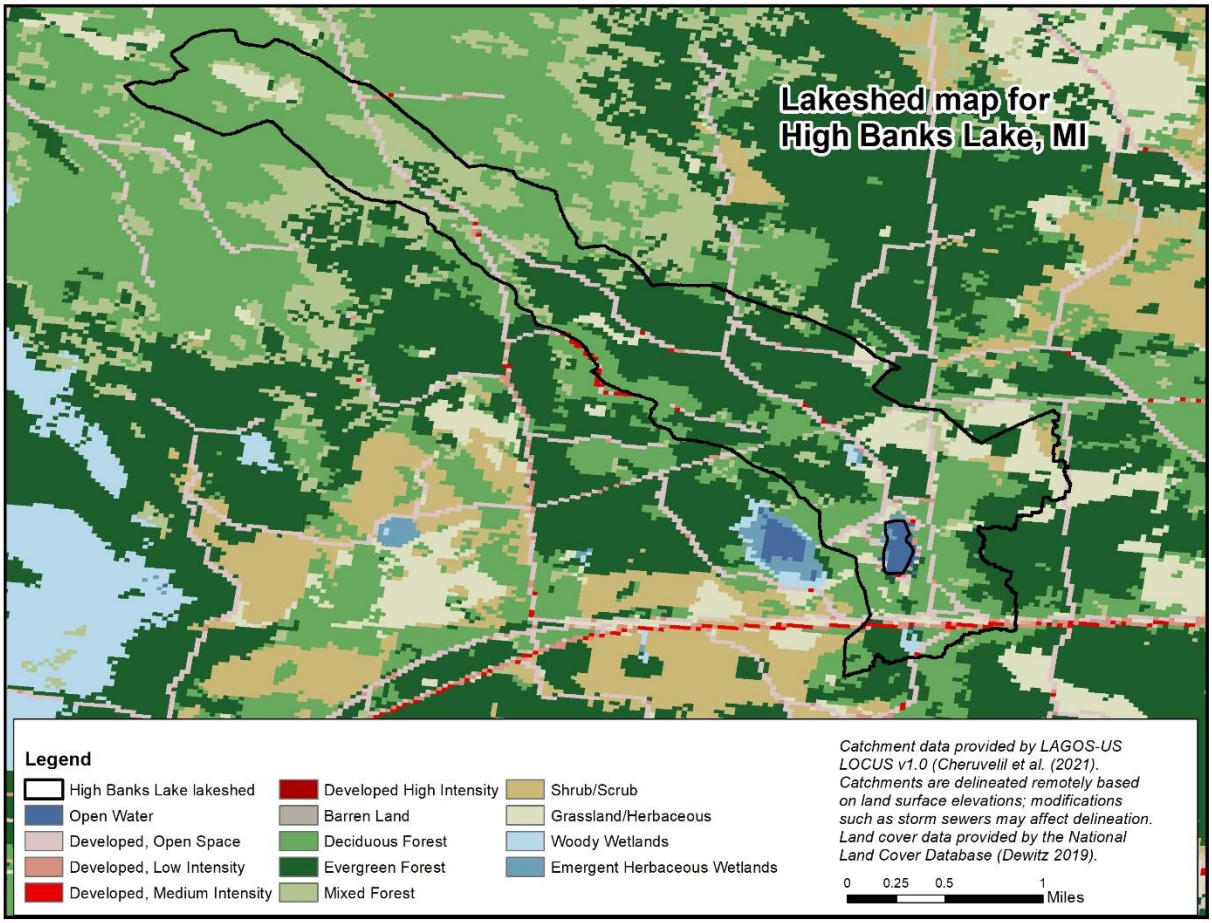

Figure 3. Land cover map of High Banks Lake watershed (Chervelil et al. 2021 and Dewitz 2019).

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