Smith Creek
Iosco County,
East Branch Au Gres watershed, last surveyed 2020

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Environment

Smith Creek is a tributary to the East Branch Au Gres River located in Iosco County. Smith Creek originates as an outlet of Loon Lake, which is approximately two miles north of the town of Hale. Smith Creek flows south and is joined by numerous tributaries before joining Guiley Creek to form the East Branch Au Gres River northeast of the M-55 and M-65 junction (Figure 1). The East Branch Au Gres River flows south and east before emptying into Lake Huron between Alabaster and Whitestone Point. Tributaries of Smith Creek include Mitchell Creek, Hale Creek, Maggie Creek, and numerous unnamed tributaries.

There are no fish passage barriers on Smith Creek and one Sea Lamprey weir on the East Branch Au Gres River. The Sea Lamprey weir does not restrict upstream and downstream passage of Salmonid species into Lake Huron and the upper reaches of the East Branch Au Gres watershed. Smith Creek is a designated trout stream based on Fisheries Order 210, which gives the stream special protection based on this classification. The watershed of Smith Creek is dominated by forested uplands with patchy areas of wetlands and agricultural land. Most of the land ownership in the watershed is either state or national forest while most river frontage is privately held.

Smith Creek is managed as a Type-1 trout stream, with statewide regulations which allow fishing and possession of trout from the last Saturday in April through September 30th. The minimum size limits are 7 inches for Brook Trout, 8 inches for Brown Trout, and 10 inches for Rainbow Trout (Steelhead). The daily bag limit is 5 trout, but no more than three may be 15 inches in length or greater. Anglers target Brook Trout in the upper reaches and Brown Trout and Steelhead in the lower reaches. Access is limited and fishing pressure can be intense in specific locations where access is available. Public access can be gained through United States Forest Service Land off Allen Road or Forest Service Road 4711.

The habitat, streamflow, and hydraulic function of Smith Creek is relatively intact. The substrate in most of the stream is sand, but patches of gravel and small cobble are mixed in especially in riffle habitats. The upper reaches have large amounts of woody debris within the stream as the result of beaver activity. In the lower reaches, the amount of woody debris decreases as the stream widens and discharge increases. Similarly, coniferous and deciduous trees dominate the riparian vegetation along the banks in the upper and middle reaches, while more tag-alders and forbs are present in the lower reaches.

History

Smith Creek has not been stocked by the state of Michigan since 1951. Prior to 1951, Smith Creek was stocked beginning with Brook Trout in 1895, 1896, and 1910. From 1933 to 1946 and 1952 to 1962, Brook Trout were stocked annually into Smith Creek. In addition, Brown Trout were also stocked in 1948 and Rainbow Trout from 1945 to 1951 except for 1948. All the fish stocked after 1944 were legal for harvest, a common practice during the 1940s and 1950s, but has since ceased due to cost, time, and

return on investment to the fishery. The East Branch Au Gres River has historically been stocked with Brown Trout and Steelhead. Prior to 2020, Smith Creek had not been sampled by the Michigan Department of Natural Resources (DNR). This knowledge gap was recognized in 2020 and four surveys were conducted by the DNR.

Previous knowledge habitat (types, complexity, composition, etc.) of Smith Creek was very limited. Archival file information (located at the Bay City office) indicated that in 1965 an intensive habitat mapping survey was conducted by the Michigan Department of Conservation (MDOC; the precursor to the DNR). In-stream habitat appeared to be diverse with log jams, gravel islands, and overhanging brush present. MDOC conducted habitat improvements after the habitat survey was completed. Habitat improvements included grading banks and constructing log jams, pine stump covers, and log sod covers.

In other correspondence from 1974, it was noted that erosion was severe in Smith Creek, especially between Esmond Road and Curtis Road. The erosion was investigated and determined a natural result of beaver activity. To this day, beaver activity is high especially between the Curtis Road stream crossing and the confluence of Hale Creek. Beaver dams are common in this stretch and the variety of habitats that beavers can create has an influence on the fish community and environmental factors including water temperature.

Current Status

Four fish community assessments were completed by the DNR on Smith Creek in 2020. The first two survey reaches at Esmond Road and Old State Road were conducted under the Status and Trends protocols described by Wills et al. (2011) for random stream sampling. The Status and Trends program was designed to gain understanding of waterbodies across the state by utilizing standard protocols for sampling both fish and aquatic habitat.

A 700-foot reach of Smith Creek upstream of the Esmond Road stream crossing was sampled with a single backpack electrofishing unit on 15 July 2020 (Figure 1). This site is the furthest upstream site sampled. The mean wetted width was 20.7 feet, and the mean depth was 0.76 feet. The water temperature was 58F. Additional habitat measurements were also taken at this site including substrate type and riparian habitat features (Table 6). All fish species shocked were netted and measured (total length [TL]; Table 1). Of note, 47 Brook Trout, 34 Brown Trout, and 5 Rainbow Trout were captured. All but three trout were < 12 in TL and ≤ age 2. Growth rates (expressed by mean length at age) for Brook Trout and Brown Trout were similar to growth rates of each species across Michigan.

On July 17, 2020, a 1,400-foot section upstream of the Old State Road crossing was surveyed with a three-probe stream shocker unit (Figure 1). This site is the furthest downstream site sampled and was the largest with an average wetted width of 27.5 ft and average depth of 1.7 ft. The water temperature was 59F. Additional habitat measurements were also taken at this site including substrate type and riparian habitat features (Table 6). All fish species shocked were netted and measured to TL. Of note, 1 Brook Trout, 67 Brown Trout, and 181 Rainbow Trout were captured (Table 2). At this location, fish species diversity was higher (16 species) and the range in size of fish captured was broader (Table 2). Similar to the Esmond Road site, Brown Trout and Rainbow Trout were growing relatively similar to growth rates of each species across Michigan. Six age-classes (0-5) of Brown Trout were present and five age-classes (0-4) of Rainbow Trout were present at this site.

On August 10, 2020 two other sites were sampled. A 775-foot reach of Smith Creek off of Allen Road on United States Forest Service property was sampled with two backpack electrofishing units (Figure 1). At these two sites, all fish species shocked were netted and measured to TL. This station had very different riparian habitat compared to the other three stations. This area was dominated by grass, higher banks (with sand erosion), and an appearance of an old beaver pond. The water temperature was the highest at this station and was 65.2F. There was little overhanging vegetation, clean gravel substrate, or woody debris in the water. Two Brook Trout, 26 Brown Trout, and 58 Rainbow Trout were captured at this station (Table 3). Five age-classes of Brown Trout (ages 0-4), and three age-classes of Rainbow Trout (ages 0-2) were present at this site. Growth rates for Brown Trout and Rainbow Trout were similar to statewide averages at the Allen Road site which was similar to the other stations on Smith Creek

The last site, a 750-foot reach of Smith Creek upstream of Curtis Road was sampled with two backpack electrofishing units (Figure 1). This station was generally wider than the Esmond Road site and had large amounts of overhanging vegetation. The water temperature at this site was 56.1F. The two-backpack electrofishing approach was used due to the abundance of woody debris in the water, which would have challenged the efficiency of the stream shocker unit. At this site, 16 Brook Trout, 105 Brown Trout, and 28 Rainbow Trout were present (Table 4). Five age-classes of Brown Trout (ages 0-3,5), and three age-classes of Rainbow Trout (ages 0-2) were present at this site. Similar to the other stations, Brown Trout and Rainbow Trout were growing similar to statewide averages at this location.

In summary, we surveyed four stations on Smith Creek, with varying amounts of electrofishing during the summer of 2020. Brook Trout, Brown Trout, and Rainbow Trout were collected at all four stations (Tables 1-5). Brook Trout were more prominent in the upper reaches of Smith Creek (Table 1); whereas Rainbow Trout were more prominent in the lower reaches (Table 2). Brown Trout were common throughout the four sampling sites. Brook Trout reach large sizes in the upper reaches, but Brown Trout and Rainbow Trout do not reach large sizes in Smith Creek relatively to the species maximum achievable lengths. However, there are many legal Brown Trout for harvest across the entire sampling area. A total of 19 fish species were collected among the sampling sites, indicating high species richness in a cold-water trout stream. The water temperatures in all sites except the Allen Road site were cold, providing good refuge for trout species during the summer heat. The riparian characteristics of the Allen Road site indicated that the thermal changes could be related to beaver activity in the past or possibly currently, but between two sampling locations.

Analysis and Discussion

The four surveys completed in 2020 provide baseline data for Smith Creek. Abundant, naturally reproduced Brook Trout, Brown Trout, and Rainbow Trout (Steelhead) populations are found throughout the system. The decline in Brook Trout downstream in the watershed is not uncommon. The upper reaches high water quality and intact habitat helps to provide an excellent Brook Trout fishery with fish reaching over 10 in TL. The downstream reaches are wider with less habitat diversity which in part increases water temperature making the stream more favorable to Brown Trout and Steelhead. Steelhead appear to be accessing all the creek based on the presence of Steelhead parr at all four sampling locations. Smith Creek appears to have good spawning habitat for salmonids and is most likely contributing to the Steelhead fishery in the East Branch Au Gres River and Lake Huron as well.

Management Direction

Smith Creek is a stream that supports natural reproduction of trout with occasional salmon reproduction as well. While no Chinook Salmon or Coho Salmon were captured during the 2020 surveys, angler reports indicate the occasional presence of salmon during the fall. These fish are likely the result of natural reproduction as Chinook Salmon are not stocked in Southern Lake Huron. Coho Salmon are stocked at Lake Huron ports, but not within close proximity (i.e., Thunder Bay River and Au Sable River).

The utmost protection should be given to Smith Creek with thorough consideration on all permit applications that are submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Additionally, road stream crossings should be surveyed and inventoried to determine if adequate upstream and downstream passage exists by all fish species throughout Smith Creek and into the East Branch Au Gres River. The Esmond Road crossing was recently replaced and has reduced erosion into the stream. Additional crossings should be considered for replacement to reduce erosion and increase fish passage if they are determined to be full- or partial barriers to migration.

Areas that have historically had problematic beaver dams should be monitored and addressed when new dams are constructed that impede fish passage and increase water surface temperatures to undesirable levels. In addition, recreational trapping should continue to be promoted to remove nuisance beavers in this area.

Additional MDNR fish and habitat surveys should continue to monitor the naturally reproducing trout populations throughout Smith Creek. Currently, the Type 1 trout regulations are appropriate and should remain in place. Due to the current lack of public access on Smith Creek, Fisheries Division should actively look for land acquisition which would provide public fishing access to Smith Creek.

References

Wills, T. C., T. G. Zorn, A. J. Nuhfer, and D. M. Infante. 2011. Stream Status and Trends Program sampling protocols. Chapter 26 in Manual of fisheries survey methods. Michigan Department of Natural Resources, Fisheries internal document, Ann Arbor.

Figures

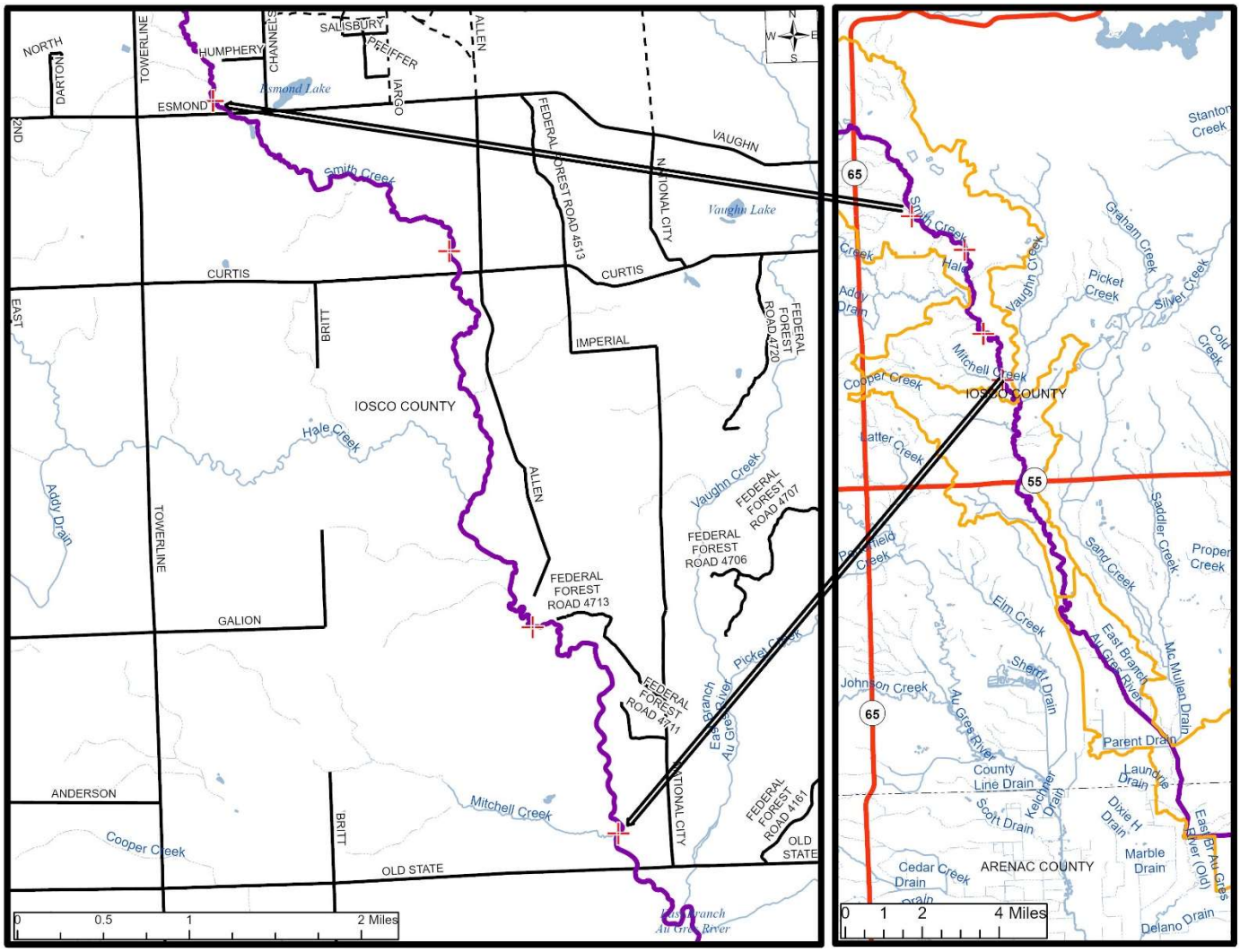

Figure 1. Eastern Iosco County with Smith Creek in the northwest corner flowing south before joining with Guiley Creek to form the East Branch Au Gres River.

Tables

Table 1. Number and size of species captured by backpack electrofishing in Smith Creek, upstream of the Esmond Road crossing on 15 July 2020.

Species	Number	Percent by number	TL range (in)	Mean TL (in)	Percent legal
Black Bullhead	2	1.2	4.0-5.9	5.0	0
Brook Trout	47	27.5	1.0-12.9	6.5	26
Brown Trout	34	19.9	4.0-14.9	9.00	65
Central Mudminnow	3	1.8	2.0-3.9	2.8	100
Green Sunfish	6	3.5	1.0-3.9	2.5	0
Largemouth Bass	2	1.2	3.0-3.9	3.5	0
Mottled Sculpin	64	37.4	1.0-3.9	2.5	100
Pumpkinseed	2	1.2	3.0-3.9	3.5	0
Rainbow Trout	5	2.9	4.0-5.9	4.7	0
Yellow Perch	6	3.5	3.0-4.9	3.7	0

Table 2. Number and size of species captured by backpack electrofishing in Smith Creek, upstream of the Old State Road crossing on 15 July 2020.

Species	Number	Percent by number	TL range (in)	Mean TL (in)	Percent legal
American Brook Lamprey	6	0.9	5.0-5.9	5.5	100
Black Crappie	3	0.5	4.0-5.9	5.0	0
Blackchin Shiner	1	1.0	2.5	5.5	100
Blacknose Dace	158	24.4	2.0-4.9	2.8	100
Bluegill	1	0.2	1.5	1.5	0
Brook Stickleback	1	0.2	1.5	1.5	100
Brook Trout	1	0.2	2.5	2.5	0
Brown Trout	67	10.4	2.0-19.9	6.2	30
Central Mudminnow	6	0.9	2.0-4.9	3.0	100
Creek Chub	14	2.2	3.0-5.9	4.0	100
Green Sunfish	18	2.8	1.0-3.9	2.6	0
Johnny Darter	15	2.3	1.0-3.9	2.5	100
Mottled Sculpin	173	26.7	1.0-3.9	2.6	100
Rainbow Trout	181	28.0	1.0-13.9	5.1	7
White Sucker	2	0.3	10.0-12.9	11.5	100

Table 3. Number and size of species captured by backpack electrofishing in Smith Creek, upstream of the Allen Road area on 10 August 2020.

Species	Number	Percent by number	TL range (in)	Mean TL (in)	Percent legal
Blacknose Dace	6	2.8	2.0-3.9	3.3	100
Black Crappie	1	0.5	3.5	3.5	0
Bluegill	3	1.4	3.0-4.9	3.8	0
Brook Trout	2	0.9	3.0-6.9	5.0	0
Brown Trout	26	12.3	2.0-16.9	6.1	27
Green Sunfish	2	0.9	2.0-3.9	3	0
Mottled Sculpin	98	46.4	1.0-3.9	2.4	100
Rainbow Trout	58	27.5	2.0-12.9	5.9	5
White Sucker	14	6.6	8.0-20.9	11.6	100
Yellow Perch	1	0.5	4.5	4.5	0

Table 4. Number and size of species captured by backpack electrofishing in Smith Creek, upstream of the Curtis Road crossing on 10 August 2020.

Species	Number	Percent by number	TL range (in)	Mean TL (in)	Percent legal
Brook Trout	16	9.2	2.0-10.9	5.5	31
Brown Trout	105	60.7	2.0-16.9	7.5	45
Creek Chub	1	0.6	2.5	2.5	100
Green Sunfish	2	1.2	1.0-3.9	2.5	0
Mottled Sculpin	18	10.4	1.0-3.9	2.6	100
Pumpkinseed	1	0.6	4.5	4.5	0
Rainbow Trout	28	16.2	1.0-9.9	5.0	7
Yellow Perch	2	1.2	3.0-3.9	3.5	0

Table 5. Length-frequency of Brook Trout, Brown Trout, and Rainbow Trout collected across the four stations of Smith Creek in 2020.

TL group (in)	Number of Brook Trout collected	Number of Brown Trout collected	Number of Rainbow Trout collected
1.0-1.9	2		36
2.0-2.9	11	40	17
3.0-3.9	4	26	5
4.0-4.9	7	6	32
5.0-5.9	9	31	89
6.0-6.9	11	15	62
7.0-7.9	5	18	14
8.0-8.9	5	19	8
9.0-9.9	2	29	3
10.0-10.9	8	13	2
11.0-11.9	1	10	2
12.0-12.9	1	8	1
13.0-13.9		5	1
14.0-14.9		3	
15.0-15.9		4	
16.0-16.9		2	
17.0-17.9		1	
18.0-18.9		1	
19.0-19.9		1	

Table 6. Habitat evaluation data from Smith Creek at the Esmond Road stream crossing and the Old State Road stream crossing, July 2020.

Habitat Measurement	Esmond Road	Old State Road
Percent riffle	0.0%	15.4%
Percent run	69.2%	84.6%
Percent pool	30.8%	0.0%
Average width (ft)	20.7	27.5
Average depth (ft)	0.76	1.7
Max depth (ft)	2.1	14.0
Discharge (cfs)	4.72	30.46
Woody cover (sq ft)	1,024	490
Linear wood (ft)	390	228
Substrate		
Percent clay	0.0%	9.2%
Percent detritus/silt	0.0%	0.0%
Percent sand	72.3%	61.5%
Percent gravel	26.2%	18.5%
Percent small cobble	0.0%	10.8%
Percent large cobble	0.0%	0.0%
Percent boulder	0.0%	0.0%
Percent wood	0.0%	0.0%
Percent island	1.5%	0.0%