Round Lake
Emmet County, T35N R05W S26
Cheboygan River watershed, last surveyed 2024

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Environment

Round Lake is a 353-acre natural lake in the upper Cheboygan River watershed. It is located in western Emmet County near the towns of Petoskey and Harbor Springs (Figure 1). Although it is situated less than a mile from Lake Michigan, it is part of the Cheboygan River watershed and drains to Lake Huron. Round Lake has a maximum depth of 15 feet, and 70% of the lake is less than 7 feet deep (Figure 2). The lake has a shoreline perimeter of 3.28 miles. The contributing watershed area of Round Lake is approximately 2400 acres and is composed primarily of forest (31%), urban (25%), wetland (20%), and agriculture and grassland (10% each) (Figures 3 and 4).

Round Lake does not thermally stratify (Table 1), as summer water temperatures stay relatively uniform from surface to the bottom of the lake. Temperature and dissolved oxygen were measured along a profile on August 8, 2024, when temperature was 77.4°F at the surface and 76.8°F at 14 feet in depth. Dissolved oxygen levels were also similar throughout the water column, ranging from 10.2 ppm at the surface to 10.0 ppm at the bottom. There was a total of 54 dwellings adjacent to the lake, with varying levels of shoreline armoring (0-100%). A total of 9 small docks and 24 large docks were observed during the August survey period. Nearshore habitat was also variable, with a total of 107 submerged trees counted, with a range of 0 to 41 trees per shoreline segment.

Water samples were also collected on August 8, 2024, and analyzed for limnological parameters (Table 2). The observed low values for total phosphorus, alkalinity, and Chlorophyll-a are indicative of fairly low productivity.

There is a hard-surfaced boating access site at the northeast side of the lake. The access site is administered by Michigan Department of Natural Resources (MDNR) Parks and Recreation Division and has parking for five vehicles.

History

Early fisheries management in Round Lake consisted primarily of stocking. Yellow Perch were stocked in 1930 by the Michigan Department of Conservation (which later became the MDNR). Varying numbers of Yellow Perch, Smallmouth Bass, Largemouth Bass, and Bluegill were stocked in Round Lake through the mid-1940s. Walleye were first stocked in this lake in 1957 but were not stocked again until 1991. Additional Walleye spring fingerling stocking was conducted in 1995, 1996, and 1998 by MDNR. Little Traverse Bay Bands of Odawa Indians (LTBB) stocked Walleye fry in Round Lake in 2018, the most recent stocking to occur in the lake. Round Lake is classified as a Type 1 Lake in the MDNR Walleye management plan. Type 1 lakes are a low priority for walleye management because of low habitat suitability and high vulnerability to climate change (Herbst et al. 2021).

The first survey of Round Lake was done by the Michigan Department of Conservation in July 1957. Effort consisted of a number of seine hauls and 15 experimental gill net sets. A typical warmwater fish community was documented, with Northern Pike, Largemouth Bass, Bluegill, Pumpkinseed, Rock Bass, White Sucker, and Brown and Yellow Bullhead in the catch, along with a variety of minnow and darter species. A total of eight Walleye were also captured. Survey notes indicate that Northern Pike were abundant, along with an abundance of food for pike. Aquatic vegetation was inventoried in 1957 as well. Fourteen different species of aquatic plants were documented in different parts of the lake, with chara (also called skunkweed or muskgrass) noted to be present in most of the lake.

Round Lake was next surveyed by the Michigan Department of Conservation in July 1959 using six experimental gill nets. Game fish encountered in this survey that were described as abundant include Bluegill, Pumpkinseed, and Northern Pike. Game fish noted to be common in the lake include Yellow Perch, Rock Bass, Largemouth Bass, and Walleye. Smallmouth Bass were relatively rare in this survey. Various forage fish were also documented, along with Bowfin.

The next fisheries survey of Round Lake was done in July 1968 by the Michigan Department of Conservation using experimental gill nets. A fish community was found similar to that of previous surveys. A total of 9 Walleye 9 - 20 inches in total length were captured, with a survey note indicating natural reproduction of Walleye.

A fish community survey was conducted by LTBB in 2009 using fyke nets, electrofishing, and seines. Sport fish common in that survey included Bluegill, Pumpkinseed, Largemouth Bass, Yellow Perch, Northern Pike, and Smallmouth Bass. Five species of small-bodied preyfish were also encountered during that survey including Spottail Shiner, Sand Shiner, Johnny Darter, Common Shiner, and Banded Killifish. A fall juvenile Walleye evaluation was also conducteed by LTBB in 2009 with electrofishing gear, but no Walleye were captured.

Tip of the Mitt Watershed Council was contracted by Pickerel-Crooked Lakes Association to do an aquatic vegetation survey of Pickerel, Crooked, and Round Lakes in 2014 and 2015 (Cronk et al. 2015). A total of 20 different aquatic plant taxa were identified in Round Lake during this survey. Native Muskgrass, Slender Naiad, Variable Pondweed, and Northern Watermilfoil were the most common plants found. Overall, most sites had light density growth of vegetation, but some areas had moderate to heavy growth. No aquatic invasive species were documented in Round Lake during this vegetation survey.

Current Status

DNR Fisheries Division staff surveyed Round Lake May 29-June 5, 2024, using Status and Trends survey protocols. Status and Trends is a survey protocol developed by Fisheries Division to standardize gear and effort as a function of lake size and to allow for temporal and spatial comparisons of survey data (Wehrly et al. In Press). Effort consisted of 12 large-mesh fyke-net lifts, 4 small-mesh fyke-net lifts, 4 experimental gill-net lifts, 4 seine hauls, and 3 ten-minute boom-shocking runs.

A total of 4,845 fish were captured representing 22 species (Table 3). Sportfish species encountered include Bluegill, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass, Walleye, and Yellow Perch.

The predator community in Round Lake was comprised of Largemouth Bass, Northern Pike, Longnose Gar, Smallmouth Bass, Bowfin, and Walleye (in decreasing order of abundance in the catch). Although Largemouth Bass were most abundant numerically, Northern Pike had the most biomass (weight) of the predators, making up 24% of the total catch biomass. Predators made up almost 58% of the overall catch by weight. Northern Pike had a good size distribution, with fish from 12 inches to 33 inches in total length (Table 4). Northern Pike were represented by nine age classes (up to age-10, Table 5) and had a growth index of -0.4, meaning on average Northern Pike growth rates were slightly below statewide average. Twenty-six percent of the Northern Pike captured were of legal size (24 inches or larger). Largemouth Bass were represented by seven age classes (up to age-7, Table 5) and had a growth index of -0.2, meaning they were also growing slightly below the statewide average for this species. Twelve percent of the Largemouth Bass captured were of legal size (14 inches or larger). Smallmouth Bass were represented by five age classes in the catch (up to age-8, Table 5) and had a growth rate of +0.2, meaning they were growing slightly above the statewide average. Eighteen percent of the Smallmouth Bass captured were of legal size (14 inches or larger).

The panfish community of Round Lake was represented by Bluegill, Rock Bass, Pumpkinseed, Hybrid Sunfish, and Yellow Perch. Bluegill were the dominant panfish species, comprising 32.5% of the numerical catch overall and 14.5% of the biomass. The panfish community comprised about 38% of the overall catch by weight. Although most of the Bluegill captured were less than four inches in length, fish in the seven- and eight-inch size range were well represented. Pumpkinseed were also captured in the 7-9-inch range (Table 4). Growth rates for all panfish species were acceptable, with Yellow Perch growing slowest with an average length about 0.5-in smaller than the statewide average length-at-age. Bluegill and Pumpkinseed were present in ages up to 7 and 8, respectively (Table 5).

The preyfish community was represented by nine species, including Mimic Shiner, Sand Shiner, Bluntnose Minnow, Blacknose Shiner, Banded Killifish, Common Shiner, Round Goby, Central Mudminnow, and White Sucker. All these species are native except for Round Goby. Mimic Shiner and Sand Shiner were the most abundant preyfish species captured, together comprising almost 44% of the numerical catch, but only 1.2% of the catch by weight.

Analysis and Discussion

Round Lake has a warmwater bass-panfish fish community typical of a shallow, medium-size natural lake in northern Michigan. It can be characterized as follows:

The predator community is diverse for a northern Michigan inland lake and dominated by Largemouth Bass and Northern Pike, both of which were growing slightly below average. The fish community is slightly predator-heavy, but there is adequate forage for these species to be growing at about the state average growth rate.

The panfish community is diverse and healthy, with all species growing at about state average growth rates. Bluegill and Pumpkinseed are common in catchable sizes, but they are only present up to the 8- or 9-inch size class. Larger fish are likely harvested/cropped off by anglers.

Management Direction

1. Round Lake is a medium-sized lake that is fairly shallow. It provides a decent panfish fishery, especially for Pumpkinseed and Bluegill, and fair fishing for Northern Pike, Smallmouth Bass, and Largemouth Bass. Current statewide fishing regulations are appropriate for this lake. Round Lake is

appropriately classified as a Type 1 Walleye lake. Walleye stocking is not needed here due to the size of the lake, the poor habitat suitability for Walleye, and the presence of an acceptable fish community.

References

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Table 1. Temperature and dissolved oxygen profile of Round Lake, Emmet County, measured on August 8, 2024, at 12:55 p.m.

Depth (ft.)	Temperature (°F)	Oxygen (ppm)
0	77.4	10.2
1	77.4	10.1
2	77.4	10.3
3	77.4	10.3
4	77.4	10.3
5	77.4	10.3
6	77.3	10.5
7	77.3	10.5
8	77.1	10.2
9	77.0	10.2
10	77.0	10.0
11	76.8	10.0
12	76.8	10.0
13	76.8	10.1
14	76.8	10.0

Table 2. Water chemistry measurements from samples collected from Round Lake, Emmet County, on August 8, 2024.

Parameter	Unit	Surface Reading
Alkalinity, Total	mg/L	96
Ammonia	mg/L	0.043
Chlorophyl a	ug/L	1.7
Nitrogen, nitrate + nitrite	mg/L	0.003
Nitrogen, Total Kjeldahl	mg/L	0.316
Phosphorus, Total	mg/L	0.003

Table 3. Number, weight, and length by species of fish captured in Round Lake, Emmet County, during the May-June 2024 survey. *Mean growth rate refers to the relative difference between observed lengths-at-age compared to the statewide average lengths-at-age for the species in inches.

Species	Number	Percent by Number	Weight (lb.)	Percent by Weight	Length Range (in.)	Mean Growth Rate*
Banded Killifish	21	0.4	0.1	0	1-2	--
Bluegill	1,577	32.5	84.9	14.5	1-8	-0.2
Bluntnose Minnow	60	1.2	0.3	0.1	1-3	--
Blacknose Shiner	52	1.1	0.2	0	1-2	--
Bowfin	9	0.2	39	6.7	20-24	--
Brown Bullhead	5	0.1	5.2	0.9	11-13	--
Common Shiner	5	0.1	0	0	1-2	--
White Sucker	1	0	1.8	0.3	16-16	--
Hybrid Sunfish	27	0.6	5.5	0.9	3-8	--
Largemouth Bass	129	2.7	65.2	11.2	3-17	-1.1
Longnose Gar	23	0.5	62.2	10.6	14-37	--
Mimic Shiner	1,267	26.2	4.4	0.7	1-2	--
Central Mudminnow	1	0	0	0	2-2	--
Northern Pike	54	1.1	140.2	24	12-33	-0.4
Pumpkinseed	346	7.1	76.2	13	2-9	-0.1
Round Goby	4	0.1	0	0	1-3	--
Rock Bass	369	7.6	53.1	9.1	2-11	--
Sand Shiner	842	17.4	2.9	0.5	1-2	--
Smallmouth Bass	22	0.5	23.7	4.1	3-18	-0.1
Walleye	2	0	5.6	1	20-20	--
Yellow Perch	8	0.2	0.4	0.1	2-6	-0.5
Yellow Bullhead	21	0.4	13.4	2.3	8-14	--

Table 4. Length frequency of select fish species captured during the May-June 2024 survey of Round Lake, Emmet County.

Inch Group	Bluegill	Largemouth Bass	Northern Pike	Pumpkinseed	Smallmouth Bass	Yellow Perch
1	5					
2	221			3		1
3	528	3		10	2	3
4	693			39	1	1
5	57	10		69		1
6	29	31		136		2
7	22	7		82		
8	22	13		5		
9		20		2	2	
10		20			2	
11		7			4	
12		3	1		5	
13			1		2	
14		11			1	
15		2				
16		1	1			
17		1	3		1	
18			3		2	
19			5			
20			5			
21			6			
22			9			
23			6			
24			4			
25			4			
26			1			
27			2			
28						
29			2			
30						
31						
32						
33			1			

Table 5. Mean length (inches) at age for various game fishes of Round Lake (Emmet County) from the 2024 Status and Trends survey. Number in parentheses represents the number aged. Growth comparison was across ages.

Species	Age Group	Mean Length (No. Aged)	Growth Compared to State Average
Bluegill			+0.2
	I	2.3 (8)	
	II	3.4 (16)	
	III	4.3 (8)	
	IV	5.7 (20)	
	V	7.5 (11)	
	VI	8.3 (7)	
	VII	8.7 (3)	
Largemouth Bass			-0.2
	I	3.7 (3)	
	II	6.2 (25)	
	III	9.4 (26)	
	IV	10.5 (19)	
	V	14.6 (10)	
	VI	15.6 (2)	
	VII	16.6 (2)	
Northern Pike			-0.4
	I	13.1 (2)	
	II	17.8 (7)	
	III	20.2 (13)	
	IV	22.7 (18)	
	V	25.0 (6)	
	VI	29.3 (1)	
	VII	26.4 (1)	
	VIII	27.5 (2)	
	X	31.8 (2)	
Pumpkinseed			+0.1
	I	2.1 (1)	
	II	3.2 (5)	
	III	4.5 (14)	
	IV	6.0 (14)	
	V	6.7 (9)	
	VI	7.4 (4)	
	VII	7.9 (5)	
	VIII	8.9 (4)	
Smallmouth Bass			+0.2
	I	3.9 (3)	
	III	11.0 (11)	
	IV	12.9 (4)	
	V	14.8 (1)	
	VIII	18.2 (3)	
Walleye			--
	VII	20.5 (2)	

Table 5. -cont.

Yellow Perch			--
	I	3.1 (3)	
	II	5.2 (5)	

Figure 1. Locator map for Round Lake, Emmet County.

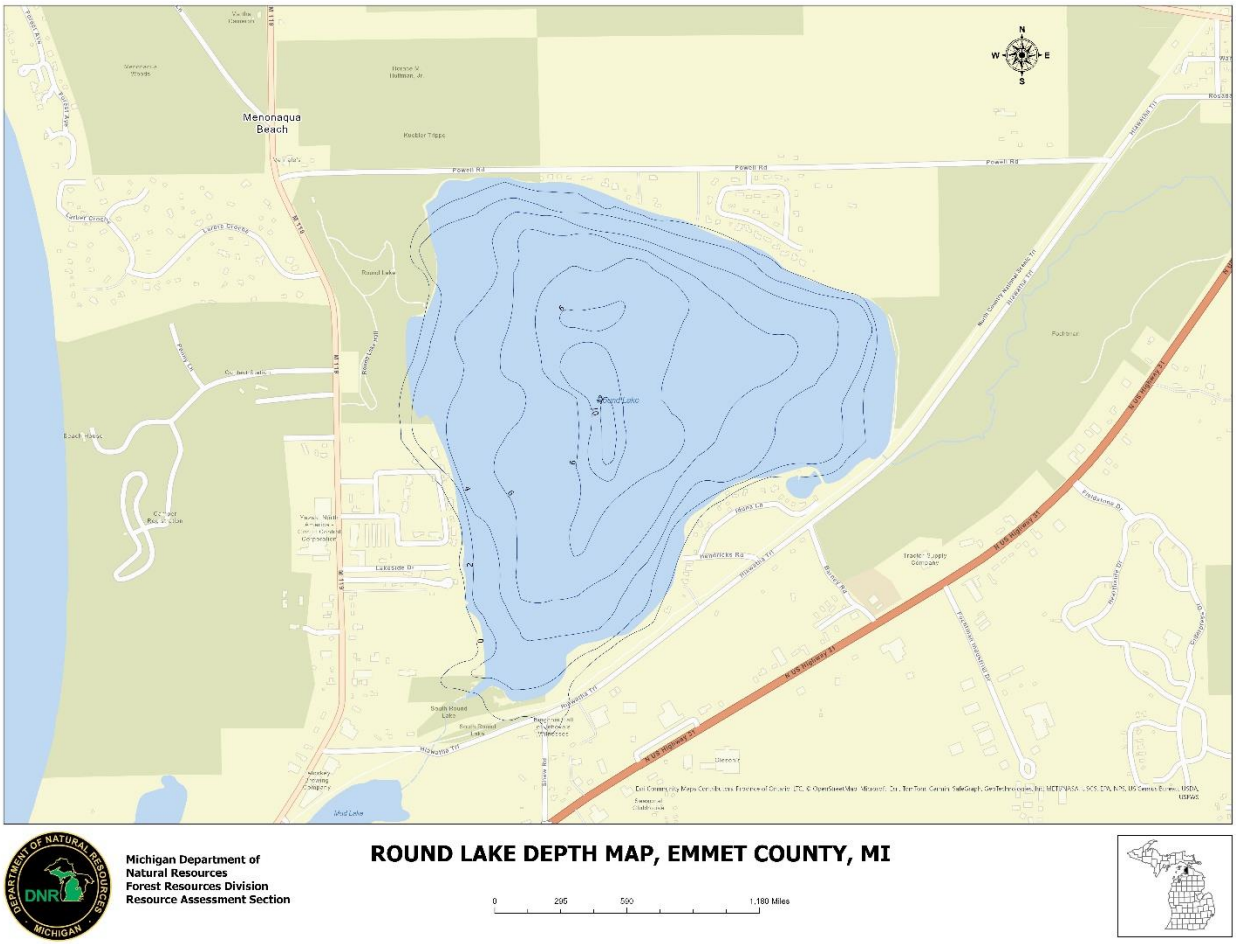

Figure 2. Depth map for Round Lake, Emmet County. Contour interval is 2 feet.

Figure 3. Contributing watershed of Round Lake, Emmet County.

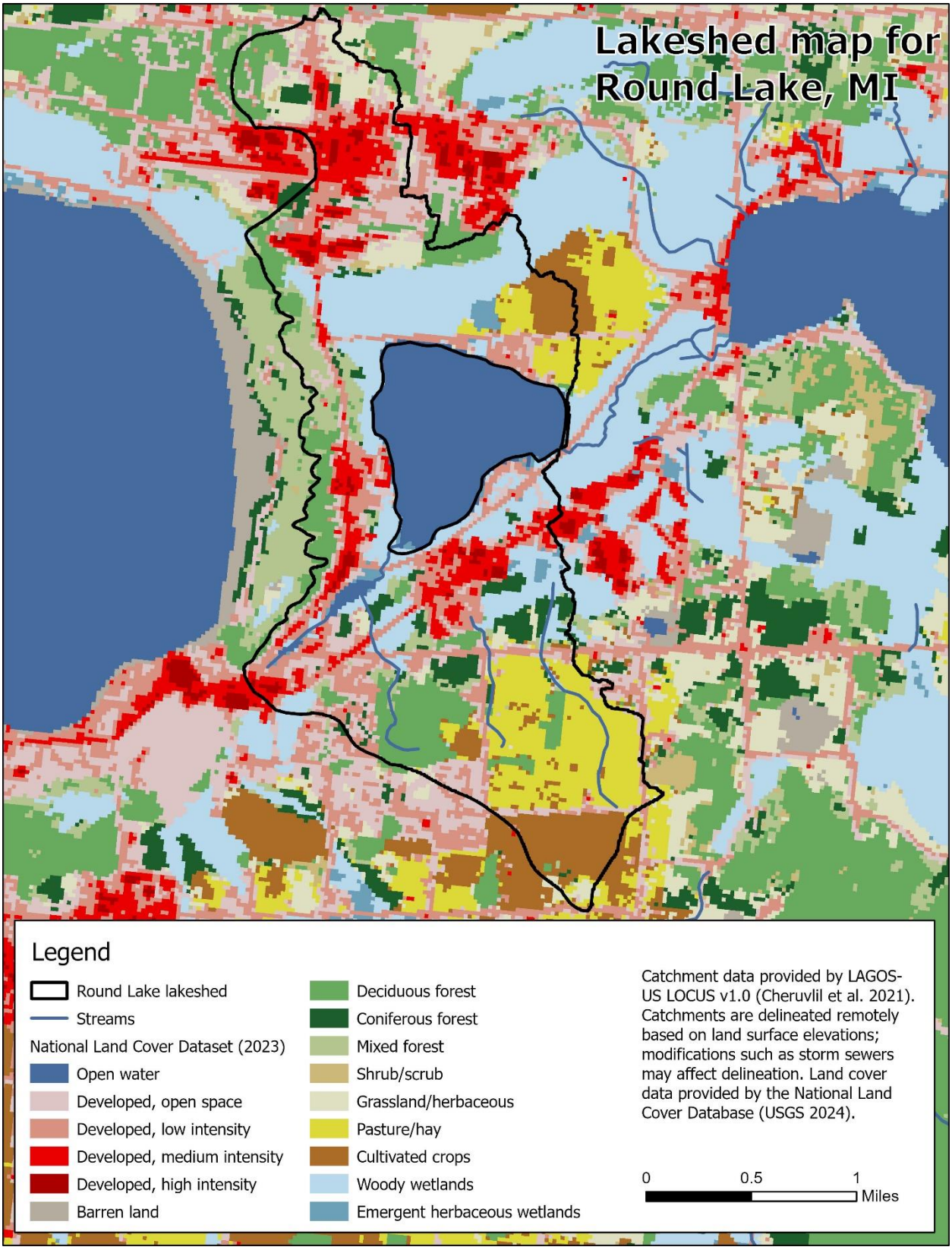

Figure 4. Land use and land cover of Round Lake watershed, Emmet County.

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