

Appendix A: Detailed descriptions of thermal habitat use designation reviews

Tributary to Amity Creek, East Branch (04010102-C43) MPCA Use Designation Review

Stream name: Tributary to East Branch of Amity Creek

AUID(s): 04010102-C43

AUID description: Headwaters to the south line of PLS section T51 R14W S23

Tributaries: NA

MPCA biological station(s): 19LS161

County: St. Louis

Watershed: Lake Superior – South

DNR designation: Not a designated trout water

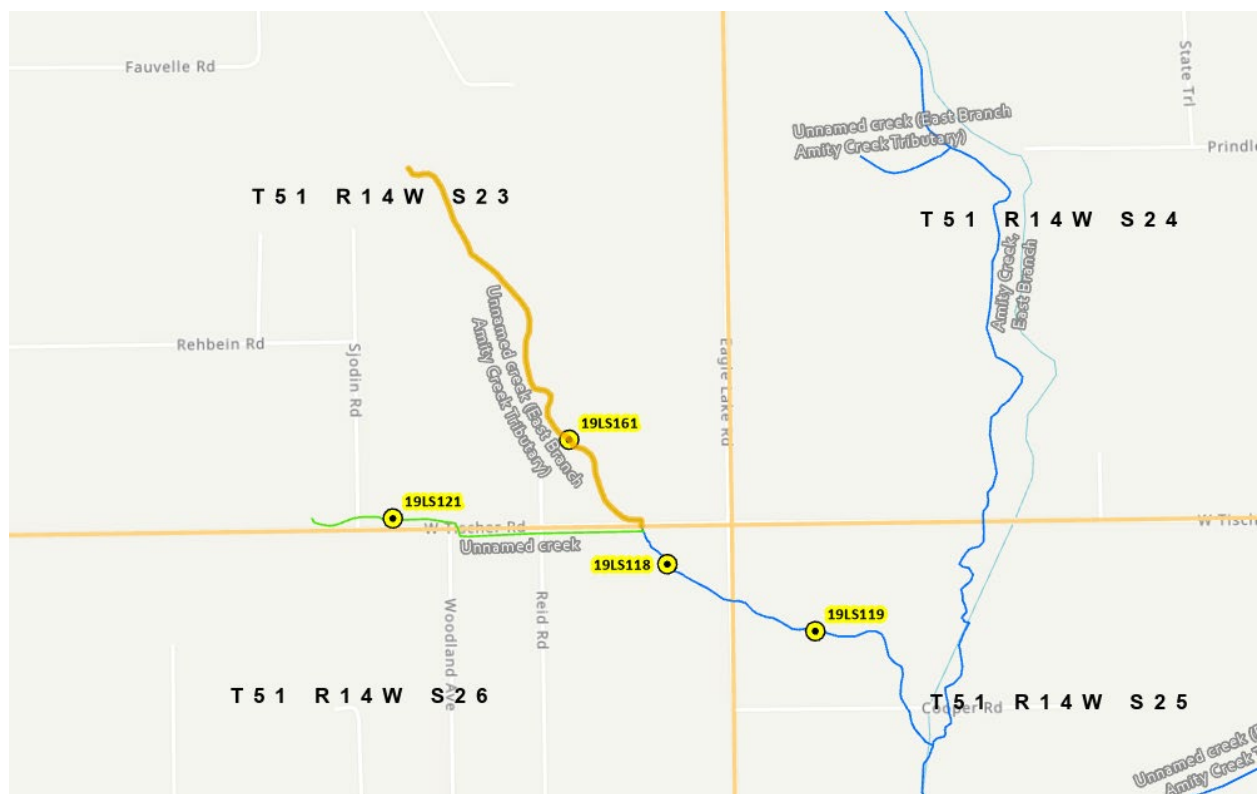
DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: The immediate downstream reach is a coldwater feeder stream which then flows into the East Branch of Amity Creek – a designated trout stream. Adjacent tributary (04010102-C44) also supports a coldwater habitat. Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of tributary to East Branch of Amity Creek (04010102-C44). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA was entirely comprised of brook trout.

Fish data: 19LS161, 7/3/2019; 100% coldwater species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	45	219	1585	63

Invertebrate Community Information: No macroinvertebrate data available.

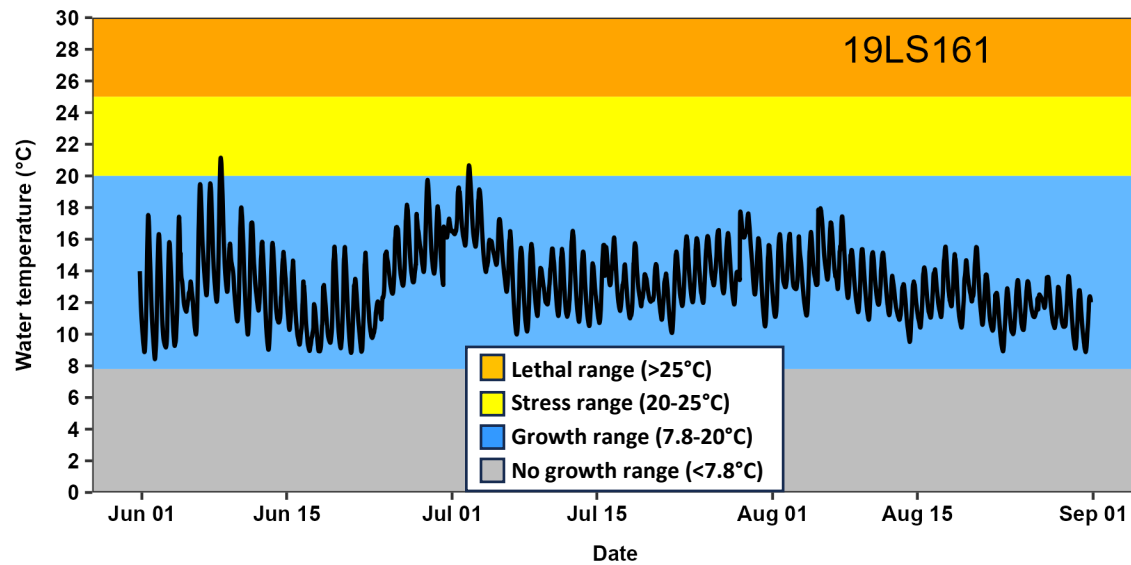
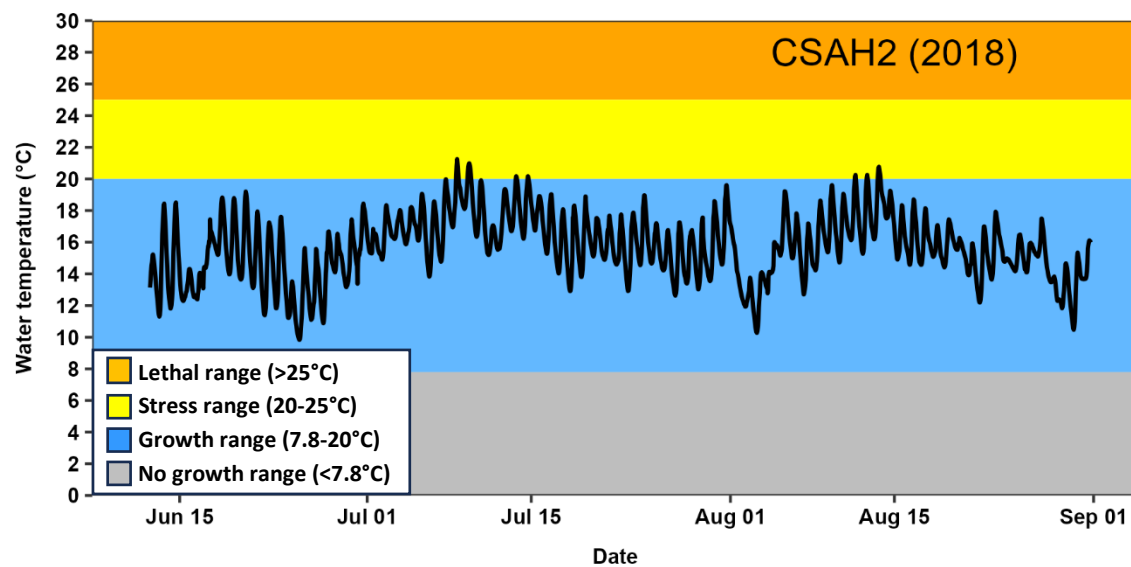
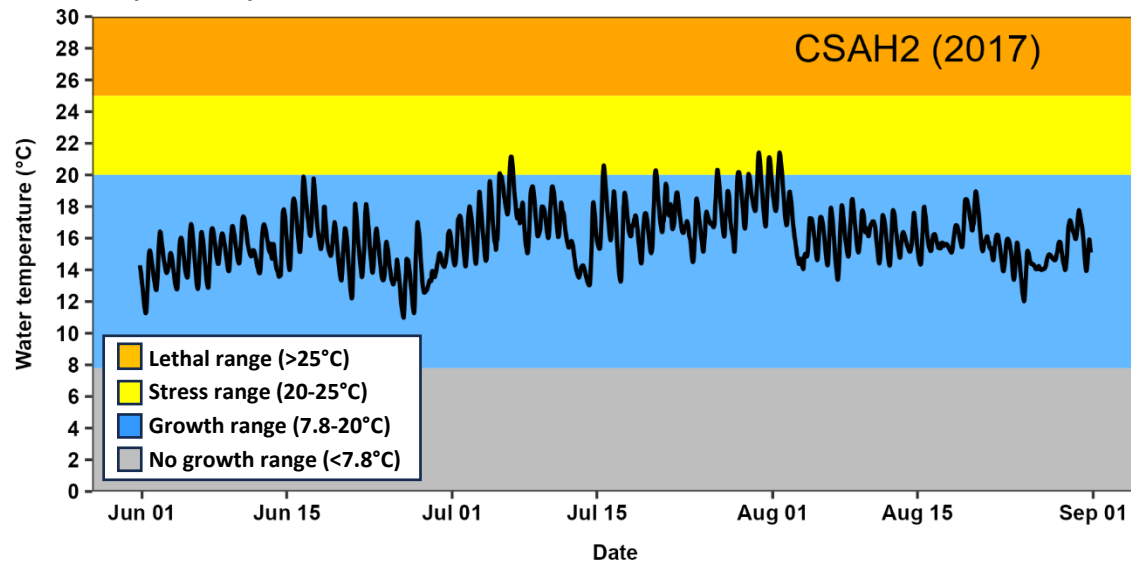
MPCA temperature data

Water temperature data loggers were deployed at the biological station (19LS161) in 2019 and outside of the biological station reach at CSAH2 (West Tischer Road) in 2017 and 2018. Average summer water temperatures ranged from 13.2-16.0°C with summer maximum temperatures ranging from 21.2-21.4°C. Water temperatures during the summer (June through August) were in the growth range for trout 98-100% of the summer. No temperatures in the no growth or lethal range for trout were measured. 0-2% of the summer had water temperatures that were in the stress range for trout. These water temperatures indicate suitable conditions for trout survival and growth in these stream reaches.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W02037015	None	2017	16.0	21.4	0%	98%	2%	0%
W02037015	None	2018	15.7	21.3	0%	99%	1%	0%
W02037022	19LS161	2019	13.2	21.2	0%	100%	0%	0%

Water temperature plots



MPCA Summary

The Minnesota Department of Natural Resources (DNR) currently does not classify this section of stream, but the entire Amity Creek drainage is a well-known brook trout fishery. In 2019, the MPCA collected a fish sample from this reach which included multiple year classes of brook trout. Temperature data from two locations along this stream reach indicated that the thermal regime is also supportive of a brook trout fishery, with thermal stress recorded 0-2% of the time and lethal threshold reached 0% of the time during the summers (June through August) of 2017-2019. The DNR agrees with a reclassification of the upper portion of this stream to Class 2A.

Tributary to Amity Creek, East Branch (04010102-C44) MPCA Use Designation Review

Stream name: Tributary to East Branch of Amity Creek

AUID(s): 04010102-C44

AUID description: Headwaters to an unnamed creek (04010102-558)

Tributaries: NA

MPCA biological station(s): 19LS121

County: St. Louis

Watershed: Lake Superior – South

DNR designation: Not a designated trout water

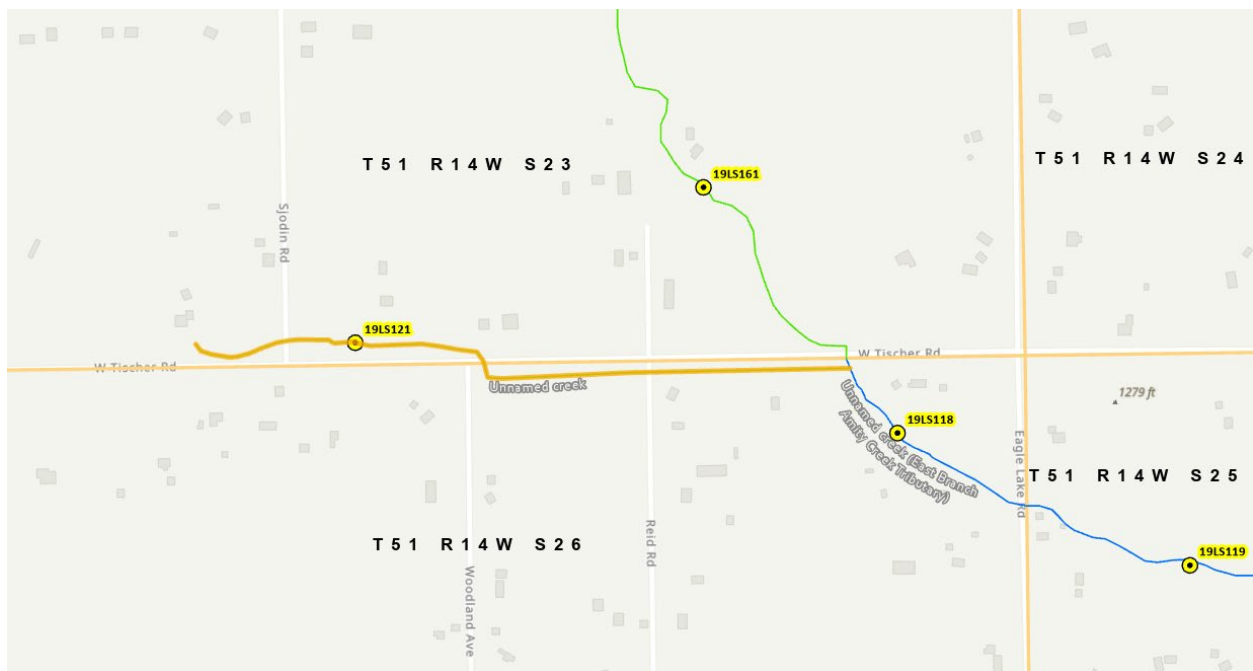
DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: The immediate downstream reach is a coldwater feeder stream which then flows into the East Branch of Amity Creek – a designated trout stream. Adjacent tributary (04010102-C43) also supports a coldwater habitat. Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of tributary to East Branch of Amity Creek (04010102-C44). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA included an adult brook trout.

Fish data: 19LS121, 7/8/2019; 33% coldwater species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	198	198	63	1
brook stickleback	BST	65	68	4	2

Invertebrate Community Information: No macroinvertebrate data available.

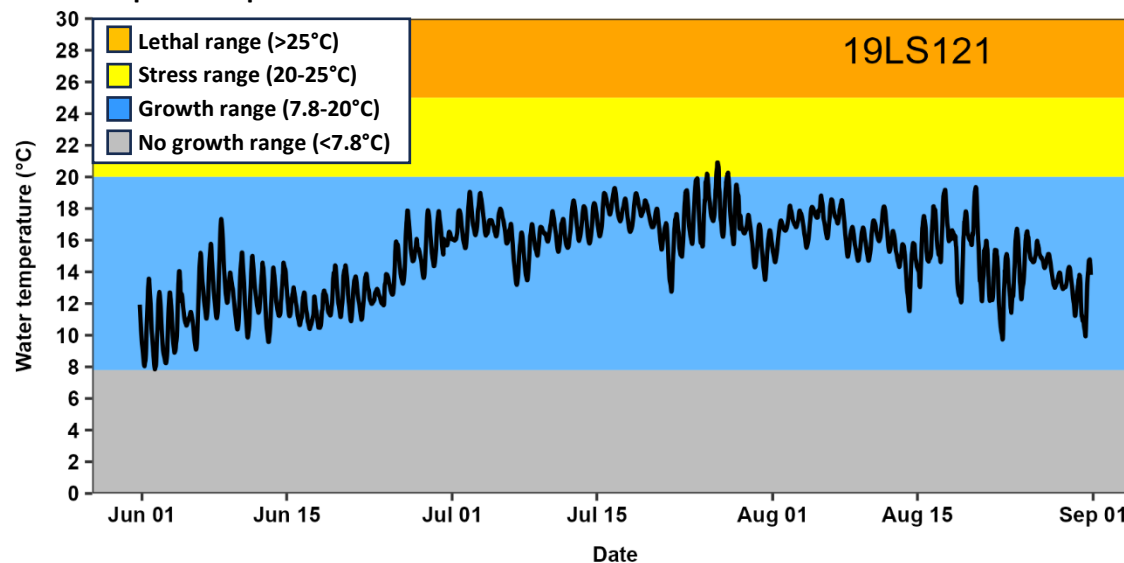
MPCA temperature data

A water temperature data logger was deployed at the biological station (19LS121) in 2019 (downstream of Sjodin Road). Average summer water temperatures was 15.0°C with a summer maximum temperature of 20.9°C. Water temperatures during the summer (June through August) were in the growth range for trout 99% of the summer. No temperatures in the no growth or lethal range for trout were measured and 1% of the summer had water temperatures that were in the stress range for trout. These water temperatures indicate suitable conditions for trout survival and growth in these stream reaches.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W02037024	19LS121	2019	15.0	20.9	0%	99%	1%	0%

Water temperature plot



MPCA Summary

The DNR currently does not classify this section of stream, but the entire Amity Creek drainage is a well-known brook trout fishery. In 2019, the MPCA collected a fish sample from this reach which included an adult brook trout. Temperature data collected downstream of Sjodin Road on this stream reach indicated that the thermal regime is also supportive of a brook trout fishery, with thermal stress recorded 1% of the time and lethal threshold 0% of the time in the summer (June through August) of 2019. The DNR agrees with a reclassification of the upper portion of this stream to Class 2A.

Tributary to the Talmadge River (04010102-C45) MPCA Use Designation Review

Stream name: Tributary to the Talmadge River

AUID(s): 04010102-C45

AUID description: Headwaters to the Talmadge River (04010102-508)

Tributaries: NA

MPCA biological station(s): 19LS116, 19LS160

County: St. Louis

Watershed: Lake Superior – South

DNR designation: Designated trout water

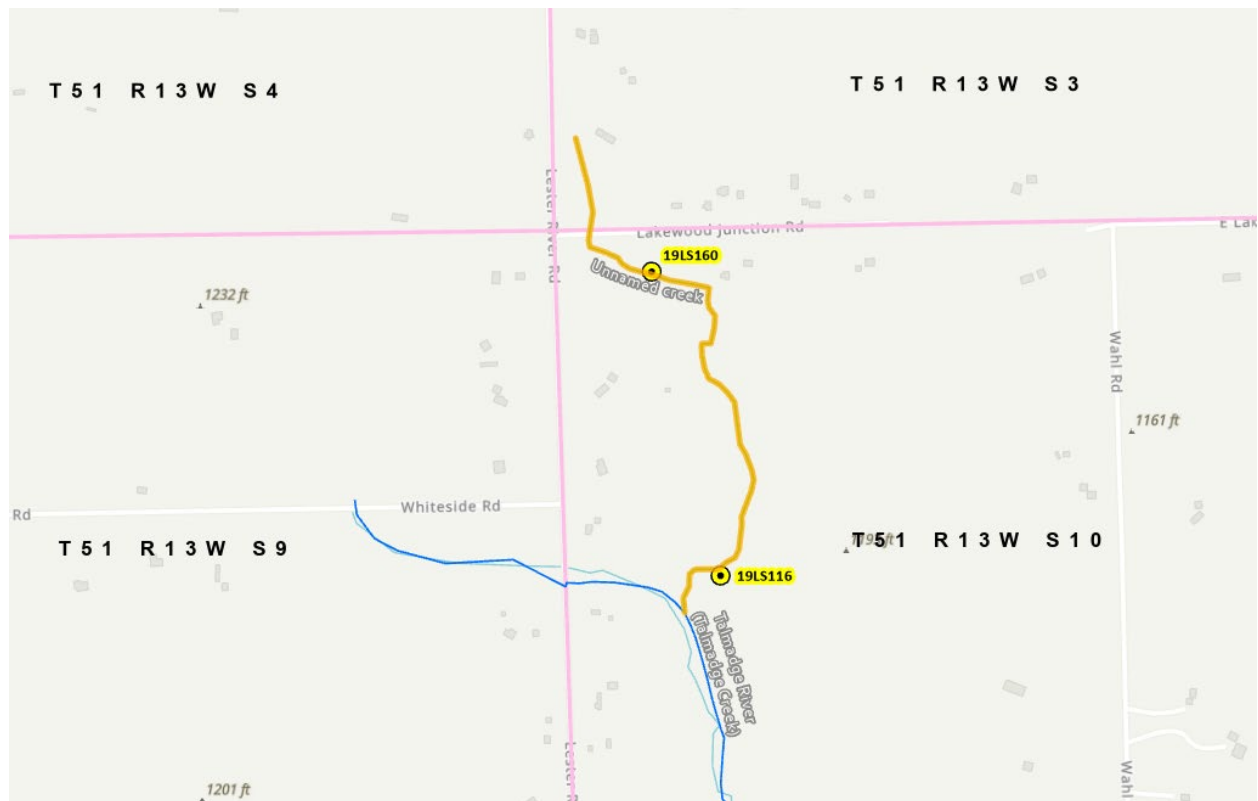
DNR management class: I-D (Marginal Trout)

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: This reach and the immediate downstream reach (04010102-508) are designated trout streams. Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of tributary to the Talmadge River (04010102-C45). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA did not include any coldwater fish species, but cool water species comprised 32-44% of the samples.

Fish data: 19LS116, 7/15/2019; 0% coldwater species, 32% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
central mudminnow	CNM	66	80	4	3
creek chub	CRC	39	138	249	101
brook stickleback	BST	50	68	6	7
iowa darter	IOD	55	55	1	1
northern pearl dace	PRD	52	120	62	22
western blacknose dace	BND	39	87	56	24
northern redbelly dace	NRD	38	60	7	25
finescale dace	FND	49	82	8	7

Fish data: 19LS160, 7/9/2019; 0% coldwater species, 44% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
central mudminnow	CNM	51	86	26	11
creek chub	CRC	34	112	17	17
brook stickleback	BST	29	60	8	21
western blacknose dace	BND	89	89	5	1
northern redbelly dace	NRD	36	36	1	1
finescale dace	FND	62	62	1	1

Invertebrate Community Information: No macroinvertebrate data available.

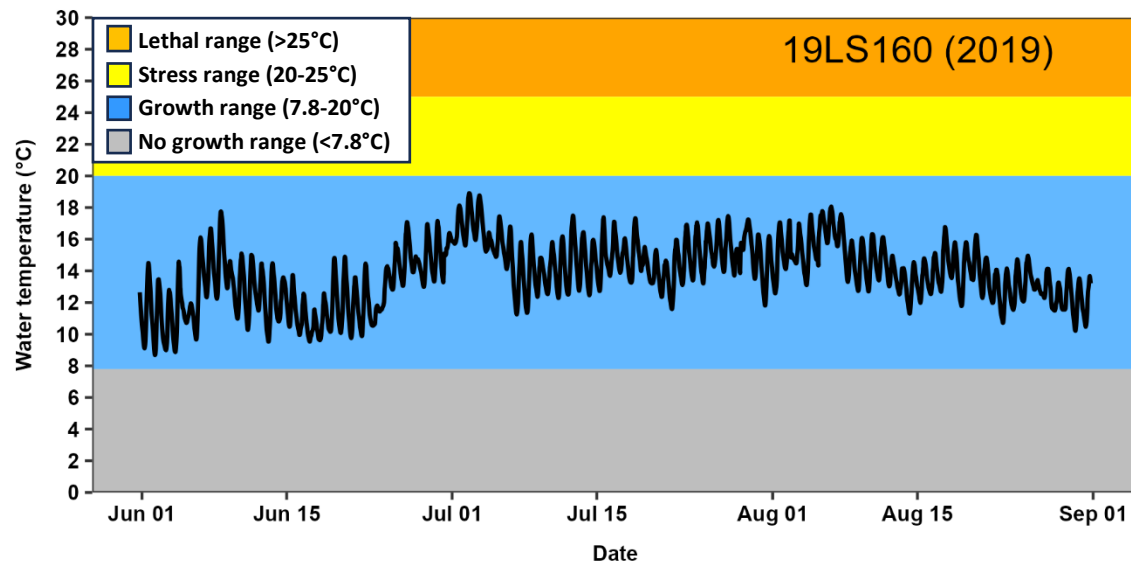
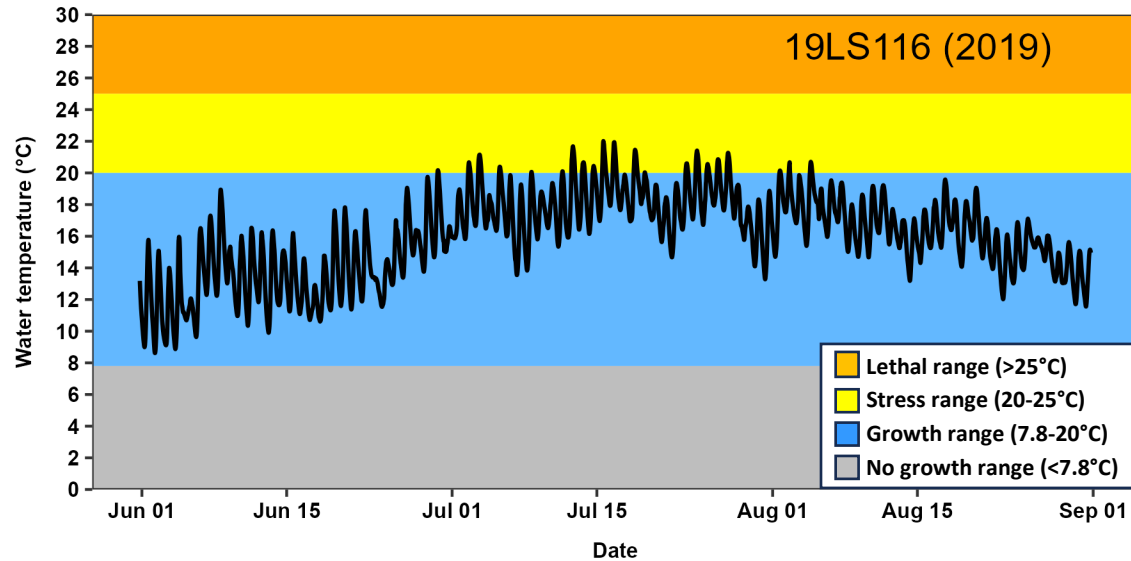
MPCA temperature data

Water temperature data loggers were deployed at the biological stations (19LS116 and 19LS160) in 2019. Average summer water temperatures ranged from 13.9-16.0°C with summer maximum temperatures ranging from 18.9-22.0°C. Water temperatures during the summer (June through August) were in the growth range for trout 94-100% of the summer. No temperatures in the no growth or lethal range for trout were measured. 0-6% of the summer had water temperatures that were in the stress range for trout. These water temperatures indicate suitable conditions for trout survival and growth in these stream reaches.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W02035024	19LS116	2019	16.0	22.0	0%	94%	6%	0%
W02035025	19LS160	2019	13.9	18.9	0%	100%	0%	0%

Water temperature plots



MPCA Summary

The DNR currently classifies this section as a marginal trout stream. In 2019, the MPCA collected a biological sample from this reach which included several cool water species. Temperature data collected from two locations along this stream reach indicated that the thermal regime is also supportive of a brook trout fishery, with thermal stress recorded 0-6% of the time and lethal threshold reached 0% of the time during the summer (June through August) of 2019. A new management plan was drafted by the DNR in 2023 that included plans to actively manage the Talmadge River and its tributaries as a brook trout fishery.

Unnamed creek (04010201-B28) MPCA Use Designation Review

Stream name: Unnamed creek

AUID(s): 04010201-B28

AUID description: Headwaters to Midway River

Tributaries: NA

MPCA biological station(s): 21LS001

County: St. Louis

Watershed: St. Louis River

DNR designation: Not a designated trout water

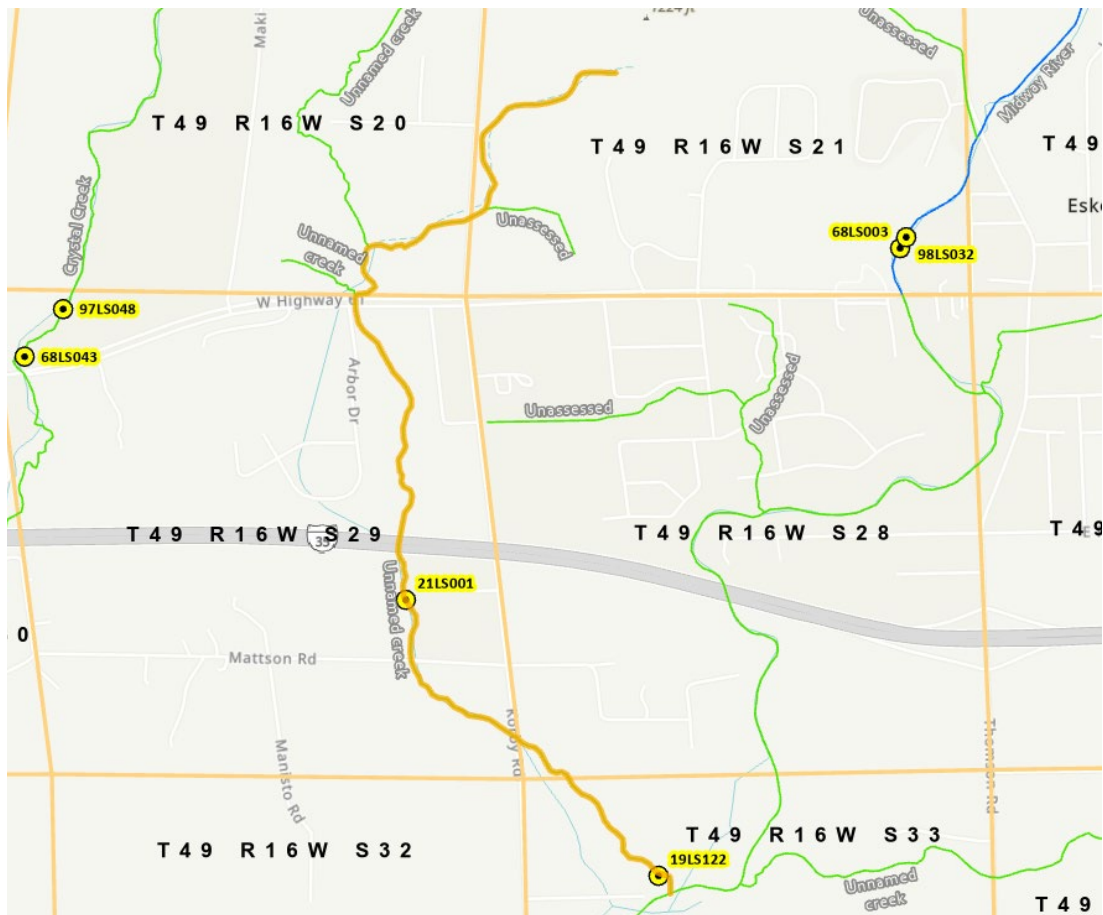
DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: A portion of this reach was designated Class 2A because it is a coldwater feeder stream under the DNR's trout streams framework. Fish data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of an unnamed creek (04010201-B28). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA included coldwater and cool water species from 2 stations. Brook trout were documented from both sites and comprised 19-49% of the samples. Mottled sculpin were also present in the upstream station. Overall, cold and cool water fish taxa dominated the samples from these two monitoring stations.

Fish data: 21LS001, 7/16/2021; 90% coldwater species, 4% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	71	176	449	35
central mudminnow	CNM	80	80	6	1
longnose dace	LND	59	59	2	1
brook stickleback	BST	55	59	3	2
mottled sculpin	MTS	54	96	150	30
western blacknose dace	BND	69	81	13	3

Fish data: 19LS122, 8/22/2019; 19% coldwater species, 31% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	74	114	80	14
central mudminnow	CNM	40	40	1	1
creek chub	CRC	106	120	72	5
brook stickleback	BST	40	55	6	7
northern pearl dace	PRD	45	106	74	15
western blacknose dace	BND	65	103	20	4

Invertebrate Community Information: No macroinvertebrate data available.

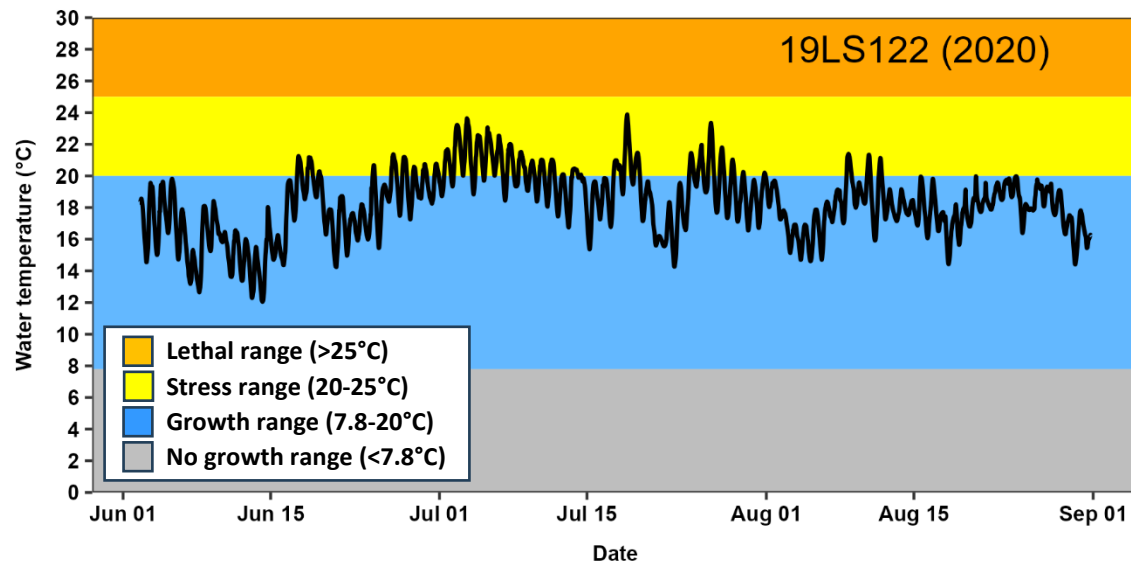
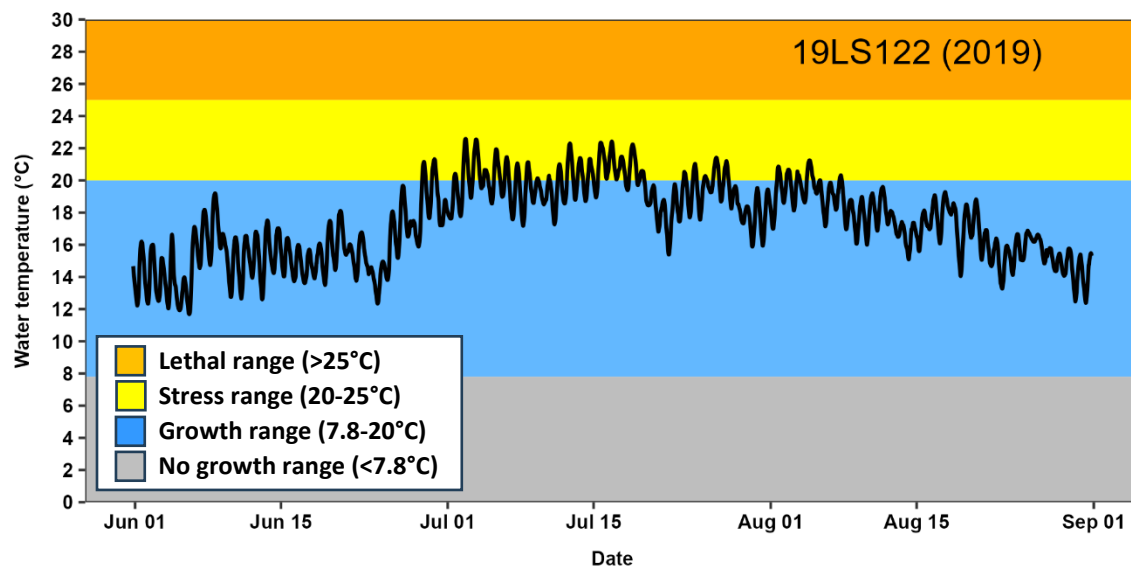
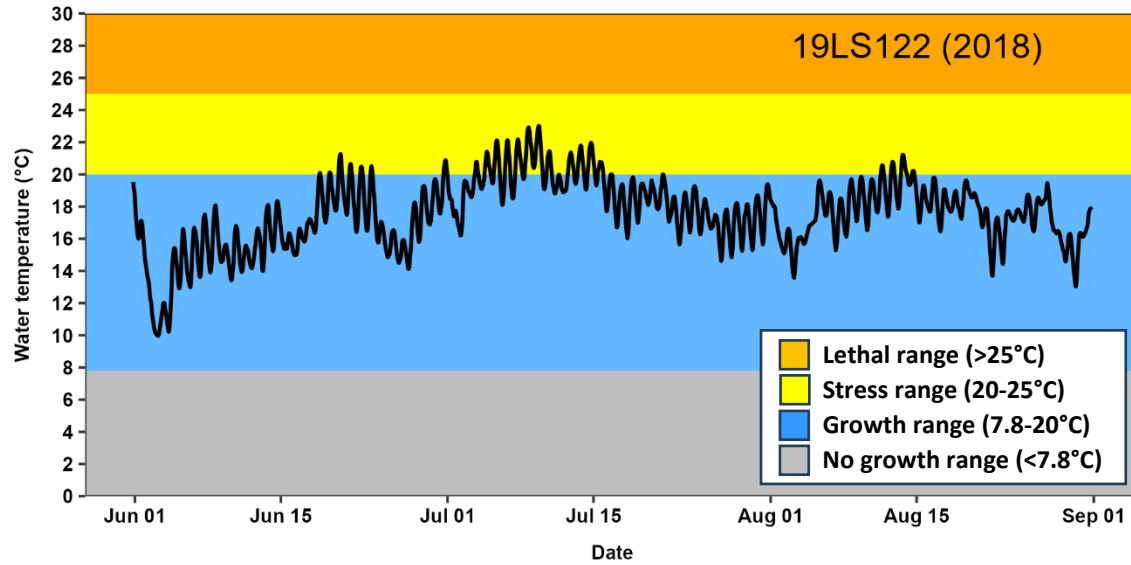
MPCA temperature data

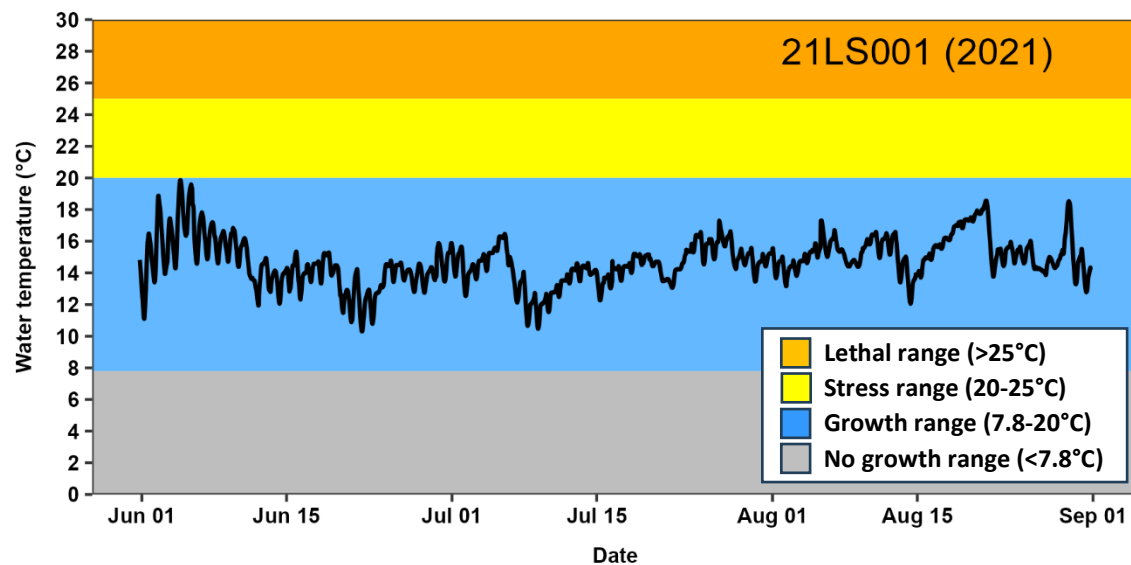
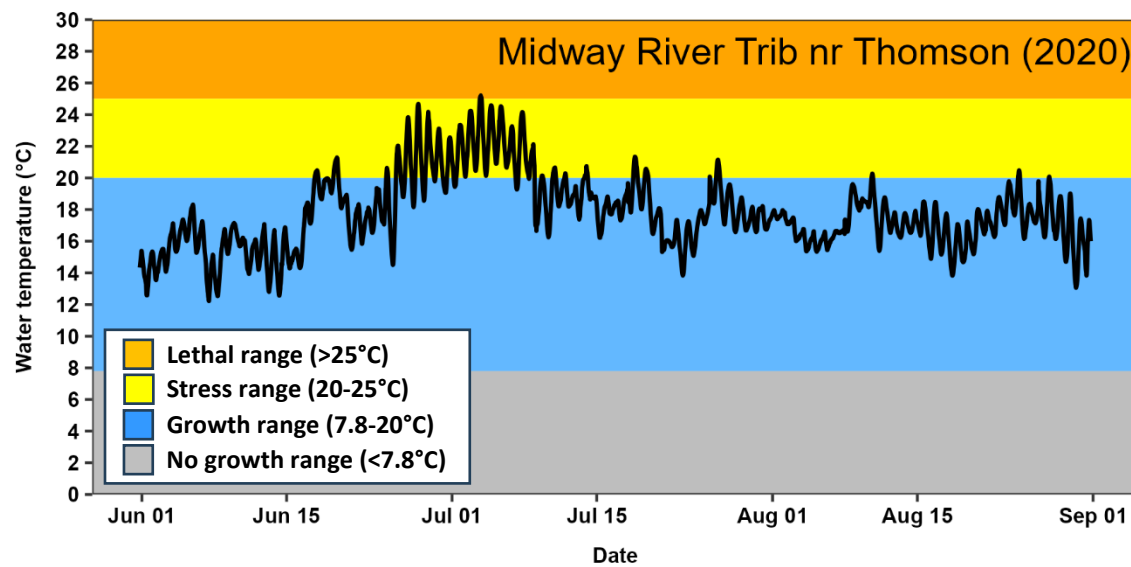
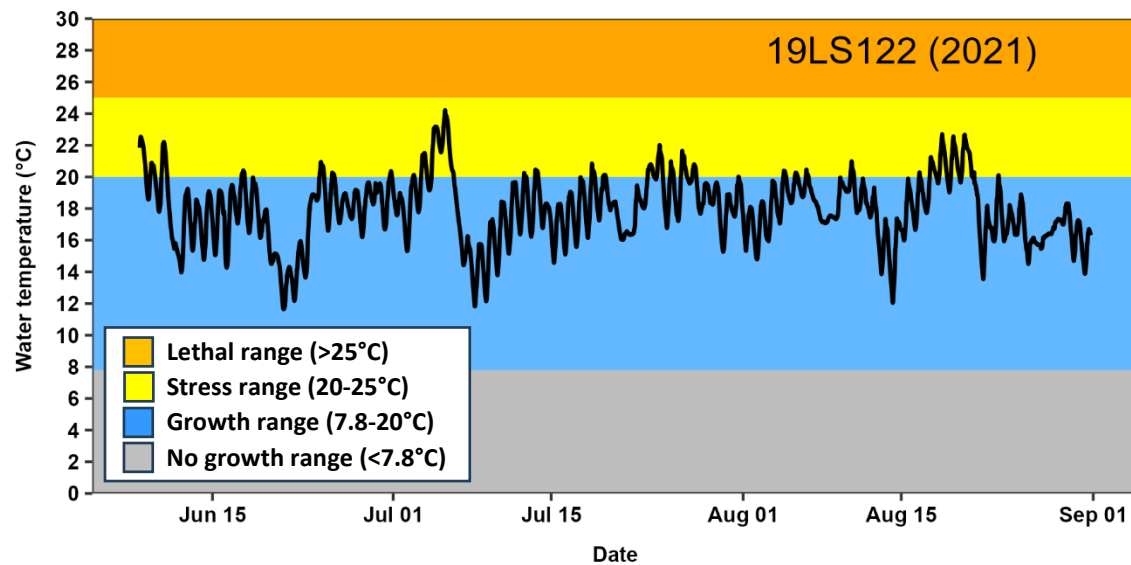
Water temperature data loggers were deployed at three stations (including both biological stations) in 2018, 2019, 2020, or 2021. Average summer water temperatures ranged between 14.7 and 18.3°C with summer maximum temperatures ranging from 19.9 to 25.2°C. Water temperatures during the summer (June through August) were in the growth range for trout 81-100% of the summer. At the upstream station (21LS001), no temperatures were in the stress or lethal range for trout. In the downstream stations, temperatures in the stress range were measured 12-19% of the summer and lethal temperatures were 0% or <1% of the summer. These water temperatures indicate suitable conditions for trout survival and growth.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W03173009	19LS122	2018	17.6	23.0	0%	88%	12%	0%
W03173009	19LS122	2019	17.4	22.6	0%	84%	16%	0%
W03173009	19LS122	2020	18.3	23.9	0%	81%	19%	0%
W03173009	19LS122	2021	17.9	24.2	0%	85%	15%	0%
W03173015	None	2020	17.8	25.2	0%	84%	16%	0%
W031730116	21LS001	2021	14.7	19.9	0%	100%	0%	0%

Water temperature plots





DNR information

No DNR data available.

MPCA Summary

Water temperature data collected by the MPCA demonstrated that summer water temperatures in this unnamed creek averaged 14.7-18.3°C with maximum water temperatures 20-25°C. Water temperatures are within the growth range for brook trout 81-100% of the summer, 0-19% of the summer was in the stress range, and no temperatures were in the lethal range for trout. These data indicate suitable thermal conditions for trout growth and survival. The sampling of good numbers of brook trout and other cool water and coldwater species in this stream during 2019 and 2021 fish surveys further demonstrate that this reach supports coldwater habitat. Although this stream is not a designated trout water, there are many other stream reaches in the area which demonstrate support for coldwater habitat. Based on the presence of brook trout and adequately cool water temperatures, this unnamed creek supports a coldwater habitat.

Unnamed creek (Rocky Run Creek Tributary) (04010201-B31) MPCA Use Designation Review

Stream name: Unnamed creek (Rocky Run Creek Tributary)

AUID(s): 04010201-B31

AUID description: Headwaters to the west line of PLSS section T50 R15W S30

Tributaries: NA

MPCA biological station(s): 19LS132

County: St. Louis

Watershed: St. Louis River

DNR designation: Not a designated trout water

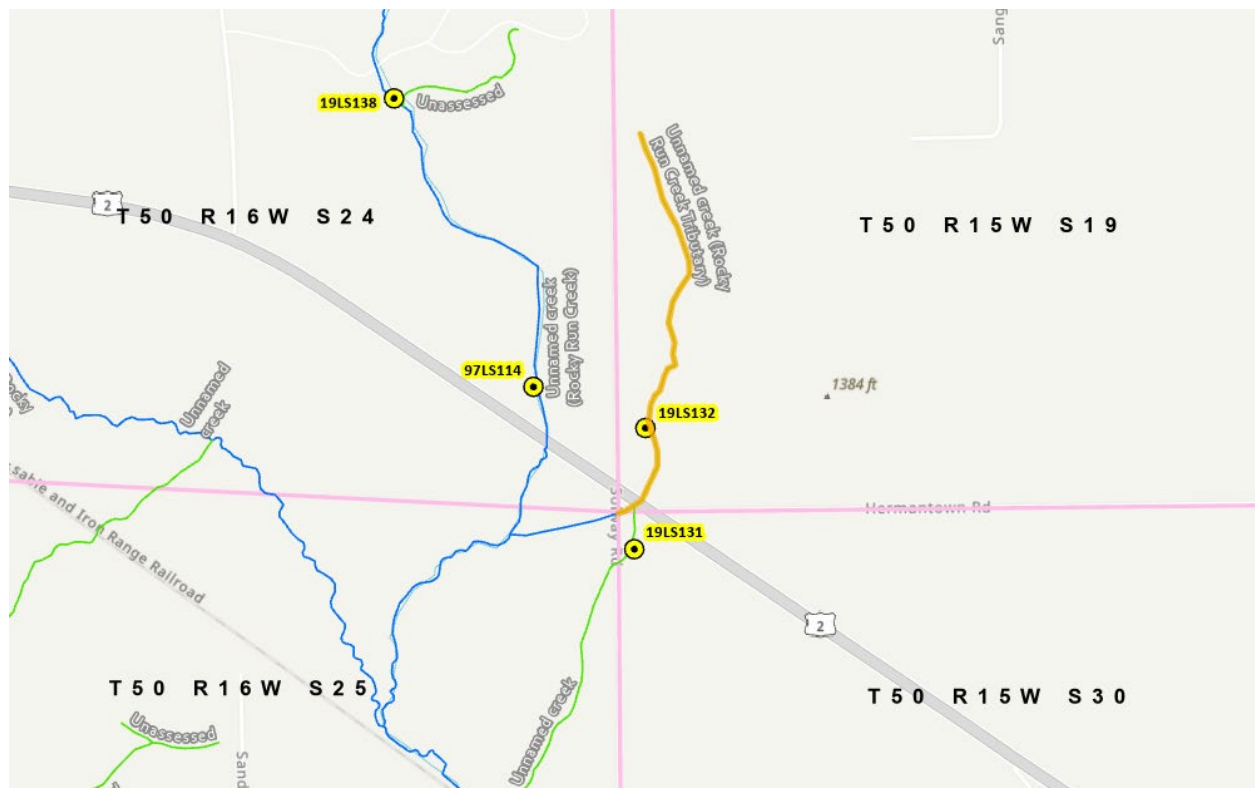
DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: This reach is currently designated Class 2Bg. The downstream reach (04010201-847) is a DNR coldwater feeder stream which then flows into a designated trout stream (04010201-625). Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of an unnamed creek (Rocky Run Creek Tributary). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA included coldwater and cool water species from 2 visits (2019, 2021) from one station. Brook trout were documented in both visits and comprised 58-32% of the samples. Two cool water species were documented from this site. Overall, cold and cool water fish taxa dominated the samples from these two monitoring stations.

Fish data: 19LS132, 8/21/2019; 58% coldwater species, 31% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	88	212	429	15
central mudminnow	CNM	82	82	6	1
creek chub	CRC	76	79	9	2
brook stickleback	BST	30	74	13	8

Fish data: 19LS132, 6/15/2021; 32% coldwater species, 24% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	95	171	416	24
central mudminnow	CNM	89	89	7	1
creek chub	CRC	60	108	268	33
brook stickleback	BST	48	75	19	12
northern pearl dace	PRD	68	102	30	6

Invertebrate Community Information: No macroinvertebrate data available.

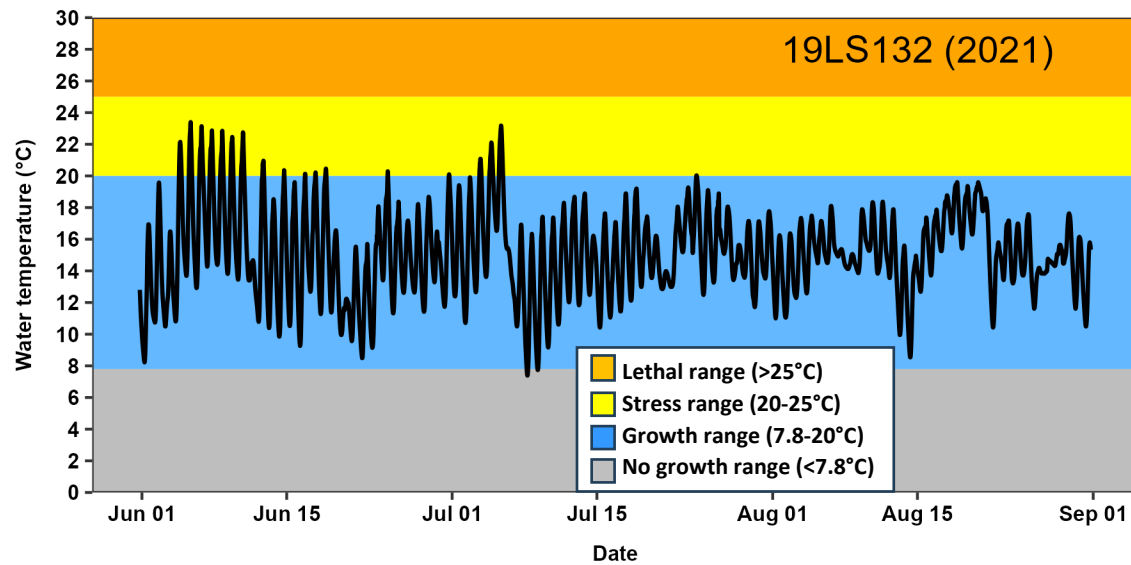
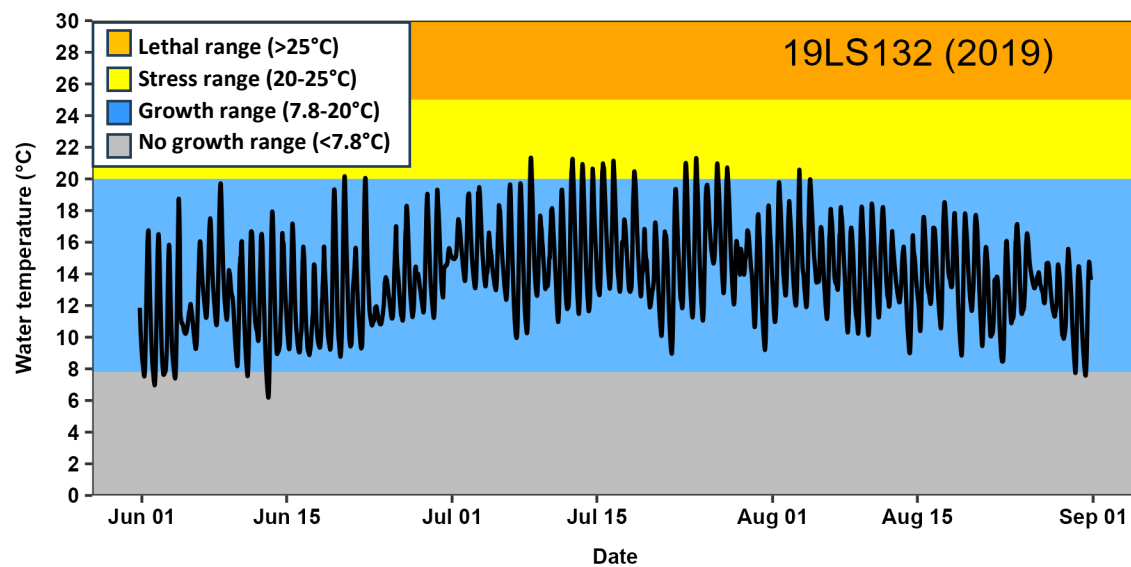
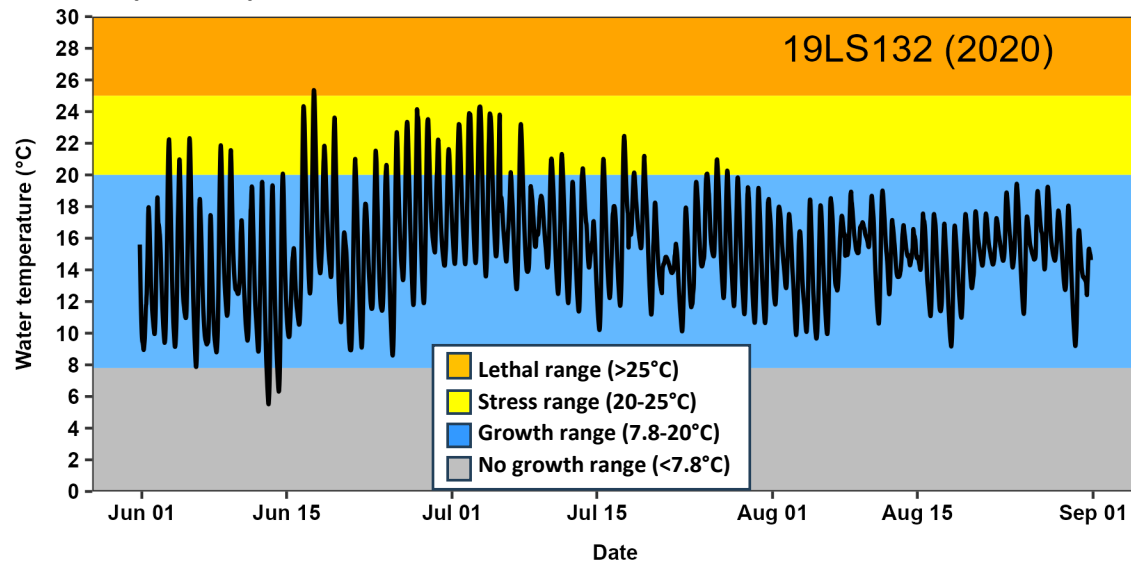
MPCA temperature data

Water temperature data loggers were deployed at the biological station (19LS132) in 2019, 2020, or 2021. Average summer water temperatures ranged between 13.8-15.4°C with summer maximum temperatures ranging from 21.3-25.4°C. Water temperatures during the summer (June through August) were in the growth range for trout 91-97% of the summer. Temperatures were in the no growth range 0-1% of the summer, the stress range for 2-9% of the summer, and the lethal range 0% of the summer. These water temperatures indicate suitable conditions for trout survival and growth.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W03161016	19LS132	2019	13.8	21.3	1%	97%	2%	0%
W03161016	19LS132	2020	15.4	25.4	1%	91%	9%	0%
W03161016	19LS132	2021	15.1	23.4	0%	96%	4%	0%

Water temperature plots



DNR information

No DNR data available.

MPCA Summary

Water temperature data collected by the MPCA demonstrated that summer water temperatures in this stream reach averaged 13.8-15.4°C with summer maximum temperatures ranging from 21.3-25.4°C. Water temperatures are within the growth range for Brook Trout 91-97% of the summer and only in the stress and lethal ranges 2-9% and 0-1% of the summer, respectively. These data indicate suitable thermal conditions for trout growth and survival. The sampling of Brook Trout and other cool water and coldwater species in this stream during 2019 and 2021 fish surveys further demonstrate that this reach supports a coldwater habitat. Although this stream is not a designated trout water, there are other stream reaches in the area which demonstrate support for coldwater habitat. Based on the presence of Brook Trout and adequately cool water temperatures, this unnamed creek supports a coldwater habitat.

Unnamed creek (04010201-B33) MPCA Use Designation Review

Stream name: Unnamed creek

AUID(s): 04010201-B33

AUID description: Headwaters to Hay Cr

Tributaries: NA

MPCA biological station(s): 19LS147

County: Carlton

Watershed: St. Louis River

DNR designation: Not a designated trout water

DNR management class: Class I-B (coldwater feeder)

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: This reach is currently designated Class 2Bg. The downstream reach (04010201-751) is a designated trout stream. Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of unnamed creek (04010201-B33). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA included coldwater and cool water species in a 2019 survey. Brook trout comprised 80% of the sample and one additional coldwater species and one additional cool water species were present. Overall, cold and cool water fish taxa dominated the sample from this monitoring station.

Fish data: 19LS147, 8/22/2019; 83% coldwater species, 8% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	58	113		32
central mudminnow	CNM				4
brook stickleback	BST				3
mottled sculpin	MTS				1

Invertebrate Community Information: No macroinvertebrate data available.

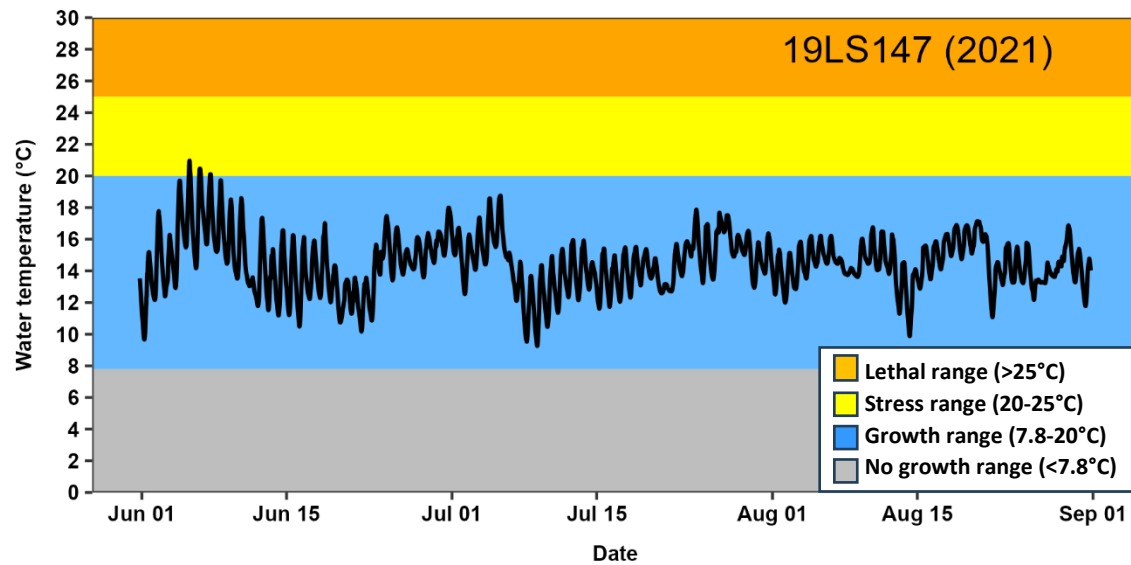
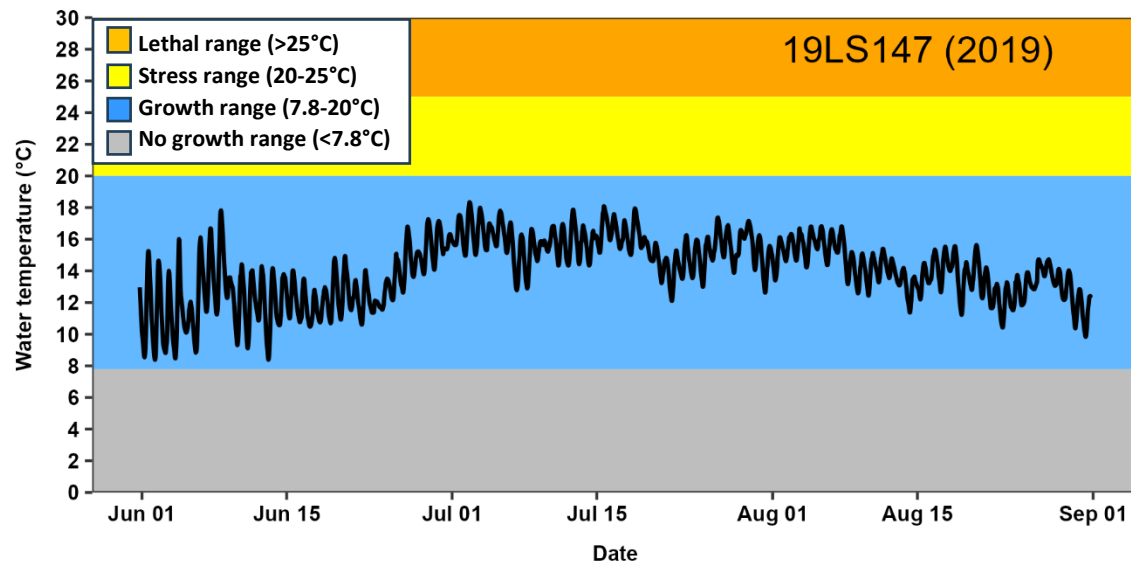
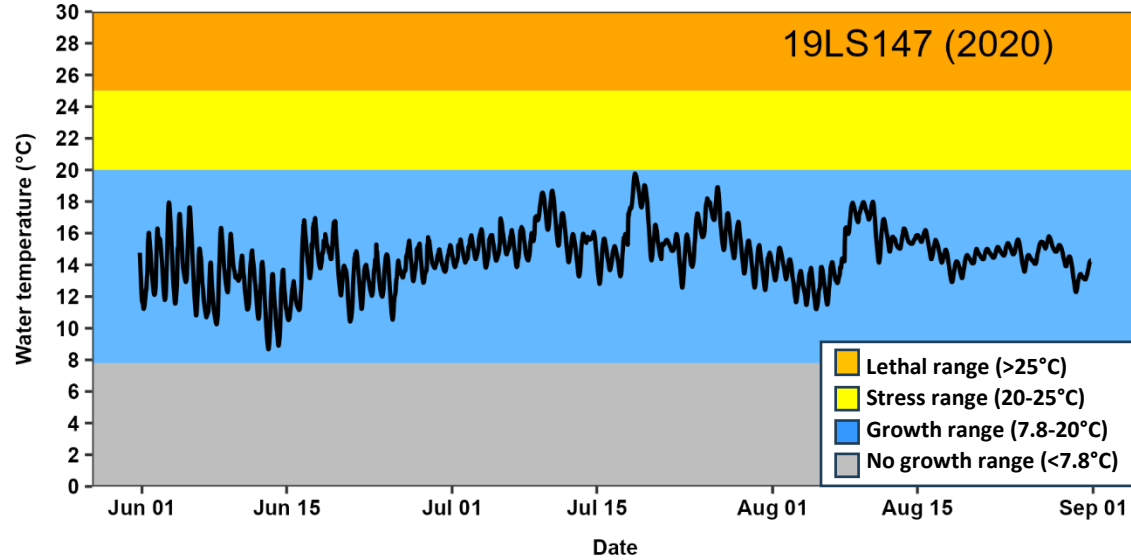
MPCA temperature data

Water temperature data loggers were deployed at the biological station (19LS147) in 2019, 2020, or 2021. Average summer water temperatures ranged between 14.1-14.5°C with summer maximum temperatures ranging from 18.3-21.0°C. Water temperatures during the summer (June through August) were in the growth range for trout 100% of the summer. These water temperatures indicate suitable conditions for trout survival and growth.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W03011016	19LS147	2019	14.1	18.3	0%	100%	0%	0%
W03011016	19LS147	2020	14.5	19.8	0%	100%	0%	0%
W03011016	19LS147	2021	14.5	21.0	0%	100%	0%	0%

Water temperature plots



DNR information

No DNR data available.

MPCA Summary

Water temperature data collected by the MPCA demonstrated that summer water temperatures in this unnamed creek averaged 14.1-14.5°C with summer maximum temperatures ranging from 18.3-21.0°C. Water temperatures are within the growth range for brook trout 100% of the summer and 0% of the summer in the stress, lethal, and no growth ranges for trout. These data indicate suitable thermal conditions for trout growth and survival. The sampling of brook trout and other cool water and coldwater species in this stream during the 2019 fish survey further demonstrated that this reach supports coldwater habitat. Although this stream is not a designated trout water, there are other stream reaches in the area which demonstrate support for coldwater habitat. Based on the presence of brook trout and adequately cool water temperatures, this unnamed creek supports a coldwater habitat.

Unnamed creek (04010201-B34) MPCA Use Designation Review

Stream name: Unnamed creek

AUID(s): 04010201-B34

AUID description: headwaters to an unnamed creek (04010201-625)

Tributaries: NA

MPCA biological station(s): 19LS131

County: St. Louis

Watershed: St. Louis River

DNR designation: Not a designated trout water

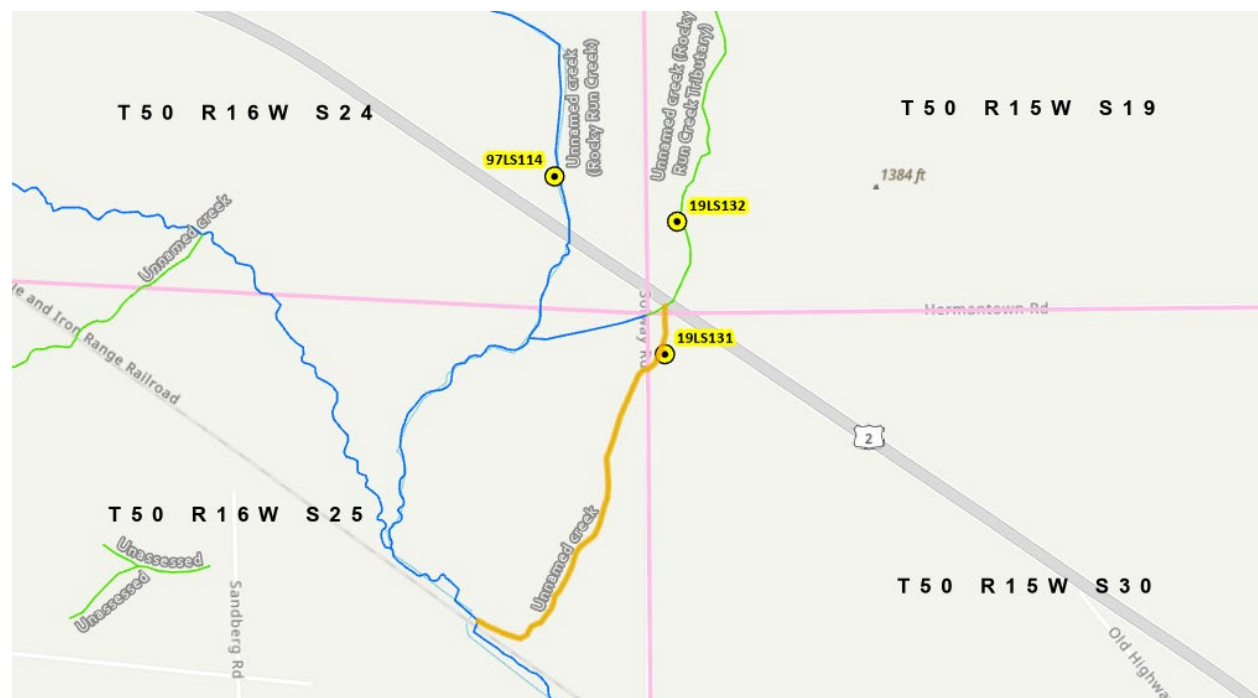
DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: This reach is currently designated Class 2Bg. The downstream reach (04010201-625) is a designated trout stream. The upstream reach also has data indicating support for coldwater habitat. Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of unnamed creek (04010201-B34). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA included coldwater and cool water species in a 2019 survey. Brook trout comprised 50% of the sample and one additional cool water species was present. Overall, cold and cool water fish taxa dominated the sample from this monitoring stations.

Fish data: 19LS131, 8/16/2019; 50% coldwater species, 26% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	77	207	622	29
central mudminnow	CNM	72	88	87	14
brook stickleback	BST	33	64	16	15

Invertebrate Community Information: No macroinvertebrate data available.

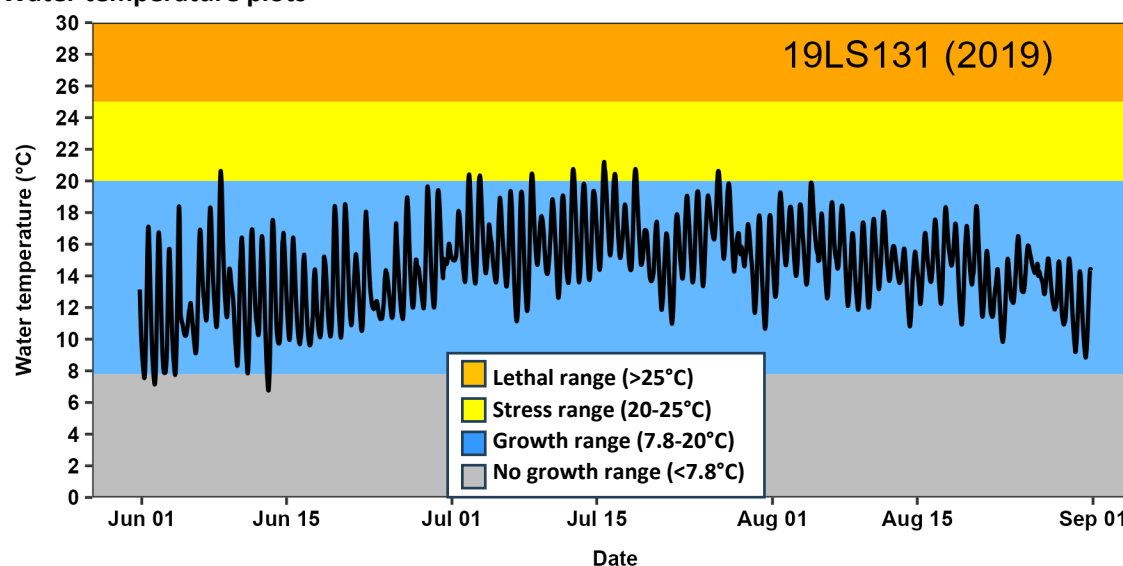
MPCA temperature data

A water temperature data logger was deployed at the biological station (19LS131) in 2019. Average summer water temperature during this year was 14.5°C with a summer maximum temperature of 21.2°C. Water temperatures during the summer (June through August) were in the growth range for trout 98% of the summer and in the stress range 2% of the summer. Temperatures were lethal for trout 0% of the summer. These water temperatures indicate suitable conditions for trout survival and growth.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W03161015	19LS131	2019	14.6	21.2	1%	98%	2%	0%

Water temperature plots



DNR information

No DNR data available.

MPCA Summary

Water temperature data collected by the MPCA demonstrated that summer water temperatures in this unnamed creek averaged 14.5°C with a summer maximum temperatures ranging from 21.2°C. Water temperatures were within the growth range for brook trout 98% of the summer and 2% of the summer was in the stress range for trout. Temperatures were not in the lethal range during the summer the logger was deployed. These data indicate suitable thermal conditions for trout growth and survival. The dominance of brook trout and another cool water species in this stream during the 2019 fish survey further demonstrated that this reach supports coldwater habitat. Although this stream is not a designated trout water, the immediate downstream water (unnamed creek (Rocky Run Creek): 04010201-625) is a designated trout stream. Based on the presence of brook trout and adequately cool water temperatures, this unnamed creek supports a coldwater habitat.

Unnamed creek (04010201-C18) MPCA Use Designation Review

Stream name: Unnamed creek

AUID(s): 04010201-C18 (parent WIDs: 04010201-684 and 04010201-B68)

AUID description: Headwaters to unnamed creek

Tributaries: NA

MPCA biological station(s): 21LS006

County: St. Louis

Watershed: St. Louis River

DNR designation: Not a designated trout water

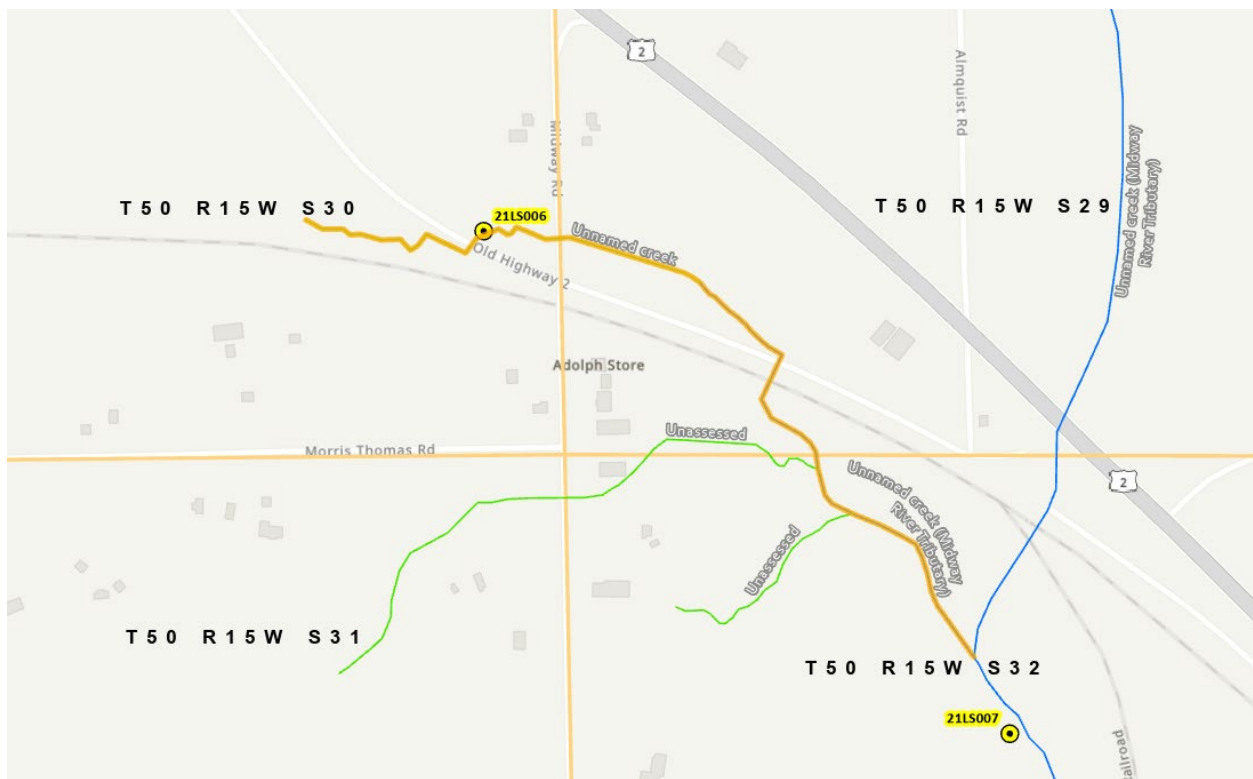
DNR management class: Class I-B (coldwater feeder) and unknown; portion in PLSS section T50 R15W S32 is a coldwater feeder and the reach outside this section is not a public water.

Current AUID designation: 2Bg (warm water) and 2Ag (cold water); portion in PLSS section T50 R15W S32 is Class 2Ag and the reach outside this section is a default Class 2Bg.

Reason for review: Fish and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: A portion of this reach was designated Class 2A because it is coldwater feeder under the DNR's trout streams framework. Fish data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of unnamed creek (04010201-C18). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data collected by the MPCA was entirely comprised of brook trout.

Fish data: 21LS006, 8/6/2021; 100% coldwater species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	41	171	295	94

Invertebrate Community Information: No macroinvertebrate data available.

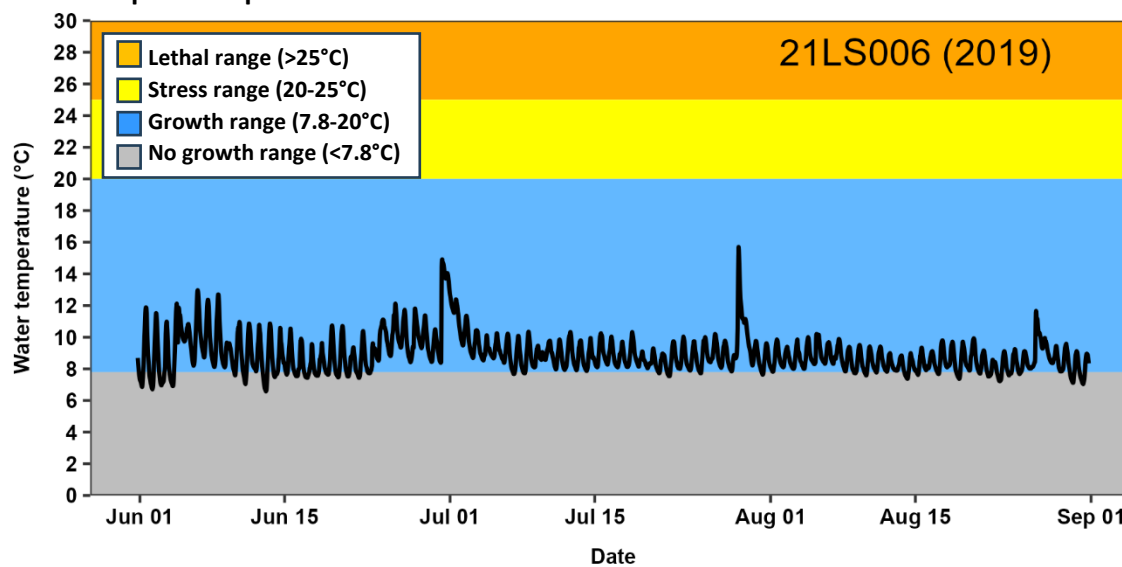
MPCA temperature data

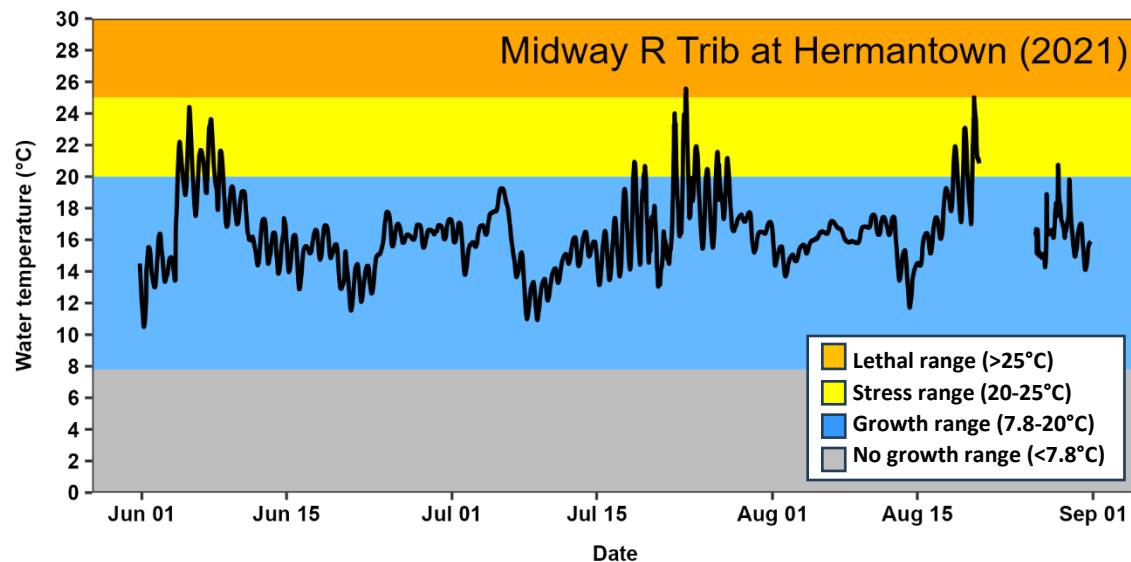
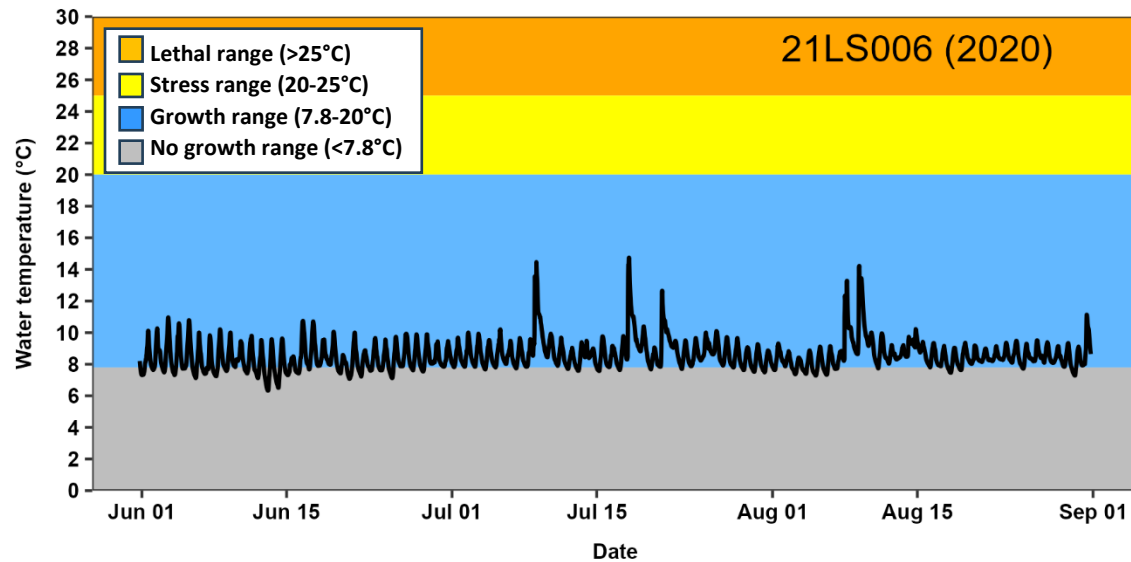
Water temperature data loggers were deployed at the biological station (21LS006) in 2019 and 2020. Average summer water temperatures were 8.6 and 8.9°C with summer maximum temperatures of 14.7 and 15.7°C. Water temperatures during the summer (June through August) were in the growth range for trout 83-88% of the summer. No temperatures in the stress or lethal range for trout were measured. 12-17% of the summer had water temperatures that were too cold for trout growth. A temperature logger was also deployed downstream of the biological station and had temperatures that were warmer than the upstream reach. In the downstream station, temperatures were in the growth range for trout 92% of the summer and were stressful 8% of the summer. These water temperatures indicate suitable conditions for trout survival and growth in these stream reaches.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W03164020	21LS006	2019	8.9	15.7	12%	88%	0%	0%
W03164020	21LS006	2020	8.6	14.7	17%	83%	0%	0%
W03164027	None	2021	16.4	25.6	0%	92%	8%	0%

Water temperature plots





DNR information

No DNR data available.

MPCA Summary

Water temperature data collected by the MPCA demonstrated that summer water temperatures in this unnamed creek averaged 8.6-16.4°C and water temperatures were within the growth range for brook trout 83-92% of the summer and no temperatures were in the lethal range for trout. The upstream reach had no temperatures in the stress range and the downstream reach temperatures were in the stress range 8% of the summer. These data indicate suitable thermal conditions for trout growth and survival. The sampling of large numbers of brook trout in this stream during a 2021 survey further demonstrate that this reach supports coldwater habitat. Although this stream is not a designated trout water, part of this reach is considered by the DNR to be a coldwater feeder stream. The downstream reaches also demonstrate support for coldwater habitat. Based on the presence of brook trout and adequately cool water temperatures, this unnamed creek supports a coldwater habitat.

Unnamed creek (04010301-769) MPCA Use Designation Review

Stream name: Unnamed creek

AUID(s): 04010301-769

AUID description: Headwaters to T48 R16W S35, south line

Tributaries: NA

MPCA biological station(s): 21LS025, 21LS024, 22LS007

County: Carlton

Watershed: Nemadji

DNR designation: Not a designated trout water

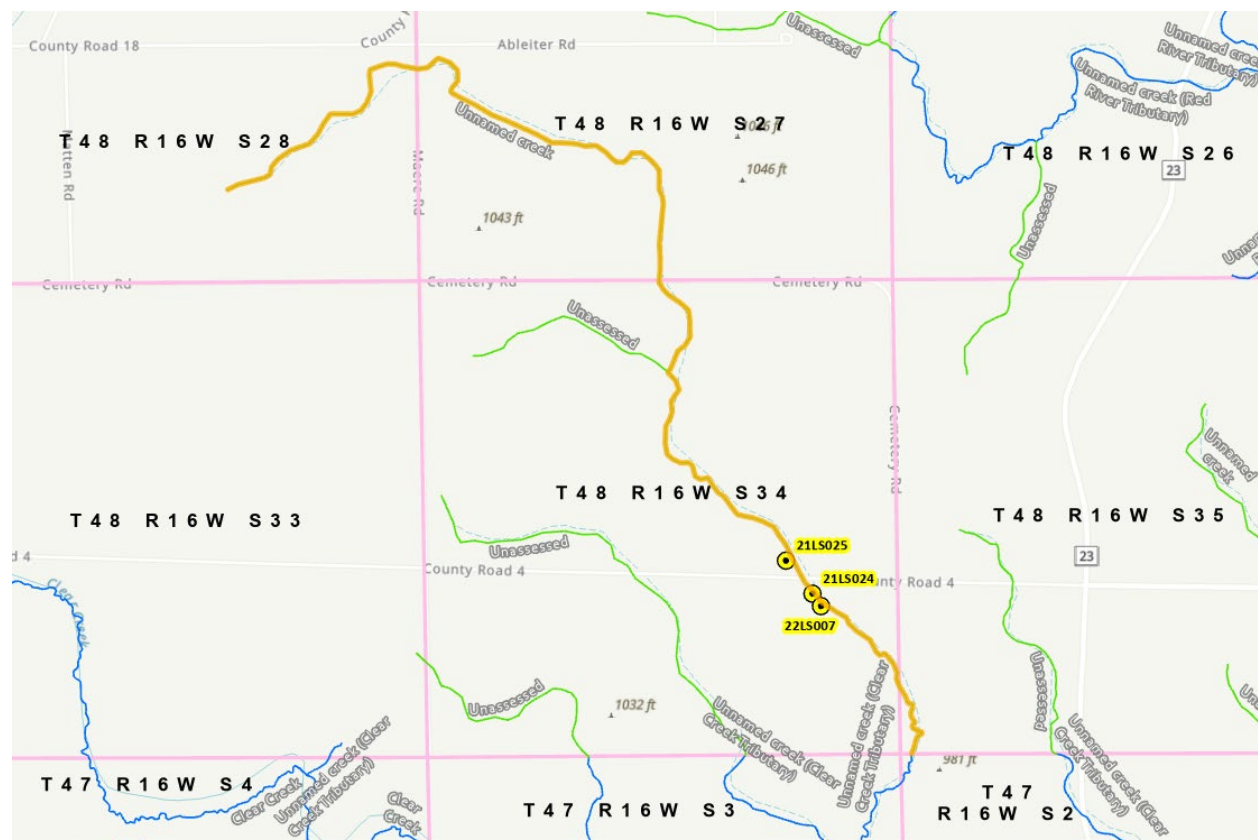
DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Fish, macroinvertebrates, and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: This reach is currently designated Class 2Bg. The downstream reach (04010301-529) is a coldwater feeder stream. This stream then flows to a designated trout stream (Clear Creek: 04010301-527). Fish and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.



Map of unnamed creek (04010301-769). Orange highlight indicates extent of reach considered in this document.

Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information: Fish community data was collected by the MPCA from 3 stations in 2021 or 2022. These samples were dominated by coldwater species (brook trout [63-85%] and mottled sculpin). One additional cool water species (brook stickleback) was present at one of the sites. Cold and cool water fish taxa were 100% of all three samples.

Fish data: 21LS025, 7/20/2021; 100% coldwater species, 0% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	58	218	1234	51
mottled sculpin	MTS	50	90	49	9

Fish data: 21LS024, 7/22/2021; 100% coldwater species, 0% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	57	230	2648	105
mottled sculpin	MTS	52	86	214	63

Fish data: 22LS007, 6/15/2022; 98% coldwater species, 2% cool water species					
Common Name	CN Code	Length Min	Length Max	Weight	Number
brook trout	BKT	43	209	1170	45
brook stickleback	BST	73	73	3	1
mottled sculpin	MTS	51	100	52	10

Macroinvertebrate Community Information: One macroinvertebrate sample was collected from 22LS007 in 2022. Eight coldwater obligate taxon were collected at this site which comprised 31% of the sample.

Macroinvertebrate data: 22LS007 – 9/13/2022; 31% coldwater species	
Taxa	Number
<i>Simulium</i>	116
Capniidae	36
<i>Glossosoma</i>	30
<i>Hesperophylax designatus</i>	18
<i>Parapsyche apicalis</i>	17
<i>Ceratopsyche slosonae</i>	14
<i>Baetis tricaudatus</i>	14
<i>Baetis brunneicolor</i>	11
<i>Gammarus</i>	9
<i>Tvetenia</i>	6
<i>Rhyacophila invaria</i>	6
Acari	4
<i>Taeniopteryx</i>	3
<i>Psychoglypha subborealis</i>	3
<i>Oligochaeta</i>	3

<i>Parametriocnemus</i>	2
<i>Orthocladius</i>	2
Limnephilidae	2
<i>Lepidostoma</i>	2
<i>Helichus</i>	2
<i>Ceratopsyche alhedra</i>	2
Tanytarsini	1
Stratiomyidae	1
Orthoclaadiinae	1
Nemata	1
<i>Micropsectra</i>	1
<i>Micrasema rusticum</i>	1
<i>Dicranota</i>	1
<i>Lype diversa</i>	1
<i>Eukiefferiella</i>	1

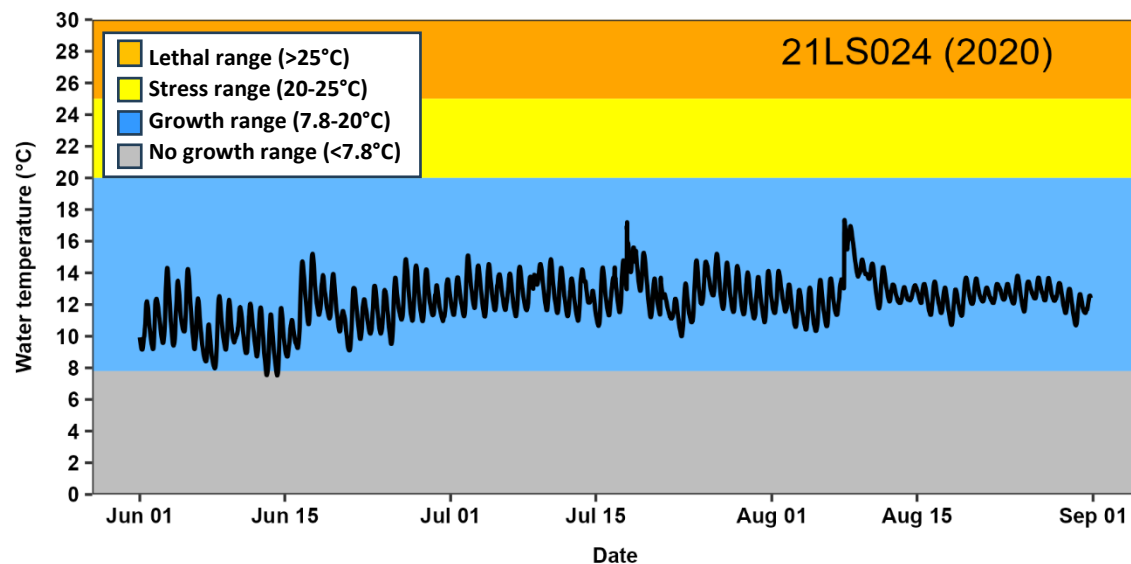
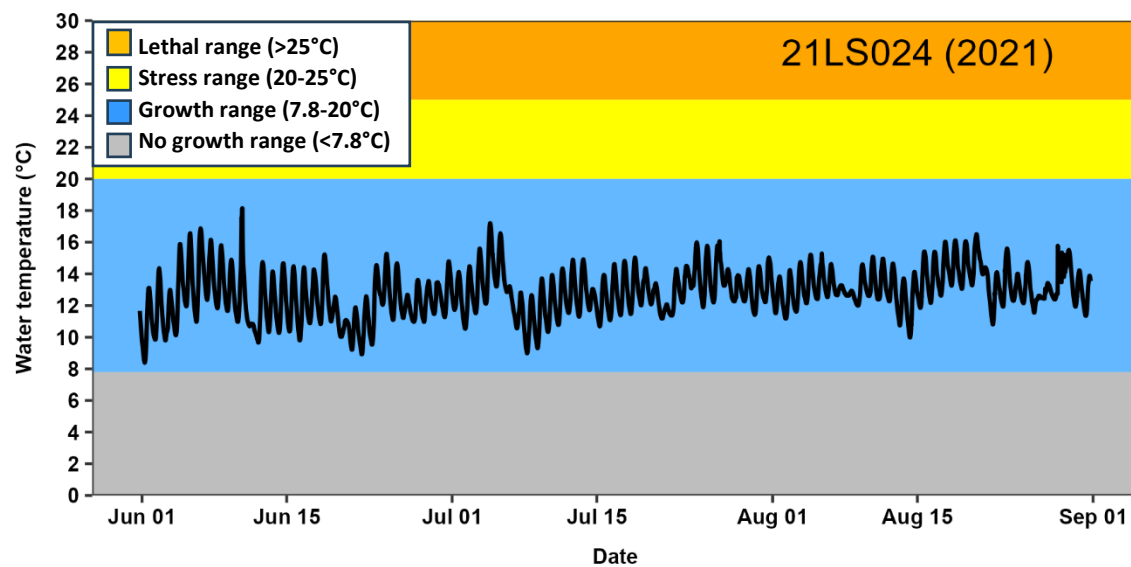
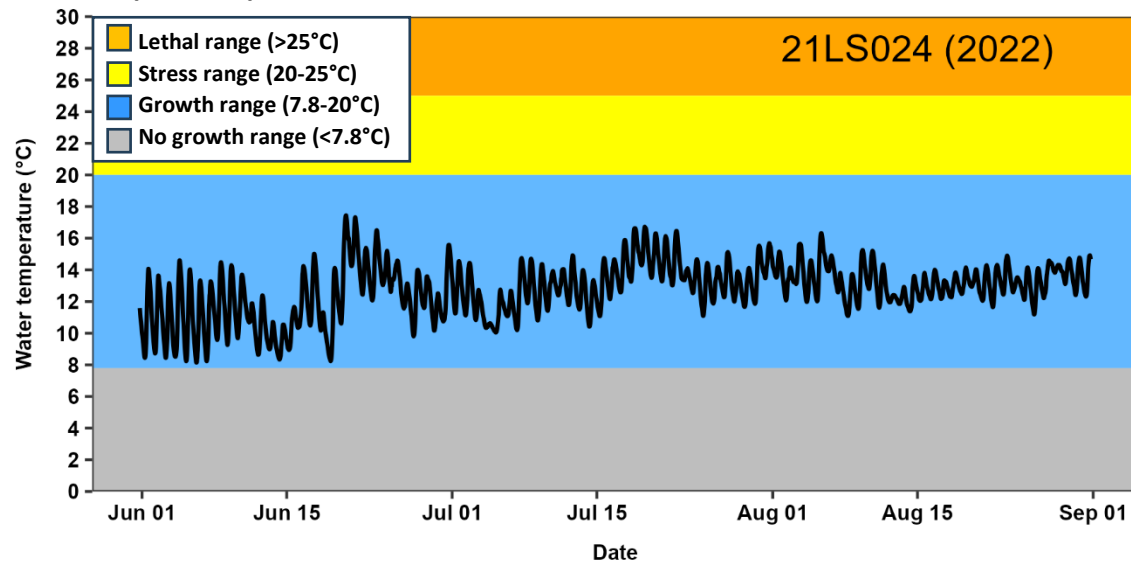
MPCA temperature data

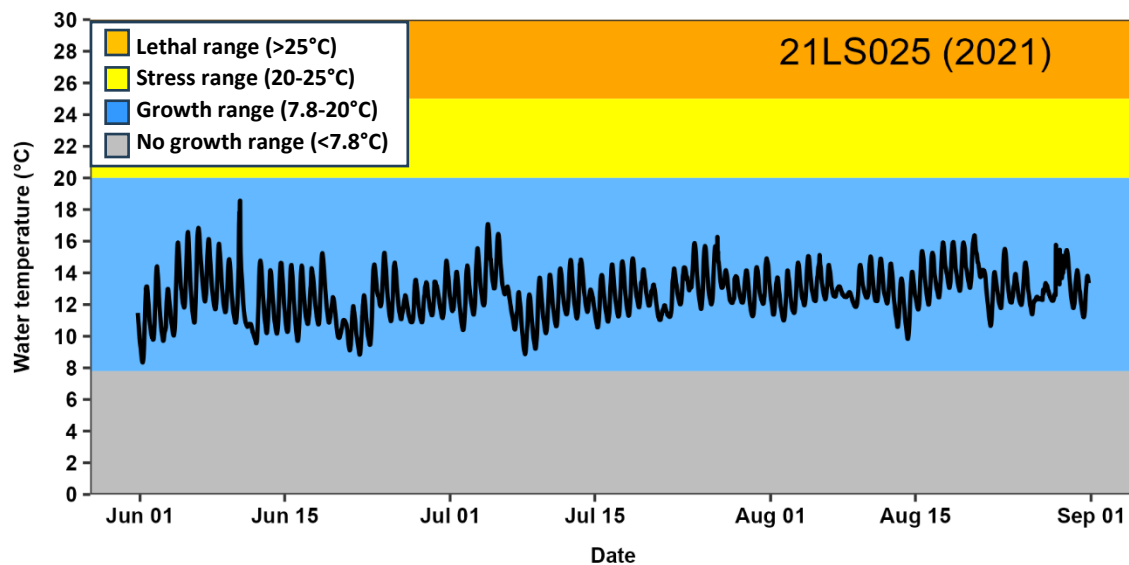
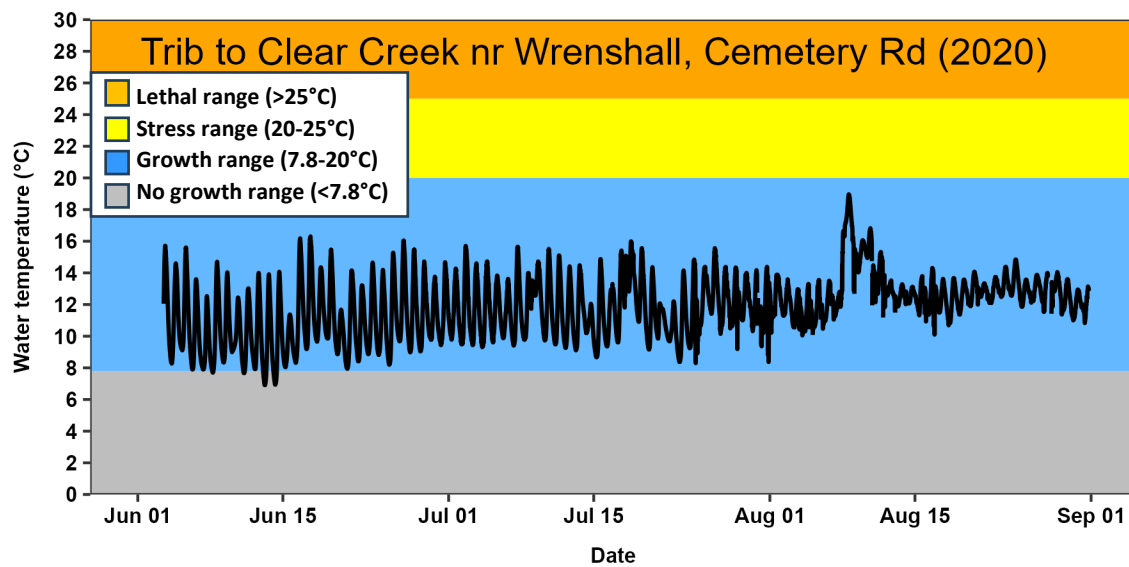
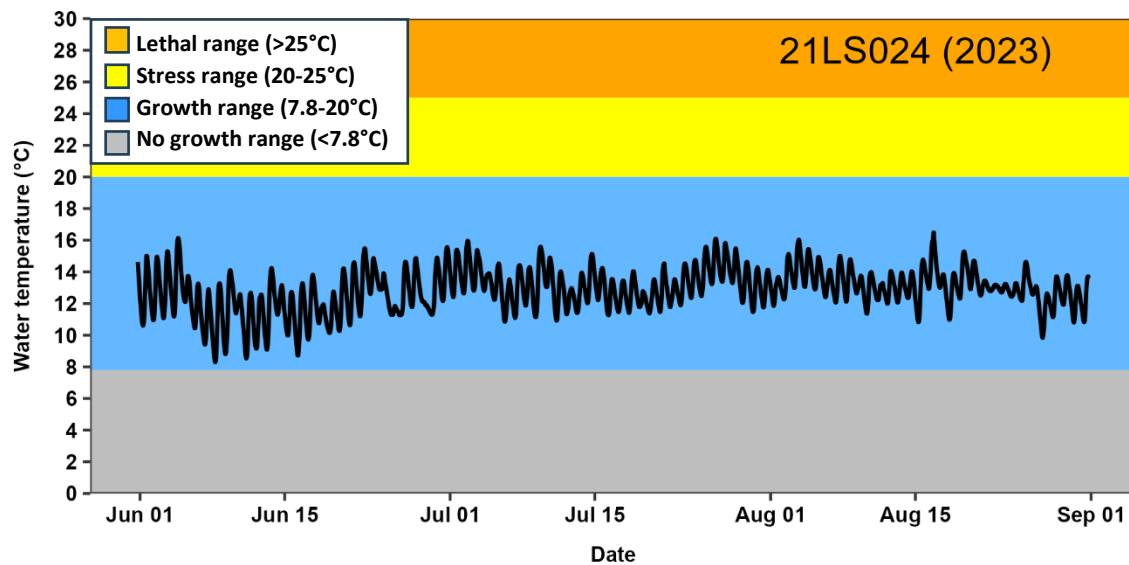
A water temperature data logger was deployed at 3 stations in 2020, 2021, 2022, or 2023. Average summer water temperatures ranged from 11.9-12.9°C with summer maximum temperature ranging from 16.5-19.0°C. Water temperatures during the summer (June through August) were in the growth range for trout 99-100% of the summer and in the no growth range 0-1% of the summer. Temperatures were stressful or lethal for trout 0% of the summers. These water temperatures indicate suitable conditions for trout survival and growth.

Summer (June-August) water temperature summary data

Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W05002004	21LS024	2020	12.2	17.3	0%	100%	0%	0%
W05002004	21LS024	2021	12.8	18.2	0%	100%	0%	0%
W05002004	21LS024	2022	12.8	17.4	0%	100%	0%	0%
W05002004	21LS024	2023	12.9	16.5	0%	100%	0%	0%
W05002005	none	2020	11.9	19.0	1%	99%	0%	0%
W05002006	21LS025	2021	12.7	18.6	0%	100%	0%	0%

Water temperature plots





DNR information

No DNR data available.

MPCA Summary

The DNR currently does not have information on this reach to classify this section of stream as a trout water. However, in 2021 and 2022, the MPCA collected several biological samples from this reach which included numerous Brook Trout, with multiple year classes present. The macroinvertebrate community that was sampled in 2022 by the MPCA included 8 coldwater obligate species (*Baetis tricaudatus*, *Eukiefferiella*, *Gammarus*, *Glossosoma*, *Hesperophylax designatus*, *Lype diversa*, *Parapsyche apicalis*, and *Rhyacophila invaria*) which comprised a large proportion of the sample (31%). In addition, summer (June through August) temperature data from three locations measured temperatures within the growth range for Brook Trout 99-100% of the summer with no stressful or lethal temperatures measured.

Sand Creek (07010104-580) MPCA Use Designation Review

Stream name: Sand Creek

AUID(s): 07010104-580

AUID description: Unnamed Creek to Unnamed Creek

MPCA field number(s): 16UM043

Watershed: Mississippi River-Brainerd (07010104)

County: Crow Wing

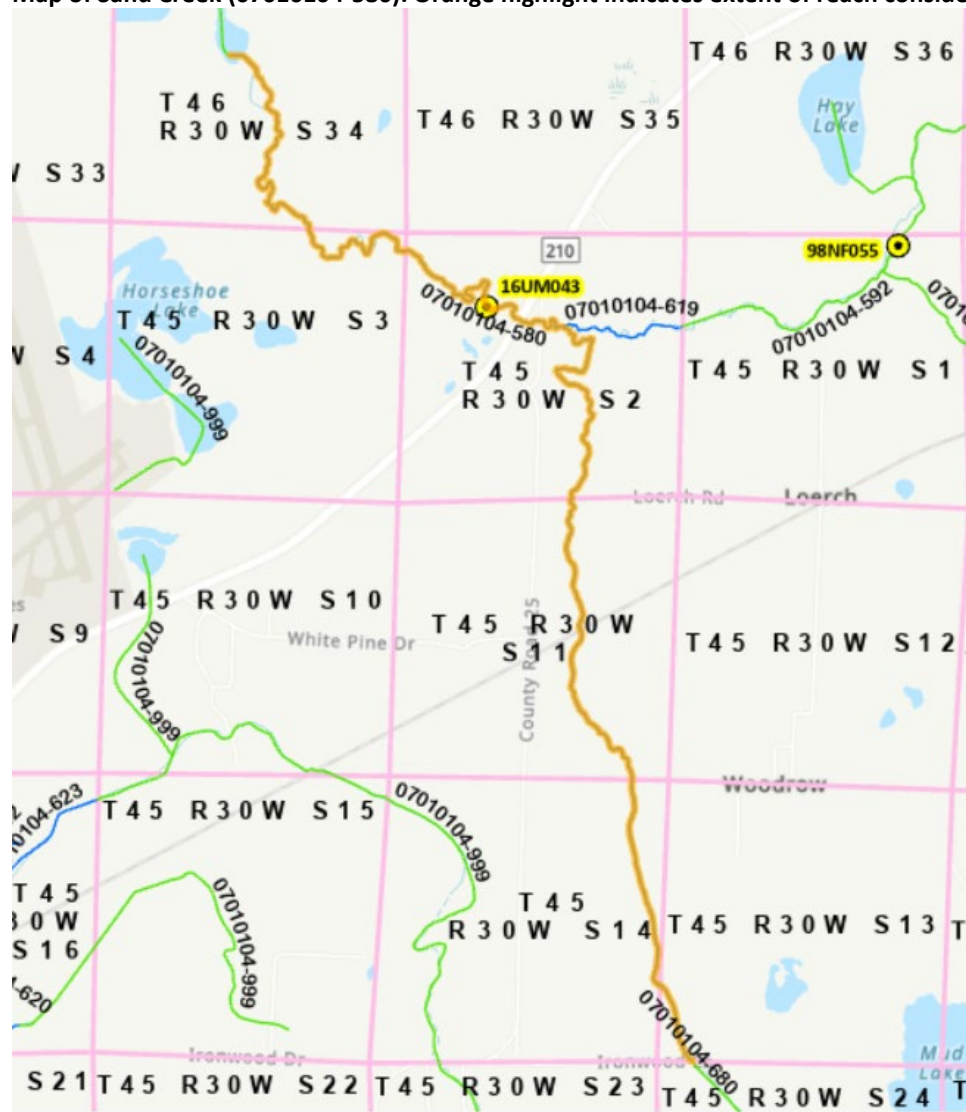
DNR designation: Trout water

DNR management class: I-D (Marginal trout water)

Current MPCA aquatic life use designation: 2Ag (coldwater)

Reason for review: Fish, macroinvertebrate, and temperature data

Map of Sand Creek (07010104-580). Orange highlight indicates extent of reach considered in this document.



Review of existing data

MPCA biological data

Fish Community Information: Fish were monitored by the MPCA at one station (16UM043) in 2017. The sample included 16 species. One coldwater species (mottled sculpin) and three cool water species (burbot, pearl dace, brook stickleback) were collected in low numbers. The high taxa richness, absence of trout species, and low numbers of cool water and cold water species indicated that this reach does not support a coldwater habitat.

MPCA fish data collected from 16UM043, 6/22/2017.

Taxon	Count
creek chub	104
common shiner	73
central mudminnow	42
blacknose dace	38
blacknose shiner	35
white sucker	26
johnny darter	26
mottled sculpin	15
fathead minnow	9
pearl dace	6
iowa darter	3
shorthead redhorse	1
pumpkinseed	1
northern pike	1
burbot	1
brook stickleback	1

Invertebrate Community Information: Macroinvertebrates were sampled by the MPCA from one station (16UM043) in 2017. No coldwater obligate species were present in the sample.

MPCA macroinvertebrate data collected from 16UM043

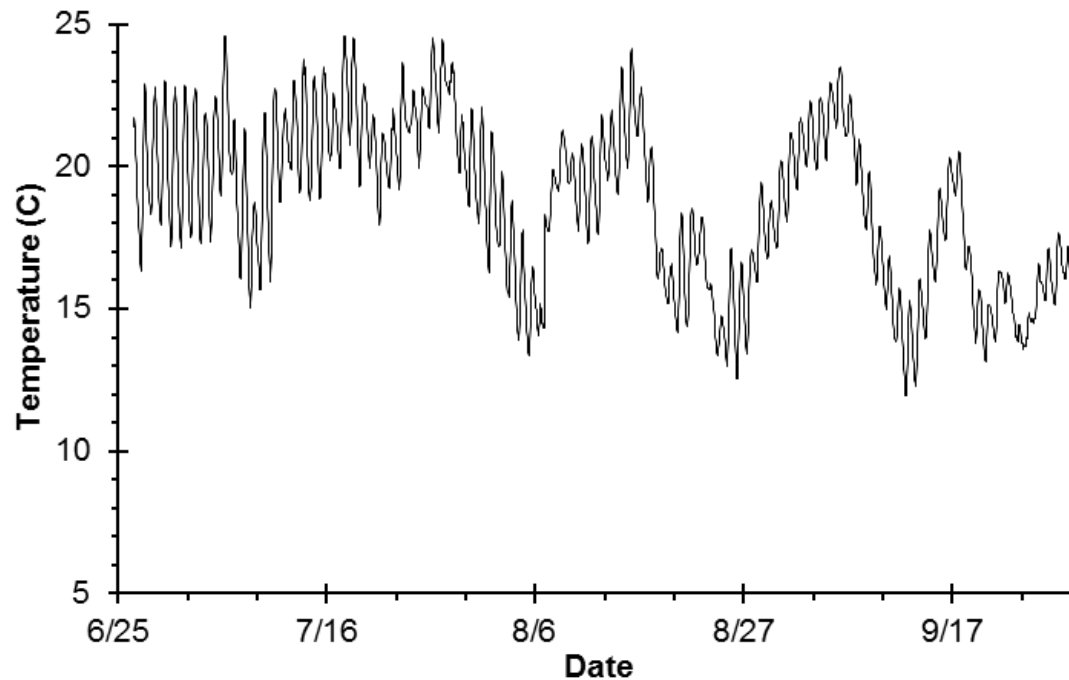
Taxon	Count
<i>Hydropsyche betteni</i>	72
<i>Pycnopsyche</i>	51
<i>Macronychus glabratus</i>	19
<i>Helicopsyche borealis</i>	16
<i>Hydropsyche</i>	12
<i>Rheotanytarsus</i>	11
<i>Polypedilum</i>	10
<i>Orthocladius (Symposiocladius)</i>	10
<i>Micropsectra</i>	9
Oligochaeta	7
<i>Baetis flavistriga</i>	7
<i>Thienemannimyia</i> Gr.	6
<i>Stenelmis</i>	6
<i>Acerpenna pygmaea</i>	6
<i>Maccaffertium</i>	6
<i>Baetis brunneicolor</i>	5

Taxon	Count
<i>Paragnetina media</i>	5
<i>Stenochironomus</i>	5
<i>Oecetis</i>	5
Pisidiidae	4
<i>Stempellinella</i>	4
<i>Hemerodromia</i>	4
<i>Neoplasta</i>	4
<i>Ferrissia</i>	3
<i>Caecidotea</i>	3
<i>Caenis diminuta</i>	3
<i>Acroneuria</i>	3
<i>Optioservus</i>	3
<i>Rheocricotopus</i>	3
<i>Stenacron</i>	2
<i>Caenis hilaris</i>	2
<i>Tvetenia</i>	2
<i>Xenochironomus xenolabis</i>	2
<i>Tanytarsus</i>	2
<i>Hyalella</i>	1
<i>Hydroptila</i>	1
Limnephilidae	1
Glossosomatidae	1
<i>Potthastia</i>	1
<i>Parametriocnemus</i>	1
<i>Paratendipes</i>	1
Tanytarsini	1
<i>Paratanytarsus</i>	1
Empididae	1

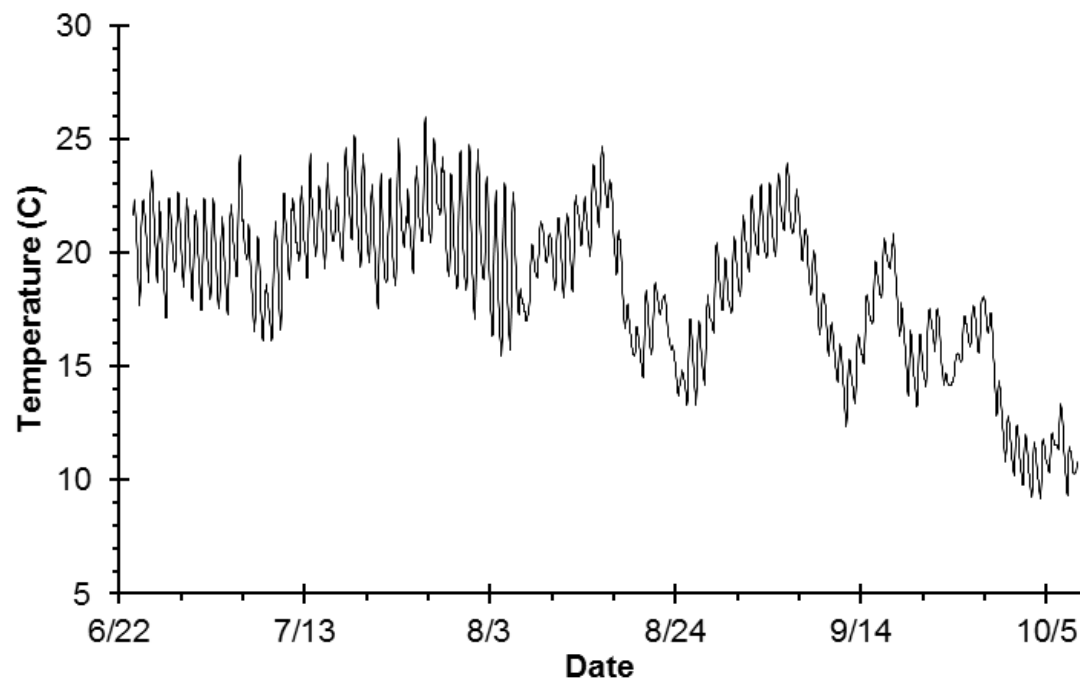
Temperature data

Water temperatures measured during the fish and macroinvertebrate visits were 18.2 °C (6/22/17) and 19.8 °C (8/7/17). MPCA staff deployed a continuously monitoring temperature logger in June 2017, but the logger could not be located during retrieval and was likely lost during a flooding event in August 2017.

In 2015, the DNR deployed 2 temperature loggers at stations upstream and downstream of the MPCA biological monitoring station. The thermal regime was similar at both stations. Water temperatures were in the stress range 31.8-32.0% and in the lethal range 0.4-1.0% of the measurement period. These temperatures indicate that the thermal regime is not suitable to maintain a coldwater habitat.



Hourly stream temperature data. Collected from Upper Sand Creek at Ironwood Road June 26 through September 29, 2015.



Hourly stream temperature data. Collected from DNR on lower Sand Creek June 23 through October 8, 2015.

Summary of DNR temperature data collected in 2015.

Thermal Range	Upper Sand	Lower Sand
Below Optimal (<10 C)	0.0%	0.4%
Optimal 10-16 C	27.0%	25%
Above Optimal 17-20C	41.0%	42%
Stressful 21-24 C	32.0%	31.8%
Lethal >24 C	0.4%	1.0%

DNR Information

There is anecdotal information that Sand Creek provided a trout fishery in the 1960s, but no documentation or surveys from this period could be located. To assess the ability of this stream to support a trout fishery and to determine if the trout water designation should be retained, the DNR collected temperature data from Sand Creek in 2015. Based on these measurements, the DNR concluded that water temperatures from both sites were unfavorable for Brook Trout survival and may be considered for removal from the trout waters list in the future.

MPCA Summary

MPCA biological monitoring and temperature logger data demonstrated that this reach of Sand Creek (07010104-580) does not support a coldwater habitat. The MPCA sampled one station for fish on Sand Creek (2017). No trout were collected. A single coldwater fish species (Mottled Sculpin) was present in low numbers. Three cool water fishes (burbot, pearl dace, brook stickleback) were also sampled in low numbers. Overall, the fish sample consisted of predominantly warm water species and high richness which is not typical of coldwater habitats. Similarly, macroinvertebrate data were dominated by warm water taxa and no coldwater obligate taxa were collected. Water temperature was continuously measured from 2 stations in 2015 by the DNR. The thermal regime was similar at both stations and indicated that conditions in Sand Creek are suitable for the maintenance of a coldwater community. The lethal threshold was exceeded for 0.4-1.0% during the temperature logger deployments. Thermal stress for Brook Trout was recorded >31.8-32.0% of the deployment time. The average July water temperatures were also high and exceeded 20°C. The DNR currently classifies this stream reach as a marginal trout water which means that the DNR has determined that it lacks suitable habitat and water quality for reproduction and year-round survival of trout. Limited information regarding the past management of Sand Creek was available including stocking records. There is anecdotal evidence that Sand Creek may have supported a trout fishery in the 1960s, but supporting records could not be located to confirm trout stocking, management goals, or fishery status at this time. However, there is no evidence that Sand Creek supported a viable trout fishery or coldwater habitat after the existing use date. In addition, this stream reach and the upstream reach has extensive ditching, beaver impoundments, and large sections which lack shading.

Grindstone River, North Fork (07030003-543) MPCA Use Designation Review

Stream name: Grindstone River, North Fork

AUID(s): 07030003-543

AUID description: Grindstone Lk to T42 R21W S28, south line

MPCA field number(s): 03SC009, 06SC034, 16SC081

Watershed: Kettle River (07030003)

County: Pine

DNR designation: Trout water

Current MPCA aquatic life use designation: 2Ag (coldwater)

Reason for review: Fish, macroinvertebrate, and temperature data

Map of Grindstone River, North Fork (07030003-543) – orange highlight.



Review of existing data

Monitoring data

Biological data: Fish

The MPCA conducted fish surveys in 2003 (03SC009), 2006 (06SC034), and 2016 (16SC081) from three biomonitoring stations. The observed fish assemblage lacked trout and were dominated by warm water taxa. No coldwater fish species were present in any samples. A single cool water fish species (finescale dace, northern redbelly dace, or brook stickleback) was present in low numbers in each of these samples (1-8 individuals, 0.1-6.7% of individuals). The DNR collected a sample from a fourth station (67SC001) in 1967. No coldwater or cool water fish species were present in this sample. Overall, the fish assemblage is indicative of a warm water habitat and does not demonstrate the presence of a coldwater habitat.

VisitNum	FieldNum	CommonName	Number
20030022	03SC009	central mudminnow	25
20030022	03SC009	creek chub	64
20030022	03SC009	hornyhead chub	115
20030022	03SC009	bluntnose minnow	12
20030022	03SC009	common shiner	248
20030022	03SC009	black bullhead	17
20030022	03SC009	rock bass	25
20030022	03SC009	bluegill	2
20030022	03SC009	pumpkinseed	3
20030022	03SC009	johnny darter	19
20030022	03SC009	yellow perch	9
20030022	03SC009	smallmouth bass	17
20030022	03SC009	white sucker	2
20030022	03SC009	western blacknose dace	33
20030022	03SC009	finescale dace	1

VisitNum	FieldNum	CommonName	Number
20060162	06SC034	central mudminnow	86
20060162	06SC034	creek chub	126
20060162	06SC034	hornyhead chub	210
20060162	06SC034	bluntnose minnow	114
20060162	06SC034	common shiner	389
20060162	06SC034	greater redhorse	5
20060162	06SC034	yellow bullhead	1
20060162	06SC034	rock bass	37
20060162	06SC034	johnny darter	308
20060162	06SC034	smallmouth bass	4
20060162	06SC034	white sucker	52
20060162	06SC034	western blacknose dace	316
20060162	06SC034	northern redbelly dace	8

VisitNum	FieldNum	CommonName	Number
20162076	16SC081	central mudminnow	32
20162076	16SC081	golden shiner	2
20162076	16SC081	creek chub	37
20162076	16SC081	hornyhead chub	25
20162076	16SC081	common shiner	61
20162076	16SC081	shorthead redhorse	3
20162076	16SC081	greater redhorse	7
20162076	16SC081	black bullhead	1
20162076	16SC081	brook stickleback	7
20162076	16SC081	rock bass	29
20162076	16SC081	bluegill	8
20162076	16SC081	pumpkinseed	4
20162076	16SC081	largemouth bass	5
20162076	16SC081	johnny darter	88
20162076	16SC081	yellow perch	6
20162076	16SC081	smallmouth bass	1
20162076	16SC081	white sucker	7
20162076	16SC081	western blacknose dace	106

VisitNum	FieldNum	CommonName	Number
19670001	67SC001	central mudminnow	3
19670001	67SC001	creek chub	25
19670001	67SC001	hornyhead chub	5
19670001	67SC001	bluntnose minnow	9
19670001	67SC001	common shiner	25
19670001	67SC001	silver redhorse	3
19670001	67SC001	black bullhead	1
19670001	67SC001	rock bass	1
19670001	67SC001	largemouth bass	2
19670001	67SC001	johnny darter	10
19670001	67SC001	iowa darter	1
19670001	67SC001	yellow perch	1
19670001	67SC001	white sucker	7
19670001	67SC001	western blacknose dace	27

Biological data: Macroinvertebrates

The MPCA conducted macroinvertebrate surveys in 2006 (06SC034) and 2016 (16SC081) from two biomonitoring stations. The macroinvertebrate samples did not include any coldwater obligate taxa. Overall, the macroinvertebrate assemblage is indicative of a warm water habitat and does not demonstrate the presence of a coldwater habitat.

FieldNum	VisitNum	Name	Total
06SC034	20060310	Thienemannimyia Gr.	1
06SC034	20060310	Turbellaria	9

FieldNum	VisitNum	Name	Total
06SC034	20060310	Oligochaeta	15
06SC034	20060310	Hirudinea	1
06SC034	20060310	Amnicola	8
06SC034	20060310	Physa	1
06SC034	20060310	Pisidiidae	5
06SC034	20060310	Hyalella	27
06SC034	20060310	Heptageniidae	2
06SC034	20060310	Stenonema femoratum	5
06SC034	20060310	Baetidae	1
06SC034	20060310	Baetis	1
06SC034	20060310	Tricorythodes	2
06SC034	20060310	Caenis	19
06SC034	20060310	Anax	1
06SC034	20060310	Hagenius brevistylus	1
06SC034	20060310	Macromia	1
06SC034	20060310	Calopteryx	1
06SC034	20060310	Coenagrionidae	3
06SC034	20060310	Paragnetina	1
06SC034	20060310	Corixidae	2
06SC034	20060310	Belostoma	1
06SC034	20060310	Haliphus	1
06SC034	20060310	Elmidae	4
06SC034	20060310	Stenelmis	8
06SC034	20060310	Dubiraphia	12
06SC034	20060310	Optioservus	5
06SC034	20060310	Ancyronyx variegatus	1
06SC034	20060310	Macronychus	2
06SC034	20060310	Sialis	1
06SC034	20060310	Nigronia	1
06SC034	20060310	Psychomyia	2
06SC034	20060310	Hydropsychidae	10
06SC034	20060310	Cheumatopsyche	1
06SC034	20060310	Ceratopsyche	9
06SC034	20060310	Hydroptilidae	1
06SC034	20060310	Hydroptila	2
06SC034	20060310	Oxyethira	2
06SC034	20060310	Leptoceridae	3
06SC034	20060310	Mystacides	1
06SC034	20060310	Oecetis	5
06SC034	20060310	Ceraclea	3
06SC034	20060310	Micrasema	3
06SC034	20060310	Helicopsyche borealis	7

FieldNum	VisitNum	Name	Total
06SC034	20060310	Polycentropus	1
06SC034	20060310	Ceratopogoninae	6
06SC034	20060310	Tanypodinae	2
06SC034	20060310	Clinotanypus	2
06SC034	20060310	Ablabesmyia	4
06SC034	20060310	Orthocladiinae	7
06SC034	20060310	Brillia	1
06SC034	20060310	Corynoneura	1
06SC034	20060310	Cricotopus	1
06SC034	20060310	Psectrocladius	1
06SC034	20060310	Chironomini	1
06SC034	20060310	Cladopelma	1
06SC034	20060310	Cryptotendipes	1
06SC034	20060310	Lauterborniella	15
06SC034	20060310	Microtendipes	5
06SC034	20060310	Paratendipes	26
06SC034	20060310	Phaenopsectra	3
06SC034	20060310	Polypedilum	3
06SC034	20060310	Tanytarsini	14
06SC034	20060310	Cladotanytarsus	1
06SC034	20060310	Rheotanytarsus	1
06SC034	20060310	Stempellina	5
06SC034	20060310	Stempellinella	1
06SC034	20060310	Tanytarsus	27
06SC034	20060310	Hemerodromia	3
06SC034	20060310	Nemata	2
06SC034	20060310	Acerpenna	1
06SC034	20060310	Acari	11
06SC034	20060310	Faxonius	1

FieldNum	VisitNum	Name	Total
16SC081	20162307	Thienemannimyia Gr.	3
16SC081	20162307	Oligochaeta	6
16SC081	20162307	Hydrobiidae	28
16SC081	20162307	Pisidiidae	5
16SC081	20162307	Hyalella	1
16SC081	20162307	Baetis flavistriga	2
16SC081	20162307	Tricorythodes	6
16SC081	20162307	Boyeria vinosa	1
16SC081	20162307	Stenelmis	3
16SC081	20162307	Dubiraphia	1
16SC081	20162307	Ancyronyx variegatus	3
16SC081	20162307	Macronychus glabratus	7

FieldNum	VisitNum	Name	Total
16SC081	20162307	Nigronia	2
16SC081	20162307	Hydropsychidae	12
16SC081	20162307	Cheumatopsyche	3
16SC081	20162307	Hydropsyche betteni	35
16SC081	20162307	Hydroptila	4
16SC081	20162307	Oxyethira	5
16SC081	20162307	Oecetis avara	3
16SC081	20162307	Ceraclea	1
16SC081	20162307	Lepidostoma	1
16SC081	20162307	Micrasema rusticum	1
16SC081	20162307	Helicopsyche borealis	2
16SC081	20162307	Neureclipsis	1
16SC081	20162307	Antocha	5
16SC081	20162307	Simulium	6
16SC081	20162307	Atrichopogon	1
16SC081	20162307	Tanypodinae	1
16SC081	20162307	Ablabesmyia	1
16SC081	20162307	Potthastia	1
16SC081	20162307	Orthocladiinae	1
16SC081	20162307	Cricotopus	3
16SC081	20162307	Parametriocnemus	3
16SC081	20162307	Rheocricotopus	3
16SC081	20162307	Microtendipes	12
16SC081	20162307	Nilothauma	1
16SC081	20162307	Polypedilum	21
16SC081	20162307	Micropsectra	7
16SC081	20162307	Paratanytarsus	13
16SC081	20162307	Rheotanytarsus	52
16SC081	20162307	Stempellina	2
16SC081	20162307	Stempellinella	1
16SC081	20162307	Tanytarsus	4
16SC081	20162307	Empididae	1
16SC081	20162307	Hemerodromia	3
16SC081	20162307	Acerpenna	4
16SC081	20162307	Oecetis furva	1
16SC081	20162307	Oecetis testacea	8
16SC081	20162307	Maccaffertium	4
16SC081	20162307	Acari	2
16SC081	20162307	Iswaeon	17
16SC081	20162307	Teloganopsis deficiens	2
16SC081	20162307	Trepaxonemata	1

Temperature data

Water temperature data were collected from 3 stations in 2006, 2016, and 2018. Average summer water temperature data for all four years was above 20°C (21.5-22.9°C) with maximum temperatures above 27°C. Water temperatures were in the stress range for Brook Trout 64-72% of the summer and lethal temperatures were recorded 5-21% of the summer. Temperature data from the North Fork of the Grindstone River (07030003-543) is indicative of a warm water habitat.

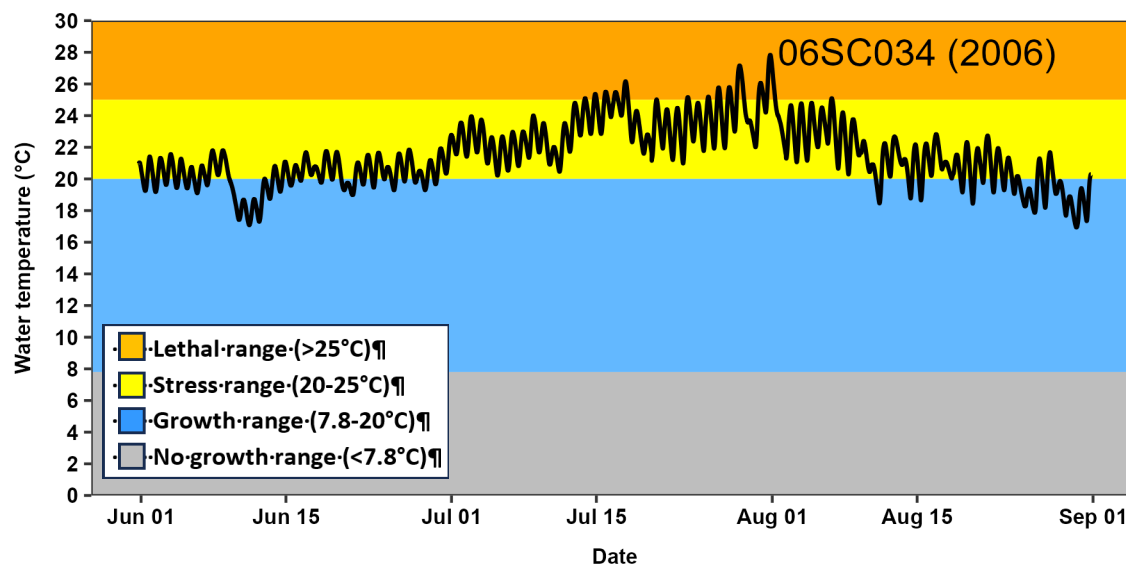
Summer water temperature statistics from Grindstone River, North Fork (07030003-543)

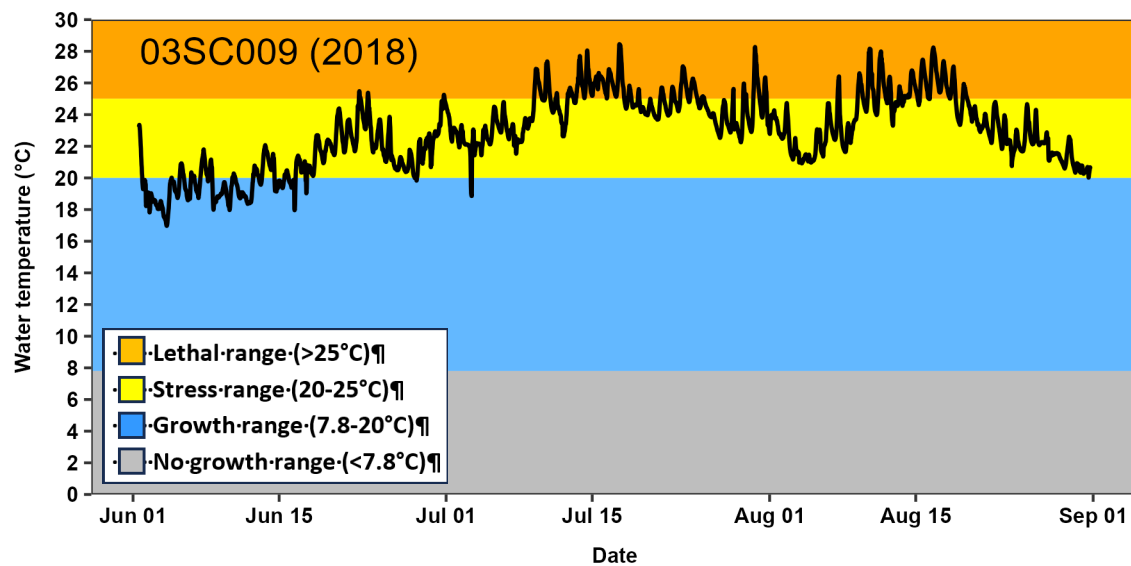
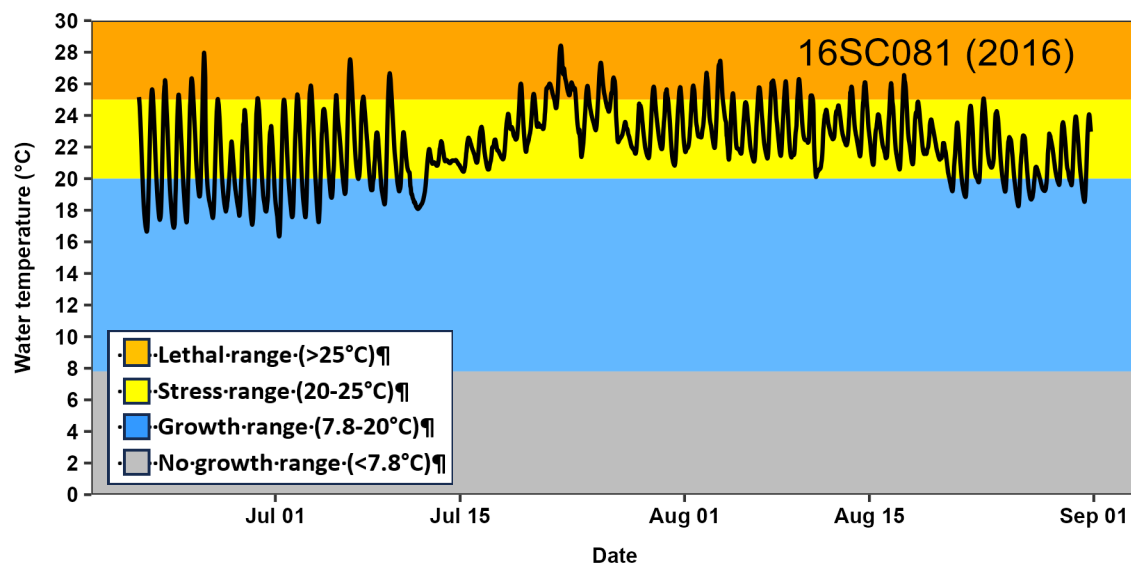
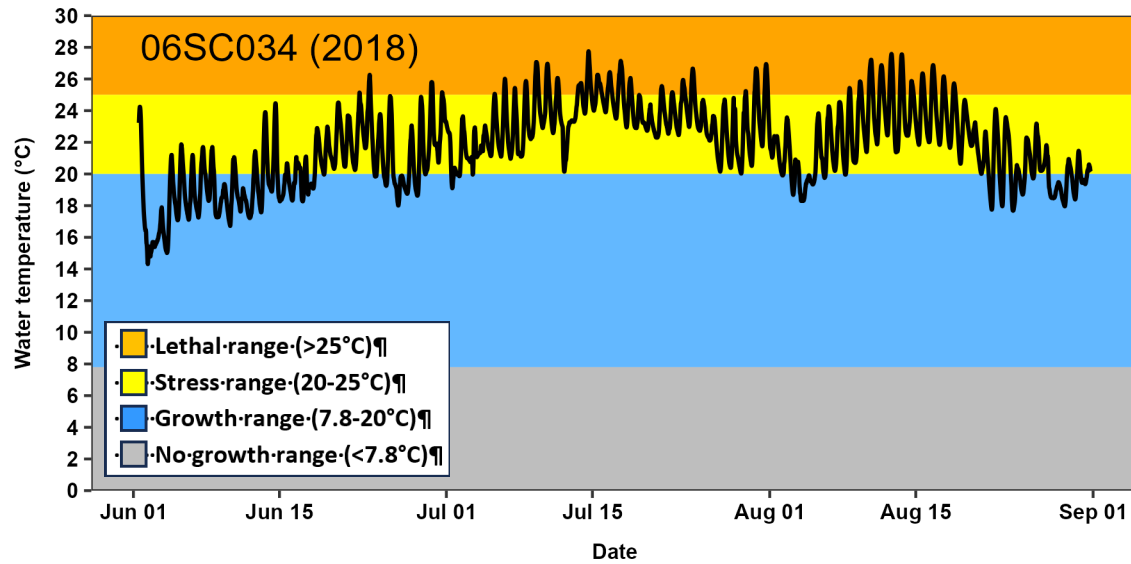
Station No	Field Num	Year	Avg. July Temp (°C)	Max Temp (°C)	Avg. Temp (°C)
W35039003	06SC034	2006	23.3	27.8	21.5
W35039003	06SC034	2018	23.4	27.8	21.8
W35039004	16SC081	2016	22.5	28.4	22.3
W35039005	03SC009	2018	24.4	28.5	22.9

Brook trout water temperature statistics from Grindstone River, North Fork (07030003-543)

Station No	Field Num	Year	%No Growth	%Growth	%Stress	%Lethal
W35039003	06SC034	2006	0%	23%	72%	5%
W35039003	06SC034	2018	0%	25%	64%	11%
W35039004	16SC081	2016	0%	17%	70%	13%
W35039005	None	2018	0%	12%	67%	21%

Water temperature plots





DNR Managment

The DNR includes this reach on their list of trout streams largely because trout have been captured in this section of stream near Grindstone Lake (58-0123-00). Catchable sized trout are stocked in this lake. The trout caught in the stream are thought to have moved from the lake into stream, but these fish are not thought to remain in the stream. There is no evidence of trout reproduction in this section stream. The DNR trout stream designation is in place so that anglers which may catch trout in this section of stream possess a trout stamp (i.e., is not based on specific management of trout in this reach).

MPCA Summary

Biological monitoring and temperature logger data demonstrated that this reach of the North Fork of the Grindstone River (07030003-543) does not support a coldwater habitat. Four stations were sampled for fish on this reach in 1967, 2003, 2006, and 2016. No coldwater fish species and a single cool water fish was collected in three of the fish samples in low abundance. Overall, these fish samples consisted of predominantly warm water species. Similarly, macroinvertebrate data were dominated by warm water taxa with no coldwater obligate taxa collected. Water temperature data were collected from 3 stations in 2006, 2016, and 2018. Average summer water temperature data for all four years was above 20°C (21.5-22.9°C) with maximum temperatures above 27°C. Water temperatures were in the stress range for Brook Trout 64-72% of the summer and lethal temperatures were recorded 5-21% of the summer. The DNR designates this reach as a trout stream, but does not manage this reach for trout. Stream trout and Lake Trout have been collected from this reach by the DNR, but these fish are thought to be transient inhabitants from a connected lake. Catchable sized trout are stocked by the DNR into a connected lake (Grindstone Lake [58-0123-00]). Trout found in this stream reach are likely from this waterbody as there is no evidence of trout reproduction in this reach. The DNR's trout water designation is largely geared toward ensuring that anglers follow regulations for trout (e.g., obtaining a trout stamp) for trout that may temporarily use this stream reach. As a result of the biological monitoring and water temperature data and the management of the fishery, it is not appropriate to maintain a Class 2A (coldwater habitat) designation for the North Fork of the Grindstone River (07030003-543).

Silver Creek (07030005-810) - MPCA Use Designation Review

Stream name: Silver Creek

AUID(s): 07030005-810

AUID description: Top of Fairy Falls to St. Croix River

MPCA field number(s): 99SC009

Watershed: Lower St. Croix River (07030005)

County: Washington

DNR designation: none

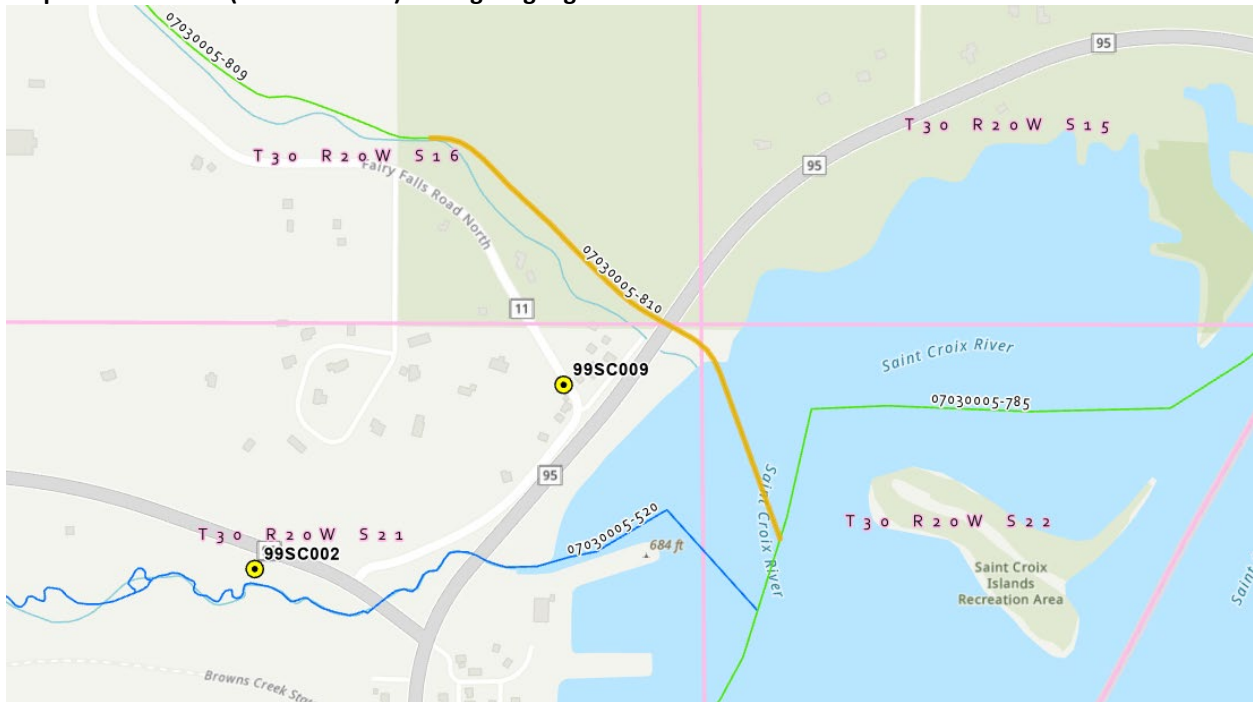
DNR management class: none

Current MPCA aquatic life use designation: 2Bg (warm/cool water)

Reason for review: Macroinvertebrate data

Additional information: This reach was split at the waterfall as downstream of this point is likely where additional groundwater inputs enter the stream. The fish and temperature data were limited from this reach, but there were many macroinvertebrate samples which indicate the maintenance of a coldwater habitat.

Map of Silver Creek (07030005-810). Orange highlight indicates extent of reach considered in this document.



Review of existing data

Monitoring data

Biological samples were collected from this reach of the Silver Creek (07030005-810) at one location (see map). This station (99SC009) is located upstream of St. Croix Trail N. The fish and macroinvertebrate surveys did not follow standard MPCA methods used to collect biological data for calculating index of biotic integrity (IBI) scores. However, these data may still be informative regarding the status of a coldwater habitat in this stream.

Biological data: Fish

A fish survey was conducted once in 1999 at the biomonitoring station (99SC009). No coldwater or cool water fish species were present. The sample size was small and was entirely composed of centrarchids. Overall, the fish assemblage is not indicative of a coldwater habitat and is likely influenced by its close proximity to the St. Croix River.

Summary of fish biomonitoring results from Silver Creek (07030005-810)

Field Number	Visit Number	Visit Date	# coldwater species	% coldwater species	# cool water species	% cool water species
99SC009	19990154	8/20/1999	0	0	0	0

Biological data: Macroinvertebrates

The biological monitoring site was sampled 19 times from 2004 through 2020 by the Metropolitan Council Environmental Services (MCES). Here only data from the six most recent years of monitoring (2015-2020) are presented. The macroinvertebrate data from this reach of Silver Creek is strongly indicative of a coldwater community. Each macroinvertebrate sample included three to six coldwater obligate species in moderate to high numbers (17-117 individuals, 5.4-37.8% of the sample). Coldwater obligate taxa present in these samples included: *Baetis tricaudatus*, *Brachycentrus*, *Diamesa*, *Gammarus*, *Glossosoma*, *Hesperophylax designatus*, *Lype diversa*, *Parachaetocladius*, and *Rhyacophila*.

Summary of coldwater macroinvertebrates collected from Silver Creek (07030005-810)

Field Number	Visit Number	Visit Date	# coldwater individuals	% coldwater individuals	# coldwater taxa
99SC009	20200385	9/28/2015	112	37.8%	5
99SC009	20200389	9/19/2016	76	24.0%	5
99SC009	20200370	9/21/2017	117	36.4%	6
99SC009	20200371	9/18/2018	17	5.4%	4
99SC009	20200372	9/20/2019	52	16.1%	3
99SC009	20200373	8/5/2020	55	17.4%	5

Temperature data

A single temperature measurement was available from the 2020 MCES macroinvertebrate sample. This August measurement taken in the afternoon indicated cool temperatures.

Date, time	Temperature (°C)
8/5/2020, 13:42	17.5

DNR information

No historical DNR survey information is available for this reach of Silver Creek.

MPCA Summary

MPCA biological monitoring and temperature logger data demonstrated that this reach of Silver Creek (07030005-810) currently supports a coldwater habitat. One station was sampled for fish and macroinvertebrates and a limited amount of temperature data was collected. The fish community was not indicative of a coldwater community and is likely influenced by the small size of the stream and the close proximity of the biological station to the St. Croix River. Several macroinvertebrate samples were available and did indicate that this stream support a coldwater habitat. Each macroinvertebrate sample included three to six coldwater obligate species in moderate to high numbers (17-117 individuals, 5.4-37.8% of the sample). The coldwater obligate taxa present in these samples included: *Baetis tricaudatus*, *Brachycentrus*, *Diamesa*, *Gammarus*, *Glossosoma*, *Hesperophylax designatus*, *Lype diversa*, *Parachaetocladius*, and *Rhyacophila*. No water temperature logger data were available but a single measurement from August 5, 2020 was cool (17.5°C) and indicated that temperatures may be suitable to support coldwater habitat. No historical DNR survey information is available for this reach of Silver Creek.

Logan Branch (07040003-F36) - MPCA Use Designation Review

Stream name: Logan Branch

AUID(s): 07040003-F36

AUID description: from an unnamed creek (PLSS T107 R11W S18) to an unnamed creek (PLSS T107 R11W S9)

MPCA field number(s): 20LM009

Watershed: Mississippi River - Winona watershed (07040003)

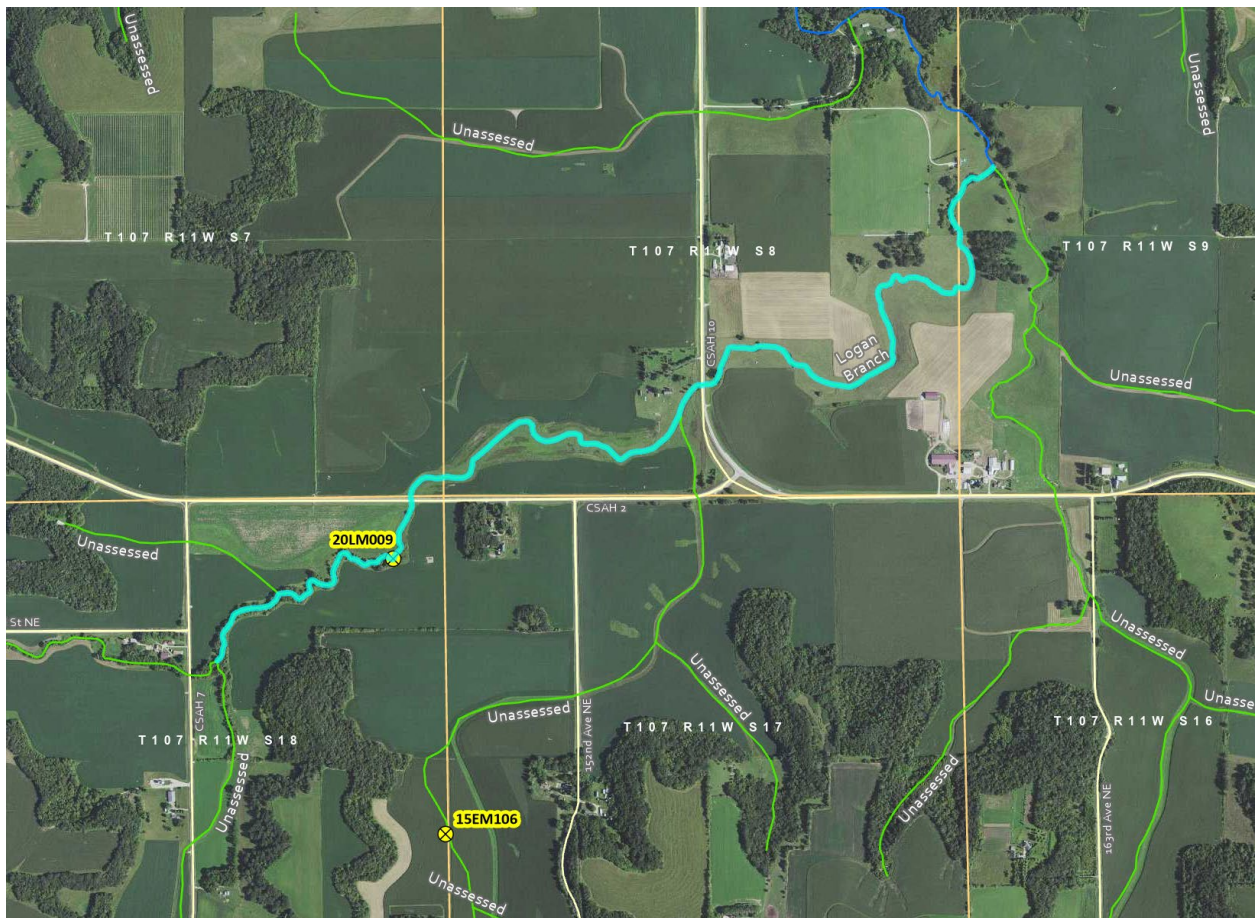
County: Olmsted

DNR designation: none (PLSS T107 R11W S7, 18); trout water (PLSS T107 R11W S8, 9)

DNR management class: warmwater (note: the lower portions of -F36 are included on the trout waters list because they are in sections 8 and 9 (i.e., it is administrative). The DNR's ecological classification for these reaches are warm water. However, the DNR is currently considering changing the ecological classification for -F36 to cool water.)

Current MPCA aquatic life use designation: 2Bg (warm/cool water)

Reason for review: Fish, macroinvertebrate, and temperature data



Map of Logan Branch (07040003-F36) showing location of the MPCA biomonitoring station (20LM009)

Review of existing data

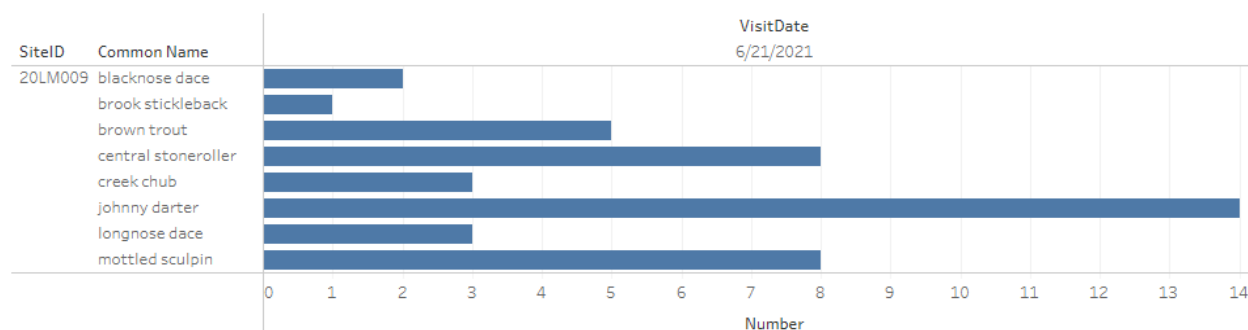
MPCA monitoring data

Biological samples were collected from this reach of Logan Branch (07040003-F36) at one location (see map). This station (20LM009) was located upstream of CSAH 2.

MPCA biological data: Fish

The MPCA conducted a fish survey in 2021 at the biomonitoring station (20LM009). Two cold water fish species (Brown Trout, Mottled Sculpin) were present in the sample. In addition, two cool water fish species (Longnose Dace, Brook Stickleback) were present. The fish community in this reach was comprised of 29.5% cold water species and 9.1% cool water species. Overall, the fish assemblage is indicative of a marginal coldwater habitat. Habitat in this reach is poor for a coldwater fishery with little channel development, sparse cover, and sand/silt substrate predominating. There was little water in the channel of this primary headwater stream (drainage 7.5 mi²; average depth was only a few inches) at the time of sampling. Alone, the fish data do not necessarily demonstrate the presence of a coldwater habitat in this portion of Logan Branch. However, the coldwater fish community may be limited by habitat (i.e., poor habitat, low water levels) rather than temperature.

Fish biomonitoring results from Logan Branch (07040003-F36)



Summary of fish biomonitoring results from Logan Branch (07040003-F36)

Field Number	Visit Number	Visit Date	# cold water species	% cold water species	# cold-cool water species	% cold-cool water species	% salmonids
20LM009	20210343	21-Jun-21	2	29.5	4	38.6	11.4

MPCA biological data: Macroinvertebrates

Based on the macroinvertebrate sample that was collected at station 20LM009 on 8/17/21, the macroinvertebrate data from this portion of Logan Branch is indicative of a coldwater community. The macroinvertebrate sample included 7 cold water obligate species which comprised 33.2% of the individuals in the sample. The macroinvertebrate data from 20LM009 are actually more indicative of a coldwater community than are data from other MPCA stations on Logan Branch (04LM127, 10LM011) that are currently designated as Class 2A coldwater. Coldwater macroinvertebrates collected at 20LM009 included: *Brachycentrus occidentalis*, *Eukiefferiella*, *Heterotrissocladius*, *Gammarus*, *Odontomesa*, *Prodiamesa*, and *Radotanypus*.

Summary of coldwater macroinvertebrates collected from Logan Branch (07040003-F36)

Field Number	Visit Number	Visit Date	# cold water individuals	% cold water individuals	# cold water taxa
20LM009	20210583	17-Aug-21	106	33.2%	7

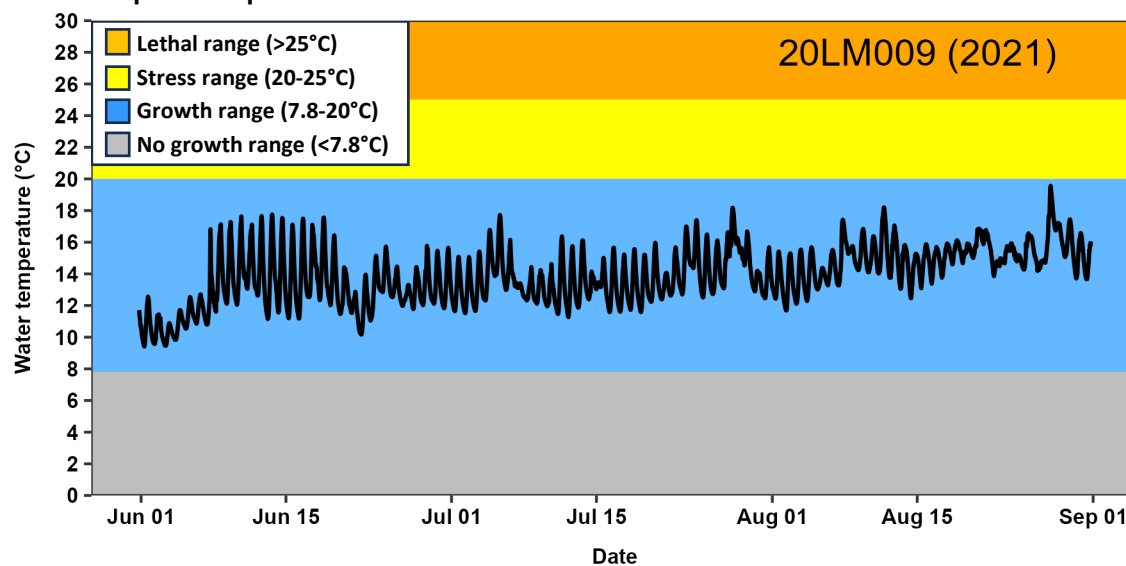
MPCA Temperature data

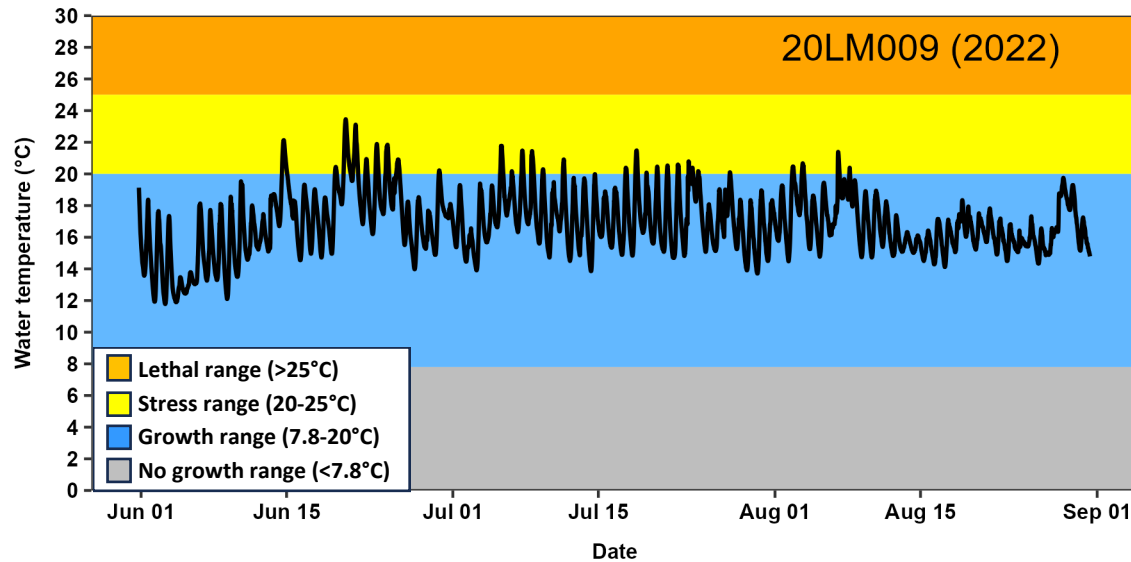
Continuously-recording stream temperature loggers were deployed at the MPCA biomonitoring station during the summers of 2021 and 2022. Summary data for the logger deployments can be found below. Temperatures at the site for both years were indicative of a coldwater habitat. Temperatures were in the growth range for Brook Trout >90% of the summer and no lethal temperatures were observed. A relatively small proportion of the summer were in the stressful range for brook trout (0-7%). Average summer temperatures were 13.9-16.9 °C. All temperature logger data indicate this reach of Logan Branch is cool enough to support trout or other cold water obligate taxa.

Water temperature logger summary data for Logan Branch (20LM009).

Brook Trout temperature metric	2021	2022
Percent		
Lethal	0%	0%
Stress	0%	7%
Growth	100%	93%
No Growth (too cold)	0%	0%
Temperature		
June Avg Temp	13.0	16.7
July Avg Temp	13.8	17.2
Aug Avg Temp	15.0	16.6
Summer Avg Temp	13.9	16.9

Water temperature plots





DNR information

No historical DNR survey information is available for this reach of Logan Branch.

MPCA Summary

MPCA biological monitoring and temperature logger data demonstrated that this reach of Logan Branch (07040003-F36) currently supports a coldwater habitat. The MPCA sampled one station for fish and macroinvertebrates on Logan Branch in 2021. Two cold water fish species (Brown Trout and Mottled Sculpin) and two cool water species (Longnose Dace, Brook Stickleback) were collected. The coldwater species comprised 29.5% of the fish collected. However, this fish community was in general indicative of a marginal coldwater habitat. This condition can likely be attributed to poor habitat which had poor channel development, sparse cover, sand/silt substrates, and low water levels. The macroinvertebrate community was more indicative of a coldwater habitat. The macroinvertebrate sample collected by the MPCA included 7 cold water obligate taxa (*Brachycentrus occidentalis*, *Eukiefferiella*, *Heterotrissocladius*, *Gammarus*, *Odontomesa*, *Prodiamesa*, and *Radotanytus*) which comprised 33.2% of the sample. Water temperature logger data were collected in 2021 and 2022. Both summer deployments indicated that temperatures in this stream reach are cold and sufficient to support cold water species. Temperatures were in the growth range for brook trout >90% of the summer and no lethal temperatures were observed. A relatively small proportion of the summer were in the stressful range for brook trout (0-7%). Average summer temperatures in July were 13.9-16.9 °C. No historical DNR survey information is available for this reach of Logan Branch. However, a portion of this reach and other downstream reaches of Logan Branch (07040003-551, 07040003-552, 07040003-F31) are included on the DNR's trout waters list ([Minn. R. 6264.0050](#)).

Whitewater River, North Fork (07040003-F37) - MPCA Use Designation Review

Stream name: Whitewater River, North Fork

AUID(s): 07040003-F37

AUID description: from its headwaters to west line of PLSS section T107 R12W S27

MPCA field number(s): 04LM005

Watershed: Mississippi River - Winona watershed (07040003)

County: Olmsted

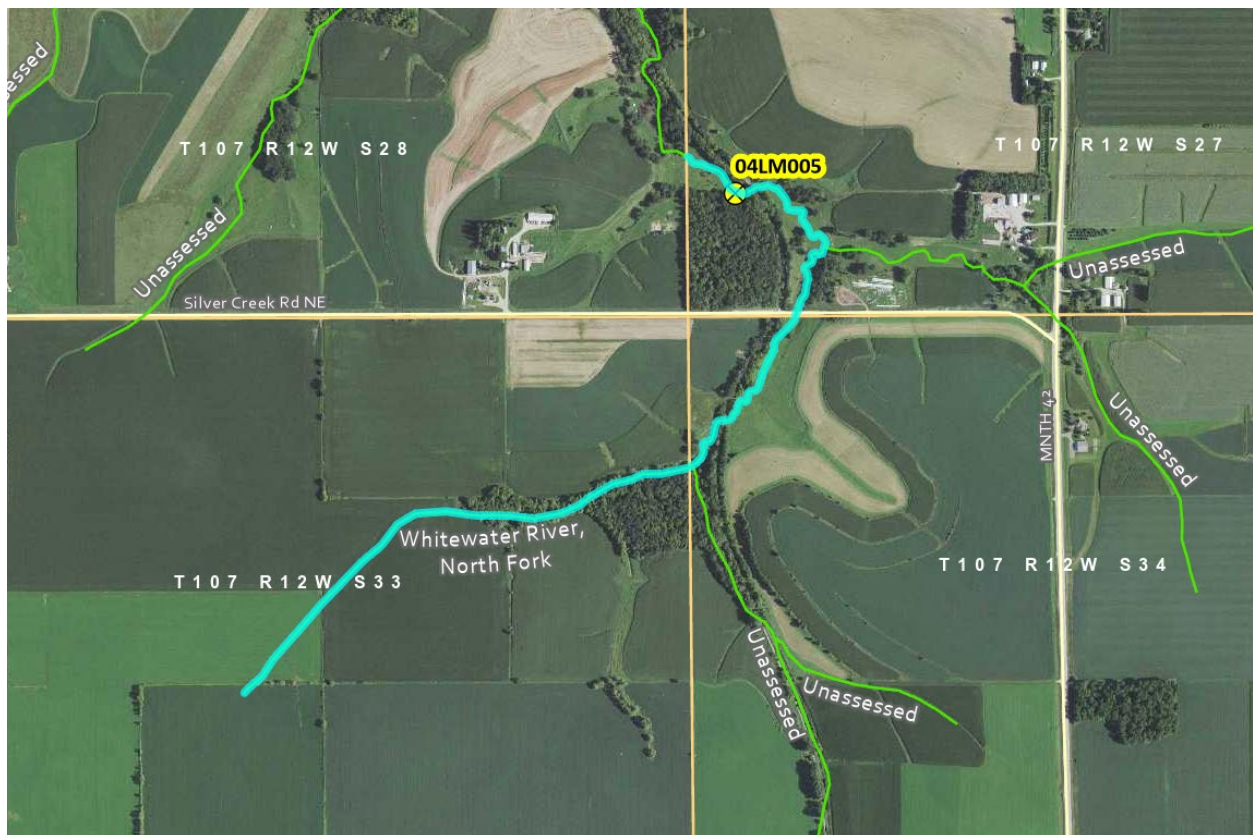
DNR designation: none

DNR management class: none

Current MPCA aquatic life use designation: 2Bg (warm/cool water)

Reason for review: Macroinvertebrate and temperature data

Additional information: The reach between 07040003-F37 and 07040003-F39 was also reviewed for cold water habitat. The results of this review were that temperatures were warmer in this middle reach compared to 07040003-F37 and 07040003-F39 and the biological assemblages were not consistent with a coldwater habitat. As a result, the Class 2Bg was recommended to be retained for this portion of the North Fork of the Whitewater River (07040003-F38).



Map of Whitewater River, North Fork (07040003-F37) showing location of the MPCA biomonitoring station (04LM005)

Review of existing data

MPCA monitoring data

Biological samples were collected from this reach of the North Fork of the Whitewater River (07040003-F37) at one location (see map). This station (04LM005) was located downstream of Silver Creek Road NE.

MPCA biological data: Fish

The MPCA conducted two fish surveys in 2004 at the biomonitoring station (04LM005). No coldwater fish species were present in either sample. Two cool water fish species (Longnose Dace, Brook Stickleback) were present and comprised 29.7-36.1% of the samples. Overall, the fish assemblage is not indicative of a coldwater habitat. In this headwater reach, it is likely the very small drainage area (1.5 sq. mi.) and downstream warm water reach are limiting factors for a coldwater fish community.

Summary of fish biomonitoring results from the North Fork of the Whitewater River (07040003-F37)

Field Number	Visit Number	Visit Date	# cold water species	% cold water species	# cool water species	% cool water species	% salmonids
04LM005	20040037	14-Jul-04	0	0%	2	29.7%	0
04LM005	20040295	24-Jun-04	0	0%	2	36.1%	0

MPCA biological data: Macroinvertebrates

One macroinvertebrate sample was collected from the biomonitoring station (04LM005). The macroinvertebrate data from this reach of the North Fork of the Whitewater River is marginally indicative of a coldwater community. The macroinvertebrate sample included a single cold water obligate species (*Eukiefferiella*) in moderate numbers (8 individuals, 2.8% of sample).

Summary of coldwater macroinvertebrates collected from the North Fork of the Whitewater River (07040003-F37)

Field Number	Visit Number	Visit Date	# cold water individuals	% cold water individuals	# cold water taxa
04LM005	20040116	18-Aug-04	8	2.8%	1

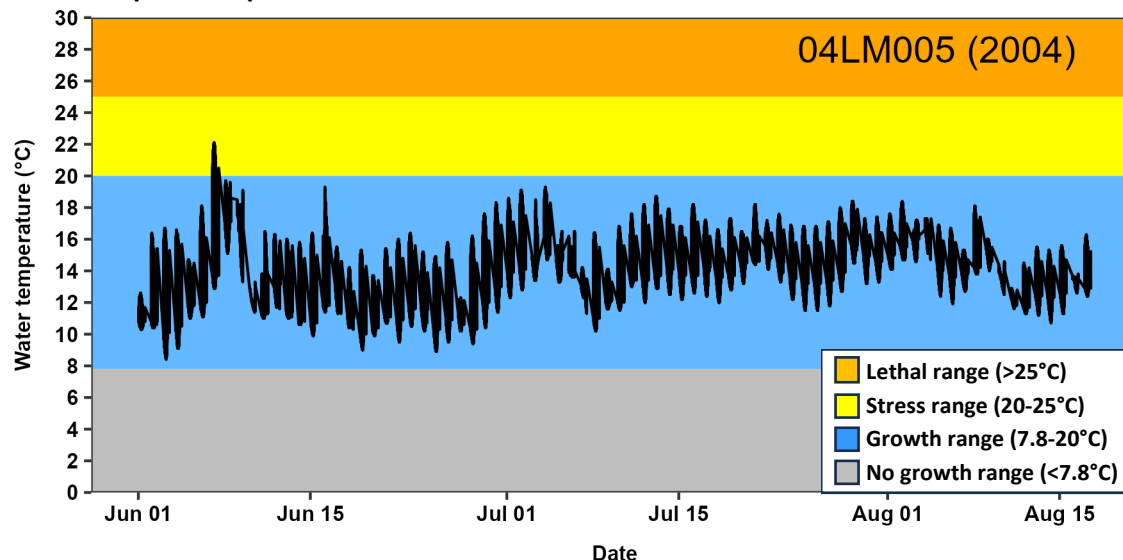
MPCA Temperature data

A temperature logger was deployed at the biomonitoring station in 2004. Summary data for the logger deployments can be found below. Temperatures at the site were indicative of a coldwater habitat. Temperatures were in the growth range for brook trout >99% of the summer and no lethal temperatures were observed. A relatively small proportion of the summer were in the stressful range for brook trout (0.4%). Average summer temperatures in July were 14.8 °C. All temperature logger data indicate this reach of the North Fork of the Whitewater River is cool enough to support cold water obligate taxa.

Water temperature logger summary data for the North Fork of the Whitewater River (04LM005).

Brook trout temperature metric	2004
Percent	
Lethal	0%
Stress	0.4%
Growth	96.4%
Temperature	
July Avg Temp	14.8

Water temperature plot



DNR information

No historical DNR survey information is available for this reach of the North Fork of the Whitewater River.

MPCA Summary

MPCA temperature logger data strongly demonstrated that this reach of the North Fork of the Whitewater River currently supports a coldwater habitat. The MPCA sampled one station for fish and macroinvertebrates on the North Fork of the Whitewater River in 2004. No coldwater fish species and two cool water species (Longnose Dace, Brook Stickleback) were collected. Overall, the fish community was not indicative of a coldwater habitat. This condition can likely be attributed to the fact that this reach is small headwater stream (i.e., limiting habitat) that is isolated by a long downstream warm water reach. The macroinvertebrate community was more indicative of a coldwater habitat, but still did not strongly demonstrate the presence of a coldwater community. The macroinvertebrate sample collected by the MPCA included 1 cold water obligate taxon (*Eukiefferiella*) which comprised 2.8% of the sample. Water temperature logger data were collected in 2004 and strongly indicated that temperatures are cool enough to support cold water obligate species. Temperatures were in the growth range for brook trout >99% of the summer and no lethal temperatures were observed. A small proportion of the summer were in the stressful range for brook trout (0.4%). The average July temperature was 14.8 °C. No historical DNR survey information is available for this reach of the North Fork of the Whitewater River.

Whitewater River, North Fork (07040003-F39) - MPCA Use Designation Review

Stream name: Whitewater River, North Fork

AUID(s): 07040003-F39

AUID description: from the south line of PLSS section T108 R12W S33 to the north line of PLSS section T108 R12W S34

MPCA field number(s): 10EM059

Watershed: Mississippi River - Winona watershed (07040003)

County: Wabasha

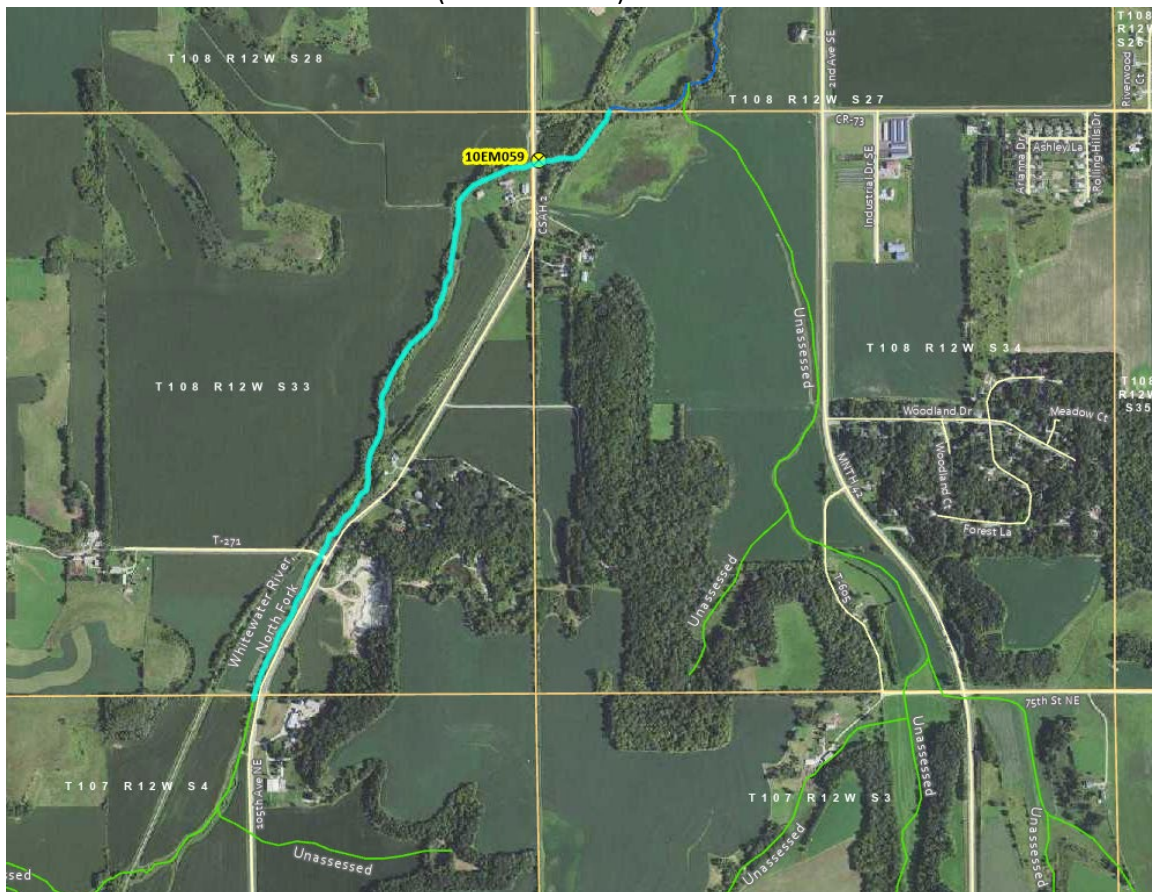
DNR designation: none

DNR management class: none

Current MPCA aquatic life use designation: 2Bg (warm/cool water)

Reason for review: Macroinvertebrate and temperature data

Additional information: The reach between 07040003-F37 and 07040003-F39 was also reviewed for cold water habitat. The results of this review were that temperatures were warmer in this middle reach compared to 07040003-F37 and 07040003-F39 and the biological assemblages were not consistent with a coldwater habitat. As a result, the Class 2Bg was recommended to be retained for this portion of the North Fork of the Whitewater River (07040003-F38).



Map of Whitewater River, North Fork (07040003-F39; light blue line) showing location of the MPCA biomonitoring station (10EM059)

Review of existing data

MPCA monitoring data

Biological samples were collected from this reach of the North Fork of the Whitewater River (07040003-F39) at one location (see map). This station (10EM059) was located downstream of CSAH 2.

MPCA biological data: Fish

The MPCA conducted four fish surveys in 2010, 2015, and 2021 (surveyed twice in 2021) at the biomonitoring station (10EM059). A single cold water fish species (Brown Trout) was present in low numbers in all four samples. Brown Trout comprised 0.7-5.1% of samples. One to two cool water fish species (Longnose Dace, Brook Stickleback) were present in these surveys and comprised 1.6-19.2% of samples. Overall, the fish assemblage is indicative of a marginal coldwater habitat. Low numbers of brown trout may indicate the presence of a transitional reach, limited trout habitat, or a degraded coldwater habitat.

Summary of fish biomonitoring results from the North Fork of the Whitewater River (07040003-F39)

Field Number	Visit Number	Visit Date	# cold water species	% cold water species	# cool water species	% cool water species
10EM059	20100156	12-Jul-10	1	1.2	1	1.6
10EM059	20151070	17-Aug-15	1	0.7	2	4.7
10EM059	20210244	01-Jul-21	1	5.0	1	5.6
10EM059	20210193	26-Aug-21	1	5.1	2	19.2

MPCA biological data: Macroinvertebrates

Three macroinvertebrate samples were collected (2010, 2015, 2021) from the biomonitoring station (10EM059). The macroinvertebrate data from this reach of the North Fork of the Whitewater River is moderately indicative of a coldwater community. The macroinvertebrate sample included one to four cold water obligate species in moderate to high numbers (10-177 individuals, 3.1-54.6% of sample). Cold water obligate taxa present in these samples included: *Brachycentrus occidentalis*, *Doncricotopus bicaudatus*, *Gammarus*, *Heterotrissocladius*, *Odontomesa*. The 2021 temperature and macroinvertebrate data from 10EM059 both indicated the coldest signature detected by MPCA monitoring at this site. The high in relative abundance of cold water obligate taxa in 2021 was due to a high density of the caddisfly *Brachycentrus occidentalis*, which previously had only been collected in low numbers or had been absent from samples at this site. The stream did not likely experience any pulses of warm water (i.e., major storm events) in 2021, indicated by the summer 2021 hydrographs of nearby gages, and may explain the relatively colder thermal regime observed at 10EM059 in 2021.

Summary of coldwater macroinvertebrates collected from North Fork of the Whitewater River (07040003-F39)

Field Number	Visit Number	Visit Date	# cold water individuals	% cold water individuals	# cold water taxa
10EM059	20101918	8/17/2010	16	5.1%	1
10EM059	20153123	8/20/2015	10	3.1%	4
10EM059	20210576	8/16/2021	177	54.6%	3

MPCA Temperature data

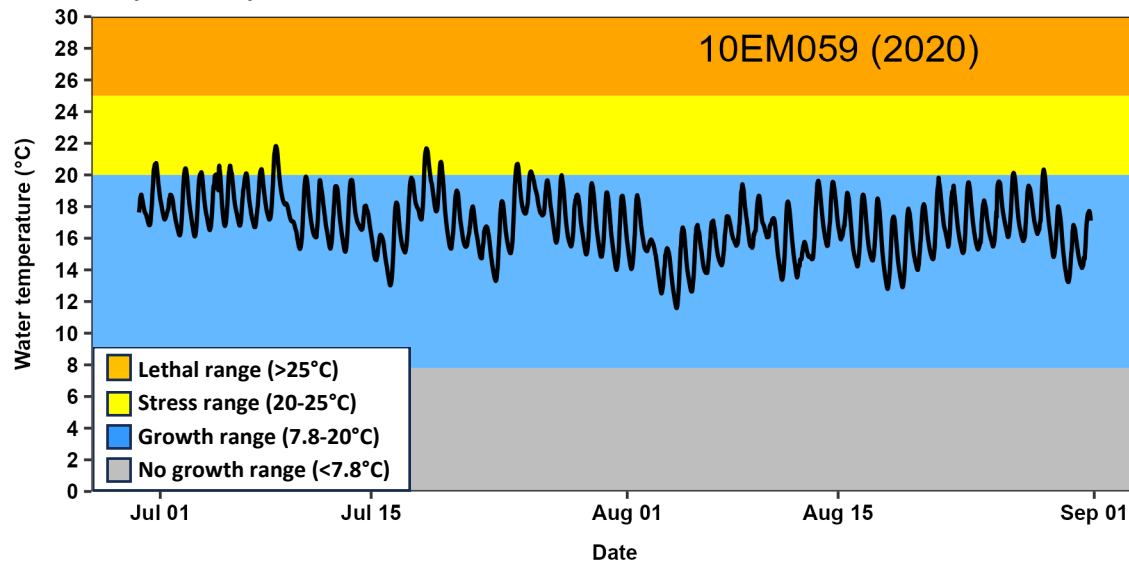
A temperature logger was deployed at the biomonitoring station in 2020 and 2021. Summary data for the logger deployments can be found below. Temperatures at the site were indicative of a coldwater habitat. Temperatures were in the growth range for brook trout 92-95% of the summer and no lethal

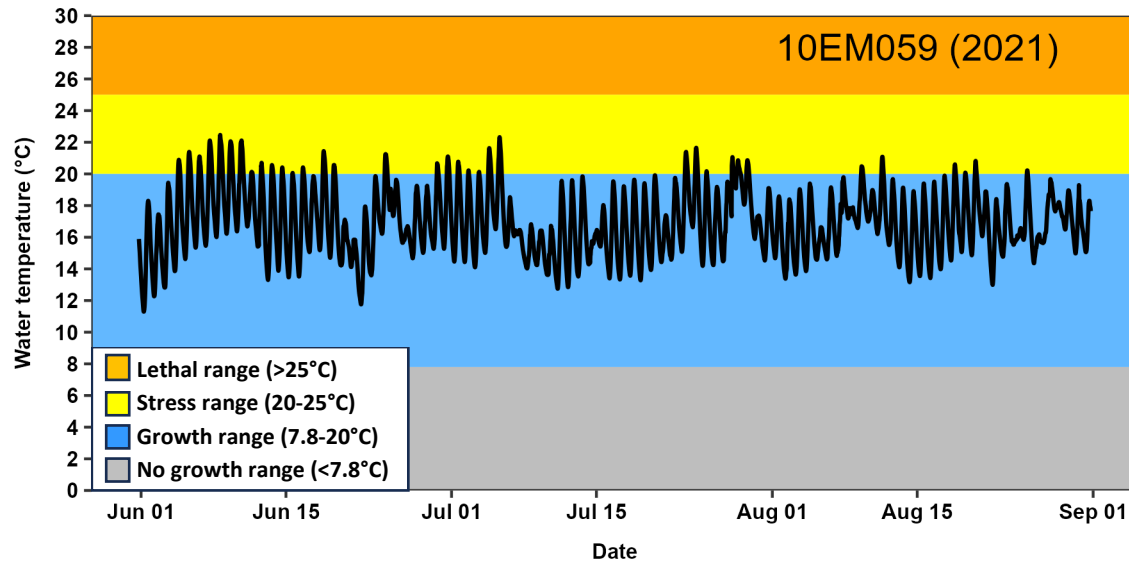
temperatures were observed. A relatively small proportion of the summer were in the stressful range for brook trout (5-8%). Average summer temperatures were 16.9-17.4°C. All temperature logger data indicated that this reach of the North Fork of the Whitewater River is cool enough to support cold water obligate taxa. Compared to the temperature data collected at 20LM001 (07040003-F38) further upstream, the temperature at 10EM059 suggests that there is significant groundwater input coming in between these two stations.

Water temperature logger summary data for the North Fork of the Whitewater River (10EM059).

Brook trout temperature metric	2020	2021
Percent		
Lethal	0%	0%
Stress	5%	8%
Growth	95%	92%
Temperature		
Average July Temperature	17.5	17.4
Summer Average	17.4	16.9

Water temperature plot





DNR information

No historical DNR survey information is available for this reach of the North Fork of the Whitewater River. Although the DNR manages downstream portions of the North Fork of the Whitewater River for trout, the reach reviewed here was not included on the DNR's trout waters list due to limited trout habitat.

MPCA Summary

MPCA macroinvertebrate and temperature logger data demonstrated that this reach of the North Fork of the Whitewater River currently supports a coldwater habitat. The MPCA sampled one station for fish and macroinvertebrates on the North Fork of the Whitewater River in 2010, 2015, and 2021. A single coldwater fish species (Brown Trout) and two cool water species (Longnose Dace, Brook Stickleback) were collected in low numbers. Overall, the fish community was indicative of a marginal coldwater habitat. This condition could be attributed to the following possible factors for this reach: 1) transitional between warm and coldwater habitats, 2) lacking limited trout habitat, or 3) being a degraded coldwater habitat. The macroinvertebrate community was more indicative of a coldwater habitat, although the degree that the macroinvertebrate demonstrated the presence of a coldwater habitat varied between samples. Macroinvertebrate samples contained one to four cold water obligate species in moderate to high numbers (10-177 individuals, 3.1-54.6% of sample). The cold water obligate taxa present in these samples included: *Brachycentrus occidentalis*, *Doncricotopus bicaudatus*, *Gammarus*, *Heterotrissocladius*, *Odontomesa*. One sample (2021) had a very high proportion of cold water obligate taxa and could possibly be attributed to a lack of warm water pulses from storm events during the summer. Water temperature logger data were collected in 2020 and 2021 and strongly indicated that temperatures are cool enough to support cold water obligate species. Temperatures were in the growth range for brook trout 92-95% of the summer and no lethal temperatures were observed. A relatively small proportion of the summer were in the stressful range for brook trout (5-8%). Average summer temperatures were 16.9-17.4°C. No historical DNR survey information is available for this reach of the North Fork of the Whitewater River.

Trout Brook (07040004-584,-585) MPCA Use Designation Review

Stream name: Trout Brook

AUID(s): 07040004-584,-585

AUID description: 07040004-584: west line of PLSS section T110 R11W S9 to Hope Coulee; 07040004-585: Hope Coulee to Zumbro R

MPCA biological station(s): 12LM012, 12LM013, 23LM006

County: Wabasha

Watershed: Zumbro

DNR designation: Designated trout water

DNR management class: I-D (Marginal Trout)

Current AUID designation: 2Bg (warm water)

Reason for review: Fish, macroinvertebrates, and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed for coldwater habitat by the MPCA.

Additional information: The immediate upstream reach (07040004-571) is a designated trout stream and is designated Class 2Ag. The tributary (Hope Coulee) that enters Trout Brook near the Wabasha CR 20 and 30 intersection is potentially also a coldwater habitat, but limited data exists. Fish, macroinvertebrate, and temperature data collected by the MPCA indicates that this reach supports a coldwater fish community.

Background

Trout Brook is in the Zumbro River Watershed near the town of Dumfries on State Highway 60 in Wabasha County. It has a drainage area of approximately 22 square miles that winds 3.4 miles through agriculture and pastureland. Currently Trout Brook consists of an upper portion designated as coldwater use (07040004-571), the middle portion designated as general warmwater use (-584), and the downstream portion designated warmwater modified use (-585).



Map of tributary to the Trout Brook (07040004-584, -585). Orange highlight indicates extent of reach considered in this document.

According to DNR stream surveys, portions of the stream between MPCA stations 12LM013 and 12LM012 are losing reaches and can run underground in dry years. Past monitoring efforts by DNR and MPCA have produced mixed results in regard to demonstrating the streams coldwater potential. However, trout have been collected by MPCA at all stations within the WIDs currently designated as warmwater (-584 & -585) and one-time water temperatures at the time of summer (June through August) biological sampling have indicated good coldwater potential.

Although these WIDs have not been previously evaluated in detail for coldwater habitat, they have been reviewed for Tiered Aquatic Life Uses. The downstream WID (07040004-585) was previously designated a Modified Use due to historical channelization and limited habitat. There was no indication of a coldwater habitat based on the fish community collected in 2012 and the community indicated non-support of the Modified Use. This reach was subsequently listed as impaired on the 2016 Impaired Waters List and later (2018) recategorized as 4C (impaired but due to a non-pollutant – lack of habitat). Significant flooding occurred in this region in 2010 and 2011 which appears to have dramatically altered the channel morphology and instream habitat of Trout Brook and likely negatively impacted the biological community sampled in 2012 (see below).

The upstream WID (07040004-584) is more indicative of coldwater use than the downstream WID (07040004-585) at this time based on the available temperature data. There is still some uncertainty or variability regarding the thermal regime in 07040004-585. Determination of the thermal regime is complicated by a losing reach section in the vicinity of the Hope Coulee confluence. Given that this WID

is currently designated as a Modified Use and needs to be changed to either warmwater or coldwater General Use – the consensus was that currently available data indicate a coldwater use designation is most appropriate. Both assemblages (fish and macroinvertebrates) currently demonstrate support of a coldwater use. Future monitoring and assessment of Trout Brook should be cognizant of these extenuating circumstances and the potential for flow and temperature variability depending on hydrologic conditions/cycles.

Photos of the stream channel in 2012 vs. 2023/24 at stations 12LM012 and 12LM013



Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information:

MPCA conducted fish community sampling at three stations on Trout Brook within the reaches currently designated as warmwater. Station 12LM012 is on the lower reach (-585) was first sampled in 2012 and no trout, coldwater taxa, or cool water taxa were collected at that time. Several Brook Trout and Brown Trout were collected at this location in 2023 as well as Longnose Dace which is considered a cool water species. At station 12LM013, 3 Brook Trout were sampled in 2012 and in 2024 31 individuals were sampled, including 13 adults and 18 young of year. A 2023 fish sampling visit to a station further upstream (23LM006) produced only two taxa - Brook Trout and Brook Stickleback. In summary, trout have been collected at all MPCA sampling stations on these WIDs in all years sampled, apart from the 2012 visit to 12LM012.

Fish community sampled at MPCA station 12LM012.

Field Num	Waterbody Name	Visit Date	Common Name	Length Min	Length Max	Weight	Number
12LM012	Trout Brook	7/9/2012	western blacknose dace	62	81	19	6
12LM012	Trout Brook	7/9/2012	white sucker	36	58	101	124
12LM012	Trout Brook	7/9/2012	green sunfish	64	64	4	1
12LM012	Trout Brook	7/9/2012	fathead minnow	36	41	2	3
12LM012	Trout Brook	7/9/2012	central stoneroller	26	26	0.5	1
12LM012	Trout Brook	7/9/2012	bigmouth shiner	36	74	249	162
Field Num	Waterbody Name	Visit Date	Common Name	Length Min	Length Max	Weight	Number
12LM012	Trout Brook	8/9/2023	western blacknose dace	55	78	34	9
12LM012	Trout Brook	8/9/2023	white sucker	51	133	91	16
12LM012	Trout Brook	8/9/2023	blackside darter	51	51	2	1
12LM012	Trout Brook	8/9/2023	johnny darter	67	67	3	1
12LM012	Trout Brook	8/9/2023	longnose dace	77	104	91	11
12LM012	Trout Brook	8/9/2023	creek chub	55	80	8	2
12LM012	Trout Brook	8/9/2023	brook trout	105	230	153	2
12LM012	Trout Brook	8/9/2023	brown trout	112	135	125	5

Fish community sampled at MPCA station 12LM013.

Field Num	Waterbody Name	Visit Date	Common Name	Length Min	Length Max	Weight	Number
12LM013	Trout Brook	7/11/2012	western blacknose dace	87	106	57	6
12LM013	Trout Brook	7/11/2012	white sucker	37	110	41	10
12LM013	Trout Brook	7/11/2012	brook stickleback	29	29	0.5	1
12LM013	Trout Brook	7/11/2012	central stoneroller	115	115	15	1
12LM013	Trout Brook	7/11/2012	bigmouth shiner	56	74	31	14
12LM013	Trout Brook	7/11/2012	creek chub	100	148	176	11
12LM013	Trout Brook	7/11/2012	brook trout	90	282	317	3
Field Num	Waterbody Name	Visit Date	Common Name	Length Min	Length Max	Weight	Number
12LM013	Trout Brook	9/10/2024	brook trout	74	288	2126	31
12LM013	Trout Brook	9/10/2024	black bullhead	74	127	63	3
12LM013	Trout Brook	9/10/2024	white sucker	86	217	1944	52
12LM013	Trout Brook	9/10/2024	creek chub	61	168	455	30
12LM013	Trout Brook	9/10/2024	western blacknose dace	54	93	42	6
12LM013	Trout Brook	9/10/2024	brassy minnow	72	75	13	2
12LM013	Trout Brook	9/10/2024	fathead minnow	50	57	13	5
12LM013	Trout Brook	9/10/2024	brook stickleback	45	46	4	3
12LM013	Trout Brook	9/10/2024	iowa darter	45	56	3	2

Fish community sampled at MPCA station 23LM006

Field Num	Waterbody Name	Visit Date	Common Name	Length Min	Length Max	Weight	Number
23LM006	Trout Brook	8/9/2023	brook stickleback	34	46	3	5
23LM006	Trout Brook	8/9/2023	brook trout	120	130	40	2

Coldwater/cool water fish community attributes at MPCA monitoring stations

FieldNum	VisitDate	#Taxa	Cold	Cold%	ColdTx%	ColdCool	ColdCool%	ColdCoolTx%	Salmonid	Salmonid%	SalmonidTx%
12LM012	7/9/2012	6	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
12LM012	8/9/2023	8	2	14.9	25.0	3	38.3	37.5	2	14.9	25.0
12LM013	7/11/2012	7	1	6.5	14.3	2	8.7	28.6	1	6.5	14.3
12LM013	9/9/2024	9	1	23.1	11.1	2	25.4	22.2	1	23.1	11.1
23LM006	8/9/2023	2	1	28.6	50.0	2	100.0	100.0	1	28.6	50.0

Invertebrate Community Information:

The MPCA conducted macroinvertebrate community surveys at two stations on Trout Brook within the reaches currently designated as warmwater. Station 12LM012 was sampled in 2012 and 2023 with two coldwater indicator taxa collected in 2012 and four collected in 2023. Three coldwater indicator taxa were sampled in 2012 at station 12LM013 and 4 taxa were sampled in 2024. The percent of coldwater individuals increased in samples collected between 2012 and 2023/2024 at both stations. Coldwater biotic index (CBI) scores, which look at the coldwater tolerance of the entire community, showed a substantial change towards a colder community between 2012 and 2023 at 12LM012 and the change was minor at station 12LM013. In summary, coldwater taxa are present at both stations, with some taxa more strongly associated with coldwater conditions present at both stations in 2023/2024 samples.

Macroinvertebrate community sampled at MPCA station 12LM012, in 2012.

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM012	Trout Brook	8/1/2012	Acari	1
12LM012	Trout Brook	8/1/2012	Baetis	7
12LM012	Trout Brook	8/1/2012	Baetis brunneicolor	27
12LM012	Trout Brook	8/1/2012	Labiobaetis propinquus	1
12LM012	Trout Brook	8/1/2012	Lethocerus	1
12LM012	Trout Brook	8/1/2012	Ceratopogoninae	1
12LM012	Trout Brook	8/1/2012	Cryptochironomus	2
12LM012	Trout Brook	8/1/2012	Dicrotendipes	8
12LM012	Trout Brook	8/1/2012	Phaenopsectra	6
12LM012	Trout Brook	8/1/2012	Polypedilum	15
12LM012	Trout Brook	8/1/2012	Saetheria	9
12LM012	Trout Brook	8/1/2012	Brillia	2
12LM012	Trout Brook	8/1/2012	Corynoneura	1
12LM012	Trout Brook	8/1/2012	Cricotopus	19
12LM012	Trout Brook	8/1/2012	Eukiefferiella	2
12LM012	Trout Brook	8/1/2012	Nanocladius	1
12LM012	Trout Brook	8/1/2012	Thienemanniella	7
12LM012	Trout Brook	8/1/2012	Tvetenia	2
12LM012	Trout Brook	8/1/2012	Thienemannimyia Gr.	35
12LM012	Trout Brook	8/1/2012	Conchapelopia	1
12LM012	Trout Brook	8/1/2012	Paramerina	5

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM012	Trout Brook	8/1/2012	Procladius	1
12LM012	Trout Brook	8/1/2012	Tanytarsini	1
12LM012	Trout Brook	8/1/2012	Cladotanytarsus	1
12LM012	Trout Brook	8/1/2012	Paratanytarsus	3
12LM012	Trout Brook	8/1/2012	Rheotanytarsus	21
12LM012	Trout Brook	8/1/2012	Stempellinella	1
12LM012	Trout Brook	8/1/2012	Tanytarsus	26
12LM012	Trout Brook	8/1/2012	Empididae	2
12LM012	Trout Brook	8/1/2012	Hemerodromia	13
12LM012	Trout Brook	8/1/2012	Ephydriidae	2
12LM012	Trout Brook	8/1/2012	Pericoma / Telmatoscopus	1
12LM012	Trout Brook	8/1/2012	Simulium	31
12LM012	Trout Brook	8/1/2012	Muscidae	2
12LM012	Trout Brook	8/1/2012	Gammarus	41
12LM012	Trout Brook	8/1/2012	Gerridae	2
12LM012	Trout Brook	8/1/2012	Hydrophilidae	5
12LM012	Trout Brook	8/1/2012	Cheumatopsyche	1
12LM012	Trout Brook	8/1/2012	Hydroptila	2
12LM012	Trout Brook	8/1/2012	Fossaria rustica	1
12LM012	Trout Brook	8/1/2012	Physa	3

Macroinvertebrate community sampled at MPCA station 12LM012, in 2023.

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM012	Trout Brook	8/10/2023	Acari	26
12LM012	Trout Brook	8/10/2023	Oligochaeta	11
12LM012	Trout Brook	8/10/2023	Baetis tricaudatus	24
12LM012	Trout Brook	8/10/2023	Baetis brunneicolor	47
12LM012	Trout Brook	8/10/2023	Cambaridae	1
12LM012	Trout Brook	8/10/2023	Dicrotendipes	1
12LM012	Trout Brook	8/10/2023	Polypedilum	16
12LM012	Trout Brook	8/10/2023	Saetheria	1
12LM012	Trout Brook	8/10/2023	Pagastia	1
12LM012	Trout Brook	8/10/2023	Cricotopus/Orthocladius	2
12LM012	Trout Brook	8/10/2023	Parametriocnemus	5
12LM012	Trout Brook	8/10/2023	Tvetenia	6
12LM012	Trout Brook	8/10/2023	Thienemannimyia Gr.	1
12LM012	Trout Brook	8/10/2023	Rheotanytarsus	19
12LM012	Trout Brook	8/10/2023	Tanytarsus	3
12LM012	Trout Brook	8/10/2023	Roederiodes	1
12LM012	Trout Brook	8/10/2023	Neoplasta	2
12LM012	Trout Brook	8/10/2023	Ephydriidae	1
12LM012	Trout Brook	8/10/2023	Simulium	57
12LM012	Trout Brook	8/10/2023	Tipula	1
12LM012	Trout Brook	8/10/2023	Antocha	12
12LM012	Trout Brook	8/10/2023	Hexatoma	2
12LM012	Trout Brook	8/10/2023	Gammarus	32
12LM012	Trout Brook	8/10/2023	Enochrus	1
12LM012	Trout Brook	8/10/2023	Hydropsychidae	18
12LM012	Trout Brook	8/10/2023	Hydropsyche	1
12LM012	Trout Brook	8/10/2023	Ceratopsyche slossonae	16

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM012	Trout Brook	8/10/2023	Hydroptila	1
12LM012	Trout Brook	8/10/2023	Limnephilidae	2
12LM012	Trout Brook	8/10/2023	Brachycentrus occidentalis	8
12LM012	Trout Brook	8/10/2023	Physella	5

Macroinvertebrate community sampled at MPCA station 12LM013, in 2012.

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM013	Trout Brook	8/1/2012	Oligochaeta	3
12LM013	Trout Brook	8/1/2012	Baetis	36
12LM013	Trout Brook	8/1/2012	Baetis tricaudatus	8
12LM013	Trout Brook	8/1/2012	Baetis brunneicolor	89
12LM013	Trout Brook	8/1/2012	Baetis flavistriga	8
12LM013	Trout Brook	8/1/2012	Chironomini	2
12LM013	Trout Brook	8/1/2012	Cryptochironomus	1
12LM013	Trout Brook	8/1/2012	Polypedilum	5
12LM013	Trout Brook	8/1/2012	Saetheria	3
12LM013	Trout Brook	8/1/2012	Corynoneura	2
12LM013	Trout Brook	8/1/2012	Cricotopus	4
12LM013	Trout Brook	8/1/2012	Eukiefferiella	1
12LM013	Trout Brook	8/1/2012	Tvetenia	2
12LM013	Trout Brook	8/1/2012	Thienemannimyia Gr.	3
12LM013	Trout Brook	8/1/2012	Helopelopia	1
12LM013	Trout Brook	8/1/2012	Paramerina	1
12LM013	Trout Brook	8/1/2012	Rheotanytarsus	3
12LM013	Trout Brook	8/1/2012	Muscidae	2
12LM013	Trout Brook	8/1/2012	Pericoma / Telmatoscopus	1
12LM013	Trout Brook	8/1/2012	Simulium	120
12LM013	Trout Brook	8/1/2012	Hemerodromia	1
12LM013	Trout Brook	8/1/2012	Dytiscidae	1
12LM013	Trout Brook	8/1/2012	Gammarus	18
12LM013	Trout Brook	8/1/2012	Hydropsyche betteni	2
12LM013	Trout Brook	8/1/2012	Ceratopsyche	2
12LM013	Trout Brook	8/1/2012	Hydroptila	2
12LM013	Trout Brook	8/1/2012	Mesovelia	1

Macroinvertebrate community sampled at MPCA station 12LM013, in 2024.

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM013	Trout Brook	8/29/2024	Nemata	3
12LM013	Trout Brook	8/29/2024	Acari	3
12LM013	Trout Brook	8/29/2024	Oligochaeta	41
12LM013	Trout Brook	8/29/2024	Trepaxonemata	2
12LM013	Trout Brook	8/29/2024	Baetis tricaudatus	4
12LM013	Trout Brook	8/29/2024	Baetis brunneicolor	9
12LM013	Trout Brook	8/29/2024	Belostoma	1
12LM013	Trout Brook	8/29/2024	Chironomini	1
12LM013	Trout Brook	8/29/2024	Paratendipes	1
12LM013	Trout Brook	8/29/2024	Phaenopsectra	2
12LM013	Trout Brook	8/29/2024	Polypedilum	16
12LM013	Trout Brook	8/29/2024	Cricotopus/Orthocladius	7
12LM013	Trout Brook	8/29/2024	Orthocladiinae	1

Field Num	Waterbody Name	Visit Date	Taxon	Count
12LM013	Trout Brook	8/29/2024	Brillia	1
12LM013	Trout Brook	8/29/2024	Corynoneura	1
12LM013	Trout Brook	8/29/2024	Cricotopus	38
12LM013	Trout Brook	8/29/2024	Eukiefferiella	6
12LM013	Trout Brook	8/29/2024	Parakiefferiella	3
12LM013	Trout Brook	8/29/2024	Thienemanniella	22
12LM013	Trout Brook	8/29/2024	Tvetenia	2
12LM013	Trout Brook	8/29/2024	Zavreliomyia	1
12LM013	Trout Brook	8/29/2024	Thienemannimyia Gr.	1
12LM013	Trout Brook	8/29/2024	Tanytarsini	5
12LM013	Trout Brook	8/29/2024	Micropsectra	1
12LM013	Trout Brook	8/29/2024	Paratanytarsus	4
12LM013	Trout Brook	8/29/2024	Tanytarsus	4
12LM013	Trout Brook	8/29/2024	Hemerodromiinae	2
12LM013	Trout Brook	8/29/2024	Ephydriidae	1
12LM013	Trout Brook	8/29/2024	Simulium	59
12LM013	Trout Brook	8/29/2024	Helichus	1
12LM013	Trout Brook	8/29/2024	Gammarus	42
12LM013	Trout Brook	8/29/2024	Hydropsychidae	1
12LM013	Trout Brook	8/29/2024	Hydropsyche bronta	1
12LM013	Trout Brook	8/29/2024	Hesperophylax designatus	1
12LM013	Trout Brook	8/29/2024	Pseudosuccinea columella	1
12LM013	Trout Brook	8/29/2024	Physella	16

Table 10. Coldwater invertebrate community attributes at MPCA monitoring stations

Field Num	Visit Date	# Coldwater Taxa	% Coldwater Ind	% Coldwater Taxa	CBI Score
12LM012	8/1/2012	2	13.8	5.3	19.4
12LM012	8/10/2023	4	20.1	13.8	18.7
12LM013	8/1/2012	3	8.4	13.0	18.6
12LM013	8/29/2024	4	17.3	13.3	18.9

MPCA temperature data

One-time water temperature measurements were taken at all fish sampling visits from three separate stations and plausibly indicate a coldwater habitat may be present. With the exception of the 7/9/12 fish visit to station 12LM012 (22.8°C) all one-time temperatures were indicative of coldwater use (range 12.4-17.1°C). The subsequent macroinvertebrate visit to station 12LM012 on 8/1/2012 three weeks later was cold at 15.6°C indicating that the high temperature recorded during the fish visit was possibly anomalous.

One time water temperatures taken at the time of MPCA fish sampling

Field Num	Waterbody Name	Visit Date	Temperature (°C)
12LM012	Trout Brook	7/9/2012	22.8
12LM012	Trout Brook	8/1/2012	15.6
12LM012	Trout Brook	8/9/2023	15.8
12LM012	Trout Brook	8/10/2023	17.1
12LM013	Trout Brook	7/11/2012	16.4
12LM013	Trout Brook	8/1/2012	14.1
23LM006	Trout Brook	8/9/2023	12.4
23LM006	Trout Brook	8/15/2023	15.6

In the summer of 2024 HOBO temperature loggers were deployed at stations 12LM012 and 12LM013 to further evaluate the coldwater potential of Trout Brook. Unfortunately, the logger was lost at station 12LM012 (07040004-585) due to heavy summer rainfall. Summer average temperatures for the months of June-August were indicative of a coldwater thermal regime (summer average = 14.8°C) with 99.3% of the summer period within the thermal growth range for brook trout and <1% in the stress range.

Summary of temperature logger data at station 12LM013 collected summer 2024

Thermal metric	Proportion
Lethal	0.0%
Stress	0.7%
Growth	99.3%
No Growth (too cold)	0.0%
	Average (°C)
June Avg Temp	14.5
July Avg Temp	15.1
Aug Avg Temp	14.8
Summer Avg Temp	14.8

DNR monitoring data

There is an extensive history of stream survey information available from the DNR on Trout Brook dating back to 1954. Excerpts from various surveys are inserted below to provide additional context and historical perspective. Historically Trout Brook was a designated trout stream prior to 1954 and was likely a native brook trout stream. Stocking records indicate the stream was stocked with Brook Trout and Brown Trout from 1946-1952. The designation was removed in 1957 after the 1954 survey reported: “this creek is in very poor condition.....it is doubtful if this stream could ever be brought to a condition where it could support any game fish.” Decades later and without any planned restoration or management, stream surveys indicated the thermal regime and other stream characteristics had recovered to the point where 1800 brook trout fingerlings were stocked in August of 2000 in an effort to re-establish a trout fishery.

A DNR survey in 2003 focused on the reach currently designated Class 2Ag (07040004-571) and determined that that the stocked fish had adequate survival, and that natural reproduction was occurring. The 2012 DNR survey sampled reaches in both the upstream (07040004-571) and downstream (07040004-584) WIDs. A single Brook Trout was collected in the upstream WID and not coldwater taxa were collected in the downstream WID. However, low flows this summer likely pushed trout into deeper pools and the DNR was unable to access the stream reach where numerous deep pools were present. Trout were observed in some pools in areas where they were unable to sample indicating that trout were present in 07040004-584. In 2017, the DNR sampled a portion of stream just downstream of State Highway 60 (within 07040004-585). Four Brown Trout were sampled in this survey and Longnose Dace were also sampled. The DNR data also indicates a possible coldwater habitat in 07040004-584 and 07040004-585, but the extent of the habitat may vary year to year due to water levels. During dry years, trout likely move to deep pools in these WIDs and may be difficult to sample due to access issues. However, these data indicate that a coldwater habitat is supported in these reaches.

MPCA Summary

Monitoring by MPCA and DNR indicates that this reach of Trout Brook supports coldwater habitat and should be designated as coldwater use (Class 2Ag). Different age classes of Brook Trout and macroinvertebrate coldwater indicator taxa have been recently collected at all monitoring stations and available stream temperature data indicates a coldwater use designation is merited.

07040004-584

Monitoring by the MPCA and DNR indicated that this reach of Trout Brook supports coldwater habitat and should be designated as coldwater use (Class 2Ag). The MPCA sampled two stations for fish on this reach of Trout Brook in 2012, 2023, or 2024. Brook Trout were collected in all three visits and one cool water species (Brook Stickleback) was also present. Coldwater and cool water fish species comprised 9-100% of the species. Overall, the fish community was indicative of a coldwater habitat. The macroinvertebrate community from one station in 2012 and 2023 was also indicative of a coldwater habitat with two to four coldwater obligate species collected in moderate numbers (14-20% of sample). The coldwater obligate taxa present in these samples included: *Baetis tricaudatus*, *Eukiefferiella*, *Gammarus*, and *Hesperophylax designatus*. Water temperature logger data were collected in 2024 from one station and indicated that temperatures are cool enough to support coldwater obligate species. Temperatures were in the growth range for Brook Trout 99% of the summer and no lethal temperatures were observed. A small proportion of the summer was in the stressful range for Brook Trout (<%). The average summer temperatures during this year was 14.8°C. One-time measurements of temperature collected during biological samples were also cool (12.4-16.4°C) and further demonstrated that reach has a thermal regime suitable to support coldwater habitat. DNR survey was limited to issues with accessing this stream, but surveys indicate the presence of trout in this reach, especially in deep pools present in some areas.

07040004-585

Monitoring by the MPCA and DNR indicated that this reach of Trout Brook supports coldwater habitat and should be designated as coldwater use (Class 2Ag). The MPCA sampled one station for fish on this reach of Trout Brook in 2012 and 2023. No coldwater or cool water species were present in the 2012 sample possibly due to impacts to habitat from flooding and low water levels this year. Brook Trout and Brown Trout were collected in 2023, and one cool water species (Longnose Dace) was also present. Coldwater and cool water fish species comprised 38% of the species in this sample. Overall, the fish community was indicative of a coldwater habitat in 2023. The macroinvertebrate community from one station in 2012 and 2024 was also indicative of a coldwater habitat with three to four coldwater obligate species collected in moderate numbers (13% of sample). The coldwater obligate taxa present in these samples included: *Baetis tricaudatus*, *Brachycentrus occidentalis*, *Eukiefferiella*, *Gammarus*, and *Pagastia*. No water temperature logger data were collected from this station due to the loss of the logger during flows. Three of four one-time measurements of temperature collected during biological samples were cool (15.6-17.1°C). One sample during the 2012 fish sample was high (22.8°C), but temperatures were cool (15.6°C) three weeks later during the macroinvertebrate visit. Although not a detailed assessment of thermal regime, the available data do indicate that the thermal regime is suitable to support coldwater habitat. The DNR survey was limited to issues with accessing this stream, but surveys indicate the presence of trout in this reach, especially in deep pools present in some areas.

Dry Run Creek (Pine Island Creek) (07040004-A04) MPCA Use Designation Review

Stream name: Dry Run Creek (Pine Island Creek)

AUID(s): 07040004-A04

AUID description: CR 21 to Zumbro Lk

MPCA biological station(s): 23LM001

County: Wabasha, Olmsted

Watershed: Zumbro

DNR designation: Not a designated trout water

DNR management class: I-C Semi-wild trout

Current AUID designation: 2Bg (warm water)

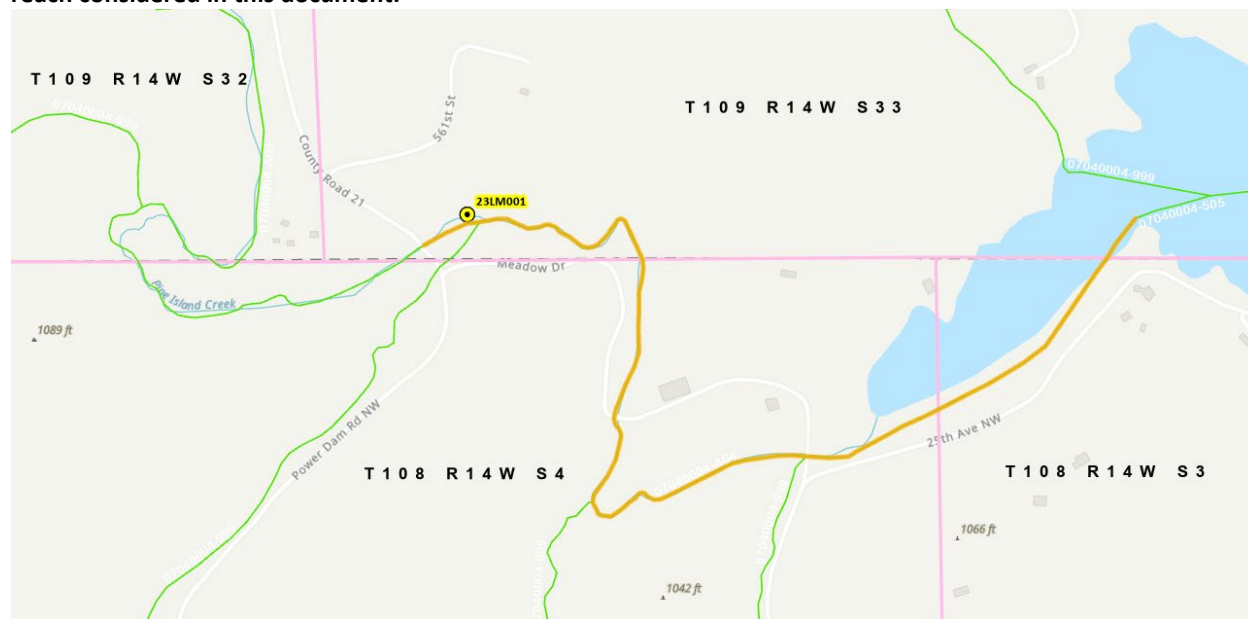
Reason for review: Fish, macroinvertebrates, and temperature data

Was this site previously reviewed? If so what were the results? This site was not previously reviewed for coldwater habitat by the MPCA.

Background

Dry Run Creek is a small stream that runs into Lake Zumbro on the border of Olmsted and Wabasha Counties. Past monitoring efforts by DNR and MPCA have indicated this stream is thermally suitable for trout species in its lower reaches. Available DNR stream surveys date back to 1980 when trout stocking was initiated based on a 1924 stream survey that indicated that it was suitable for trout stream management. Several introductions of Brook Trout and Brown Trout were conducted in the early 1980s, but the stockings apparently did not result in establishing a viable population. Beginning in 2016, Brook Trout of various lengths and ages were transferred from East Indian Creek to Dry Run Creek. Three batches of approximately 150 trout were stocked just downstream from the Olmsted County 21 Bridge. The DNR's goal in their 2023 management plan is to "maintain a population of Heritage brook trout with multiple age classes present."

Map of tributary to the Dry Run Creek (Pine Island Creek) (07040004-A04). Orange highlight indicates extent of reach considered in this document.



Review of existing data

MPCA monitoring data

MPCA biological data

Fish Community Information:

MPCA has conducted fish community sampling at one station on Dry Run Station 23LM001 is just downstream of CR 21 and was monitored in 2023. The station (23LM001) exhibited a coldwater fish community with few species present and dominated by brook trout. Station 23LM001 has an FIBI score (Southern Coldwater) of 84.4 and clearly supports of the coldwater use class. Trout have also been captured during DNR stream surveys at a station downstream of CR 21 (river mile 0.4).

Fish community sampled at MPCA station 23LM001							
Field Num	WB Name	Visit Date	Common Name	Length Min	Length Max	Weight	Number
23LM001	Dry Run Creek	8/9/2023	brook trout	67	315	6416	83
23LM001	Dry Run Creek	8/9/2023	white sucker	32	166	51	18
23LM001	Dry Run Creek	8/9/2023	western blacknose dace	30	30	1	1

Trends in trout for Dry Run Creek, 1980 to 2019 from DNR surveys

Station	Similar Reach	Date	Total No. Brook Trout	Total No. Brown Trout
0.4	1	07/09/1980	0	0
0.4	1	03/16/1981	24	125
0.4	1	09/03/1981	0	14
0.4	1	04/12/1982	38	8
0.4	1	09/20/1982	4	1
0.4	1	09/02/1983	4	1
0.4	1	07/27/1984	0	1
0.4	1	04/16/1996	0	0
0.4	1	09/27/2019	11	0

Invertebrate Community Information:

The MPCA conducted macroinvertebrate community sampling at one station on Dry Run Creek. Station 23LM001 is just downstream of CR 21 and was monitored in 2023, with a follow-up sample collected in 2024 to determine if the drought in 2023 had an outsized impact on the stream. The macroinvertebrate community data supports a change in thermal regime in this reach. The monitored station (23LM001) exhibits a coldwater macroinvertebrate community. There were five coldwater indicator taxa present in the two samples and these taxa comprised 14-18% of the sample.

Invertebrate community sampled at station 23LM001, 2023			
Field Num	Waterbody Name	Invertebrate Taxon	Count
23LM001	Dry Run Creek	<i>Cricotopus/Orthocladius</i>	10
23LM001	Dry Run Creek	Oligochaeta	47
23LM001	Dry Run Creek	Lymnaeidae	1
23LM001	Dry Run Creek	<i>Physella</i>	13
23LM001	Dry Run Creek	<i>Gammarus</i>	24
23LM001	Dry Run Creek	<i>Baetis tricaudatus</i>	4
23LM001	Dry Run Creek	<i>Baetis brunneicolor</i>	4

Invertebrate community sampled at station 23LM001, 2023			
Field Num	Waterbody Name	Invertebrate Taxon	Count
23LM001	Dry Run Creek	<i>Belostoma</i>	1
23LM001	Dry Run Creek	Limnephilidae	1
23LM001	Dry Run Creek	<i>Tipula</i>	1
23LM001	Dry Run Creek	<i>Simulium</i>	2
23LM001	Dry Run Creek	<i>Cricotopus</i>	32
23LM001	Dry Run Creek	<i>Eukiefferiella</i>	28
23LM001	Dry Run Creek	<i>Heterotrissocladius</i>	1
23LM001	Dry Run Creek	<i>Limnophyes</i>	1
23LM001	Dry Run Creek	<i>Orthocladius</i>	5
23LM001	Dry Run Creek	<i>Parakiefferiella</i>	2
23LM001	Dry Run Creek	<i>Parametrioctenus</i>	6
23LM001	Dry Run Creek	<i>Thienemanniella</i>	20
23LM001	Dry Run Creek	<i>Tvetenia</i>	43
23LM001	Dry Run Creek	Chironomini	1
23LM001	Dry Run Creek	<i>Dicrotendipes</i>	20
23LM001	Dry Run Creek	<i>Polypedilum</i>	2
23LM001	Dry Run Creek	Tanytarsini	14
23LM001	Dry Run Creek	<i>Micropsectra</i>	17
23LM001	Dry Run Creek	<i>Paratanytarsus</i>	4
23LM001	Dry Run Creek	<i>Hemerodromia</i>	1
23LM001	Dry Run Creek	Ephydriidae	1
23LM001	Dry Run Creek	Muscidae	2
23LM001	Dry Run Creek	Acari	2

Invertebrate community sampled at station 23LM001, 2024			
Field Num	Waterbody Name	Taxon	Count
23LM001	Dry Run Creek	Oligochaeta	15
23LM001	Dry Run Creek	<i>Cricotopus/Orthocladius</i>	2
23LM001	Dry Run Creek	<i>Thienemannimyia</i> Gr.	2
23LM001	Dry Run Creek	Hirudinea	1
23LM001	Dry Run Creek	<i>Physella</i>	8
23LM001	Dry Run Creek	<i>Gammarus</i>	14
23LM001	Dry Run Creek	<i>Baetis tricaudatus</i>	1
23LM001	Dry Run Creek	<i>Baetis brunneicolor</i>	3
23LM001	Dry Run Creek	Dytiscidae	2
23LM001	Dry Run Creek	<i>Hydropsyche slossonae</i>	1
23LM001	Dry Run Creek	<i>Hesperophylax designatus</i>	1
23LM001	Dry Run Creek	<i>Simulium</i>	146
23LM001	Dry Run Creek	<i>Cricotopus</i>	33
23LM001	Dry Run Creek	<i>Eukiefferiella</i>	28
23LM001	Dry Run Creek	<i>Limnophyes</i>	2
23LM001	Dry Run Creek	<i>Orthocladius</i>	2
23LM001	Dry Run Creek	<i>Rheocricotopus</i>	2
23LM001	Dry Run Creek	<i>Tvetenia</i>	15
23LM001	Dry Run Creek	<i>Dicrotendipes</i>	1
23LM001	Dry Run Creek	<i>Phaenopsectra</i>	5
23LM001	Dry Run Creek	<i>Polypedilum</i>	27
23LM001	Dry Run Creek	<i>Micropsectra</i>	4
23LM001	Dry Run Creek	<i>Paratanytarsus</i>	1

Invertebrate community sampled at station 23LM001, 2024			
Field Num	Waterbody Name	Taxon	Count
23LM001	Dry Run Creek	<i>Tanytarsus</i>	6
23LM001	Dry Run Creek	<i>Hemerodromia</i>	1
23LM001	Dry Run Creek	Ephydriidae	1

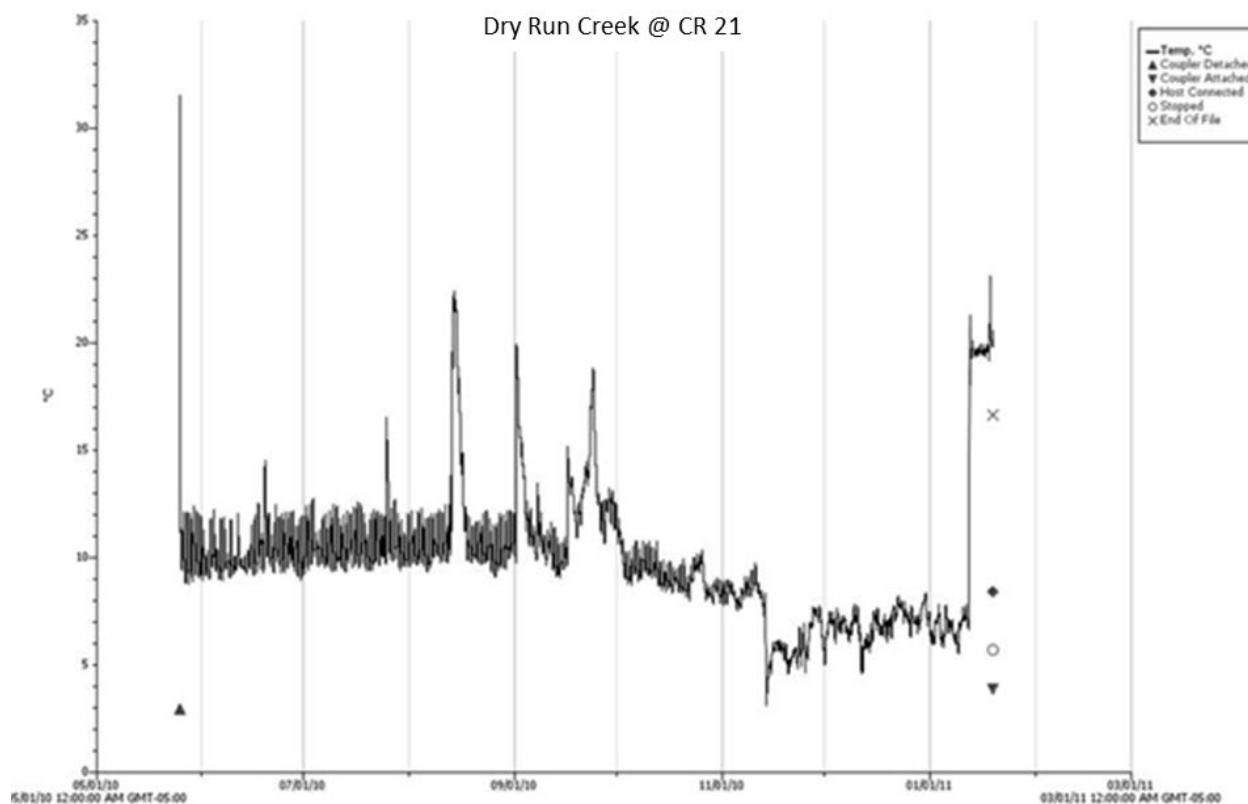
Temperature data

Available water temperature data indicates that Dry Run Creek downstream of CR 21 supports a coldwater thermal regime. One time water temperatures taken at the time of MPCA monitoring in 2023 at MPCA station 23LM001 immediately downstream of CR 21 were 11.4 °C on 7/31/2023 and 9.4 °C on 8/9/2023. Temperatures were considerably warmer at MPCA station 04LM066 approximately 0.4 mi. upstream of CR 21 on 6/21/2004 (19.7 °C). Additionally, a temperature logger deployed at CR 21 in 2010 demonstrated that water temperatures are continuously cold enough (< 15 °C) throughout the summer/fall months to support a viable coldwater use designation. There is evidence that a spring is present below the CR 21 bridge which suggests that this is the start of the coldwater reach.

One time water temperatures taken at the time of MPCA biological monitoring sampling

Field Num	Waterbody Name	Visit Date	Temperature (°C)
04LM066	Dry Run Creek	6/21/2004	19.7
23LM001	Dry Run Creek	8/9/2023	9.4
23LM001	Dry Run Creek	7/31/2023	11.4

2010 continuous temperature logger data @ CR21, immediately upstream of MPCA station 23LM001



MPCA Summary

Monitoring by MPCA and DNR indicates that Dry Run Creek below CR 21 supports coldwater habitat. Brook Trout of various age classes were collected downstream of CR 21 and dominated the fish community. The MPCA fish survey sample was dominated by Brook Trout. Although Dry Run Creek is not currently designated a trout stream by the DNR, reach is currently being managed by DNR as a Brook Trout stream. The composition of the macroinvertebrate community also indicates the stream supports a coldwater habitat. Five coldwater indicator taxa (*Gammarus*, *Baetis tricaudatus*, *Hesperophylax designatus*, *Eukiefferiella*, *Heterotrissocladius*) were present in two samples which comprised 14-18% of the total number of individuals. Temperature data also indicated Dry Run Creek has cool temperatures consistent with a coldwater habitat. A temperature logger was deployed in 2010 which indicated that water temperatures remain below 15 °C most of the summer.

Valley River (09030005-681) MPCA Use Designation Review

Stream name: Valley River

AUID(s): 09030005-681

AUID description: west line of PLSS section T62 R23W S11 to Little Fork River

MPCA field number(s): 08RN020 and 08RN037

Watershed: Little Fork River (09030005)

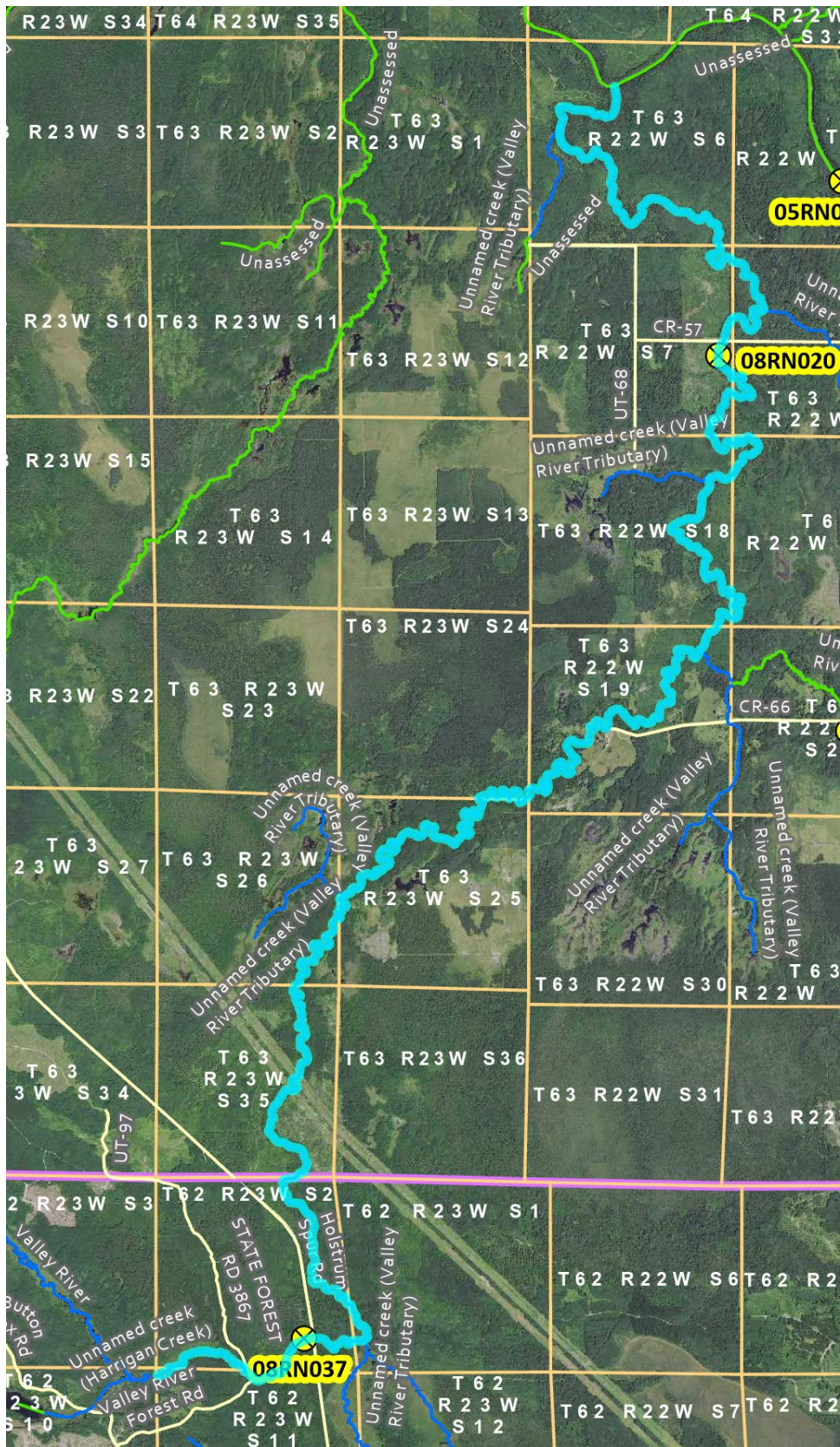
County: Koochiching and Itasca

DNR designation: Trout water

DNR management class: I-D (Marginal trout water)

Current MPCA aquatic life use designation: 2Ag (cold water)

Reason for review: Fish, macroinvertebrate, and temperature data



Map of Valley River (09030005-681) showing location of MPCA biomonitoring stations

Review of existing data

MPCA monitoring data

Biological samples were collected from this reach of Valley River (09030005-681) at two locations (see map). The furthest upstream station (08RN037) was located upstream of Holstrum Spur Road and the downstream station (08RN020) was located upstream of CR 57.

MPCA biological data: Fish

The MPCA conducted fish surveys at two locations: 08RN020 and 08RN037. Fish were sampled at these stations in 2008 and 2018. The observed fish assemblage lacked trout and were dominated by warm water taxa. A single cold water fish species was present (mottled sculpin) in low numbers (<0.7% of individuals) in 3 of the 5 samples. One mottled sculpin was captured at station 08RN037 in 2008 and another in 2018. Three mottled sculpin were captured at 08RN020 in 2018. No other cold water fish species were observed at either station. Three cool water fish species (longnose dace, norther pearl dace, and brook stickleback) were sampled. Overall, the fish assemblage is indicative of a warm to cool water habitat and does not support the presence of a cold water habitat.

Fish biomonitoring tables from Valley River (09030005-681)

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN020	6/17/2008	bigmouth shiner	57	65	4	3
08RN020	6/17/2008	blacknose dace	35	90	28.5	11
08RN020	6/17/2008	blackside darter	53	75	19	5
08RN020	6/17/2008	brassy minnow	53	88	4.5	2
08RN020	6/17/2008	brook stickleback	66	66	2.5	1
08RN020	6/17/2008	central mudminnow	57	87	22	6
08RN020	6/17/2008	common shiner	34	113	57	28
08RN020	6/17/2008	creek chub	44	223	552	60
08RN020	6/17/2008	hornyhead chub	36	121	70	13
08RN020	6/17/2008	johnny darter	35	71	21.5	19
08RN020	6/17/2008	lamprey ammocoete	96	96	2.5	1
08RN020	6/17/2008	longnose dace	67	67	3	1
08RN020	6/17/2008	rock bass	64	122	38.5	2
08RN020	6/17/2008	shorthead redhorse	342	393	1486	3
08RN020	6/17/2008	white sucker	85	124	80	5

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN020	8/1/2018	bigmouth shiner	49	78	7	2
08RN020	8/1/2018	blacknose dace	44	87	19	10
08RN020	8/1/2018	blackside darter	35	82	129	54
08RN020	8/1/2018	central mudminnow	69	85	11	2
08RN020	8/1/2018	common shiner	44	125	340	81
08RN020	8/1/2018	creek chub	49	217	720	131
08RN020	8/1/2018	fathead minnow	62	62	2	1
08RN020	8/1/2018	Gen: Ichthyomyzon	90	150	51	11
08RN020	8/1/2018	hornyhead chub	43	153	142	20
08RN020	8/1/2018	johnny darter	38	66	15	14
08RN020	8/1/2018	longnose dace	60	90	24	5
08RN020	8/1/2018	mottled sculpin	61	72	9	3
08RN020	8/1/2018	pearl dace	46	47	2	2

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN020	8/1/2018	rock bass	50	202	727	14
08RN020	8/1/2018	shorthead redhorse	86	148	85	5
08RN020	8/1/2018	trout-perch	66	125	271	32
08RN020	8/1/2018	white sucker	37	133	1848	46

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN037	7/8/2008	blacknose dace	56	99	90	20
08RN037	7/8/2008	blackside darter	90	90	6	1
08RN037	7/8/2008	brook stickleback	25	59	13	11
08RN037	7/8/2008	central mudminnow	47	98	90	25
08RN037	7/8/2008	common shiner	48	96	52	12
08RN037	7/8/2008	creek chub	67	93	12	2
08RN037	7/8/2008	fathead minnow	68	68	3	1
08RN037	7/8/2008	finescale dace	60	79	10	3
08RN037	7/8/2008	johnny darter	39	64	28	11
08RN037	7/8/2008	mottled sculpin	47	47	1	1
08RN037	7/8/2008	northern redbelly dace	37	64	38	45
08RN037	7/8/2008	pearl dace	52	115	157	28
08RN037	7/8/2008	white sucker	77	138	106	8

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN037	8/1/2018	blacknose dace	64	101	59	7
08RN037	8/1/2018	brook stickleback	25	56	39	34
08RN037	8/1/2018	central mudminnow	27	108	191	45
08RN037	8/1/2018	common shiner	74	109	70	9
08RN037	8/1/2018	creek chub	34	191	102	10
08RN037	8/1/2018	finescale dace	68	89	53	12
08RN037	8/1/2018	johnny darter	44	55	11	6
08RN037	8/1/2018	mottled sculpin	54	54	3	1
08RN037	8/1/2018	northern redbelly dace	48	63	45	26
08RN037	8/1/2018	pearl dace	39	111	25	11
08RN037	8/1/2018	white sucker	107	128	30	2

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN037	8/30/2018	blackside darter	87	87	5	1
08RN037	8/30/2018	brook stickleback	38	57	28	25
08RN037	8/30/2018	central mudminnow	57	108	150	30
08RN037	8/30/2018	common shiner	98	98	7	1
08RN037	8/30/2018	finescale dace	49	82	35	9
08RN037	8/30/2018	johnny darter	45	69	54	29
08RN037	8/30/2018	northern redbelly dace	28	65	35	18
08RN037	8/30/2018	pearl dace	48	56	20	16
08RN037	8/30/2018	white sucker	52	69	9	4

MPCA biological data: Macroinvertebrates

Macroinvertebrates were sampled from both MPCA biomonitoring stations in 2008 and 2018. In 2008, five individuals (1.6% of individuals in the sample) from the caddisfly family Psychomyiidae (genus: *Lype*) were collected from the downstream station (08RN020). The larvae of this caddisfly are often found in

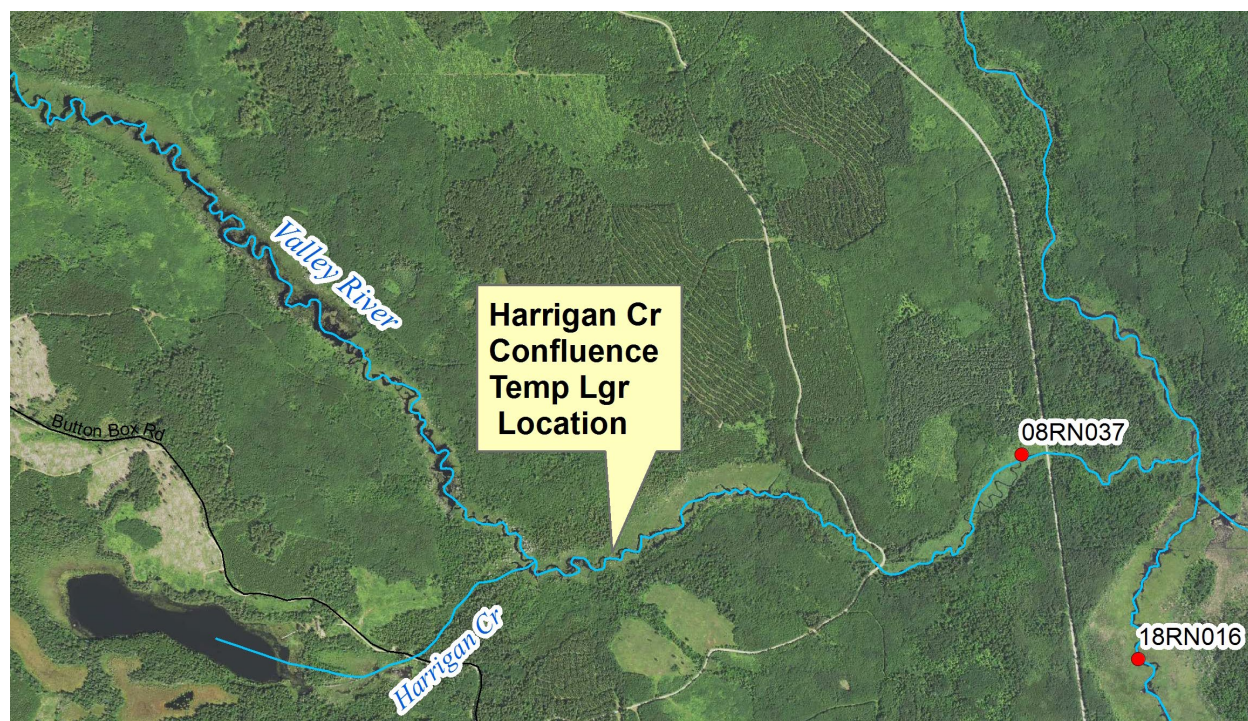
small cool/coldwater streams. No coldwater obligate macroinvertebrates were collected in 2018 from 08RN020 or in either visit from 08RN037. Overall, the macroinvertebrate community was indicative of a warm or cool water habitat.

Summary of coldwater macroinvertebrates collected from Valley River (09030005-681)

Field Num	Visit Date	# Cold water invertebrates	% Cold water invertebrates
08RN020	28-Aug-08	5	1.6%
08RN020	22-Aug-18	0	0.0%
08RN037	05-Aug-08	0	0.0%
08RN037	21-Aug-18	0	0.0%

MPCA Temperature data

Continuously-recording stream temperature loggers were deployed at both MPCA biomonitoring stations during the summers of 2008, 2017, and 2019. In addition, 08RN037 and a site near the confluence with Harrigan Creek were monitored in the summer of 2019. Summary data for the logger deployments can be found below. Some of the recording data from station 08RN037 was incomplete, especially during June and August of 2008. As a result, these data are not considered in detail here. In general, temperatures at both biomonitoring sites were marginal for trout with temperatures in the growth range for brook trout <80% of the summer. Lethal temperatures were briefly observed during most of these deployments. Temperatures were cooler at the site below Harrigan Creek which reflect the influence of this stream on Valley River, but these temperatures were still marginal for trout.



Location of the additional temperature logger station. The other temperature loggers were deployed at the two biomonitoring stations.

Water temperature logger summary data for Valley River.

Logger Location	Year	Trout Thermal Area	Complete %	Lethal %	Stress %	Growth %	No Growth %	Summer Average	June Avg	July Avg	Aug Avg
08RN020	2018	Area 1	100	0.1	59.8	40.1	0	20.2	19.7	21.4	19.6
08RN020	2017	Area 2	100	1	34.6	64.3	0	19.2	18.8	20.7	18.2
08RN020	2008	Area 2	100	0	29	71	0	18.5	16.8	19.8	18.7
08RN037	2018	Area 1	100	2.2	57.2	40.6	0	20.5	20	22	19.3
08RN037	2019	Area 1	100	1	43.7	55.3	0	19.5	18.4	21.4	18.7
08RN037	2017	Area 2	77	0.1	26.9	73	0	18.5	18.6	19.8	16.3
08RN037	2008	Area 2	50	0	26.9	73.1	0	18.2	15.4	19.5	19.4
Harrigan Con TL	2019	Area 2	100	0.2	33.5	66.2	0	18.9	18.2	20.7	17.8

DNR information

The DNR current includes this stream on its trout waters list and has performed several surveys on this reach and adjacent reaches to determine the suitability of this stream to support a trout fishery. Brook trout were stocked extensively from 1942-1989. The carry-over of stocked fish was only observed once in a 1990 survey (4 fish). No trout were captured in 1973, 1979, 1980, and 1998 surveys. Brown Trout were stocked between 1993 and 1997 and none were sampled in the 1998 survey. In surveys, the DNR noted that beaver activity in the stream are potential limitations to a coldwater fishery. These surveys also noted that the best habitat for cold water fisheries was found in Harrigan Creek and Valley River near the Harrigan Creek confluence. The DNR initially stocked brook trout into Valley Creek, but in 1990 a DNR survey determined that carry over and growth of stocked brook trout was poor due to limited habitat and warm summer temperatures. At this time, the DNR recommended shifting from the stocking of brook trout to more tolerant Brown Trout. A 1998 DNR survey failed to capture any of the brown trout stocked in the 1990s and the report for this survey noted that the only suitably cool habitat for trout was located in Harrigan Creek and just downstream of the confluence with Harrigan Creek. No natural reproduction has been documented in this reach and the DNR halted stocking of all trout species in 1997. These surveys indicate that potential coldwater habitat in Valley River are located outside of the reach reviewed here (09030005-681).

MPCA Summary

MPCA biological monitoring and temperature logger data demonstrated that this reach of Valley River (09030005-681) does not support a coldwater habitat. MPCA biological monitoring collected one cold water fish species (mottled sculpin), but this species only occurred in 3 of 5 samples and when present accounted for <0.7% of the fish collected. No natural reproduction of any trout species has been documented in this stream. Several cool water fish species were present in MPCA fish surveys (Finescale Dace, Northern Pearl Dace, Brook Stickleback), but were not sufficient to indicate the presence of a coldwater habitat. A single macroinvertebrate sample included 1 cold water taxa (*Lype* [Trichoptera: Psychomyiidae]) which comprised 1.6% of the sample (5 individuals). Continuous temperature logger data had an average July water temperature that ranged from 19.8-22.0°C and temperatures were in the growth range only 40-71% of the summer. The DNR currently manages this stream reach as a marginal trout water which means that the DNR has determined that it lacks suitable habitat and water quality for reproduction and year-round survival of trout. As a result of poor survival and growth of stocked trout, the DNR halted stocking of all trout species in 1997. The DNR has noted in surveys that a reach of Valley River which could potentially support trout are immediately below the confluence with Harrigan Creek. This potential cold water habitat reach is upstream of the reach 09030005-681 and is recommended to retain the Class 2Ag designation at this time.

Sand Creek (09030005-683) MPCA Use Designation Review

Stream name: Sand Creek

AUID(s): 09030005-683

AUID description: south line of PLSS section T61 R2W S3 to the Sturgeon River

MPCA field number(s): 08RN030

Watershed: Little Fork River (09030005)

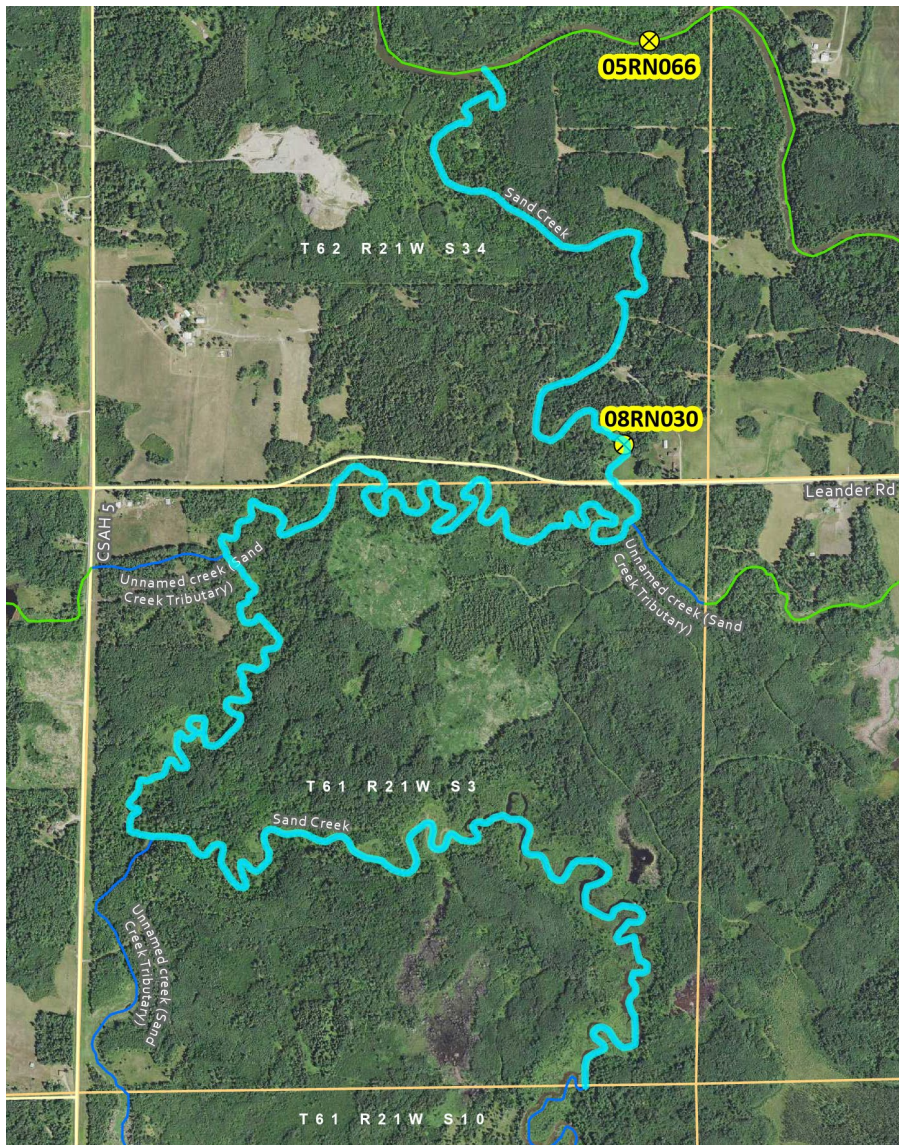
County: Saint Louis

DNR designation: Trout water

DNR management class: I-D (Marginal trout water)

Current MPCA aquatic life use designation: 2Ag (cold water)

Reason for review: Fish, macroinvertebrate, and temperature data



Map of Sand Creek (09030005-683) showing location of the MPCA biomonitoring station

Review of existing data

MPCA monitoring data

Biological samples were collected from this reach of Sand Creek (09030005-683) at one location (see map). This station (08RN030) was located downstream of Leander Road.

MPCA biological data: Fish

The MPCA conducted fish surveys in 2008 and 2018 at the biomonitoring station (08RN030). Fish were sampled once in 2008 and twice in 2018. The observed fish assemblage lacked trout and were dominated by warm water taxa. No coldwater fish species were present in any samples. A single cool water fish species (brook stickleback) was present in low numbers (1 individual, 0.4% of individuals) in one sample and no cool water fish species were collected in the other two samples. Overall, the fish assemblage is indicative of a warm water habitat and does not demonstrate the presence of a coldwater habitat.

Fish biomonitoring tables from Sand Creek (09030005-683)

FieldNum	VisitDate	Common Name	LengthMin	LengthMax	Weight	Number
08RN030	6/17/2008	black bullhead	49	49	1.5	1
08RN030	6/17/2008	blacknose dace	45	48	1	2
08RN030	6/17/2008	blacknose shiner	37	59	8	10
08RN030	6/17/2008	blackside darter	30	45	8	6
08RN030	6/17/2008	brassy minnow	49	49	1	1
08RN030	6/17/2008	brook stickleback	52	52	1	1
08RN030	6/17/2008	central mudminnow	50	113	298	97
08RN030	6/17/2008	common shiner	34	77	56.5	61
08RN030	6/17/2008	creek chub	44	82	79	39
08RN030	6/17/2008	fathead minnow	37	63	23	12
08RN030	6/17/2008	golden shiner	53	84	41	10
08RN030	6/17/2008	johnny darter	38	38	0.5	1
08RN030	6/17/2008	northern redbelly dace	38	51	31.5	31
08RN030	6/17/2008	rock bass	48	97	18	2
08RN030	6/17/2008	shorthead redhorse	390	390	517	1
08RN030	6/17/2008	white sucker	52	76	33	9

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN030	7/31/2018	black crappie	197	197	109	1
08RN030	7/31/2018	blackside darter	27	70	58	48
08RN030	7/31/2018	bluegill	70	84	15	2
08RN030	7/31/2018	brassy minnow	50	50	1	1
08RN030	7/31/2018	central mudminnow	59	95	79	14
08RN030	7/31/2018	common shiner	33	69	90	74
08RN030	7/31/2018	creek chub	36	57	9	5
08RN030	7/31/2018	golden shiner	51	97	90	32
08RN030	7/31/2018	johnny darter	45	45	1	1
08RN030	7/31/2018	largemouth bass	46	50	3	2
08RN030	7/31/2018	northern pike	405	496	1224	2
08RN030	7/31/2018	pumpkinseed	65	65	5	1
08RN030	7/31/2018	rock bass	157	157	80	1
08RN030	7/31/2018	trout-perch	72	120	276	36
08RN030	7/31/2018	walleye	104	118	25	2
08RN030	7/31/2018	white sucker	42	340	1540	10

FieldNum	VisitDate	CommonName	LengthMin	LengthMax	Weight	Number
08RN030	8/27/2018	black crappie	177	177	58	1
08RN030	8/27/2018	blacknose shiner	49	51	8	3
08RN030	8/27/2018	blackside darter	33	84	188	124
08RN030	8/27/2018	central mudminnow	32	87	46	13
08RN030	8/27/2018	common shiner	38	77	61	36
08RN030	8/27/2018	creek chub	47	57	24	18
08RN030	8/27/2018	golden shiner	66	104	46	7
08RN030	8/27/2018	johnny darter	33	69	24	21
08RN030	8/27/2018	largemouth bass	89	111	33	2
08RN030	8/27/2018	rock bass	74	177	106	2
08RN030	8/27/2018	shorthead redhorse	51	108	22	4
08RN030	8/27/2018	trout-perch	59	128	323	47
08RN030	8/27/2018	white sucker	87	356	2956	11

MPCA biological data: Macroinvertebrates

Macroinvertebrates were sampled from one MPCA biomonitoring station in 2008 and 2018. In 2008, 2 samples were collected and neither contained any cold water obligate species. In 2018, three individuals (0.9% of individuals in the sample) of the caddisfly family Psychomyiidae (genus: *Lype*) were collected. The larvae of this caddisfly are often found in small cool/coldwater streams. Overall, the macroinvertebrate community was indicative of a warm or cool water habitat.

Summary of cold water macroinvertebrates collected from Sand Creek (09030005-683)

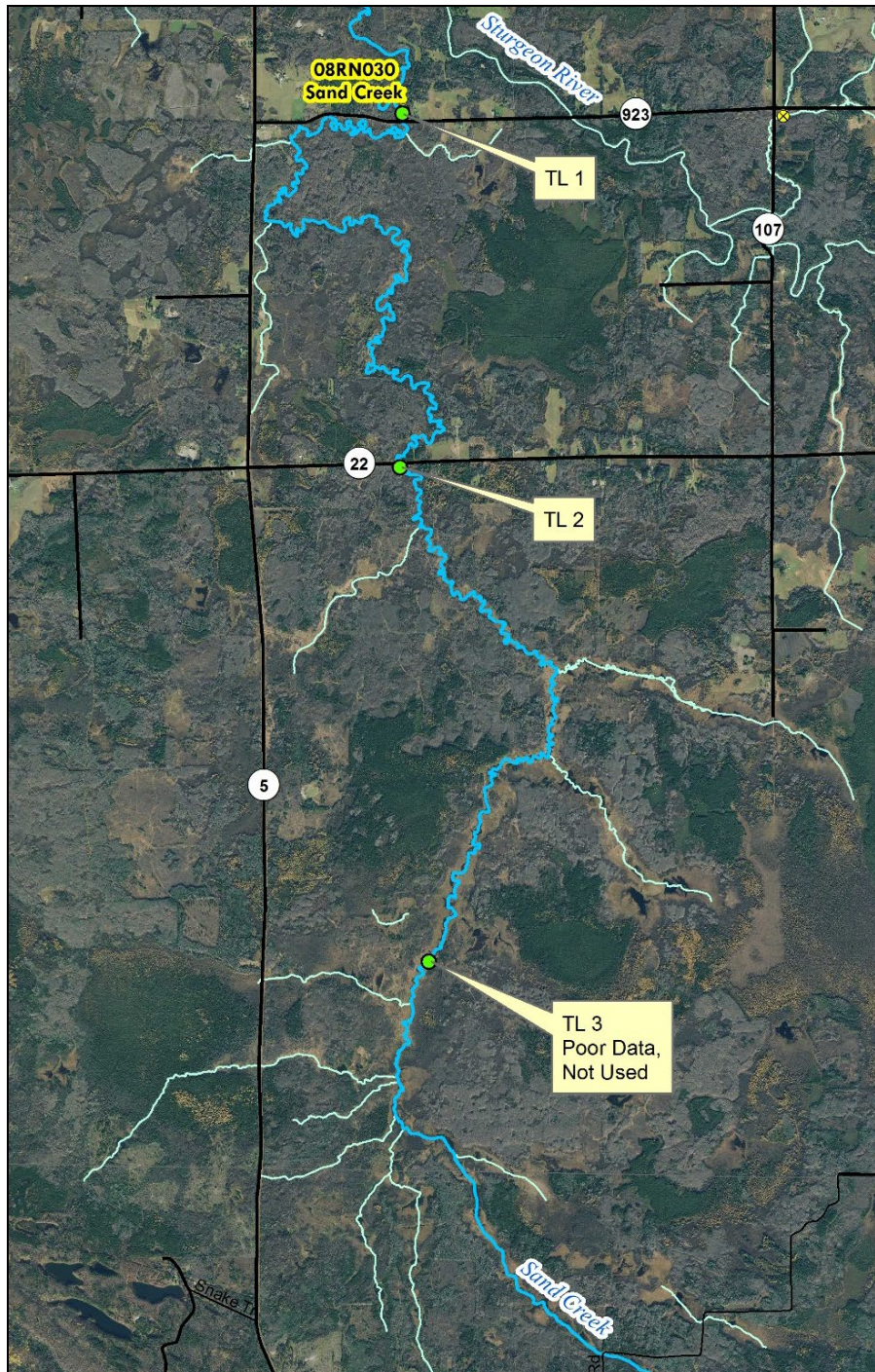
FieldNum	VisitNum	VisitDate	# Cold water invertebrates	% Cold water invertebrates
08RN020	20081760	03-Sep-08	0	0.0%
08RN020	20081577	03-Sep-08	0	0.0%
08RN020	20186054	21-Aug-18	3	0.9%

MPCA Temperature data

Continuously-recording stream temperature loggers were deployed at the MPCA biomonitoring station during the summers of 2008, 2018, and 2019. In addition, two upstream sites outside of 09030005-683 were monitored in 2017. Sediment covered the furthest upstream logger (TL 3) which resulted in data that could not be used. Some of the recording data from station 08RN030 in 2008 was incomplete and these data are not considered in detail here. Summary data for the logger deployments can be found below. In general, temperatures at both logger sites were marginal for trout with temperatures in the growth range for brook trout <50% of the summer. Lethal temperatures were observed for 1.9-5.9% of the summer during these deployments. Average summer temperatures in July were 20.3-21.2 °C. All temperature logger data indicated this reach of Sand Creek is too warm to support trout or other cold water obligate taxa.

Water temperature logger summary data for Sand Creek. Note: temperature logger TL 2 is upstream of the reach reviewed in this document.

Logger	year	Trout Thermal Area	% Recording	% Lethal	% Stress	% Growth	% No Growth	Average	June Avg	July Avg	Aug Avg
08RN030	2019	Area 1	100	1.9	53.5	44.6	0	20.3	19	22.4	19.5
08RN030	2018	Area 1	90.3	5.9	60.7	33.4	0	21.2	20.3	23	19.8
08RN030	2008	Area 2	52.2	0.5	30.6	68.9	0	18.6	17.8	20	
TL 2	2017	Area 1	79.1	2.4	53.4	44.1	0	20.4	20.1	22	17.9



Location of temperature logger stations on Sand Creek. Note: temperatures loggers TL2 and TL3 are upstream of the reach reviewed in this document.

DNR information

There are limited stocking and fisheries records from Sand Creek. However, there is evidence that stocking of trout occurred periodically until at least 1962. Brook trout were captured in the far upstream reaches of Sand Creek in a 1979 survey and were likely the result of natural reproduction. In 1996, a DNR Forestry employee claimed to have observed brook trout within a small tributary near PLSS sections T61 R21W S33 and S34. These fish would have presumably been the result of natural reproduction. There is no evidence that Sand Creek below PLSS section T61 R21W S34 supported trout historically. In fact, the trout populations in the upper reaches and tributaries may no longer be extant due to numerous beaver dams and impoundments (based on 2017 MPCA field observations and 2015 MNDNR observations). Regardless, there is no evidence to indicate that the reach of Sand Creek reviewed in this document (09030005-683) ever supported a coldwater fishery.

MPCA Summary

MPCA biological monitoring and temperature logger data demonstrated that this reach of Sand Creek (09030005-683) does not support a coldwater habitat. The MPCA sampled one station for fish on Sand Creek (once in 2008 and twice 2018) approximately 1.2 miles upstream of the confluence with the Sturgeon River. No coldwater fish species and a single cool water fish was collected in the three samples. Overall, these fish samples consisted of predominantly warm water species. Similarly, macroinvertebrate data were dominated by warm water taxa with a single cold water obligate collected (*Lype* [Trichoptera: Psychomyiidae]) in one sample which comprised 0.9% of the sample (3 individuals). No coldwater taxa were collected in the other two macroinvertebrate samples. All water temp data collected at this station and upstream at the County Road 22 crossing (upstream of 09030005-683) indicate that conditions in Sand Creek are marginal for supporting a coldwater community. The lethal threshold was exceeded for 1.9-5.9% of the summer during deployments. Thermal stress for brook trout was recorded >50% of the deployment time. The average summer temperatures were also high and exceeded 20°C. The DNR currently classifies this stream reach as a marginal trout water which means that the DNR has determined that it lacks suitable habitat and water quality for reproduction and year-round survival of trout. Limited information regarding the past management of Sand Creek was available including stocking records. However, there is evidence that Sand Creek was stocked historically although there are no contemporary records documenting trout stocking. One historical record from 1955 does indicate that the stocking of Brook Trout would be discontinued because natural reproduction was adequate. Documentation indicates that the location of the naturally reproducing Brook Trout population was within the uppermost reaches of Sand Creek (PLSS section T61 R21W S34 and upstream reaches) and in the associated tributaries within that area. These reaches are well outside of 09030005-683 and will retain a Class 2Ag designation at this time.

Unnamed creek (Brown's Creek) (09030009-542) MPCA Use Designation Review

Stream name: Unnamed creek (Brown's Creek)

AUID(s): 09030009-542

AUID description: Unnamed cr (Browns Creek) to Unnamed ditch (Judicial Ditch 62)

Tributaries: NA

MPCA biological station(s): 09RN002, 23RN006

County: Lake of the Woods

Watershed: Lake of the Woods

DNR designation: Not a designated trout water

DNR management class: none

Current AUID designation: 2Bg (warm water)

Reason for review: Temperature data

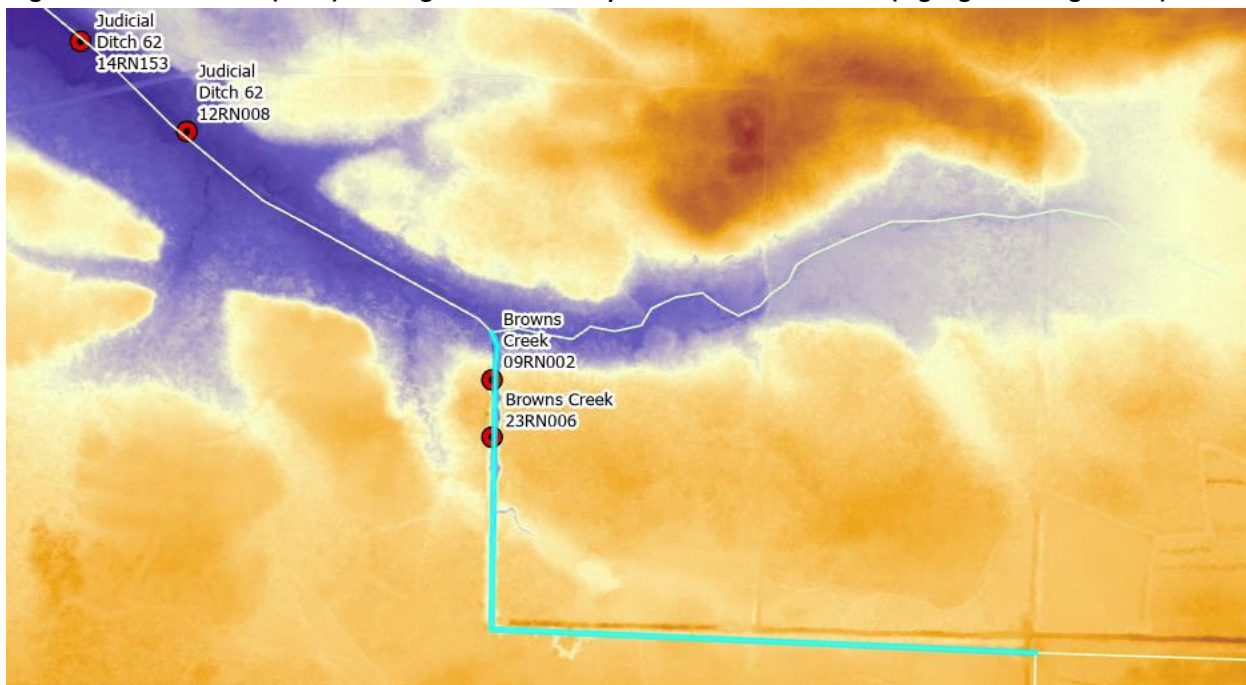
Was this site previously reviewed? If so what were the results? This site was not previously reviewed by the MPCA.

Additional information: Browns Creek 09030009-542 is a small 0.78mi ditched WID which, connects with 09030009-558 Judicial Ditch 62 700m SW of Faunce Butterfield Forest Road. Both systems fall within a narrow gravel/sand glacial deposit which separates two large and extensively ditched peat bogs. Historically, a natural stream linked the two bogs, across the glacial deposit. This historic natural channel was ditched to create what is now Judicial Ditch 62. What is now Browns Creek 09030009-542 was created as another ditched outlet for the southern bog complex, but unlike JD 62, it does not follow a historic flow path. Just upstream of its confluence with JD 62, Browns Creek cuts at a perpendicular angle through the raised land to the south of the low wetland floodplain which parallels JD 62. Browns Creek cuts deeply into this raised terrain. Steep ditch banks parallel both sides of Browns Creek in this area and multiple rock/wood riffle/pool sequences are present, creating novel habitat for aquatic life relative to the surrounding low gradient bog/wetland landscape. Numerous spring seeps have also been observed within this area with an especially significant groundwater input present where the ditch channel intersects a historic tributary to the prior natural JD 62 channel.

Satellite photo of Unnamed creek (Browns Creek) and Unnamed Ditch (Judicial Ditch 62). Browns creek is a ditched tributary to JD 62. Both systems drain a large wetland/peat bog to the southwest of our monitoring locations. The proposed reach is highlighted in light blue.



Digital elevation model (DEM) coverage of the landscape around 09030009-542 (highlighted in light blue).



An especially significant groundwater input is located where the ditch channel intersects a historic tributary to the prior natural JD 62 channel.



DNR monitoring data

According to a 2009 DNR report, "Brown's Creek was managed for Brook Trout in the 1960's (1000 brook trout fingerling stocked annually). Since 1970, trout management does not occur on Brown's Creek, mainly as a result of poor recreational use and a lack of beaver control." The DNR sampled Browns Creek/JD62 again in 1979 and only Fathead Minnow, Central Mudminnow, and Brook Stickleback were present in reach. In 2009, DNR staff again investigated Brown's Creek's suitability as a trout fishery. A fish survey was performed at this time at station 09RN002. Although no trout or sculpin were collected in this visit, the temperature data collected at this location was considered suitable for Brook Trout reintroduction. The following are quotes from the 2009 DNR report:

"The water temperatures for both reaches appear to peak at a high in the low 70F range in June as a result of warm water snow melt from Brown's Lake (water is heated by the sun as it stands in Brown's Lake, which is shallow) and increased spring precipitation (see figure 2) and then temperatures fall to within the 40's and 50's throughout the remainder of the year as a result of cold ground water influx"

"Overall, it appears that thermal regime and habitat requirements are suitable for brook trout reintroduction within Brown's Creek. The only limiting factors are the remote location of Brown's Creek in the Beltrami Island State Forest near the Norris Camp Wildlife Management Office (Headquarters for the Red Lake WMA) and the presence of heavy mosquito activity during the summer months".

MPCA monitoring data

MPCA biological data

In 2023, the MPCA targeted 09RN002 as an anchor site for intensive watershed monitoring in the Lake of the Woods Watershed as it represents one of only two potential coldwater resources within the watershed. A temperature logger was deployed in the spring of 2023 near the upstream end of 09RN002, but due to a beaver impoundment, MPCA biomonitoring crews were unable to sample within the existing reach. Rather than forgo sampling Browns Creek, staff established 23RN006 directly upstream of the beaver impoundment and sampled both fish and macroinvertebrates. Fish numbers were much lower than at the 2009 DNR sample but the same six species were collected. Neither the MPCA or DNR fish sample contained trout or sculpin, but several cool water taxa were collected, which indicates that groundwater influences this system.

Fish; 09RN002 (MPCA/DNR station); 07/02/2009. Note: sample was collected by DNR staff and is non-reportable (inconsistent methods)						
WBName	Common Name	CW Species	Min	Max	Weight	Number
Unnamed creek (Browns Creek)	finescale dace	Cool water	30	85	325.8	362
Unnamed creek (Browns Creek)	brook stickleback	Cool water	34	60	289.8	322
Unnamed creek (Browns Creek)	northern redbelly dace	Cool water	32	47	145.8	243
Unnamed creek (Browns Creek)	northern pearl dace	No	36	95	427.2	89
Unnamed creek (Browns Creek)	fathead minnow	No	35	61	45.1	41
Unnamed creek (Browns Creek)	central mudminnow	No	49	118	31.8	6

Fish; 23RN006; 08/30/2023. Note: visit is non-reportable (insufficient capture).						
WBName	CommonName	CW species?	Min	Max	Weight	Number
Unnamed creek (Browns Creek)	central mudminnow	No	50	76	120	39
Unnamed creek (Browns Creek)	brook stickleback	Cool water	45	64	19	9
Unnamed creek (Browns Creek)	finescale dace	Cool water	38	58	13	9
Unnamed creek (Browns Creek)	northern pearl dace	No	50	77	18	9
Unnamed creek (Browns Creek)	northern redbelly dace	Cool water	32	41	4	7
Unnamed creek (Browns Creek)	fathead minnow	No	38	42	3	4

In 2015 the MPCA collected a macroinvertebrate sample and deployed a temperature logger at 09RN002 as a part of its biocriteria development project. The 2015 macroinvertebrate survey yielded a single coldwater obligate macroinvertebrate taxa (*Eukiefferiella*). Two coldwater obligate macroinvertebrate taxa were collected at 23RN006 in 2023. Although the macroinvertebrate sample is considered assessable, it was dominated by midges and contained very few long lived or POET taxa, suggesting that this reach experiences variable conditions (flow, water temp, dissolved oxygen, habitat availability, etc.). While stressors and/or unique site-specific conditions may have resulted in the extirpation of/lack of colonization of macroinvertebrate coldwater indicator species, water temperature logger data collected in 2023 again demonstrated water temperatures that are consistent with a coldwater habitat.

Macroinvertebrates; 09RN002; 09/09/2015		
Taxon	Count	CW Species
<i>Simulium</i>	53	
<i>Neoplasta</i>	45	
<i>Rheotanytarsus</i>	43	
<i>Tvetenia</i>	31	
<i>Lepidostoma</i>	29	
<i>Micropsectra</i>	21	
<i>Thienemannimyia</i> Gr.	20	
<i>Parametriocnemus</i>	16	
<i>Hydropsyche betteni</i>	10	
Acari	9	
Pisidiidae	8	
<i>Polypedilum</i>	6	
<i>Eukiefferiella</i>	4	Yes
<i>Hydropsyche</i>	4	
Oligochaeta	3	
<i>Tipula</i>	2	
<i>Cricotopus</i>	2	
<i>Parakiefferiella</i>	1	
Hydropsychidae	1	
Baetidae	1	
<i>Paracladopelma</i>	1	
<i>Xenochironomus xenolabis</i>	1	
Orthocladiinae	1	

Macroinvertebrates; 23RN006; 8/29/2023		
Taxon	Count	CW Species
<i>Chironomus</i>	182	
<i>Micropsectra</i>	52	
Oligochaeta	16	
<i>Polypedilum</i>	14	
<i>Parametriocnemus</i>	13	
<i>Eukiefferiella</i>	9	Yes
<i>Stictochironomus</i>	6	
<i>Thienemanniella</i>	5	
<i>Limnophyes</i>	5	
<i>Zavreliomyia</i>	4	
<i>Cricotopus</i>	4	
<i>Ptilostomis</i>	2	
<i>Dicranota</i>	2	
<i>Prodiamesa</i>	2	Yes
<i>Dixella</i>	1	
Ptychopteridae	1	

Macroinvertebrates; 23RN006; 8/29/2023		
Taxon	Count	CW Species
<i>Psectrotanypus</i>	1	
Limnephilidae	1	
<i>Thienemannimyia</i> Gr.	1	
<i>Physella</i>	1	
<i>Procladius</i>	1	

Water temperature data

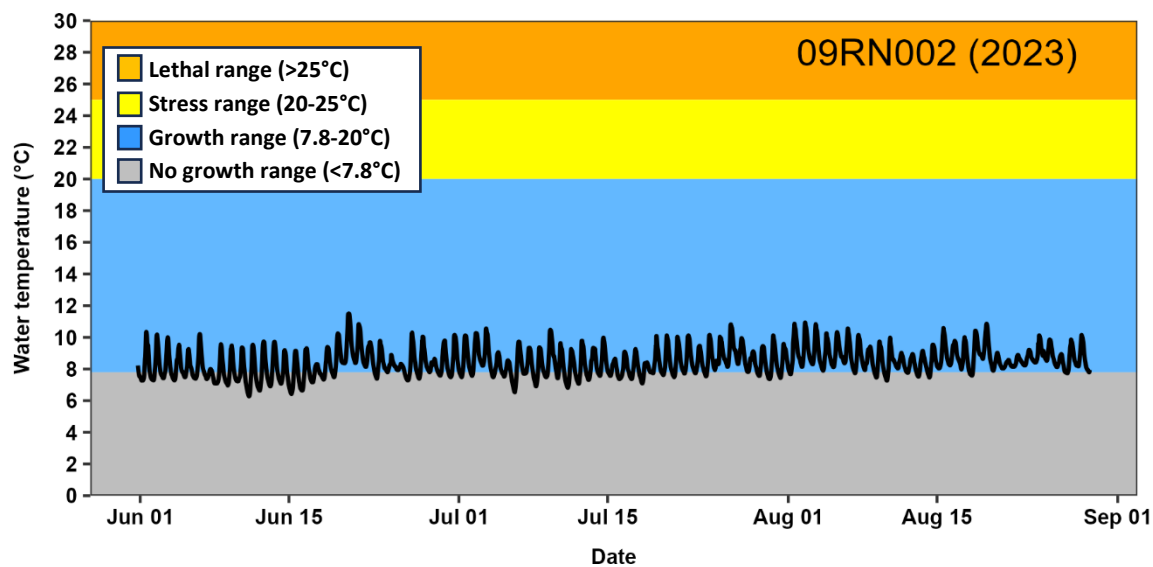
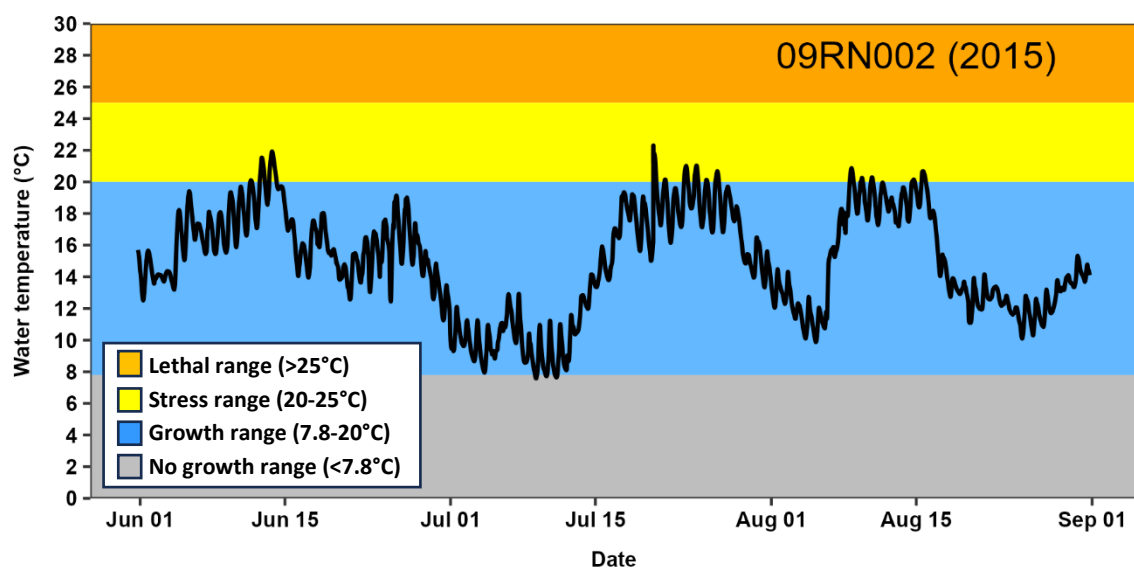
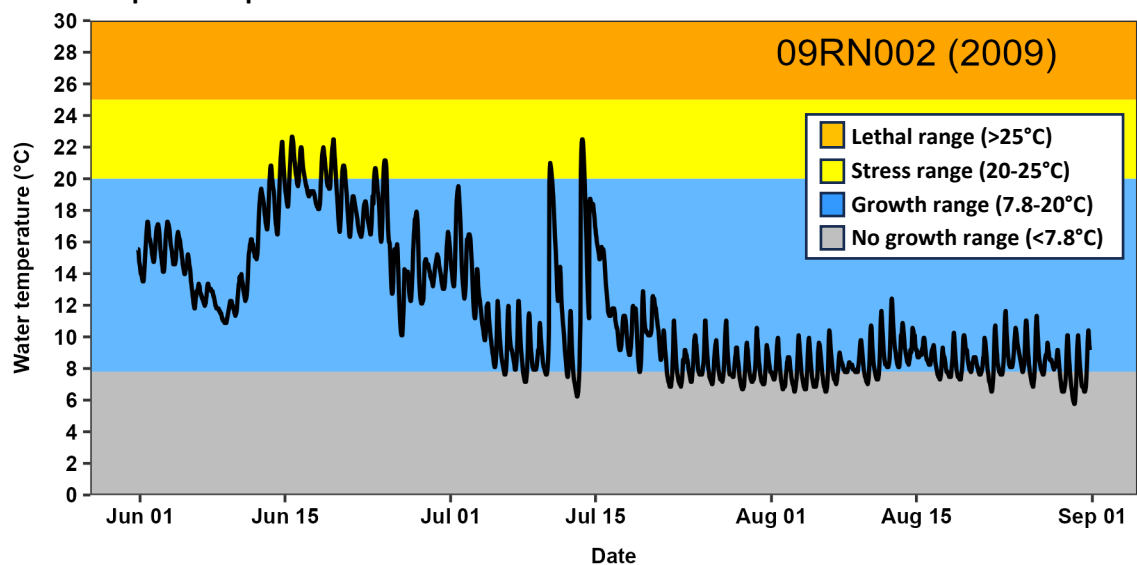
Water temperature was measured continuously using temperature loggers in 2009, 2015, and 2023. In addition, water temperature was measured during biological sampling visits. Summer temperatures during all MPCA biological visits were below 10 °C. Temperature loggers also indicated cool conditions with summer average temperatures ranging from 8.5-15.0 °C and maximum temperatures ranging from 11.5-22.7 °C. Water temperatures were in the growth range for Brook Trout 76-95% of the summer and in the stress range 0-5% of the summer.

Water temperatures were more variable in 2009 and 2015. These patterns were likely the result of warmer surface water input from the upstream bog/wetland complex. Warmer surface water from the upstream wetland complex raises water temperatures in Browns Creek during June, but with the exception of high flow/rainfall events, temperatures drop quickly in July and through the rest of the summer as flows become dominated by groundwater inputs. Despite these fluctuations, water temperature were still below “stress” zone for Brook Trout for most of the summer in 2009 and 2015. The 2023 temperature logger dataset did not experience the same fluctuations in temperature that were documented in 2009 and 2015 and remained below 12C for the entirety of the deployment.

One-time water temperatures (°C) measured during MPCA bio sampling				
FieldNum	WBName	VisitDate	Visit Type	Temp
09RN002	Unnamed creek (Browns Creek)	09/09/2015	Inverts	9.9
23RN006	Unnamed creek (Browns Creek)	8/29/2023	Inverts	8.1
23RN006	Unnamed creek (Browns Creek)	8/30/2023	Fish	7.9

Summer (June-August) water temperature summary data								
Station	Bio station	Year	Average	Max	% no growth	%growth	% stress	% lethal
W80020003	09RN002	2009	11.6	22.7	19%	76%	5%	0%
W80020003	09RN002	2015	15.0	22.3	1%	95%	5%	0%
W80020003	09RN002	2023	8.5	11.5	24%	76%	0%	0%

Water temperature plots



Summary of coldwater review decision:

Fish sampled from 09RN002 and 23RN006 did not yield coldwater fish taxa (trout or sculpin) but were indicative of a lower gradient stream with some coldwater inputs. Two coldwater obligate macroinvertebrate taxa (*Eukiefferiella*, *Prodiamesa*) were collected at 09RN002 and 23RN006. These two taxa comprised a small portion (1-3%) of the macroinvertebrate sample. Alone the fish and macroinvertebrate data do not justify a coldwater classification for this stream reach. However, a 2009 survey conducted by the MNDNR concluded that that thermal regime and habitat requirements in this reach were suitable for Brook Trout reintroduction. Additional water temperature monitoring in 2015 and 2023 also indicated that thermal conditions were suitable to support coldwater habitat. The three years of temperature logger data indicated cool conditions with summer average temperatures ranging from 8.5-15.0 °C and maximum temperatures ranging from 11.5-22.7 °C. Water temperatures were in the growth range for Brook Trout 76-95% of the summer and in the stress range 0-5% of the summer. Water temperature data from 2009 and 2015 had relatively high temperature fluctuations because of surface water input from the upstream bog complex. However, these surface water contributions rarely push temperatures in the stream above the 20 °C threshold for Brook Trout stress. Monitoring by the MPCA and DNR indicates that this unnamed creek (Browns Creek) supports coldwater habitat and should be redesignated as a coldwater based on water temperature data.