

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

Stream Survey Report

Stony Creek

2015

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Study Area

Stony Creek (M-74-35) is a small, cold water stream located near Spring Hill in western Stearns County (Figure 1). The stream flows approximately 10 miles from the headwater near Elrosa to the Sauk River. Land use within the watershed (11,364 acres) was estimated to be 68% row crops and 21% hay/pasture (based on 2011 National Land Cover Database; Figure 2). The riparian area is primarily row crops and grasses; overhanging reed canary grass provides some shading. The substrate is gravel, large cobble, and silt and channelization is evident in the study area.

Brook Trout were stocked in Stony Creek since at least the 1940s and it was a designated trout stream until 1977. Local residents have reported that Brook Trout were common in the stream many years ago and recall people angling for them. An increase in groundwater appropriation prior to 1977, low flows, and high water temperatures likely led to the extirpation of trout. Favorable water temperatures were recorded in the early 2000s and Brook Trout were reintroduced in 2002 and 2004 and electrofishing surveys were conducted annually from 2003 to 2006 (Minnesota Department of Natural Resources 2006, 2007).

Methods

Water temperatures were recorded hourly using Onset Pendant loggers at two sites (Figure 3). The upper site was located downstream of the 353rd Avenue culvert and the lower site was located east of MN Highway 4 downstream of a private driveway. Fish were sampled using a Halltech HT 2000 backpack electrofisher using pulsed DC current. All fish were identified, counted, and bulk-weighed by species.

Results

Water temperatures were marginal for Brook Trout at both sites. Maximum temperatures were 23.6°C at the upper site on July 15 and 23.0°C at the lower site on July 15 (Table 1, Figure 4.) Minimum temperatures were 2.1°C and 1.3°C on April 22 at the upper and lower sites, respectively.

Two stations were sampled by electrofishing (Table 2, Figure 3). EF 1 began at the upstream end of the first culvert west of Highway 4 and extended 820 feet upstream to the first field road crossing. This station was ditched in the past few years and a pool at the beginning was too deep to wade and heavily silted. EF 2 began at the end of EF 1 and extended 250 feet upstream, ending at a

steep riffle. The end of EF 2 was in dense willow, dogwood, and alder. Total on-time was 2,406 seconds for EF 1 and 1,840 seconds for EF 2.

A total of 11 fish species were captured, but no trout (Table 2). Fish numbers were dominated by Creek Chub (53%) and Blacknose Dace (34%); total weight was also highest for Creek Chub (68%) and Blacknose Dace (27%). Other species sampled included: Brook Stickleback, Central Mudminnow, Common Shiner, Fathead Minnow, Iowa Darter, Johnny Darter, Mimic Shiner, Northern Redbelly Dace, and White Sucker. Iowa Darter was the only intolerant species and made up 2% of the sample by number.

Discussion

Trout management in Stony Creek was discontinued due to poor thermal conditions and low water in the 1970s. The thermal regime in some recent years has been adequate for Brook Trout, but marginal or poor in others (Minnesota Department of Natural Resources 2007). Adult Brook Trout prefer water temperatures below 20 °C (Scott and Crossman 1979) and growth stops above 20°C (Wisner and Christie 1987). In 2015, 11% of the temperature readings at the upper site and 8% of the readings at the lower site were greater than 20°C and likely hinder Brook Trout survival, particularly in early life stages when thermal tolerance is even lower.

No trout were found during a survey in 2000 and Brook Trout were stocked on a trial basis in 2002 (fingerlings) and 2004 (yearlings). Angler access was granted for a limited time by the landowner. Electrofishing was conducted annually from 2003 to 2006 and survival appeared to be low. However, growth was fast; Brook Trout grew to 360 mm in four years based on scale ages. The first evidence of natural reproduction was one young-of-year and four juveniles sampled in 2006. A survey conducted by the Minnesota Pollution Control Agency in 2008 captured 4 adult Brook Trout.

The watershed is heavily agricultural and runoff may hinder trout survival and reproduction. Water samples taken in 2005 showed high levels of phosphorus and suspended solids. The only intolerant species found in the survey were a few Iowa Darters; the lack of other intolerant species and the presence of many tolerant species is also an indicator of poor water quality. Ditch clean-outs continue, severely limiting habitat in some areas and the relative lack of shade likely raises water temperatures. Riparian buffers and other best management practices should be implemented, particularly in the study area and upstream, and ditch clean-outs should be discouraged.

Stony Creek has not been stocked since 2004 and further stocking of Brook Trout or Brown Trout is not recommended until watershed and riparian land use issues are addressed and the thermal regime is shown to be stable over several years. Angling easements would also need to be pursued.

References

Minnesota Department of Natural Resources. 2007. Stony Creek 2006 Stream Survey Division of Fish and Wildlife, St. Paul, MN.

Minnesota Department of Natural Resources. 2006. Stony Creek 2005 Stream Survey Division of Fish and Wildlife, St. Paul, MN.

Scott, W.B. and E.J. Crossman. 1979. Freshwater Fishes of Canada. Department of Fisheries and Oceans, Scientific Information and Publications Branch. Ottawa, Canada.

Wismer, D.A. and A.E. Christie. 1987. Temperature Relationships of Great Lakes Fishes: A Data Compilation. Great Lakes Fish. Comm. Spec. Pub. 87-3. 165 p.

Table 1. Summary of temperature data (°C) from Stony Creek (M-74-35) at two sites, April 3 to October 21, 2015.

Site	Min	Avg	Max	Readings	N ¹ > 20°C	% Readings > 20°C	Consecutive N ¹ > 20°C
Upper	2.1	14.5	23.6	4,823	537	11	40
Lower	1.3	14	23	4,823	367	8	21

¹Number of hourly observations recorded above 20°C.

Table 2. Species sampled by backpack electrofishing on Stony Creek (M-74-35), October 21, 2015.

Species	EF 1	EF 2	Total	Bulk Weight (g)	Length Range (mm)
Blacknose Dace ²	137	64	201	1,400	42 – 103
Brook Stickleback ²	1	7	8	20	61 – 68
Central Mudminnow ²	2	8	10	88	63 – 109
Common Shiner		4	4	1	34 – 36
Creek Chub ²	86	223	309	3,450	26 – 187
Fathead Minnow ²		1	1	4	72
Iowa Darter ¹	1	9	10	14	32 – 55
Johnny Darter	7	27	34	61	32 - 64
Mimic Shiner		1	1	2	65
Northern Redbelly Dace		1	1	1	36
White Sucker ²	15	6	21	66	41 – 81
Total	234	351	585	5,107	

¹ Intolerant species

² Tolerant species

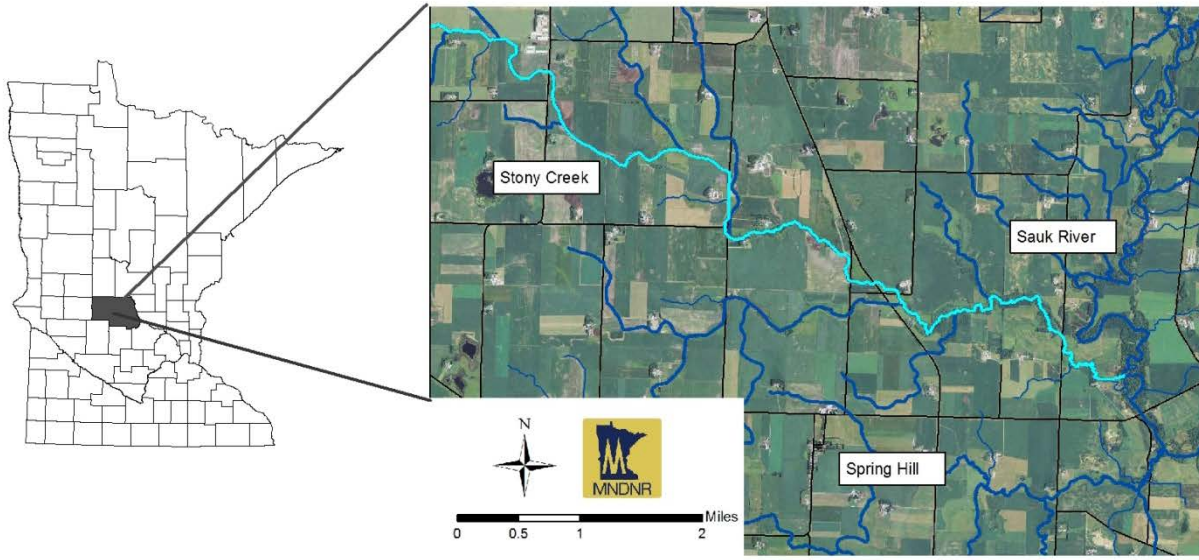


Figure 1. Location of Stony Creek (M-74-35), Stearns County, Minnesota.

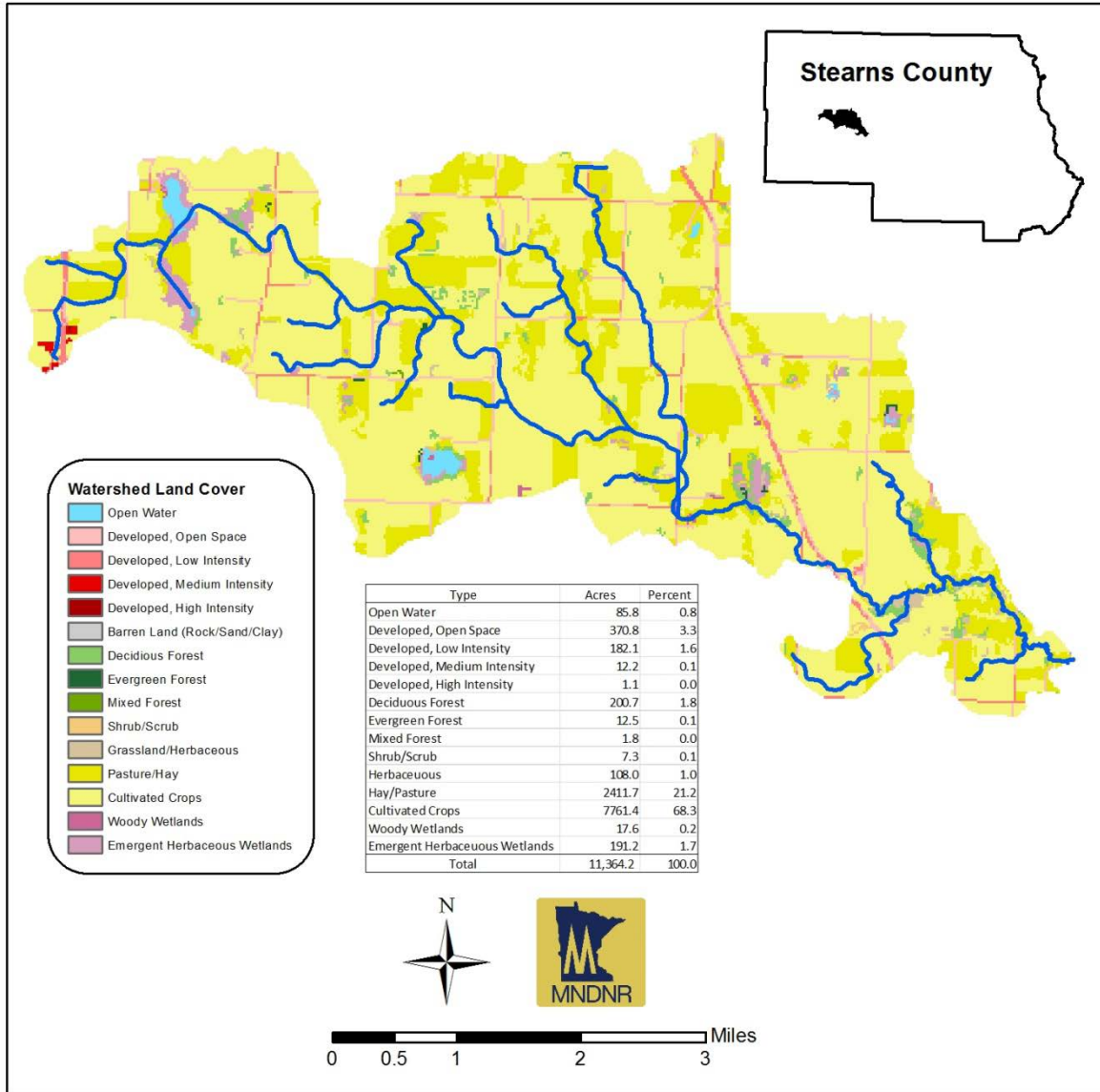


Figure 2. Location and land cover for the Stony Creek (M-74-35) watershed.

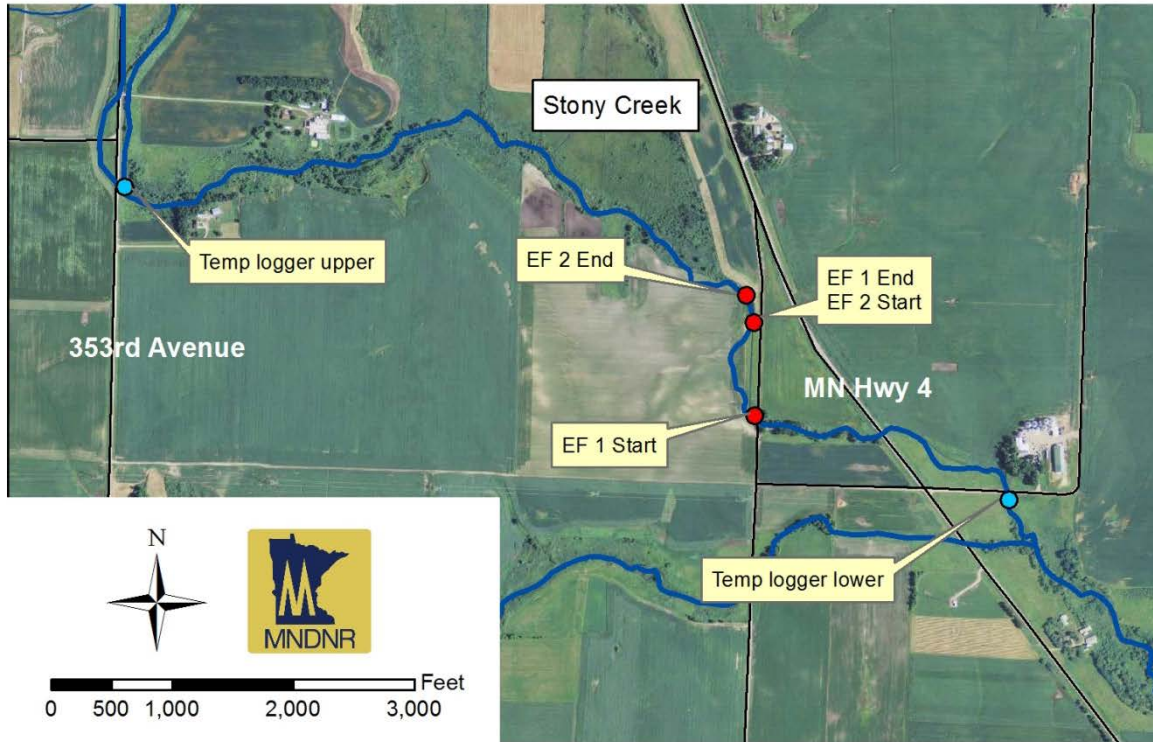


Figure 3. Location of electrofishing and temp logger sites on Stony Creek (M-74-35), 2015.

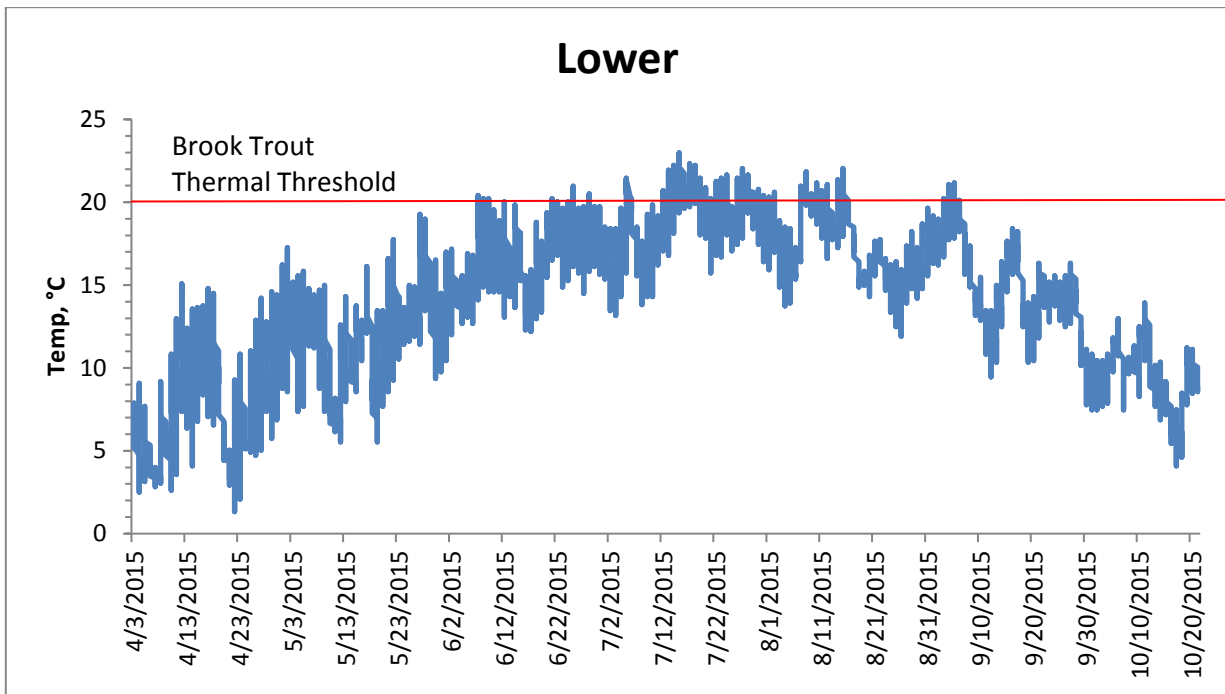
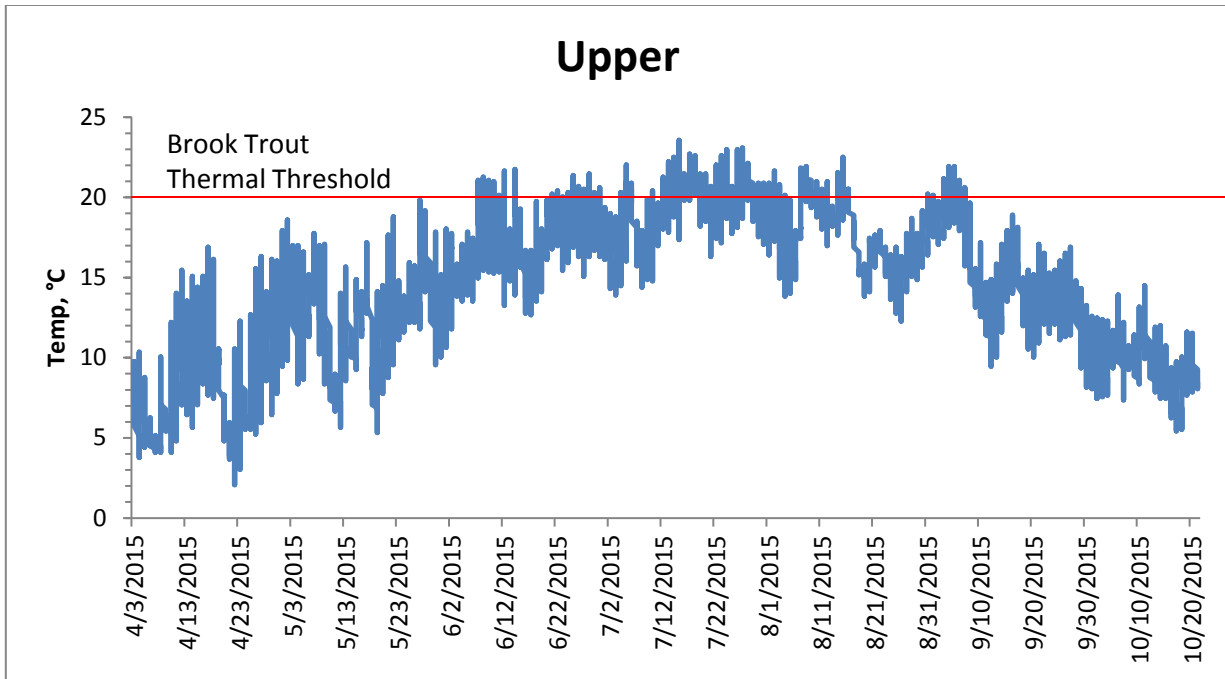


Figure 4. Hourly temperatures (°C) from Stony Creek (M-74-35) at two sites, April 3 to October 21, 2015.

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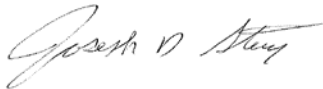
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