

Minnesota Department of Natural Resources  
Division of Fish and Wildlife  
Section of Fisheries

Stream Survey Report

Seven Mile Creek 2019



**Funding:** Federally funded under aid from the Sport Fish Restoration Act, F-29-R(P), Fisheries Management

**Field work by:** Tony Sindt, Hannah Anema, Chris Foster, Tanner Stevens

**Report completed by:** Hannah Anema, Hutchinson Area Fisheries Office

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

RIVER OR STREAM SURVEY

Initial Survey  
Resurvey  
Pop. Assessment  
Special Assessment   X  

Date(s) of Field Work: 9 September 2019

Leader (s) Hannah Anema, Tony Sindt  
Assistant(s) Chris Foster, Tanner Stevens

NAME, LOCATION AND FLOW CHARACTERISTICS

1. Stream Name: Seven Mile Creek
2. Alternate Name(s): None
3. Tributary Number: M-55-71.5
4. Counties: Nicollet
5. Watershed Name and Number: Lower Minnesota #29
6. Sequence of Waterways to Basin: Seven Mile Creek to Minnesota River to Mississippi River.
7. Map(s) Used: Prim Maps
8. Average Width - Upper Stations: Not measured      Lower Stations: Not measured
9. Mouth Location: T. 109 N                      R. 27 W                      S. 12
10. Flow at Mouth of watershed (SMC\_WQ3): 9.75 cfs      Date: 9/9/19
11. Location of SMC\_WQ3: River mile 0.4, below second bridge in park (E: 417873 x N: 4901492).

WATERSHED DESCRIPTION AND USE

12. Description of Watershed (soil types, cover types, topography, land use and ownership).

a) Watershed description: The watershed is in mostly row crop agriculture on rather flat slopes, except for the creek valley below Highway 99, which is a hardwood forest on steep slopes.

b) Land adjacent to stream: The corridor consists of mostly hardwood trees once the stream enters its natural channel below Highway 99. Above Highway 99 the stream is an open ditch flowing through agricultural fields.

**GENERAL INFORMATION ON THE STREAM**

**13. Reason for Survey:** To assess the fish community in conjunction with restoration measures being implemented as part of the Seven Mile Creek Watershed Program. Four standardized stations (SMB\_BS1 - SMB\_BS4) were sampled (Fig. 1). A Seven Mile Creek Watershed Program Monitoring Plan was written in December, 2011 and much of this report follows those protocols.

**14. Previous Investigations and Surveys:** Initial survey in 1985; population assessments in 1986, 1987, 1991, 1993, 1996, 2002, and 2011-2019; brown trout abundance estimates in 2002, 2003, 2005, and 2008.

**15. Special Problems or Conditions:** Problems include flooding, hydrological 'flashiness', seasonal low base flows attributed to a lack of groundwater recharge, agricultural run-off, channel and stream bank deterioration, and lack of deep pool habitat for adult brown trout.

**GENERAL INFORMATION ON THE STREAM (continued)**

**16. Dams and other obstructions (including beaver dams):** See 1985 survey.

**17. Use of Water:** Fishing   X   Recreation   X   Com. Navigation  
Power        Irrigation        Livestock Watering   X    
Other (specify)

**18. Access (location and ownership):** Road crossings and within the park.

**19. Recreational Boating:**  
1) Navigable reach: None.  
2) Type of Boating: n/a.

**20. Tributaries and springs:** Springs near SMC\_BS4 allow brown trout to occupy a small section (approximately 1,000 feet) of Seven Mile Creek.

**21. Stream Physical Characteristics:** Several physical stream measurements were taken during this survey. Miles from mouth was estimated using Arcmap10 "Stream routes with Kittle numbers" layer. The stream layer was not an exact match to the actual stream location.

<b>a) Station no.</b>	SMC_BS1	SMC_BS2	SMC_BS3	SMC_BS4	SMC_WQ3
<b>b) Date</b>	9/9/19	9/9/19	9/9/19	9/9/19	9/9/19
<b>c) Loc. (mi from Mouth)</b>	5.8	5.2	0.6	1.0	0.4
<b>d) Length of station (ft)</b>	350	350	350	350	0
<b>e) % station in</b>					
<b>Pools</b>	100	50	10	10	---
<b>Riffle &amp; Rapids</b>	0	0	40	80	---
<b>Runs</b>	0	50	50	10	---
<b>Other (list)</b>					
<b>f) Avg. width</b>	Not measured	Not measured	Not measured	Not measured	30'
<b>g) Avg. depth</b>	Not measured	Not measured	Not measured	Not measured	.1"
<b>h) Flow (cfs)</b>	Not measured	Not measured	Same as SMC WQ3	Same as SMC WQ3	9.75
<b>i) High water mark</b>	Not checked	Not checked	Not checked	Not checked	---
<b>j) Present stage</b>	Moderate	Low	Low	Low	Low
<b>k) Banks:</b>	Heavy veg. Reed canary	Reed canary & brush	Heavy grass, brush, & Forbes	Hardwoods, brush, & Reed canary	---
<b>Avg. height</b>	Not measured	Not measured	Not measured	Not measured	---
<b>Height range</b>	Not measured	Not measured	Not measured	Not measured	---
<b>Erosion</b>	Light-moderate	Moderate-severe	Moderate	Moderate	---
<b>%grazed</b>	0	0	0	0	---
<b>%ditched</b>	100	20, near Hwy 13.	0	0	---
<b>l) Shade</b>	None	Heavy	Light	Heavy	---
<b>m) Overall Bottom type</b>					
<b>Rubble</b>			70	70	---
<b>Boulder</b>			20	20	---
<b>Sand</b>		30	10	10	---
<b>Gravel</b>		10			---
<b>Silt</b>	100	60			---
<b>n) Wood debris</b>	none	Heavy	Light	Moderate	---

**22. Characteristics of Water:** No grab samples were taken during this survey.

<b>a) Station No.</b>	SMC_BS1	SMC_BS2	SMC_BS3	SMC_BS4	SMC_WQ3
<b>b) Date</b>	9/9/19	9/9/19	9/9/19	9/9/19	9/9/19
<b>c) Loc. (mi. from mouth)</b>	5.8	5.2	0.6	1.0	0.4
<b>d) Length of station (ft)</b>	350	350	350	350	0
<b>e) Time</b>	1301	1216	913	1010	900
<b>f) Air temp F</b>	77	72	62	66	60
<b>g) Water temp C</b>	22.7	18.9	15.2	15.2	15.2
<b>h) Color</b>	Brown	Brown	Clear	Clear	Clear
<b>i) Cause of color</b>	Sediment	Sediment	None	None	None
<b>j) Secchi disc (ft.)</b>	Not measured	Not measured	Not measured	Not measured	Not measured
<b>Field Determinations</b>					
<b>Dissolved oxygen (mg/l)</b>	Not measured	Not measured	Not measured	Not measured	12.36
<b>T Tube - Turbidity (cm)</b>	30	34	>60	>60	>60
<b>Conductivity (umhos)</b>	730	559	Not measured	Not measured	738

**23. Temperature Profile:** There may have been an issue with the thermometer when taking temperatures at SMC\_BS3 and SMC\_BS4. The temperature reading that was taken at SMC\_WQ3 was applied to both lower stations due to all three of these stations having similar temperature readings in the past. No temperature loggers were deployed during this survey.

**24. Biological Characteristics:**

**a) Distribution of aquatic plants:** Aquatic plants were not quantitatively examined in this survey.

**b) Distribution and abundance of aquatic invertebrates:** No samples collected.

**25. Fishery Characteristics:**

<b>Station number:</b>	SMC_BS1	SMC_BS2	SMC_BS3	SMC_BS4
<b>b) Date</b>	9/9/19	9/9/19	9/9/19	9/9/19
<b>c) Start location - downstream end (UTM)</b>	E: 414187 N: 4904792	E: 414078 N: 4903934	E: 417624 N: 4901646	E: 417275 N: 4901935

<b>d) Length of Station</b>	350 ft	350 ft	350 ft	350 ft
<b>e) Gear</b>	Haltech- Backpack Pulsed DC 250 volts 60 pps	Haltech- Backpack Pulsed DC 250 volts 60 pps	Haltech- Backpack Pulsed DC 250 volts 60 pps	Haltech- Backpack Pulsed DC 250 volts 60 pps
<b>f) Amt. of sampling effort</b>	640 sec	405 sec	1067 sec	860 sec
<b>ff) Number of netters</b>	1	1	1	1

**(g) Species present:**

Station:	SMC_BS1		SMC_BS2		SMC_BS3		SMC_BS4	
	Num	Wt (g)	Num	Wt (g)	Num	Wt (g)	Num	Wt (g)
Bigmouth Shiner					24	44	4	10
Blacknose Dace					72	244	74	442
Blacksided Darter					6	37		
Bluntnose Minnow					25	53	1	1
Brassy Minnow					7	19		
Brown Trout							6	2403
Brook Stickleback	9	9	25	24				
Common Shiner					12	37	4	25
Creek Chub					4	32	6	90
Central Stoneroller					3	20		
Emerald Shiner					5	21		
Fathead Minnow	10	46	14	50	39	66		
Johnny Darter					51	81	8	12
Largemouth Bass					5	28		
Sand Shiner					28	59	7	15
Shorthead Redhorse					5	95		
Spotfin Shiner					128	257	16	39
White Sucker					3	19	4	26
Yellow Perch					1	4		
<b>Total</b>	<b>19</b>		<b>39</b>		<b>418</b>		<b>130</b>	

**Remarks:** A total of 19 species were found. Species included; Bigmouth Shiner, Blacknose Dace, Blacksided Darter, Bluntnose Minnow, Brassy Minnow, Brown Trout, Brook Stickleback, Common Shiner, Creek Chub, Central Stoneroller, Emerald Shiner, Fathead Minnow, Johnny Darter, Largemouth Bass, Sand Shiner, Shorthead Redhorse, Spotfin Shiner, White Sucker, and Yellow Perch. No anomalies (deformations, tumors, discoloration, open sores, diseases, or parasites) were seen on any fish.

**26. Fish Sizes:** Lengths of game fish grouped into one inch categories.

Species	Brown Trout
< 2.0	
2.0 - 2.9	
3.0 - 3.9	
4.0 - 4.9	
5.0 - 5.9	
6.0 - 6.9	
7.0 - 7.9	
8.0 - 8.9	
9.0 - 9.9	
10.0 - 10.9	1
11.0 - 11.9	1
12.0 - 12.9	2
13.0 - 13.9	1
14.0 - 14.9	1
15.0 - 15.9	
16.0 - 16.9	
17.0 - 17.9	
18.0 - 18.9	
19.0 - 19.9	
20.0 - 20.9	
21.0 - 21.9	
22.0 - 22.9	
23.0 - 23.9	
24.0 - 24.9	
25.0 - 25.9	
Total	6

**27. Age and Growth of Gamefish:** Game fish were not aged. Given the inability to accurately and/or consistently assign ages of Brown Trout from scales collected during the 2011 survey, no scales were collected in recent surveys from any game fish. In future surveys, it might be beneficial to age Brown Trout using different aging structures.

**28. Comparisons with past investigations and surveys:** This was the ninth consecutive year that all four stations were surveyed together in one assessment. Station SMC\_BS4 was the same as site 09MN090 Minnesota Pollution Control Agency (PCA) sampled in 2010, 2011, 2013, and 2015. Therefore, these two sites were used to compare similarities between PCA and MNDNR IBI scores in the past. As of 2018, MPCA denied our request for FIBI score calculation due to the fact that the MNDNR methodology is inconsistent with IBI fish collection of the MPCA. Also Note that MPCA will only be sampling Seven Mile Creek when the Middle Minnesota River Intensive Watershed Sampling schedule calls for it, which returns again in 2023.

IBI Score between years and sampling agency:

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>2PCA</b>	11	23.9		57		26.1				
<b>MDNR</b>		22.2	47.8	60	59.2	22.9	38.4	35.4	---	---

Any IBI score below a threshold of 45 can be considered impaired (Bryan Spindler, personal communication). Technically, the site sampled in 2012, 2013, and 2014 indicated a status of non-impairment; however, impairment decisions are based on a weight of evidence approach. Since other recent fish surveys were well below the threshold, the stream is still likely considered impaired for fish. Despite wide fluctuations in IBI scores among years, the table above and below provides confidence that sampling methods and scoring remain constant, as seen by the high agreement between IBI scores and number of species sampled in the same year by different agencies.

The higher scores in 2012, 2013 and 2014, relative to previous surveys may have been due to the decrease in tolerant species in the sample, which was likely attributed to the extremely low water flow during most of those years.

Total Species Sampled between years and sampling agency:

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>PCA</b>	21	14		10		11				
<b>MDNR</b>		12	8	12	17	9	19	19	21	19

The low water flows in 2012, 2013, and 2014 may have significantly depleted habitat available to fish. This limited habitat may have decreased the percent of habitat generalists in the sample, in turn increasing IBI scores. Extremely high water levels and flows during 2015, 2016, and 2017 may have allowed movement of a variety of species into newly inundated habitat, lowering the IBI score. Although we did not calculate an IBI score for SMC\_BS4 in 2018 and 2019, comparing fish species and numbers from 2017 with 2018 and 2019 helps predict that scores would most likely be similar between the three years, continuing to show impairment of this stretch of creek. High water clarity at stations SMC\_BS3 and SMC\_BS4 might have both helped and hindered the effectiveness of backpack electrofishing. Fish were easier to spot in clearer water, but the sight of the fish was increased as well, giving them time to out-swim the backpack shocker. At stations SMC\_BS1 and SMC\_BS2, water clarity was less than 35 centimeters, which made spotting fish species more difficult than the stations further downstream.

Aquatic macro-invertebrates are a good indicator of impairment, but have only been sampled three times by the PCA and twice by MDNR. First by the PCA in September of 2009 with an IBI score 23.1, in August of 2011 with a score of 49.9, and again in August of 2013 with a score of 32. The first MDNR sample was collected in October of 2014 with a score of 23.5, and the second was collected in October of 2015. An IBI score was not calculated for the sample collected in 2015 due to the number of organism collected being insufficient. The impairment threshold for aquatic macro-invertebrates is 43. Thus, aquatic macro-invertebrates IBI appears to be highly variable (likely due to flow conditions), with one score above the impairment threshold and three below.

**29. History of fishing conditions:** One angler was observed during the 2019 assessment. He caught 2 Brown Trout on 9/9/19 and had caught 4 more Brown Trout earlier in the summer. He also mentioned that he had seen 15 trout in a pool at the start of SMC\_BS4. He discussed that trout were prevalent, but not always biting. According to the acting conservation officer for the St. Peter area, on



average a couple anglers are checked per year at Seven Mile Creek Park. Many of the anglers surveyed tend to practice catch and release within this park instead of harvesting fish. Low water conditions during 2019 may have lead Brown Trout to congregate in pools that were outside of our sampling stations. Brown Trout were only sampled at SMC\_BS4, which had more pools and trout habitat than the other 3 stations sampled this year.

**30. Records of past management:** Trout habitat improvements (3 J-hooks, 2 cross-vanes, 2 channel constrictors, bank resloping, and root wad placements) were completed in 2002. Native vegetation was planted to stabilize eroding banks in 2003. Trout habitat improvements (5 Luncker structures and several rock weirs) were completed in 2007. In 2016, a habitat improvement project was completed that included repairs to existing structures as well as new habitat features (channel constriction, bank resloping, and rock weir construction). 2016 was the first year that a put-and-take strategy of stocking was used to stock 7 Mile Creek. Adult fish have been stocked instead of fingerlings over the past four years.

**Fish stocking:**

Year	Species	Size	Number or pounds
2004	Brown Trout	Fingerling	10,500 fgl
2005	Brown Trout	Fingerling	7,500 fgl
2006	Brown Trout	Fingerling	7,500 fgl
2007	Brown Trout	Fingerling	7,500 fgl
2008	Brown Trout	Fingerling	7,500 fgl
2009	Brown Trout	Fingerling	7,500 fgl
2010	Brown Trout	Fingerling	7,500 fgl
2011	Brown Trout	Fingerling	7,500 fgl
2012	Brown Trout	Fingerling	7,500 fgl
2013	Brown Trout	Fingerling	7,500 fgl
2014	Brown Trout	Fingerling	7,500 fgl
2015	Brown Trout	Fingerling	7,500 fgl
2016	Brown Trout	Adult	200 adl
2017	Brown Trout	Adult	300 adl
2018	Brown Trout	Adult	300 adl
2019	Brown Trout	Adult	300 adl

**31. Special Regulations:** Portions of Seven Mile Creek are defined as "Designated Trout Stream" in Minnesota Rules Chapter 6264.0050 as they lie within Township 109 North; Range 27 West; and Sections 2-4 and 10-12.

**32. Discussion of Fishery:**

**a) General characteristics:** A total of 19 species representing 6 families were sampled. The most abundant species sampled at SMC\_BS3 and SMC\_BS4 was Blacknose Dace and Spottail Shiner. 6 adult Brown Trout (10-15 inches) were sampled at station SMC\_BS4. Brown Trout were not found at any of the other 3 stations. The lower two sites contained the most fish by far (90%) and yielded almost 500 more individuals than the upper two sites. The two upper sites, only yielded 10% of the fish caught and also contained only two sampled species: Fathead Minnow and Stickleback. The total catch in 2019 (606) was 275 fish more than that of the previous year (331). However, 2 less species were documented in 2019 vs. 2018. Besides Brown Trout, Largemouth Bass and Yellow Perch were the only other gamefish species sampled during this survey. However the individuals sampled were much too small to be utilized by fishermen. All game fish were sampled at the lower two stations. It remains unlikely that Brown Trout would be able to survive in the upper reaches of seven mile creek throughout the summer considering minimal flow even during high water years. The upper stations offer no recreational fishing opportunity due to highly degraded, low flow conditions, and the complete absence

of game fish.

**b) Fish management problems:** Poor land use practices within the watershed have resulted in degradation of water quality and loss of in-stream habitat through erosion, siltation, pollution, and flooding. Seven Mile Creek has become a 'flashy' stream with minimal base flows primarily due to changes in the watershed that have removed the ability of wetlands to store water, such as drain tiling and surface water management. Above the Highway 99 Bridge, the stream is severely ditched. Drain tiling and bank erosion have caused this area of the river to build up with thick layers of silt that choke out potential trout habitat. Following heavy precipitation events, periods of very high flow cause the stream to widen because it has limited connection to a natural floodplain. Due to the hard substrate found throughout much of the stream, down cutting is minimal. These factors result in the widening of the stream because energy is focused on the banks of the stream. The widening stream has yielded a loss of the focused flow that is needed to scour pools, which also reduces in-stream cover habitat by washing large rocks downstream, even displacing habitat improvement structures. Spring floods, particularly in 2010 (park manager, personal communication), altered several of the trout habitat improvement projects installed in 2002 and 2007. Flooding was so bad in the park in 2010, that parts of the creek channel had to be moved and reshaped (park manager, personal communication). Unstable flows, lack of deep pools, and insufficient herbaceous and woody vegetation cover, likely limit spawning habitat and cover for the stocked Brown Trout population. Springs in the lower section of Seven Mile Creek allow Brown Trout to occupy approximately 2,290 feet of the Creek that remains connected to the Minnesota River with at least some minimal flow throughout the year. Other segments of Seven Mile Creek between the upper parking lot at Seven Mile Creek County Park and the Hwy 99 Bridge have maintained isolated pools even in late summer. Although isolated pools have been observed in the SMC\_GM1 and SMC\_GM2 study reaches, higher temperatures, lack of flow, and lack of woody vegetation (SMC\_GM1) prevent trout from occupying these areas. Pools in the lower stretches of the creek were generally created by spring fed flow that became trapped by outcroppings of non-porous stream bed. These are areas of Seven Mile Creek that could be the focus of future habitat improvements. This area of the state was in a drought in the falls of 2011, 2012, and 2013 so stream conditions reflected this. The highest flow measured in 2014, below the springs, was measured at 0.67 cfs. Substantially higher flows were measured in 2015 at 24.38 cfs, 2016 at 16.7 cfs, 2017 at 28.9 cfs, and 2018 at 24.9 cfs. In 2019 flows were reduced and only measured 9.75 cfs. Due to difficulty measuring flow at SMC\_WQ3 in 2019, cfs was determined using MNDNR Cooperative Stream Gaging (CSG).

**33. Ecological Classification of Waterway:** 0-4.5 I-D marginal trout waters

#### **34. Summary and Recommendations**

**Summary:** 2019 was the fourth year that adult Brown Trout were stocked instead of fingerlings. Brown Trout are usually found at both SMC\_BS3 and SMC\_BS4, but during the 2019 survey, trout were only found in pools and runs at SMC\_BS4. This was probably due to low flow and limited access to habitat and pools at SMC\_BS3. The average size of fish sampled in 2019 was 12.50 inches. These fish were a smaller average size than fish sampled in 2018 (average size of 14.00 inches). However, we sampled twice the amount of fish in 2019 than we did in 2018. This could have been a result of lower flows trapping fish in more congregated areas, resulting in more fish sampled. In 2018, a large rain event on June 9th caused flows to go increase from 70 cfs to 520 cfs in less than 3 hours (MNDNR). This flashiness may have been responsible for washing trout downstream into the Minnesota River. High flow rates and flashiness throughout the summer of 2019 may have also decreased the amount of trout present in Seven Mile Creek. Low water levels during our survey period may

have trapped remaining trout in isolated pools upstream and downstream of our survey sites, limiting our total catch rate. Anglers were another factor that potentially limited our catch rate. Fishing pressure may have been high during opener or shortly after. Although not many trout were surveyed in 2019, switching to a put-and-take strategy has been beneficial because it gives anglers more fishing opportunities and provides higher chances for trout to spawn if the conditions of the river are right. In order to conclude that most of the fish stocked were harvested in spring, some type of creel survey would be beneficial in providing an idea of what number of fish were harvested and what number died of natural causes. This would help to conclude that moving from a put-grow-and-take strategy to a put-and-take strategy provides better angling opportunities for fishermen. During the year of 2017, stocking of adult trout and high flows allowed at least a few trout to produce a year class based on the evidence that 2 juvenile trout were surveyed under 4.0 inches during the 2017 survey. No juvenile trout were surveyed during the 2018 or 2019 survey. High water years along with habitat improvements will make natural reproduction for trout more of a possibility. This would allow for an evaluation of natural reproduction in upcoming surveys. The 2011 survey report indicated that "perhaps a more thorough investigation into what remains of the in-stream habitat improvements should be conducted before additional money is spent on that type of work." On-site visits in spring 2012 conducted by Stream Habitat specialists from the MDNR led to a determination that during periods of sustained flow (spring) that habitat improvement structures were functioning as designed, thus, have provided appropriate trout habitat and remained functional. Unfortunately, reduced base flow is difficult to correct and regulate. Despite all of this, Seven Mile Creek offers a unique trout angling opportunity in this part of the state.

**35. CREDITS AND SIGNATURES**

**a. Funding:** Federally funded under aid from the Sport Fish Restoration Act, F-29-R (P), Fisheries Management.

**b. Field work by:**

**Name of crew leader:** Hannah Anema

**Name of aide(s):** Tony Sindt, Chris Foster, Tanner Stevens

**c. Completed report by:**

**Name:** Hannah Anema

**Title:** Fisheries Technician - Hutchinson

**Approved by:** \_\_\_\_\_ **Date:**  
**Area Fisheries Supervisor**

**Approved by:** \_\_\_\_\_ **Date:**  
**Regional Fisheries Manager**

**Figure 1.** Sampling stations for the 2016 Seven Mile Creek special assessment.

