



MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
STREAM ASSESSMENT REPORT

Region	Area	Stream Name	Tributary No.	Stream Length
3	Lake City	Cold Spring Brook	M-34-48	2.2 miles
County			Source (T, R, S)	Mouth (T, R, S)
Wabasha			T110N.R14W.S25	T110N.R14W.S36

Date(s) of Assessment: October 16, 2014

Assessment Purpose: Long-term monitoring to evaluate annual variation and temporal trends in trout populations, fish community (IBI), and stream habitat..

Station	Similar Reach	Stream Mile	Length (ft)	Mean Width (ft)	Acres	Water Temp (°F)	Air Temp (°F)	Downstream UTM's	
								utmX (↔)	utmY (↓)
0.5	1	0.5	1170	25	0.67			545185	4904438

Summary:

Station 0.5 on Cold Spring Brook is one of the Long Term Monitoring (LTM) stations in southeastern Minnesota. This station has been sampled annually in the fall since 1998 as part of the LTM program. Estimates were obtained using a two pass depletion method using a stream shocking barge.

The Brown Trout population had an estimated 177 adults/mile and 403 recruits/mile. The estimates of larger Brown Trout were 81/mile \geq 12 inches, 63/mile \geq 14 inches, and 54/mile \geq 16 inches.

The Brook Trout population had an estimated 41 adults/mile and 148 recruits/mile. The number of Brook Trout \geq 10 inches was estimated at 9/mile.

There were no White Suckers sampled in Cold Spring Brook in this survey.

Fishery Characteristics – Population Estimates

Station: 0.5 Date: 10/16/2014 Gear: Shocking Barge Method: Two Pass Depletion Station length (ft): 1170

Brook Trout			
In Station			
	Recruits	Adults	Total
n	33	9	42
95% CI	13.05	0.98	
Per Mile			
	Recruits	Adults	Total
n	148	41	189
	≥ 10 inches		
n	9		
95% CI	0.00		
Per Acre			
	Recruits	Adults	Total
n	49	14	62
lbs	2.6	3.6	6.3

Brown Trout			
In Station			
	Recruits	Adults	Total
n	89	39	129
95% CI	120.44	1.24	
Per Mile			
	Recruits	Adults	Total
n	403	177	580
	≥ 12 inches	≥ 14 inches	≥ 16 inches
n	81	63	54
95% CI	0.00	0.00	0.00
Per Acre			
	Recruits	Adults	Total
n	133	58	191
lbs	9.6	65.8	75.4

Length (in)	Brook Trout	Brown Trout	White Sucker
1			
2			
3	2		
4	5	6	
5	19	24	
6	4	15	
7		1	
8	2		
9	2	2	
10	1	7	
11	1	9	
12		2	
13		2	
14			
15		2	
16		5	
17		3	
18		3	
19		1	
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30+			
Total	36	82	0

Other Species Sampled:

Common Name	Number Sampled
Slimy Sculpin	10

Coldwater Index of Biotic Integrity (Mundahl and Simon 1998)

<u>Metric (Max Score)</u>	<u>Value (Score)</u>
Total Captured	128
Number of Species (10)	3 (10)
Number of Coldwater Species (10)	3 (5)
Number of Minnow Species (10)	0 (10)
Number of Benthic Species (10)	1 (10)
Number of Tolerant Species (10)	0 (10)
Percent Salmonids as Brook Trout (10)	30.5 (5)
Percent Intolerant Individuals (10)	35.93 (5)
Percent Coldwater Individuals (10)	100 (10)
Percent White Suckers (10)	0 (10)
Percent Top Carnivores (10)	92.18 (10)
Number of Coldwater Individuals per 150m (10)	53.83 (5)
Number of Warmwater Individuals per 150m (10)	0 (10)
TOTAL IBI SCORE (120 maximum)	100
Percent of maximum score:	83.33%

Stream Characteristics – Minnesota Stream Habitat Assessment (MSHA)

MSHA Metric	Component score maximum	Component score
Surrounding Land Use	5	2.5
Riparian Zone	15	9
Instream Zone - Substrate	27	11.7
Instream Zone - Cover	17	14
Channel Morphology	36	28
	100	MSHA Score (Max = 100)
		65.2

Discussion of Fishery:

Station 0.5 on Cold Spring Brook is one of the stations in the Long Term Monitoring (LTM) program in southeastern Minnesota. This station has been sampled annually since the fall of 1998 to assess the Brown Trout and Brook Trout populations (Figures 1 and 2).

In the fall of 2014, the Brown Trout population was estimated at 177 adults/mile. This estimate was substantially lower than the 16 year mean of 1,052/mile and lower than the estimate of 490/mile in 2013 (Table 1). The estimated number of recruits was 403/mile, far lower than the 16 year mean of 1,715/mile but higher than last year's estimate of 187/mile. There was an estimated 81 Brown Trout/mile ≥ 12 inches, 63/mile ≥ 14 inches, and 54/mile ≥ 16 inches. All of these values for size classes decreased from 2013, except fish ≥ 16 inches. This was the highest estimate of Brown Trout ≥ 16 inches ever recorded in this station. The biomass of Brown Trout was 75.4 lbs/acre, which was lower than the 16 year mean of 172 lbs/acre and is the lowest ever recorded. The number of adult Brown Trout per mile has generally been lower in the last few years, but the number of Brown Trout ≥ 12 inches has generally been stable over time (Figure 1).

The estimated number of adult Brook Trout was 41/mile (Table 2). This is lower than the 16 year fall mean of 295/mile, but higher than the estimate of 32/mile in 2013. The Brook Trout population had an estimated 148 recruits/mile, which was lower than the 16 year mean of 843/mile but higher than the estimate in 2013 of 24/mile. There were 9 Brook Trout ≥ 10 inches estimated in this survey. Brook Trout biomass was 6.3 lbs/acre which is higher than the 2013 value of 4.8 lbs/acre. The number of adult Brook Trout in the LTM station has generally declined over time (Figure 2). This decrease may be the result of habitat changes and frequent flood events. It also appears that Brook Trout numbers may have increased in upstream portions of Cold Spring Brook. The upper reaches now have areas with flowing water that had been dry in the past.

The Coldwater Index of Biotic Integrity (Mundahl and Simon 1998) score has been variable in Cold Spring Brook (Table 3). This may be the result of the stations proximity to the Zumbro River, which allows different fish species to immigrate/emigrate frequently. Slimy Sculpin was the only non-trout species sampled in 2014.

In 2014, the Minnesota Stream Habitat Assessment (MSHA) score was 65.2 (Table 3). The stream is characterized by moderate bank erosion, but recent flooding has added stress to banks. Shade, instream cover, channel stability, and sinuosity are moderate. The stream is also moderately embedded. Cold Spring Brook has good channel development with a good pool; riffle dynamic. A habitat improvement project was done in the summer of 2013. The work was done above and below the LTM station. Additional work was done in 2014 in the LTM station. This raised the MSHA score due to less exposed bank and some added instream habitat. The project was implemented by Trout Unlimited. Annual surveys will continue to monitor effects of the habitat project on fish populations and stream characteristics.

Credits and Signatures:

Field Crew:		
Randy Binder, Dan Spence, Jeff Weiss		
Report completed by:		
Name: Dan Spence	Title: Fisheries Specialist	Date: Jan. 20, 2015
Approved by:		
Area Fisheries Supervisor's Signature	Regional Fisheries Manager's Signature	Date:
		

Figure 1. Brown Trout population trends in the LTM station of Cold Spring Brook.

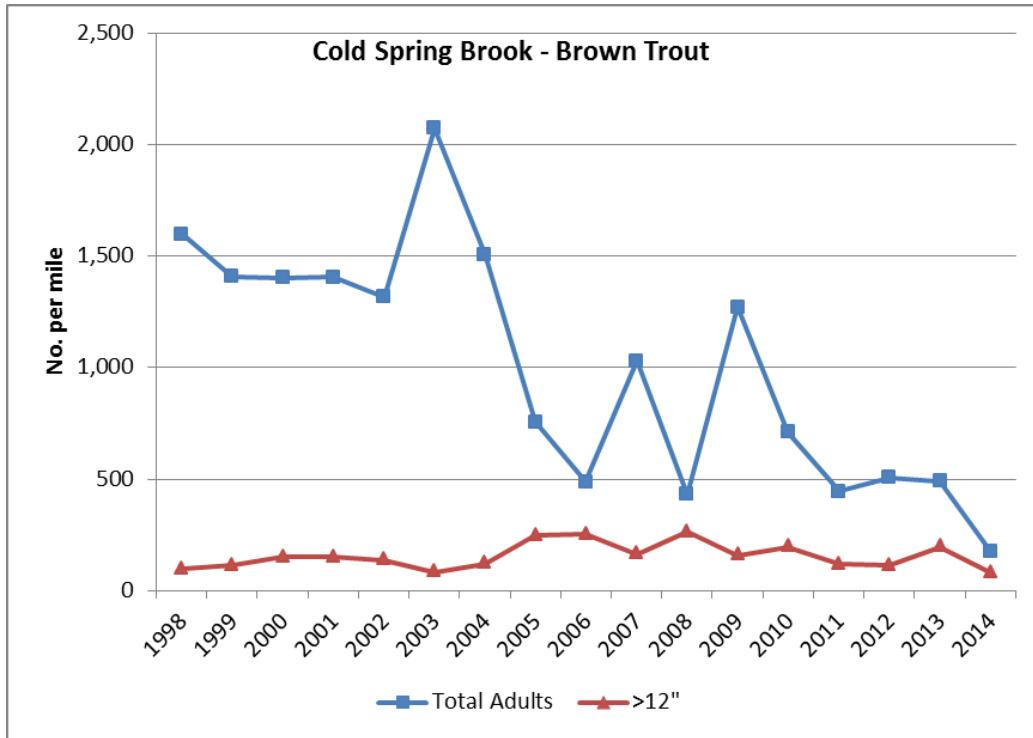


Figure 2. Brook Trout population trends in the LTM station of Cold Spring Brook.

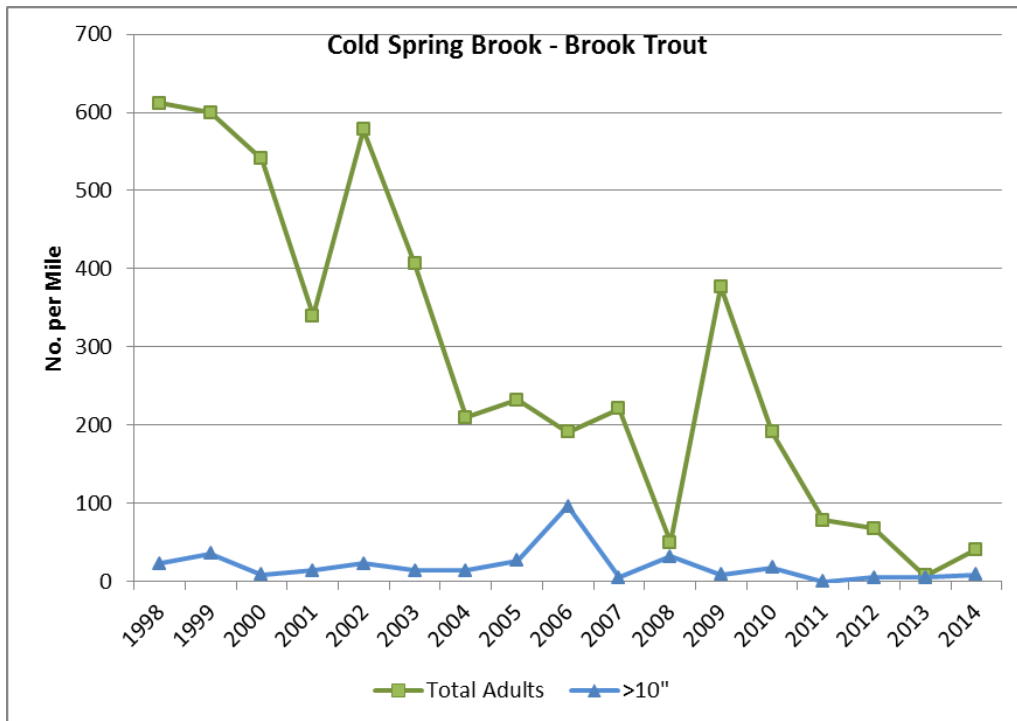


Table 1. Trends in Brown Trout population metrics for Cold Spring Brook, years 1998-2014.

Station	River Mile	Similar Reach	Date	No./mile (Adult)	No./mile (Recruits)	No./mile (≥12 in.)	No./mile (≥14 in.)	No./mile (≥16 in.)	lbs/acre (all sizes)
0.5	0.5	1	10/16/2014	177	403	81	63	54	75.4
0.5	0.5	1	10/24/2013	490	187	197	109	41	126.8
0.5	0.5	1	9/28/2012	508	1703	114	45	5	122.9
0.5	0.5	1	9/29/2011	444	519	118	74	18	97.8
0.5	0.5	1	10/5/2010	711	689	195	95	45	193.97
0.5	0.5	1	9/16/2009	1,270	696	158	81	32	181.53
0.5	0.5	1	10/1/2008	431	1,825	262	81	27	133.11
0.5	0.5	1	9/27/2007	1,029	47	164	106	55	153.73
0.5	0.5	1	10/5/2006	489	4,395	251	120	41	200.8
0.5	0.5	1	9/27/2005	757	266	246	59	9	142
0.5	0.5	1	9/24/2004	1,506	1,727	120	27	5	178.3
0.5	0.5	1	9/22/2003	2,072	1,637	82	5	5	204
0.5	0.5	1	9/20/2002	1,318	3,017	137	27	9	193.7
0.5	0.5	1	9/21/2001	1,405	2,507	150	68	45	207.7
0.5	0.5	1	9/26/2000	1,403	3,118	150	55	27	230.7
0.5	0.5	1	9/30/1999	1,407	3,020	113	57	20	210.22
0.5	0.5	1	9/28/1998	1,598	2,080	97	63	36	179.7
0.5	0.5	1	Fall Mean	1052	1715	160	67	26	172.3

Table 2. Trends in brook trout population metrics for Cold Spring Brook, years 1998-2014.

Station	River Mile	Similar Reach	Date	No./mile (Adult)	No./mile (Recruits)	No./mile (≥10 in.)	lbs/acre (all sizes)
0.5	0.5	1	10/16/2014	41	148	9	6.3
**0.5	0.5	1	**10/24/2013	32	24	5	4.8
0.5	0.5	1	9/28/2012	68	169	5	8.7
0.5	0.5	1	9/29/2011	78	554	0	12.9
0.5	0.5	1	10/5/2010	191	994	18	24.67
0.5	0.5	1	9/16/2009	377	115	9	20.93
0.5	0.5	1	10/1/2008	50	721	32	12.39
0.5	0.5	1	9/27/2007	221	139	5	12
0.5	0.5	1	10/5/2006	191	611	96	31.3
0.5	0.5	1	9/27/2005	232	72	27	22.7
0.5	0.5	1	9/24/2004	210	1,638	14	29
0.5	0.5	1	9/22/2003	406	99	14	21.64
0.5	0.5	1	9/20/2002	578	1,232	23	43
0.5	0.5	1	9/21/2001	340	1,633	14	30.6
0.5	0.5	1	9/26/2000	541	928	9	34.4
0.5	0.5	1	9/30/1999	600	3,525	36	53.17
0.5	0.5	1	9/28/1998	612	1,030	23	29.8
0.5	0.5	1	Fall Mean	295	843	21	24.5

** Brook Trout adults and recruits per mile have been corrected from the 2013 report. The 2013 report inadvertently contained Brook Trout in station, rather than per mile.

Table 3. Trends in Index of Biotic Integrity (Mundahl and Simon 1998) and Minnesota Stream Habitat Assessment (Fisheries Stream Survey Manual 2007) scores for Cold Spring Brook, years 2003-2014.

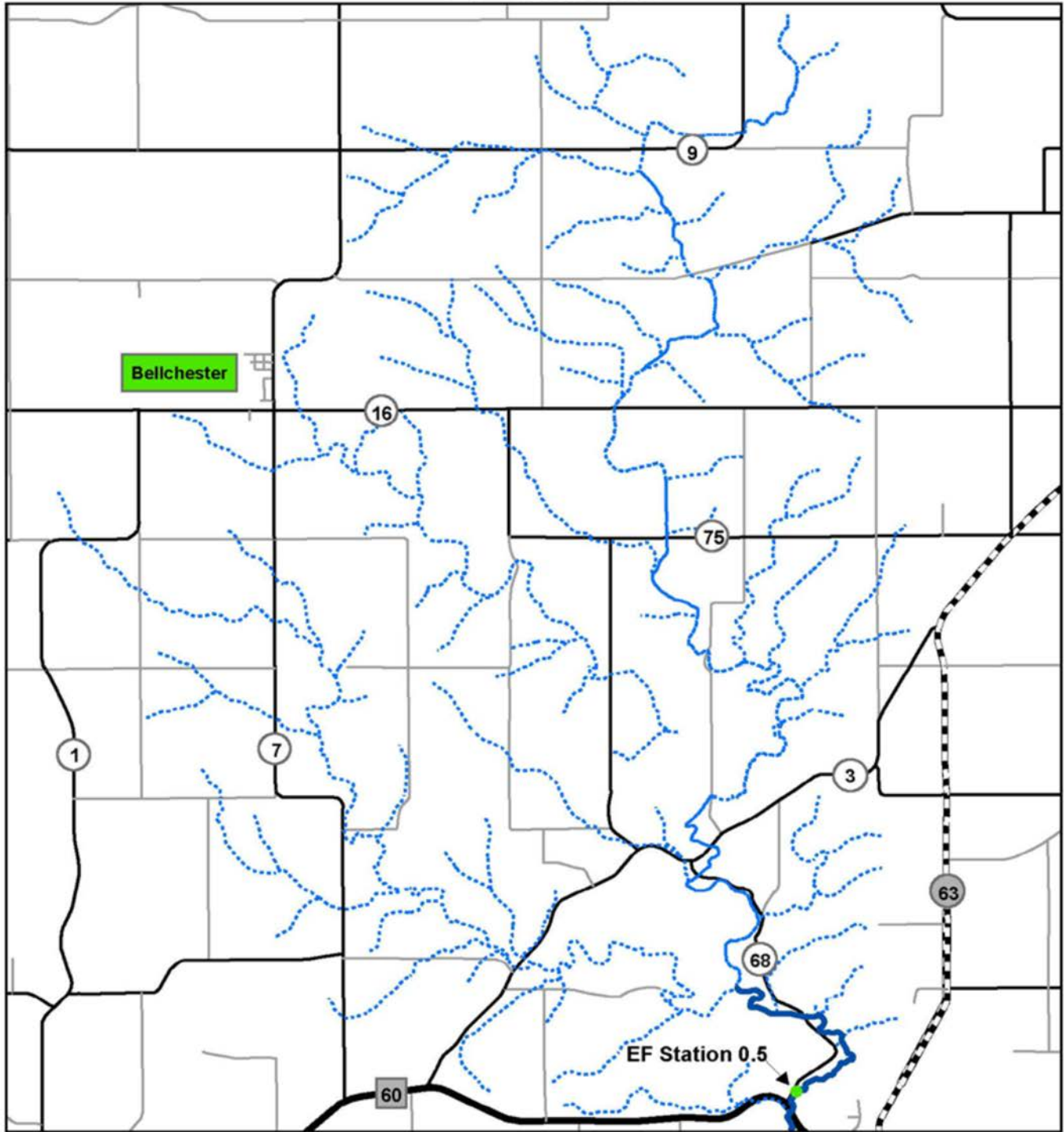
Station	River Mile	Similar Reach	Date	IBI	Land Use	Riparian Zone	Instream Substrate	Instream Cover	Channel Morphology	Final Score
0.5	0.5	1	10/16/2014	100	2.5	9	11.7	14	28	65.2
0.5	0.5	1	10/24/2013	90	3.75	8	9.6	14	28	63.35
0.5	0.5	1	9/28/2012	100	3.75	8	9.6	14	28	63.35
0.5	0.5	1	9/29/2011	105	3.75	8	9.6	14	28	63.5
0.5	0.5	1	10/5/2010	70	3.75	8	16.4	14	28	70.15
0.5	0.5	1	9/16/2009	105	3.75	9	16.4	14	28	71.15
0.5	0.5	1	10/1/2008	105	2.5	7.5	17.15	13	28	68.15
0.5	0.5	1	9/27/2007	85	3.5	7	17.05	13	28	67.55
0.5	0.5	1	10/5/2006	100	-	-	-	-	-	-
0.5	0.5	1	9/27/2005	105	-	-	-	-	-	-
0.5	0.5	1	9/24/2004	105	-	-	-	-	-	-
0.5	0.5	1	9/22/2003	100	-	-	-	-	-	-

References

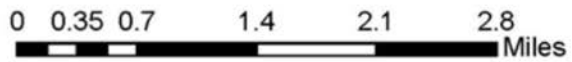
Fisheries Stream Survey Manual. 2007. Special Publication No. 165. Minnesota Department of Natural Resources.

Mundahl, N.D., and T.P. Simon. 1998. Development and application of an index of biotic integrity for coldwater streams of the upper Midwestern United States. Pages 383-415 In Thomas P. Simon (ed.). Assessing the Sustainability and Biological Integrity of Water Resources Using Fish Communities. CRC Press, Boca Raton, Florida.



Cold Spring Brook EF Station



EF Station UTM's
545185, 4904438



Credits and Signatures:

Field Crew: Randy Binder, Dan Spence, Jeff Weiss		
Report completed by:		
Name: Dan Spence	Title: Fisheries Specialist	Date: Jan. 20, 2015
Approved by:		
Area Fisheries Supervisor's Signature	Regional Fisheries Manager's Signature	Date:
		4.14.15