

Wheeler Creek
Wexford County, T24N, R11W
Manistee River Watershed, Last Surveyed in July and August, 2015

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Environment

Wheeler Creek is a second-order tributary to the Manistee River near Sherman, MI, in northwestern Wexford County (Figure 1). There are two main branches of Wheeler Creek, the East Branch and the West Branch. The West Branch begins near M-37, approximately one mile west of the Village of Buckley. The West Branch flows south for approximately three miles before joining the East Branch. The East Branch begins just south of the Village of Buckley and is immediately impounded by the privately owned Lake Gitchegumee Dam. Lake Gitchegumee is a private lake with no public access. Flow out of Lake Gitchegumee is intermittent due to evaporation from the lake and lake level maintenance. However, a short distance downstream, the East Branch begins to flow perennially. The East Branch flows south for about one and a half miles before joining with the West Branch. The Wheeler Creek mainstem then flows south and then west for approximately two miles before entering the Manistee River just west of M-37.

The Wheeler Creek watershed is primarily forested with hardwoods and conifers, with approximately half of the watershed in state ownership as part of the Cadillac State Forest Management Unit. The terrain is hilly, with elevations in the watershed reaching over 1,100 feet. From the origin of the West Branch of Wheeler Creek (1,027 feet) to its confluence with the Manistee River (819 feet), it drops a total of 208 feet in approximately 5¼ miles, for a drop of approximately 40 feet per mile. This makes Wheeler Creek one of the highest gradient tributaries in the Manistee River watershed. The mainstem of the Manistee River averages gradients of 5-10 feet per mile, and in some reaches is below 5 feet per mile (Rozich 1998).

Wheeler Creek and both of its branches are Designated Trout Streams. The mainstem of Wheeler Creek is classified as a Top Quality Trout Mainstream, while the East and West Branches of Wheeler Creek are classified as Top Quality Trout Feeder Streams (Anonymous 2000). Wheeler 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.

History

The Wheeler Dam (also known as the "Guthrie Dam") was originally built in 1867 by John Wheeler to operate a sawmill (Rozich, 1998) and was located immediately upstream of the M-37 crossing. This dam was likely the first dam built in the Manistee River watershed. In 2006, Fisheries Division was contacted by the dam owner who was interested in removing the dam and was looking for assistance. The dam was in poor condition and at risk for failure. The dam also blocked all upstream fish passage. In 2009, the dam was removed and Wheeler Creek returned to a free-flowing condition. Further site

restoration work was conducted in the summers of 2010, 2011, and 2012. The restoration work included restructuring and stabilizing steep eroding streambanks, adding instream fish cover, and vegetative cover plantings. All work associated with the Wheeler Creek Dam Removal was a cooperative effort led by the Conservation Resource Alliance (CRA), a non-profit natural resource stewardship organization based out of Traverse City. Funding sources for the project included grants from the Consumers Energy Habitat Improvement Account, the United States Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the Natural Resource Conservation Service, the Fish America Foundation, and the CRA Rivercare account.

The first known fish stocking of Wheeler Creek occurred in 1905, when the Michigan Department of Conservation (MDOC), the precursor of the Michigan Department of Natural Resources (MDNR), stocked 9000 Brook Trout fry (Table 1). From the 1930s to the mid-1950s, Brook Trout were regularly stocked. Rainbow Trout were also stocked in some years. There have been no fish stocked into Wheeler Creek by the MDNR since the mid-1950s.

Fisheries Surveys

The first known fisheries survey of Wheeler Creek was conducted by MDOC personnel in 1966. Two sites were sampled with a backpack shocking unit. The first site was near the headwaters of the East Branch in Section 6, and the other site was near the headwaters of the West Branch, also in Section 6. Brook Trout and Sculpins were the only species collected at both sites.

In 2004 Bob Stuber from the US Forest Service and Kyle Kruger from MDNR Fisheries Division collected flow and temperature data on Wheeler Creek downstream of M-37 (MDNR files, Cadillac). On July 1, 2004 they measured the discharge at 15.67 cubic feet/second (cfs), and the water temperature was 58.8° F. On August 20, 2004 discharge was 9.98 cfs and the water temperature was 54.9° F.

Another electrofishing survey of Wheeler Creek was done on August 16, 2004 (Tonello 2004). Five sites in the watershed were surveyed (Figure 2) with a Wisconsin battery-powered backpack shocker. All sites were located upstream of the dam. Brook Trout and sculpins were caught at each site. The only other species caught in the survey was one Central Mudminnow caught at the most upstream site. Water temperatures at each site were quite consistent at all sites, at either 51° or 52°F.

On May 24, 2007 another electrofishing survey was conducted at two sites on Wheeler Creek (Tonello 2007; Table 2). The first site was just downstream of the Wheeler Dam, while the second site was just upstream of the impoundment created by the Wheeler Dam (Figure 2). Both sites were surveyed with one Wisconsin battery-powered backpack shocking unit. The purpose of the survey was to determine differences in the fish community of Wheeler Creek upstream and downstream of the dam. At the site upstream of the dam, only Brook Trout and sculpins were caught. At the site below the dam, eleven different species were caught, including Brook Trout, Brown Trout, Rainbow Trout, Burbot, Creek Chub, Johnny Darter, Northern Redbelly Dace, sculpins, Smallmouth Bass, Trout-perch, and White Sucker (Table 2). At 3:15 pm, the water temperature upstream of the dam was 61°F; while downstream of the dam the water temperature was 64°F. The air temperature was 88°F.

Wheeler Creek was surveyed by the Grand Traverse Band of Ottawa and Chippewa Indians on April 11, 2010. This survey also utilized a backpack electrofishing unit, and it was conducted approximately

0.9 miles upstream from M-37 (Figure 2). The survey covered approximately 400 feet of stream. The catch included Brook Trout (44 up to 8.9 inches in length) and 10 Mottled Sculpins.

The first MDNR post-dam removal fisheries survey of Wheeler Creek was conducted on July 7, 2011 (Tonello 2013). In that survey, approximately 1,500 feet of Wheeler Creek was sampled. The survey began at the confluence of Wheeler Creek with the Manistee River and proceeded 1,500 feet upstream (Figure 2). This survey covered a reach of the stream that was previously downstream of the dam, a reach that was previously inundated by the dam, and a short reach that was previously upstream of the impoundment. In the 2011 survey, a total of 10 species were caught, including Brook Trout, Brown Trout, Rainbow Trout, Blacknose Dace, Creek Chub, Johnny Darter, Logperch, Northern Redbelly Dace, sculpins, and White Sucker (Table 2). Brook Trout were by far the most abundant species in the catch, with 206 caught from 1-9 inches in length. Brown Trout were also numerous, with 23 caught from 2-9 inches. Only three 4-5 inch Rainbow trout were caught. Eleven sculpin were caught, and no more than five individuals from any of the other species were caught. This survey marked the first time that Brown Trout or Rainbow Trout were captured in Wheeler Creek above M-37.

In the 1,500 foot stream reach sampled in 2011, there were several different habitat types represented. The first 300 foot segment just upstream of the confluence with the Manistee River flowed through the Manistee River flood plain and was characterized by low gradient. This reach is influenced by the water level of the Manistee River and "backs up" during high water events, resulting in braiding and sand deposition. However, the low gradient braids in this reach were very productive for young of the year Brook Trout, which seemed to prefer the gentle habitat that the braids provide. Despite this reach having lower gradient, substrates still consisted of primarily gravel, with a few areas of sand and silt.

Further upstream in the old impoundment area and just above it, Wheeler Creek was much different. The upper 1,000 feet of the survey station were characterized by extremely high gradient water, with gravel and cobble substrate. In this area, Wheeler Creek resembles a mountain stream. There is a distinct lack of instream cover and channel diversity, although some habitat work has been done, including whole tree revetments. Over time, trees and overhanging vegetation will grow and woody debris from upstream reaches will recruit to this area, increasing instream cover and channel diversity. While this area experienced intense downcutting shortly after the dam removal, it seemed to have stabilized by the 2011 survey. Although no sampling was conducted upstream of the 1,500 foot reach, the researchers did observe downcutting occurring upstream of the sampling reach.

Temperature studies of Wheeler Creek were conducted in the summers of 2007 and 2012 (Table 3). Continuous recording temperature monitors were deployed in Wheeler Creek from May through September of those years (Tonello 2013). In 2007, one temperature monitor was placed just upstream of the impoundment on Wheeler Creek, and another was placed just downstream of the Wheeler Creek Dam, under the M-37 bridge. At that time the Wheeler Creek Dam had a relatively minor impact on average stream temperatures in Wheeler Creek, warming the creek by about 1 degree Fahrenheit. There was however a substantial (over 3 degrees Fahrenheit) increase in maximum temperatures below the dam. In 2012, the monitor was placed at the location where the dam had previously stood.

Current Status

The most recent fisheries surveys of Wheeler Creek were conducted by MDNR on July 16 and August 24, 2015. Sampling was conducted at five different sites in the watershed (Figure 2), using a Wisconsin battery-powered 12-volt backpack shocker with one probe.

On July 16 the first site sampled was in the vicinity of the old Wheeler Dam (Figure 2). The station began at the mouth of Wheeler Creek and extended 2,000 feet upstream. The station encompassed the historical dam site and impoundment. Eight fish species were captured (Tables 2 and 4). The station was dominated by Brook Trout, with 121 captured (1-8 inches long). Brown Trout were also abundant with 68 caught (1-14 inches long). Sculpin were also abundant. Other species present in smaller numbers included Blacknose Dace, Burbot, Johnny Darter, and Rainbow Trout. At 2:25 pm, the air temperature was 76° F and the water temperature was 56° F.

In this reach, Wheeler Creek had an average width of 18 feet and an average depth of 9 inches. Substrates consisted of approximately 67% cobble, 21% gravel, 9% sand, 2% boulder, and 1% silt. Stream channel morphology consisted of approximately 77% riffle, 14% run, and 9% pool. The surveyed reach showed a high level of habitat diversity. The lower 300 feet of the station is located within the Manistee River floodplain and is heavily influenced by water levels in the Manistee River. The habitat had changed since 2011, however. The braided channels that were documented in 2011 were gone. It is likely that the braids were the result of ongoing sediment movement out of the old impoundment zone, and their disappearance indicates the stream channel was continuing to adjust to the free flowing condition. Downstream from M-37, riparian cover was largely unchanged from 2011 and consisted of cedar and tag alder.

Streambank cover in the impoundment zone consisted of sedges and grasses. Willows have sprouted in many places along the stream, and it is expected that forest succession will occur in the coming years as the impoundment zone recovers. In addition, plantings of many native shrub and tree species were made after the removal, and many of these have survived and are growing well. Moving upstream out of the impoundment zone, the stream becomes forested, with cedar and tag alder being the primary riparian cover. In this area (approximately 1,500 feet upstream of the historical dam site), Wheeler Creek continues to experience intense downcutting. Prior to the dam removal project there was one short "cut through" channel that carried a small portion of the Wheeler Creek flow, while the main channel meandered a much further distance. However, since the dam was removed, the "cut through" has now become the primary channel, and the old channel streambed is mostly dry.

Four different sites in the Wheeler Creek watershed were sampled on August 24, 2015 (Figure 2). The furthest upstream two sites were the West Branch of Wheeler Creek and the East Branch of Wheeler Creek directly upstream of the confluence of these streams. In both of these stations, only Brook Trout and Sculpin were caught (Tables 5 and 6). The East Branch station averaged 7 feet in width and 1 foot deep. Substrates were 40% gravel, 40% sand, and 20% clay. Stream morphology consisted of 70% run, 20% riffle, and 10% pool. Riparian cover was tag alder and cedar. Fish cover was abundant in the form of undercuts, woody debris, and logjams. At 10:00 am, the air temperature was 62.4°F, while the water temperature was 54.1°F.

The West Branch was slightly wider and deeper than the East Branch, averaging 12 feet in width and 1.3 feet deep. Substrates in the West Branch were 40% sand, 30% gravel, 25% clay, and 5% cobble. Morphology was 50% run, 30% riffle, and 20% pool. Riparian cover consisted of tag alder, cedar, and

aspen. Fish cover was common, in the form of woody debris, undercuts, and overhanging grass. Watercress beds were present as well. The West Branch had high levels of calcium precipitated out on rocks, logs, vegetation, etc. At 10:48 am, the water temperature was 54.5°F.

The next station was the mainstem of Wheeler Creek just downstream of where the East and West Branches combine (Figure 2). Again, only Brook Trout and Sculpin were caught (Table 7). Here the stream averaged 15 feet wide and 1.5 feet deep. Substrates consisted of 50% sand, 25% clay, 20% gravel, and 5% cobble. Stream morphology consisted of 75% run, 15% pool, and 10% riffle. Riparian cover consisted of cedar and tag alder. Instream fish habitat was abundant in the form of undercut banks, woody debris, and overhanging grass. At 11:35 am, the water temperature was 54.4°F.

The final station sampled on August 24, 2015 was approximately ½ mile further downstream, near where No. 10 Rd. dead ends near the stream (Figure 2). Here, Brook Trout and sculpins were the two dominant species; although Brown Trout and Burbot were also present (Table 8). At this site, the stream was different than the upper three sites. Gradient appeared to be much lower, and the stream valley has been impacted by beaver damming. Active dams and older, inactive dams were observed. The stream was approximately 20 feet wide and 2 feet deep. Substrates were 50% silt, 48% sand, and 2% gravel. Stream morphology consisted of 60% run and 40% pool. No riffle habitat was present. The valley had an open canopy, with riparian vegetation consisting of tag alder and grasses. Instream woody cover was very abundant, along with some undercut banks. There were wood and concrete remnants of what appeared to be an old bridge at this site, possibly of No. 10 Road at some time in the distant past.

Analysis and Discussion

Since the removal of the Wheeler Creek Dam, Wheeler Creek has undergone a remarkable transformation. The shallow, silty waters of the historical pond have been replaced by a cold, rushing stream that resembles a mountain stream. The 2015 survey showed that both Brown Trout and Brook Trout are very abundant in the historical pond reach, with multiple year classes represented, and some fish reaching minimum legal size for angling.

The 2011 MDNR survey of Wheeler Creek (Tonello 2013) was the first to document Brown Trout in Wheeler Creek upstream of the historical dam site. The 2015 survey confirmed that Brown Trout have extended their range in Wheeler Creek to at least the area near No. 10 Road, which is approximately one mile upstream of the historical dam location. Although Brown Trout were present at that location, Brook Trout were still numerically dominant. Brown Trout were not found further upstream in Wheeler Creek near the confluence of the two branches. Burbot had also never been documented upstream of the historical dam location, and they were found at the No. 10 Road site in 2015. Further upstream, the Wheeler Creek fish community does not appear to have changed, as it still consists of only Brook Trout and sculpins.

Management Direction

Wheeler Creek continues to provide excellent opportunity for anglers to catch trout, primarily Brook Trout. Wheeler Creek offers a small stream angling experience where anglers can catch Brook Trout in

a beautifully forested setting. Although not a "trophy" fishery, keeper sized Brook Trout are available to anglers, and the potential exists for larger fish, especially in the reaches occasionally dammed by beaver. As the Wheeler Creek watershed continues to mend from its formerly impounded condition, the primary management goal should be protection. 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 Wheeler Creek watershed and particularly those actions close to the stream should follow best management practices (BMP's) with the conservation of Wheeler Creek in mind.

Wheeler 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 health of the fish populations of the creek. In particular, the historic Wheeler Creek Dam reach should be surveyed to monitor and track the continuing effects of the dam removal. In addition to fisheries surveys, water quality monitoring and invertebrate surveys would also provide additional knowledge of the Wheeler Creek watershed.

References

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- Rozich, T. J. 1998. Manistee River Assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report Number 21. Ann Arbor.
- Tonello, M. A. 2004. Stream Fisheries Survey Report: Wheeler Creek, Wexford County. Michigan Department of Natural Resources Fisheries Division, Cadillac.
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Figure 1. Wheeler Creek watershed, Wexford County, Michigan.

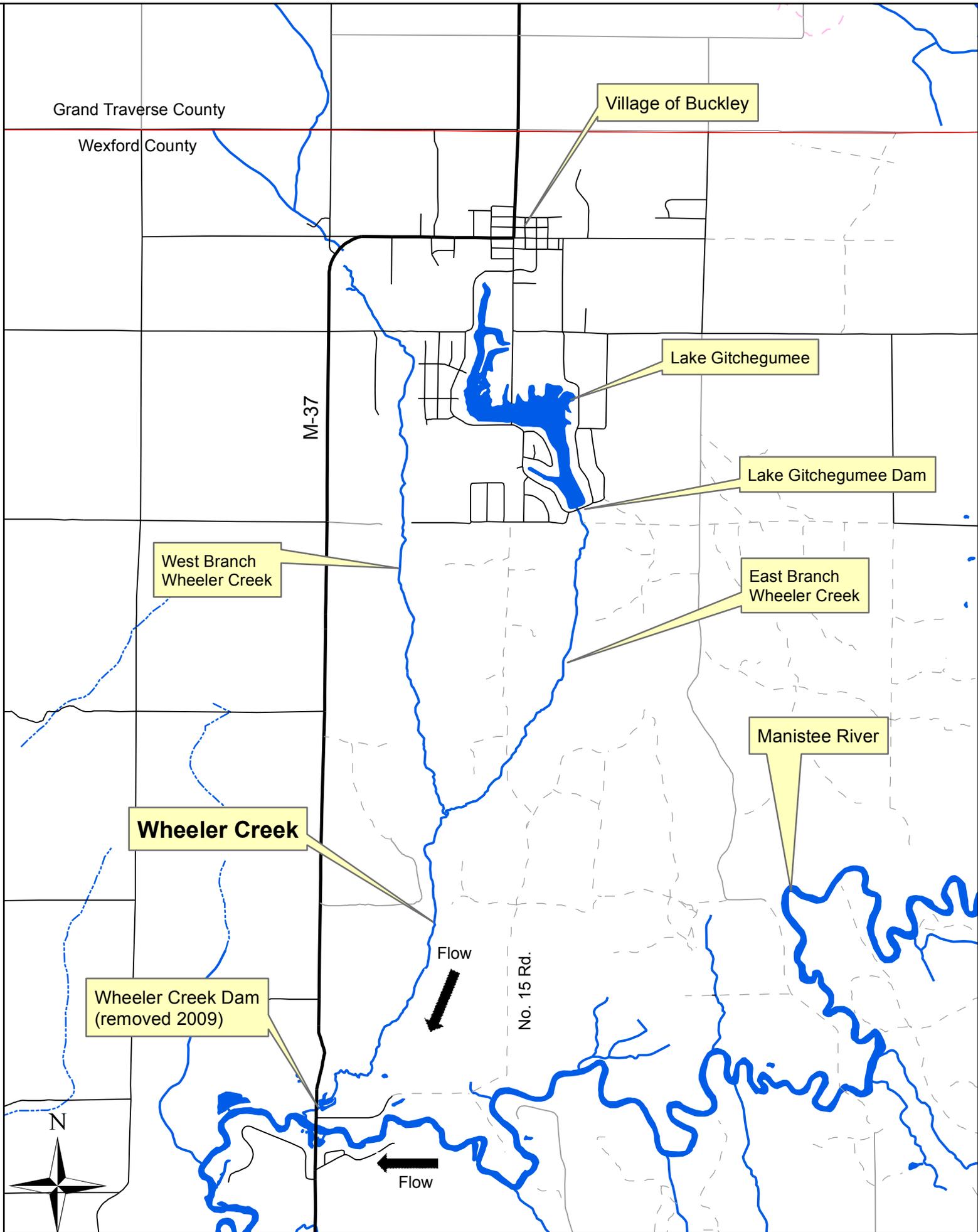


Figure 2. Recent fisheries surveys conducted in the Wheeler Creek watershed, Wexford County, Michigan.

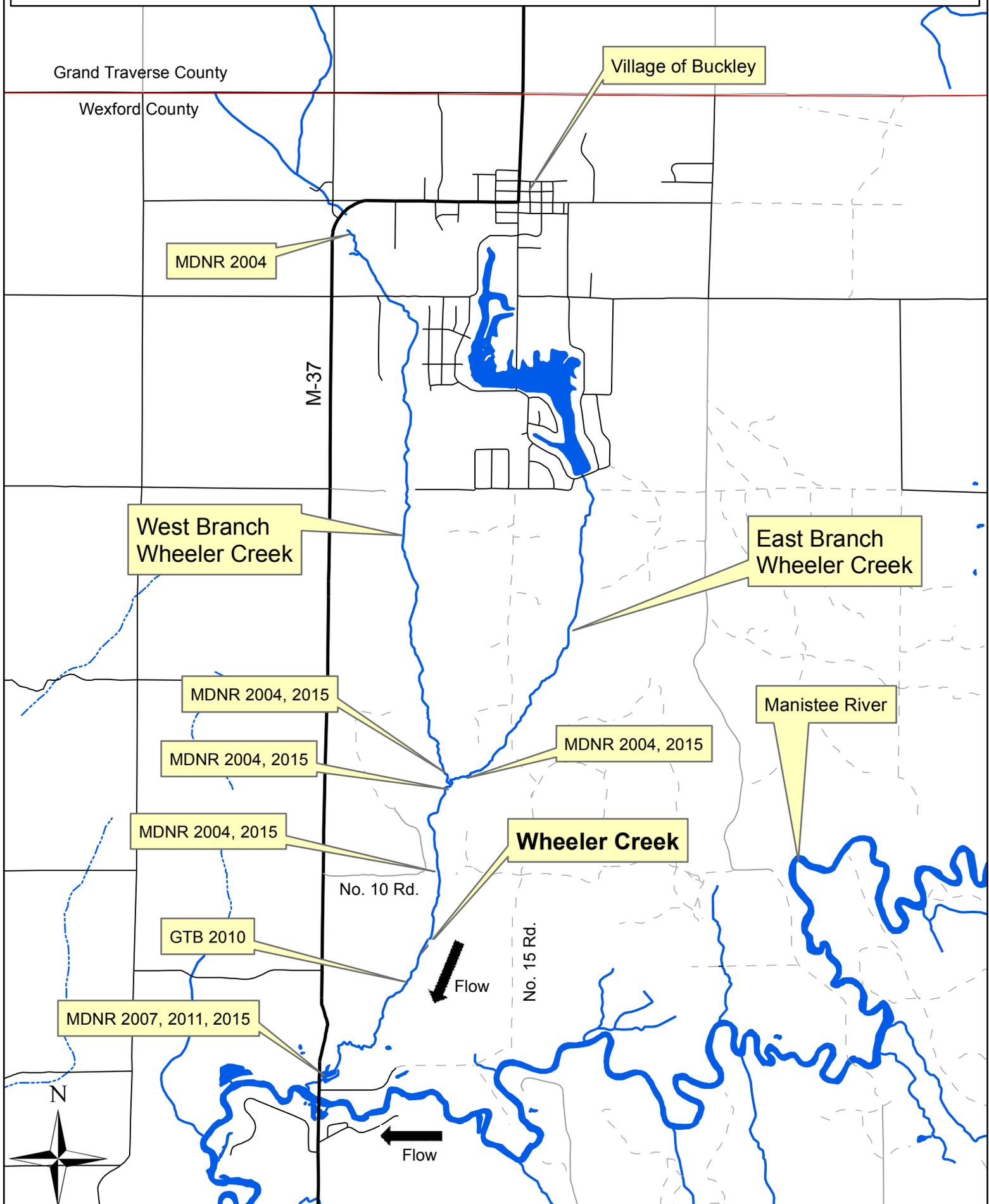


Table 1. Fish stocked in Wheeler Creek, Wexford County.

Year	Species	Number	Life stage
1905	Brook trout	9,000	fry
1934	Brook trout	6,000	8 mo.
1936	Brook trout	2,000	8 mo.
1937	Brook trout	6,000	8 mo.
1939	Brook trout	4,000	8 mo.
	Rainbow trout	2,000	4 mo.
1940	Brook trout	6,000	7 mo.
1941	Brook trout	4,000	5 mo., yearlings
	Rainbow trout	4,000	3 mo.
1942	Rainbow trout	6,000	3 mo.
1944	Brook trout	4,300	4 mo., yearlings
1945	Brook trout	300	17-24 mo.
1946	Brook trout	200	25 mo.
	Brook trout*	100	25 mo.
	Rainbow trout	10,000	fry
1951	Brook trout	400	legal
1955	Rainbow trout	200	legal
1956	Rainbow trout	500	legal

*Indicates that the fish were actually stocked into Wheeler Pond

Table 2. Numerical abundance of fish species in recent fisheries surveys of the lower reaches of Wheeler Creek, Wexford County. The 2007 survey took place prior to dam removal and consisted of segments below and just upstream of the dam. The 2011 survey was approximately 2 years post-removal, while the 2015 survey was approximately 6 years post-removal.

Species	Year and approximate length of station		
	2007 (700')	2011 (1,500')	2015 (2,000')
Blacknose Dace		5	3
Brook Trout	90	206	121
Brown Trout	13	23	68
Burbot	2		1
Creek Chub	3	4	
Johnny Darter	1	4	7
Logperch		1	
Northern Redbelly Dace	1	2	1
Rainbow Trout	3	3	3
Sculpin	4	11	85
Smallmouth Bass	1		
Trout-Perch	1		
White Sucker	5	2	

