2015 Follow-up Stream Assessments for three reaches in the Cannon River Watershed

During the 2013 stream assessment for the Cannon River Watershed (HUC 07040002), three AUIDs were given an IF for insufficient information to make an aquatic life assessment due to uncertain flow and wetland conditions at the biological stations. The three reaches were Dutch Creek (07040002-572), Heath Creek (07040002-521), and unnamed creek (07040002-528). For all three reaches, additional monitoring was recommended. During a follow-up assessment during 2015, these three reaches were reviewed for aquatic life use support. The results of the follow-up assessment for each reach are included below. All 2013 assessment results for other stream and lakes within the Cannon River Watershed is contained in the Cannon River Watershed Monitoring and Assessment Report. This report and other information on the Cannon River Watershed can be found on the MPCA website (http://www.pca.state.mn.us/udgxdb2).

Dutch Creek (AUID 07040002-572) - New Aquatic Life Listings for fish (FIBI) and macroinvertebrate (MIBI) communities.

Dutch Creek (-572) is a tributary to Chub Creek (07040002-528) within the Chub Creek Subwatershed. This reach is located northwest of Northfield in Dakota County.

Original Assessment 2013: Dutch Creek (-572) was initially not assessed due to potential wetland conditions at the biological stations that put into question whether the reach should be assessed against stream criteria. Flow at the stations was slow, instream vegetation was fairly dense, and Dissolved Oxygen (DO) was below the 5 mg/L standards (2.9 to 3.5 mg/L). Additionally, the fish communities were dominated (>85%) by species that are often associated with wetlands (e.g., central mudminnow, fathead minnow) and the macroinvertebrate communities were dominated by taxa that are tolerant of low DO conditions often associated with wetlands. Phosphorus was also elevated (183 and 215 µg/L).

Follow-up Assessment 2015: During 2014, the MPCA wetland monitoring team reviewed characteristics at a location between the two biological monitoring stations. Based on soil type and vegetation at the wetland monitoring station, the location was determined to be more stream-like than wetland. A follow-up assessment occurred in 2015. Dutch Creek (-572) was assessed using stream criteria and determined to be impaired for fish and macroinvertebrates.

Table 1. 2015 Follow-up assessment results for Dutch Creek (07040002-572). 2015 assessment results underlined.

AUID, Reach Name, *Reach Description*	Reach Length (miles)	Use Class	Biological Station ID	Location of Biological Station	Aquatic Life Indicators:								Bacteria	Aquatic Life	Aquatic Rec.
					Fish IBI	Invert IBI	Dissolved Oxygen	Turbidity	Chloride	pH	NH_3	Pesticides			
07040002-572, Dutch Creek, Headwaters to Chub Cr	9.3	2C	11LM044 04LM143	Upstream of Foliage Ave, 6 mi NW of Northfield Downstream of CR 90 (300th St W), 5 mi. NW of Northfield	**EXP**	**EXP**	EXP	--	--	--	--	--	--	**NS**	NA

Abbreviations for Indicator Evaluations: **--** = No Data, **NA** = Not Assessed, **IF** = Insufficient Information, **MTS** = Meets criteria; **EXP** = Exceeds criteria, potential impairment; **EXS** = Exceeds criteria, potential severe impairment; **EX** = Exceeds criteria (Bacteria).
Abbreviations for Use Support Determinations: **NA** = Not Assessed, **IF** = Insufficient Information, **NS** = Non-Support, **FS** = Full Support
Key for Cell Shading: = existing impairment, listed prior to 2012 reporting cycle; = new impairment; = full support of designated use

Heath Creek (AUID 07040002-521) – New Aquatic Life Impairment listings for fish (FIBI) and macroinvertebrate (MIBI) communities

Heath Creek (-521) is a 13 mile reach just west of Northfield in Rice County. This reach is located in the Heath Creek Subwatershed and flows into the Cannon River.

Original Assessment 2013: In 2008, Heath Creek was listed as impaired due to turbidity and not supporting aquatic life. However, review during the 2013 assessment determined that water chemistry data at monitoring station S001-935 were influenced by algal conditions within Union Lake, due to its close proximity to the lake outflow, and were not representative of Heath Creek. As such, those data were removed from the assessment dataset and a new assessment showed that Heath Creek (-521) meets the water quality standard for turbidity and will be removed from the 2014 Impaired Waters List. For biological indicators, the 2013 assessment proposed that additional monitoring for fish and invertebrates was needed in order to determine an aquatic life use support status. Two biological stations were reviewed during the 2013 assessment; one near the headwaters (04LM076) sampled in 2004 and one near the outlet (11LM005) sampled in 2011. At 11LM005, both fish and macroinvertebrate IBIs scored above threshold with sensitive taxa present; however, the opposite occurred at 04LM076 where both IBI scores for both biocriteria were well below the threshold with a high percentage of tolerant individuals (100% for fish, 93.3% for macroinvertebrates). Habitat quality was rated fair at the upstream station (04LM076) with silt and sand substrate and moderate channel instability. Dissolved oxygen was also low (2.95 mg/L), vegetation was dense, and phosphorus was high (0.453 mg/L) suggesting a potential nutrient issue. Heath Creek flows out of Union Lake which is impaired by excess nutrients and may be a potential contributor to the low DO and poor biological conditions. At the downstream station (11LM005), habitat was rated good with cobble riffle habitat and a fairly stable channel. This station was one of only two locations in the Cannon River Watershed where the pollution-sensitive, turtle shell case-maker caddisfly larvae, *Glossosoma sp.,* was collected. Phosphorus was also high (0.301 mg/L). The lower reach appears to be supporting aquatic life and the upstream reach sampled seven years earlier indicated a non-supporting condition. Due to the potential that there may have been watershed or local improvements between those two time periods, but with no new data available to confirm improved biological condition or present impairment, additional monitoring was recommended by the watershed assessment team.

Follow-up Assessment 2015: During 2013, additional biological monitoring was conducted on Heath Creek at the upstream station (04LM076) and at a new location in between the two existing stations (13LM001). The fish communities at both stations were dominated by tolerant individuals and the F-IBI scores at both stations were below the threshold. Macroinvertebrate IBI scores at both stations sampled during 2013 were also below the threshold. The 2015 follow-up assessment determined that Heath Creek is impaired for aquatic life for both fish and macroinvertebrates. Continuous DO measurements collected during August 2014 show that DO is a potential stressor. Stressor Identification will determine the candidate causes of biological impairment. Site images also suggest that the channel at both upstream stations is very incised with bank cutting evident, although the riparian area is in better condition at the downstream station.

Table 2. 2015 Follow-up assessment results for Heath Creek (07040002-521) within the Heath Creek Subwatershed. 2015 assessment results underlined.

AUID, Reach Name, *Reach Description*	**Reach Length (miles)**	**Use Class**	**Biological Station ID**	**Location of Biological Station**	**Aquatic Life Indicators:**								**Bacteria**	**Aquatic Life**	**Aquatic Rec.**
					Fish IBI	Invert IBI	Dissolved Oxygen	Turbidity	Chloride	pH	NH_3	Pesticides			
07040002-521, Heath Creek, Headwaters (Union Lk 66-0032-00) to Cannon R	13.4	2B	04LM076 13LM001 11LM005	Upstream of CR 59 (90th St), 4 mi W of Northfield Downstream of CR 59 (90th St E), 1.5 mi. W of Northfield	**EXP**	**EXP**	MTS	MTS	MTS	MTS	MTS	--	EX	NS	NS

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Abbreviations for Use Support Determinations: **NA** = Not Assessed, IF = Insufficient Information, **NS** = Non-Support, **FS** = Full Support

Key for Cell Shading: = existing impairment, listed prior to 2012 reporting cycle; = new impairment; = full support of designated use; = previous impairment, list correction proposed.

Unnamed Creek (07040002-628) – Not Assessed due to uncertain flow conditions prior to sampling.

Unnamed creek is located south of Lonsdale in Rice County. This reach is within the Wolf Creek Subwatershed.

Original Assessment 2013: For unnamed creek (-628), additional monitoring was recommended. The biological station (04LM084) was sampled once in 2004 for fish and macroinvertebrates. Fish were sampled in June and macroinvertebrates were sampled in August. Only 11 fish were collected and the F-IBI score was 0 suggesting severe impairment for fish. In contrast, aquatic macroinvertebrates scored above threshold but within the confidence interval; hence the assessment decision was that this reach supports aquatic life for macroinvertebrates. The macroinvertebrate community had good overall taxa richness and an even distribution of species abundances, although with only moderate EPT richness (EPT is short for *Ephemeroptera, Plecoptera,* and *Trichoptera,* insect orders with species that are generally intolerant of pollution) and no sensitive taxa. Channel instability may be a stressor. This station has intact riparian zone, but from sampling images (Image 14) appears to be incised with moderate bank erosion that may be associated with a change in flow conditions related to a change in watershed hydrology. This part of the watershed experienced a severe drought during 2003 and so it was unclear if water quality issues or drought may have been the reason for the low number of fish collected, and so additional monitoring was recommended before a formal assessment for fish could be made.

Follow-up Assessment 2015: The 2013 fish visit also collected relatively few individuals (29 fish) in this small headwater stream and the FIBI for 2013 was also below threshold, suggesting potential impairment, although a severe drought also occurred in this area during the fall/winter prior to sampling as well, and could be a factor in the low number of fish observed. Macroinvertebrate IBI was just slightly below the impairment threshold. Due to the remaining uncertainty of how drought conditions during the preceding year may have influenced the biological samples, the 2015 assessment team decided to not assess for aquatic life for either fish or macroinvertebrates. Phosphorus measured in 2004 and 2013 was high (430 and 330 µg/L, respectively) and could be a source of high nutrients in downstream Circle Lake which is impaired for aquatic recreation. The TMDL on downstream Circle Lake will incorporate this subwatershed in the load calculation and remediation plan.

Table 3. 2015 Follow-up assessment results for Unnamed creek (07040002-628) within the Wolf Creek Subwatershed. 2015 assessment results underlined.

AUID, Reach Name, *Reach Description*	**Reach Length (miles)**	**Use Class**	**Biological Station ID**	**Location of Biological Station**	**Aquatic Life Indicators:** Fish IBI	Invert IBI	Dissolved Oxygen	Turbidity	Chloride	pH	NH_3	Pesticides	Bacteria	**Aquatic Life**	**Aquatic Rec.**
07040002-628, Unnamed creek, Unnamed cr to Unnamed cr	1.6	2B	04LM084	Downstream of Gilbert Ave, ~3.5 mi. S of Lonsdale	**EXS†**	**EXP†**	IF	MTS	--	MTS	MTS	--	--	**IF†**	NA

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Abbreviations for Use Support Determinations: **NA** = Not Assessed, **IF** = Insufficient Information, **NS** = Non-Support, **FS** = Full Support

Key for Cell Shading: = existing impairment, listed prior to 2012 reporting cycle; = new impairment; = full support of designated use.

†Not assessed due to uncertain flow conditions at station.