

Sanborn Creek
Lake County
Pere Marquette River Watershed

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Environment

Sanborn Creek is a third-order tributary to the Pere Marquette River near Baldwin, Michigan, located in southern Lake County (Figure 1). Sanborn Creek originates from springs in eastern Lake County and then flows roughly southwest for approximately 19 miles before joining the Baldwin River just east of the village of Baldwin. Sanborn Creek is the longest tributary to the Baldwin River.

The Sanborn Creek watershed is primarily forested with hardwoods and conifers, with a mix of private land and state ownership as part of the Cadillac State Forest Management Unit. The terrain is hilly, with elevations in the eastern portion of the watershed exceeding 1,250 feet. From its origin to its confluence with the Baldwin River (elevation of 836 feet), Sanborn Creek drops a total of 414 feet in approximately 19 miles, for a drop of nearly 22 feet per mile. This makes Sanborn Creek one of the higher gradient tributaries in the Pere Marquette River watershed. In contrast, the mainstem of the Pere Marquette River averages approximately 4.1 feet per mile (Anonymous 1999). Near its confluence with the Baldwin River, Sanborn Creek typically carries flows from 11-25 cubic feet per second (unpublished data, United States Fish and Wildlife Service (USFWS)).

Because the Pere Marquette River is a State-designated Natural River (Anonymous 1978), most of Sanborn Creek is as well. The 14.3 mile reach of Sanborn Creek from the State Road crossing downstream to the Baldwin River confluence is under Natural Rivers zoning regulations. These regulations include a 400 foot district on both sides of the stream within which certain zoning standards apply. For Sanborn Creek, the Natural Rivers regulations include a 50 foot natural vegetation zone (within which only limited cutting may occur), and a minimum 100 foot building setback for new structures.

Sanborn Creek is a Designated Trout Stream and is classified as a Top Quality Trout Mainstream (Anonymous 2000). Sanborn Creek is regulated as a Type-1 Trout Stream and is open to fishing from the last Saturday in April through September 30. The minimum size limit for Brook Trout is 7 inches, 8 inches for Brown Trout, and 10 inches for Rainbow Trout. A total of five trout can be kept per day, with no more than three of those over 15 inches.

There is one known dam in the Sanborn Creek watershed. It is a privately-owned structure near Frank Smith Road, several miles downstream from the origins of the creek. The dam likely blocks all fish passage and may warm the stream to some extent. Satellite photo scrutiny indicates that there are reaches of the stream that are occasionally dammed by beavers.

Both Figures 1 and 2 show two "breaks" in the stream (one downstream of State Road and one upstream of State Road). These are not accurate. While Sanborn Creek does flow through several swampy areas in this reach, the stream is contiguous and flows year-round. Also, there is a permanently flowing, unnamed tributary to Sanborn Creek near 40th Street that is not present on either

map. These discrepancies are likely due to a deficiency in the database upon which the maps were created.

History

Stocking

Although no official records exist, it is likely that the only salmonid native to Sanborn Creek was the Arctic Grayling. Unfortunately, the Arctic Grayling disappeared from the Pere Marquette watershed in the late 1800s, to be replaced by non-native trout species, including Brook and Brown Trout. The first known fish stocking of Sanborn Creek occurred in 1889, when 15,000 Brook Trout fry were stocked (Table 1). Brook Trout were also stocked in the early 1890s, 1909, and 1910. These early stockings were likely conducted by the Michigan Fish Commission. In 1929, Brook, Brown and Rainbow Trout were stocked. This marked the only known stocking of Rainbow Trout into Sanborn Creek. Through the 1930s, 1940s, and 1950s, Brown Trout were regularly stocked, and Brook Trout were also stocked occasionally. These stockings were conducted by the Michigan Department of Conservation (MDOC; the precursor to today's Michigan Department of Natural Resources or MDNR). There have been no fish stocked into Sanborn Creek since the mid-1950s.

Fisheries Surveys

The first known fisheries survey of Sanborn Creek was conducted by MDOC personnel in 1966. Two sites were sampled with a backpack shocking unit (Figure 2). The first site was upstream of State Road in Section 19, and the other site was several miles downstream, just above Gormley Road in Section 36. At the State Road site, Brook Trout, Brown Trout, Pumpkinseed Sunfish, and Slimy Sculpins were captured. At the Gormley Road site, Brook Trout, Brown Trout, and Slimy Sculpins were captured.

Habitat Improvement

The Pere Marquette River Restoration Committee (PMRRC) is a partnership that consists of many different agencies and organizations, all of which are dedicated to protecting and improving the Pere Marquette River. Prominent partners include the Pere Marquette Watershed Council, Conservation Resource Alliance (CRA), Trout Unlimited, MDNR, the U. S. Forest Service (USFS), the Mason-Lake Conservation District, several different county road commissions, and others. The PMRRC meets on a regular basis to discuss issues related to the Pere Marquette River and its tributaries.

In recent years, Sanborn Creek has come under scrutiny from the PMRRC for its poor road/stream crossings that negatively impact the stream. So far, that scrutiny has resulted in the replacement of five different crossings within the watershed. The newly replaced crossings included King's Highway (also known as Cedar Road) and Nelson Road (completed in 2011), two crossings on 40th Street (the mainstem of Sanborn Creek and an unnamed tributary; completed in 2014), and the Queen's Highway crossing (completed in the fall of 2016).

At both the King's Highway and Nelson Road crossings, undersized and severely perched corrugated tubes were replaced. Both crossings blocked fish passage, impounded the stream above, and caused scouring downstream that increased sediment entry into the stream. At both crossings a 16 foot bottomless arch culvert was installed, and a significant reach of adjacent road was paved to control runoff and mitigate erosion. The new road crossings allow for natural flows, provide a natural stream bottom, span the base channel width, and prevent at least one ton of sediment from being delivered to the stream each year. Combined, the two projects cost approximately \$350,000 and were funded by the

USFS American Recovery Reinvestment Act, the Lake County Road Commission, and the CRA River Care Fund. Other partners included CRA, the Michigan Department of Environmental Quality (MDEQ), MDNR, Wilcox Professional Services, and McDowell Construction.

In addition to the replacement of undersized and poorly placed culverts, the 40th Street project included the relocation of 200 feet of the unnamed tributary to Sanborn Creek. Prior to the project, the stream ran parallel and in close proximity to the road, resulting in sediment deposition into the stream and threatening to wash out the road. A new stream channel was constructed, including ample woody debris and re-seeding. The undersized culvert at the unnamed tributary crossing was replaced with a 6 foot elliptical culvert, and again a significant portion of the road was paved to control runoff and prevent sediment deposition into the stream. For the Sanborn Creek crossing at 40th Street, a 16 foot bottomless arch culvert was installed, and a significant reach of the adjacent road was paved. The 40th Street projects cost approximately \$260,000 and were funded by the MDNR Aquatic Habitat Grant program, the Lake County Road Commission, the Upper Baldwin Association, the Vogt Foundation, the Pere Marquette Watershed Council, USFS, and USFWS. Other partners included CRA, MDEQ, Prein and Newhof Engineering, and Kanouse Outdoor Restoration.

The Queen's Highway crossing of Sanborn Creek was replaced in the fall of 2016. As with King's Highway and Nelson Road, the existing undersized twin tubes were replaced with a 16 foot bottomless arch culvert. A significant reach of adjacent road was also paved to control runoff and prevent sand and gravel from washing into the creek. The Queen's Highway project cost approximately \$225,000, with funding provided by the Mason Lake Conservation District, Sustain Our Great Lakes, the Manistee National Forest, the USFWS Fish Passage fund, and the Lake County Road Commission. Other partners included CRA and Link Engineering.

Current Status

The most recent fisheries survey of Sanborn Creek was conducted by MDNR on July 16, 2015. Sampling was conducted at four different sites in the watershed (Figure 2), using a Wisconsin battery-powered 12-volt backpack shocker with one probe.

The furthest upstream site sampled in 2015 was on an unnamed tributary to Sanborn Creek (Figure 2; tributary not visible on the map). The station began at the 40th Street crossing and extended upstream for 150 feet. Only three species were captured- Brown Trout, Brook Trout, and sculpins (Table 2). Seventeen Brown Trout from 1 to 6 inches were caught, along with three Brook Trout from 4 to 6 inches. Sculpins were also abundant, with 19 caught from 1 to 3 inches. At 11:40 am, the air temperature was 77.5° F and the water temperature was 51.0° F. The unnamed tributary had an average width of four feet, and average depth of four inches, and a maximum depth of one foot. Substrate consisted of 25% silt, 60% sand, and 15% gravel. The stream morphology was primarily run (85%), with some pool (5%) and riffle (10%) habitat also present. Instream cover in the form of undercut banks and woody debris also provided habitat. The 2014 culvert replacement project has resulted in downcutting in the area previously impounded by the old, undersized culvert.

Sanborn Creek was also sampled where it crosses under 40th Street (Figure 2). Here, the survey ran for 300 feet upstream to the new crossing. Four species were captured at this site (Table 3), including Brown Trout (16 from 1 to 12 inches), Coho Salmon (one at 3 inches), Rainbow Trout (one at 4 inches), and 18 sculpins from 1 to 3 inches. At 2pm, the air temperature was 80.9° F and the water

temperature was 56.1° F. Within this reach, the stream averaged approximately 15 feet wide and 4 inches deep, with a maximum depth of 2 feet. Substrate in this reach consisted of sand (70%), gravel (15%), silt (14%), and boulder (1%). The reach was 90% run, with 5% pool and 5% riffle habitat also present. Field notes indicate that this reach was low gradient, and that there was some braiding within the stream channel.

The next site downstream sampled in 2015 was at the King's Highway (also referred to as Cedar Road on some maps) crossing (Figure 2). Here, the survey station ran for 250 feet upstream from the crossing. Brown Trout were again abundant, with 16 from 2 to 10 inches caught (Table 4). Other species caught included Rainbow Trout (one at 5 inches), Central Mudminnow (one at 3 inches), and sculpins (17 from 1 to 3 inches). At 2:15 pm, the air temperature was 80.9° F and the stream temperature was 56.3° F. Sanborn Creek averaged 15 feet wide at this station, with an average depth of 6 inches and a maximum depth of 2 feet. The stream morphology consisted of 45% run, 45% riffle, and 10% pool. Substrate composition was 80% gravel, 15% sand, and 5% silt. Field notes indicate that there was ample woody debris structure and undercuts. There were also some braids and islands present. This reach appeared to be higher in gradient than the other reaches sampled.

The furthest downstream station sampled on July 16, 2015 was the James Road crossing (Figure 2). This is the lowermost road crossing of Sanborn Creek, as it joins the Baldwin River several hundred yards downstream of the crossing. The station began 250 feet downstream of the crossing and ran upstream to the crossing. Six different species were captured at this site (Table 5). Brown Trout were numerically dominant, with 16 collected from 2 to 16 inches. Other salmonids present here included Rainbow Trout (9 from 1 to 7 inches) and Coho Salmon (4 from 2 to 3 inches). Other species present included Blacknose Dace, Central Mudminnow, and sculpins. At 10:00am the air temperature was 78.4° F and the stream temperature was 59.1° F. In this station, Sanborn Creek averaged 11 feet wide and 6 inches deep, with a maximum depth of 3 feet. Stream morphology consisted of 70% run, 15% riffle, and 15% pool. Substrate composition was 60% gravel, 30% sand, 5% cobble, and 5% boulder. This reach had adequate woody cover and undercut banks. The James Road crossing consists of twin 6 foot culverts that are moderately perched.

Analysis and Discussion

Sanborn Creek remains a high quality cold water tributary in the Pere Marquette River watershed. It supports wild populations of at least four different salmonid species. The 2015 survey documented populations of Brown Trout, Brook Trout, Rainbow Trout (likely juvenile Steelhead), and Coho Salmon. Although none were caught in the survey, it is also highly likely that Chinook Salmon naturally reproduce in Sanborn Creek. Apart from several remaining poor road/stream crossings, the habitat in Sanborn Creek appears to be relatively intact and unimpaired.

Management Direction

Sanborn Creek continues to provide excellent opportunity for anglers to catch trout, primarily Brown Trout. Sanborn Creek offers a small stream angling experience where anglers can catch Brown Trout in a beautifully forested setting. It is also likely that Brown Trout produced in Sanborn Creek migrate downstream into the Baldwin and Pere Marquette Rivers, also providing fisheries in those streams. In addition, Sanborn Creek provides Coho Salmon, Steelhead, and possibly Chinook salmon smolts that migrate downstream to Lake Michigan. These naturally reproduced trout and salmon from Sanborn

Creek provide angling opportunities in the open waters of Lake Michigan. When they return for spawning runs, they provide more angling opportunities in the Ludington harbor area, Pere Marquette Lake, and the Pere Marquette and Baldwin Rivers. These recreational opportunities significantly enhance the local economies in the area.

The primary management goal for Sanborn Creek should be to replace the remaining poor road/stream crossings. In particular, the crossings at State Road, Spruce Road, Broadway Street, and Forman Road are in need of replacement. The Forman and Broadway Road crossings are slated to be replaced in the summer of 2017, while the Spruce and State Road crossings are slated for the summer of 2018 (Personal communication, Paul Kogelschatz, CRA).

Once the remaining poor road/stream crossings on Sanborn Creek are replaced, the primary management goal should be resource protection, as it is far easier and less expensive to protect a watershed than it is to restore one that has been degraded. Protection should occur by working with the Michigan Department of Environmental Quality to review both wetlands (Part 303) and inland lake and stream (Part 301) permit applications in the watershed. Also, MDNR timber management in the Sanborn Creek watershed and particularly those actions close to the stream should follow best management practices (BMP's) with the conservation of Sanborn Creek in mind.

Sanborn Creek should be surveyed again sometime within the next 10 years. Several different sites within the watershed should be sampled by backpack electrofishing to monitor the condition of fish populations of the creek. In addition to fisheries surveys, water quality monitoring, invertebrate surveys, and habitat evaluation would also provide additional knowledge of the Sanborn Creek watershed.

References

- Anonymous. 1978. Pere Marquette River Natural River Plan. Fisheries Division, Michigan Department of Natural Resources, Lansing.
- Anonymous. 1999. Pere Marquette River Watershed Assessment. Pere Marquette Watershed Council, Baldwin, Michigan.
- Anonymous. 2000. Michigan stream classification: 1967 system. Chapter 20 in Schneider, James C. (ed.) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Figure 1. Upper Pere Marquette River watershed, including Sanborn Creek, Lake County, Michigan.

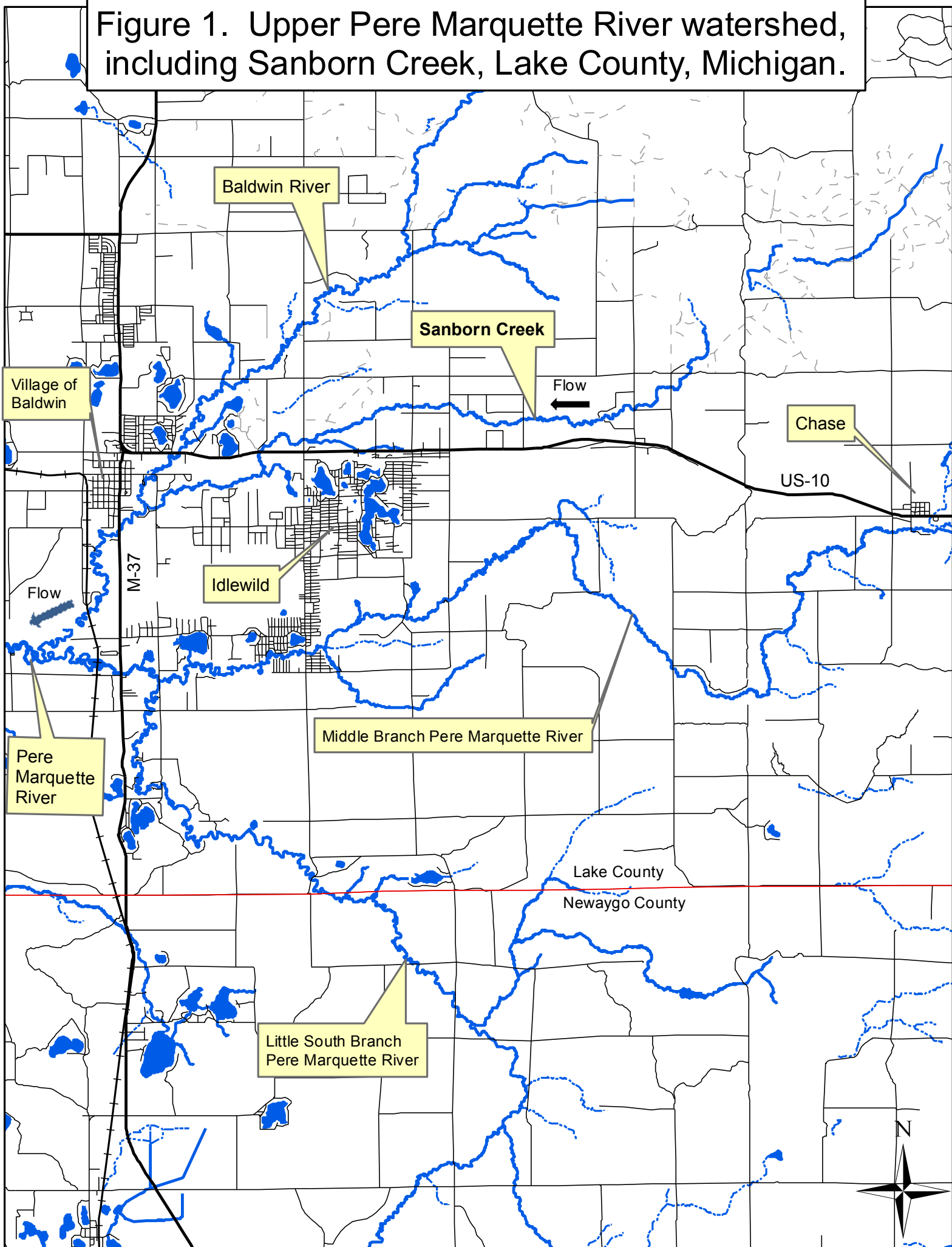


Figure 2. Sanborn Creek Watershed, Lake County, MI., with historical and recent fisheries survey sites. Yellow dots indicate 1966 survey sites, while red dots indicate 2015 survey sites.

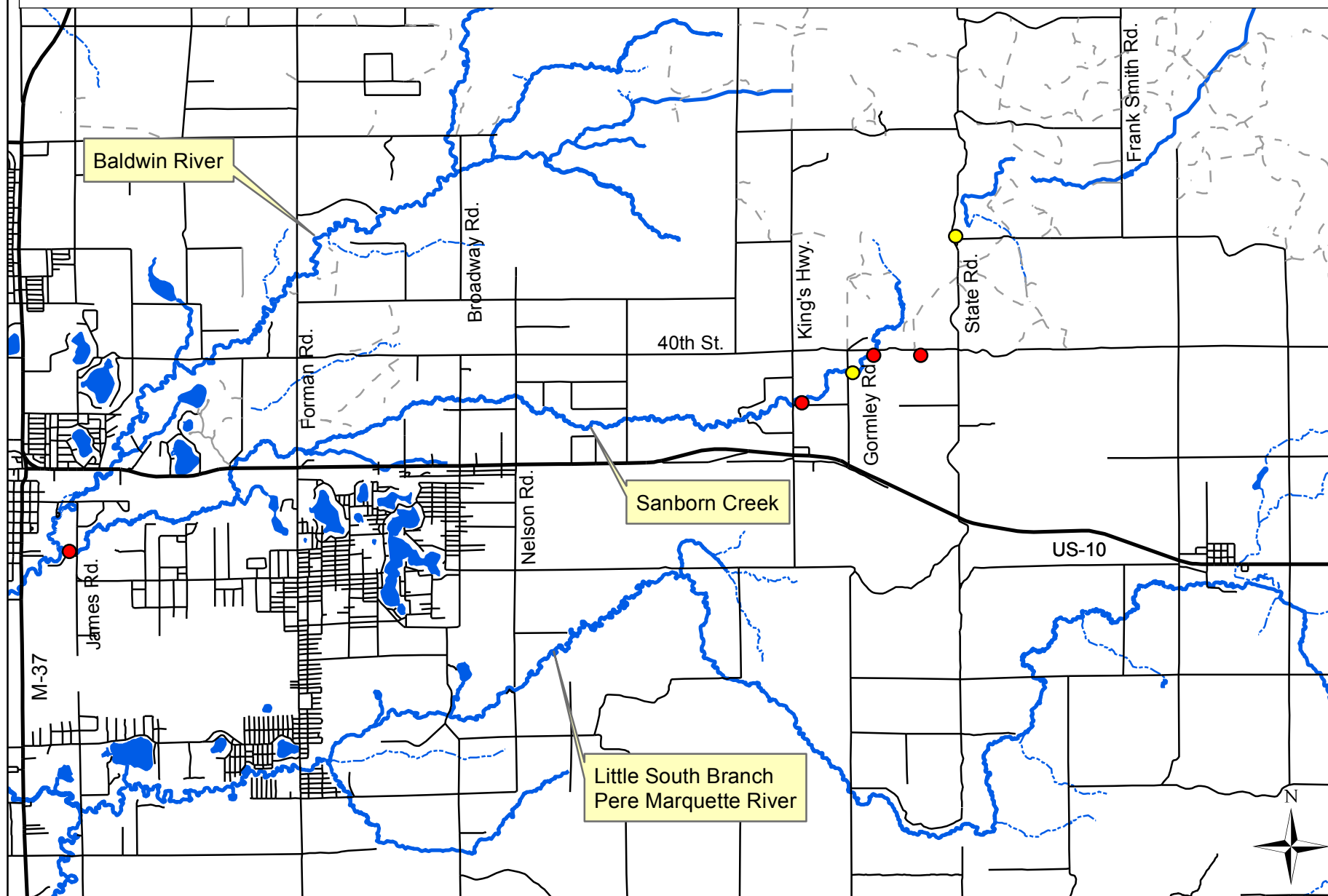


Table 1. Fish stocked in Sanborn Creek, Lake County.

Year	Species	Number	Life stage
1889	Brook Trout	15,000	
1890	Brook Trout	10,000	
1893	Brook Trout	9,000	
1894	Brook Trout	9,000	
1895	Brook Trout	5,000	
1909	Brook Trout	6,000	fry
1910	Brook Trout	5,000	fry
1929	Brook Trout	6,000	7 mo.
	Brown Trout	38,000	
	Rainbow Trout	22,000	1-4 mo.
1934	Brook Trout	4,500	6 mo.
	Brown Trout	50,000	3-6 mo.
1935	Brown Trout	24,200	1-7 mo.
1936	Brook Trout	1,000	7 mo.
	Brown Trout	25,000	1 mo. - yearling
1937	Brook Trout	4,500	6 mo.
	Brown Trout	32,000	fry - 6 mo.
1938	Brook Trout	3,500	8 mo. - yearling
	Brown Trout	10,500	3 mo. - adult
1939	Brown Trout	21,000	8 mo. - adult
1940	Brown Trout	20,000	2 mo.
1941	Brown Trout	20,000	2 mo.
1942	Brown Trout	20,000	2 mo.
1943	Brown Trout	58,928	fry - adult
1944	Brown Trout	41,664	fry - adult
1945	Brook Trout	850	adult
	Brown Trout	15,200	2 mo. - adult
1946	Brook Trout	800	adult
1947	Brown Trout	18,000	3 mo. - 6 mo.
1948	Brook Trout	1,000	legal
	Brown Trout	11,000	fry
1950	Brown Trout	5,000	fry
1951	Brown Trout	5,000	fry
1952	Brown Trout	15,000	fry
1953	Brown Trout	10,000	sublegal
1954	Brown Trout	11,050	legal, sublegal
1956	Brown Trout	10,000	fry

Table 2. Catch from 7/16/2015 DNR electrofishing survey of an unnamed tributary to Sanborn Creek upstream of 40th Street (150 feet).

Inch Class	Brook Trout	Brown Trout	Sculpin spp.
1		6	10
2		4	6
3		4	3
4	2	2	
5			
6	1	1	
Total:	3	17	19

Table 3. Catch from 7/16/2015 DNR electrofishing survey of Sanborn Creek downstream of 40th Street (300 feet).

Inch Class	Brown Trout	Coho Salmon	Rainbow Trout	Sculpin spp.
1	1			2
2	1			10
3		1		6
4	5		1	
5	2			
6	2			
7				
8				
9	3			
10				
11	1			
12	1			
Total:	16	1	1	18

Table 4. Catch from 7/16/2015 DNR electrofishing survey of Sanborn Creek upstream of the King's Highway (Cedar Road) crossing (250 feet).

Inch Class	Brown Trout	Central Mudminnow	Rainbow Trout	Sculpin spp.
1				2
2	1			8
3	2	1		7
4	4			
5	1		1	
6	3			
7	1			
8	3			
9				
10	1			
Total:	16	1	1	17

Table 5. Catch from 7/16/2015 DNR electrofishing survey of Sanborn Creek downstream of James Road (250 feet).

Inch Class	Blacknose Dace	Brown Trout	Coho Salmon	Central Mudminnow	Rainbow Trout	Sculpin sp.
1	2			1	1	
2	2	4	2	4	1	8
3			2	1		1
4						
5		1			3	
6					2	
7		2			2	
8		2				
9		4				
10		1				
12		1				
16		1				
Total:	4	16	4	6	9	9