

STREAM ASSESSMENT



MINNESOTA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FISH AND WILDLIFE

Report Date: January 22, 2010

Region	Area	Stream Name	Tributary No.	Stream Length
3	Lake City	West Indian Creek	M-034-017	7.2 miles
County	Watershed Name, No.	Source (T, R, S)	Mouth (T, R, S)	
Wabasha	Zumbro River, 41	T109N, R11W, S21	T110N, R11W, S31	

Date(s) of Assessment: Station 5.40 - September 17, 2009

Assessment Purpose: Station 5.40 - Long-term monitoring – brown trout, brook trout, and white sucker populations
Natural reproduction check – brown trout population

Station	Similar Reach	Stream Mile	Length (ft)	Mean Width (ft)	Acres	Water Temp (F)	Air Temp (F)	Downstream UTM's	
								utm _x (↔)	utm _y (↓)
5.4	2	5.40	780	17.3	0.310	51	65	568328	4898689

Summary:

Station 5.4 on West Indian Creek is one of the 23 stations in the Long-Term Monitoring program in southeast Minnesota.

Estimated brown trout numbers were 731 adults/mile and 2,955 recruits/mile in this assessment. Number of brown trout ≥12 inches was estimated to be 121/mile, and the number ≥14 inches was estimated at 7/mile, but there were no brown trout ≥16 inches. Total brown trout biomass was estimated at 141.68 lbs/acre.

Brook trout are typically collected in this station during each assessment, but estimated numbers of brook trout were only 7 adults/mile and 0 recruits/mile. Brook trout biomass was estimated at 1.26 lbs/acre.

There were no white suckers sampled during this assessment.

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Fishery Characteristics – Population Estimates

Population Metrics

Station	5.4 (LTM)		
Date	September 17, 2009		
Gear	T & J		
Method	Two pass depletion		
Station length (ft)	780		

Population Estimate in Station, Adults

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	108	41.92				
95% CI	±4.92					
Brook trout	1	0.45				
95% CI	±0					
Rainbow trout	0	0				
95% CI	-					
Total trout	109	42.37				

Population Estimate in Station, Recruits (YOY or yearlings)

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	437	8.82				
95% CI	±30.72					
Brook trout	0	0				
95% CI	-					
Rainbow trout	0	0				
95% CI	-					
Total trout	437	8.82				

Population Estimate in Station, Total

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	545	50.74				
Brook trout	1	0.45				
Rainbow trout	0	0				
Total trout	546	51.19				

Population Estimate in Station, White Suckers (LTM stations only)

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Adults	0					
95% CI	-					
Recruits	0					
95% CI	-					
Total white sucker	0					

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West Indian Creek

Fishery Characteristics – Population Estimates (continued)

Population Estimate Summary

Station	5.4 (LTM)								
Date	September 17, 2009								
Species	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre
Brown trout	3,686	1,521	141.68						
Adults	731	302	117.06						
≥12 inches	121	50							
95% CI	±19.38	±7.99							
≥14 inches	7	3							
95% CI	±0	±0							
≥16 inches	0	0							
95% CI	-	-							
Recruits	2,955	1,219	24.63						
Brook trout	7	3	1.26						
Adults	7	3	1.26						
≥10 inches	0	0							
95% CI	-	-							
Recruits	0	0	0						
Rainbow trout	0	0	0						
Adults	-	-	-						
≥12 inches	-	-							
95% CI	-	-							
Recruits	-	-	-						
All trout	3,693	1,523	142.94						
Adults	738	305	118.31						
Recruits	2,955	1,219	24.63						

Population Estimate Summary (LTM stations only)

Species	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre
White sucker	0	0							
Adults	-	-							
Recruits	-	-							

Fishery Characteristics – Length Frequency in Station (Actual Catch)

Species	Brown trout	Brook trout	
Station	5.4 (LTM)	5.4 (LTM)	
Date	September 17, 2009	September 17, 2009	
Length Class			
0 – 2.9	68		
3.0 – 3.4	95		
3.5 – 3.9	102		
4.0 – 4.4	81		
4.5 – 4.9	37		
5.0 – 5.4	3		
5.5 – 5.9			
6.0 – 6.4			
6.5 – 6.9	2		
7.0 – 7.4	10		
7.5 – 7.9	13		
8.0 – 8.4	11		
8.5 – 8.9	12		
9.0 – 9.4	8		
9.5 – 9.9	3		
10.0 – 10.4	5		
10.5 – 10.9	5	1	
11.0 – 11.4	9		
11.5 – 11.9	10		
12.0 – 12.4	9		
12.5 – 12.9	5		
13.0 – 13.4	2		
13.5 – 13.9			
14.0 – 14.9	1		
15.0 – 15.9			
16.0 – 16.9			
17.0 – 17.9			
18.0 – 18.9			
19.0 – 19.9			
20.0 – 20.9			
21.0 – 21.9			
22.0 – 22.9			
23.0 – 23.9			
24.0 – 24.9			
25.0 – 25.9			
26.0 – 26.9			
27.0 – 27.9			
28.0 – 28.9			
29.0 – 29.9			
30.0+			
Sample Size	491	1	

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Fishery Characteristics – Non-game species

Species Sampled

Station	5.4 (LTM)		
Date	September 17, 2009		
Length (ft)	780		
Mean Width (ft)	20		
Species	Number	Number	Number
Sculpin sp.	141		
Stickleback, Brook	1		

Coldwater Index of Biotic Integrity (Mundahl and Simon 1998) for Station 5.4 (LTM)

Value	Score	Metric	IBI Rating Guidelines	
434		Total Captured		
4	10	Number of Species	105-120	Excellent
4	10	Number of Coldwater Species	70-100	Good
0	10	Number of Minnow Species	35-65	Fair
1	10	Number of Benthic Species	10-30	Poor
0	10	Number of Tolerant Species	0-5	Very Poor
0.34	0	Percent Salmonids as Brook Trout		
32.72	5	Percent Intolerant Individuals		
100	10	Percent Coldwater Individuals		
0	10	Percent White Suckers		
67.28	5	Percent Top Carnivores		
273.82	10	Number of Coldwater Individuals per 150m		
0	10	Number of Warmwater Individuals per 150m		
	100	TOTAL IBI SCORE (120 maximum)		
	83.33	Percent of maximum score		

Stream Characteristics – Minnesota Stream Habitat Assessment (MSHA) (Fisheries Stream Survey Manual)

MSHA Metric	Component score maximum	Component score of station
Surrounding Land Use	5	2.5
Riparian Zone	15	10
Instream Zone – Substrate	27	17.6
Instream Zone – Cover	17	16
Channel Morphology	36	28
	100	Final score 74.1

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Discussion of Fishery:

Station 5.4 on West Indian Creek is one of 23 stations in the Long-Term Monitoring program of southeast Minnesota. This station has been assessed 17 times in the fall and 17 times in the spring since 1981 (Table 1).

Estimated numbers of adult brown trout in this assessment (731/mile) is similar to the 17-assessment mean of 747/mile (Table 1). Estimated number of brown trout recruits was 2,955/mile, which is the highest value since 2001 (2,966/mile), and almost three times the amount of the 17-year mean (940/mile). Brown trout ≥ 12 inches were estimated at 121/mile, which is above the 17-year mean of 97/mile (Table 1). Estimated number of brown trout ≥ 14 inches was 7/mile, but there were no brown trout collected ≥ 16 inches in this assessment. Total brown trout biomass was estimated at 141.68 lbs/acre.

The brook trout population was estimated at 7 adults/mile and 0 recruits/mile (Table 2). Total brook trout biomass was estimated at 1.26 lbs/acre.

There were no white suckers collected during this assessment.

A section of West Indian Creek is currently being managed using a 12-16" protected slot with bait allowed. This area begins at the County 4 bridge and continues upstream to the stream source, and this LTM station is included in this stretch.

The Coldwater IBI (Mundahl and Simon 1998) score of 100 is the same last year (2008) but higher than in 2007 (85) and 2006 (90) (Table 3). This score reflects the absence of white suckers, and the reason for deductions was the high percentage of top carnivores, and the low percentage of brook trout.

The Minnesota Stream Habitat Assessment score was 74.1 and reflects the poor land use near the station (row crop agriculture) (Table 3). Moderate bank erosion was evident with moderate to substantial shade provided by the surrounding vegetation. Sand was a dominant substrate in pools, and embeddedness was moderate. Extensive amounts of cover were available in all types except undercut banks. Channel stability and sinuosity was moderate and channel development good.

This stream is currently designated as a high priority stream for the Long-Term Monitoring Program of southeast Minnesota. This requires annual measurements of discharge, geomorphology, fish habitat, and aquatic plants. In 2009, the discharge was 5.87 (Table 4), width to depth ratio was 7.2 (Table 5), entrenchment ratio was 1.3, and the stream was typed as a F4. The brown trout habitat quality index (HQI) score was 25 (Table 6). The highest percentage of cover for larger fishes was instream vegetation (42%), with water depth > 2 feet at 20.62% and overhanging vegetation at 8.11% (Table 7). American brooklime was abundant, reed canary, spotted touch-me-not, and water buttercup were common, small duckweed was occasional, and water cress and algae were rare (Table 8).

Credits and Signatures:

Field Crew:

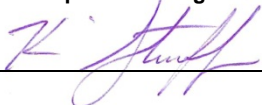
Melissa Konsti, James Melander, Jason Roloff, Doug Dieterman, John Hoxmeier, Derrick Casper

Report completed by:

Name:	Title:	Date:
Melissa L. Konsti	Fisheries Specialist	January 22, 2010

Approved by:

Fisheries Supervisor's Signature	Regional Fisheries Manager's Signature	Date:
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Credits and Signatures:

Field Crew:

Melissa Konsti, James Melander, Jason Roloff, Doug Dieterman, John Hoxmeier, Derrick Casper

Report completed by:

Name: Melissa L. Konsti	Title: Fisheries Specialist	Date: January 22, 2010
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Approved by:

Fisheries Supervisor's Signature 	Regional Fisheries Manager's Signature 	Date: 3-6-14
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Table 1. Trends in brown trout population metrics for West Indian Creek 1981-2009

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)
5.4	5.4	2	9/17/2009	731	2,955	121	7	0	141.68
5.4	5.4	2	9/22/2008	879	622	68	14	0	149.66
5.4	5.4	2	9/26/2007	1,579	144	163	27	0	267
5.4	5.4	2	10/3/2006	545	884	92	11	0	108.14
5.4	5.4	2	9/27/2005	766	92	32	0	0	94.6
5.4	5.4	2	10/12/2004	1,111	975	114	0	0	175.37
5.4	5.4	2	10/17/2003	973	1,168	252	16	0	193.4
5.4	5.4	2	9/16/2002	2,063	1,144	193	54	16	286
5.4	5.4	2	9/24/2001	2,115	2,966	199	40	13	312.81
5.4	5.4	2	9/20/2000	755	2,437	98	32	5	168.32
5.4	5.4	2	9/16/1999	725	669	79	20	7	115.2
5.4	5.4	2	9/26/1986	64	694	44	-	-	74
5.4	5.4	2	9/23/1985	109	58	53	-	-	44
5.4	5.4	2	9/24/1984	144	646	52	-	-	91
5.4	5.4	2	10/3/1983	51	144	33	-	-	29
5.4	5.4	2	10/5/1982	54	288	23	-	-	48
5.4	5.4	2	10/13/1981	32	94	32	-	-	25
			Fall Mean	747	940	97	20	4	136.7
5.4	5.4	2	3/29/2004	1,165	1,574	108	5	0	231.01
5.4	5.4	2	4/7/2003	1,505	1,137	45	5	0	216.78
5.4	5.4	2	3/29/2002	2,238	2,027	211	27	5	333.11
5.4	5.4	2	3/30/2001	1,302	3,518	132	40	7	290.5
5.4	5.4	2	3/15/2000	978	858	70	5	5	168.17
5.4	5.4	2	3/26/1999	1,670	1,605	214	148	43	309.4
5.4	5.4	2	4/3/1998	1,510	787	134	20	0	252.9
5.4	5.4	2	3/22/1995	657	787	47	0	0	124.1
5.4	5.4	2	3/22/1994	1,100	724	48	3	3	155
5.4	5.4	2	4/9/1993	535	3,712	58	10	0	225
5.4	5.4	2	3/26/1987	40	450	30	-	-	31
5.4	5.4	2	3/26/1986	122	16	37	-	-	40
5.4	5.4	2	3/22/1985	502	477	25	-	-	98
5.4	5.4	2	4/6/1984	109	97	28	-	-	23
5.4	5.4	2	4/4/1983	102	77	17	-	-	18
5.4	5.4	2	4/15/1982	51	45	10	-	-	10
5.4	5.4	2	4/28/1981	77	6	23	-	-	28
			Spring Mean	804	1,053	73	26	6	150.2

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Table 2. Trends in brook trout population metrics for West Indian Creek, 1993-2009

Station	River Mile	Similar Reach	Date	No./mile (Adult)	No./mile (Recruits)	No./mile (≥10 in.)	lbs/acre (all sizes)
5.4	5.4	2	9/17/2009	7	0	0	1.26
5.4	5.4	2	9/22/2008	7	14	0	0.92
5.4	5.4	2	9/26/2007	108	0	7	12
5.4	5.4	2	10/3/2006	11	11	0	1.21
5.4	5.4	2	9/27/2005	0	0	0	0
5.4	5.4	2	10/12/2004	5	5	0	0.7
5.4	5.4	2	10/17/2003	0	22	0	1
5.4	5.4	2	9/16/2002	32	0	0	3
5.4	5.4	2	9/24/2001	0	0	0	0
5.4	5.4	2	9/20/2000	0	0	0	0
5.4	5.4	2	9/16/1999	0	0	0	0
			Fall Mean	16	5	1	1.8
5.4	5.4	2	3/29/2004	5	0	0	0.8
5.4	5.4	2	4/7/2003	22	0	0	2.8
5.4	5.4	2	3/29/2002	0	0	0	0
5.4	5.4	2	3/30/2001	0	0	0	0
5.4	5.4	2	3/15/2000	0	0	0	0
5.4	5.4	2	3/26/1999	0	0	0	0
5.4	5.4	2	3/22/1995	0	0	0	0
5.4	5.4	2	3/22/1994	0	0	0	0
5.4	5.4	2	4/9/1993	6	3	0	-
			Spring Mean	3	0	0	0.4

Table 3. Trends in Index of Biotic Integrity (Mundahl and Simon 1998) and Minnesota Stream Habitat Assessment (Fisheries Stream Survey Manual 2007) scores for West Indian Creek, 2003-2009

Station	River Mile	Similar Reach	Date	IBI	Land Use	Riparian Zone	Instream Substrate	Instream Cover	Channel Morphology	Final Score
5.4	5.4	2	9/17/2009	100	2.5	10	17.6	16	28	74.1
5.4	5.4	2	9/22/2008	100	2.5	9.5	17	13	28	70
5.4	5.4	2	9/26/2007	85	2.5	8.5	17.2	13	25	66.2
5.4	5.4	2	10/3/2006	90	-	-	-	-	-	-
5.4	5.4	2	10/12/2004	105	-	-	-	-	-	-
5.4	5.4	2	3/29/2004	95	-	-	-	-	-	-
5.4	5.4	2	10/17/2003	105	-	-	-	-	-	-
5.4	5.4	2	4/7/2003	85	-	-	-	-	-	-

Table 4. Discharge measurements for West Indian Creek, years 2008-2009

Station	Date	Discharge (cfs)	Stage
5.4	8/27/2009	5.7808	**
5.4	8/20/2008	4.95	-

** Need to check with PCA for stage measurement at water quality site. Discharge measurement was taken at 12:30 pm.

Table 5. Geomorphologic measurement summary for West Indian Creek, years 2008-2009

Station	Date	Bankfull Width	Mean Depth	W/D	Bankfull XS Area	Flood Prone Width	Entrench. Ratio	Slope (water)	Sinuosity	Stream Type
5.4	7/23/2009	10.1	0.71	14.4	7.2	13.4	1.3	0.0033	1.2	F4
5.4	7/30/2008	10.5	0.68	15.5	7.1	13.9	1.3	0.0023	1.3	F4

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Table 6. Brown trout Habitat Quality Index (Thorn and Anderson 2001) for West Indian Creek, years 2008-2009

Station	Date	Shade	Pool Area	Pool Type	Fines	Cover	Erosion	Width	W/D	HQI Total
5.4	8/27/2009	4	3	3	1	3	4	4	3	25
5.4	8/20/2008	4	3	3	1	3	4	4	3	25

Table 7. Cover for larger fishes summary for West Indian Creek, years 2008-2009

Station	Date	UCB (%)	OHV (%)	WD (%)	OD (%)	BO (%)	ISV (%)	>2' (%)	>3' (%)
5.4	8/27/2009	0.66	8.11	3.04	0.14	2.33	42.0	20.62	9.48
5.4	8/20/2008	1.02	8.08	2.72	0	0.24	27.0	26.25	11.06

UCB = undercut bank, OHV = overhanging vegetation, WD = woody debris, OD = other debris, BO = boulders, ISV = instream vegetation

Table 8. Abundance of aquatic plants in West Indian Creek, years 2008-2009

Station	Date	American Brooklime	Reed Canary	Small Duckweed	Spotted touch-me-not	Water Buttercup	Water Cress	Algae
5.4	8/27/2009	A	C	O	C	C	R	R
5.4	8/20/2008	A	C	O	R	C	R	O

A = abundant, C = common, O = occasional, R = rare

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.
- Thorn, W.C., and C.S. Anderson. 2001. Evaluating habitat quality from stream survey variables. Minnesota Department of Natural Resources Fish Management Report 35.

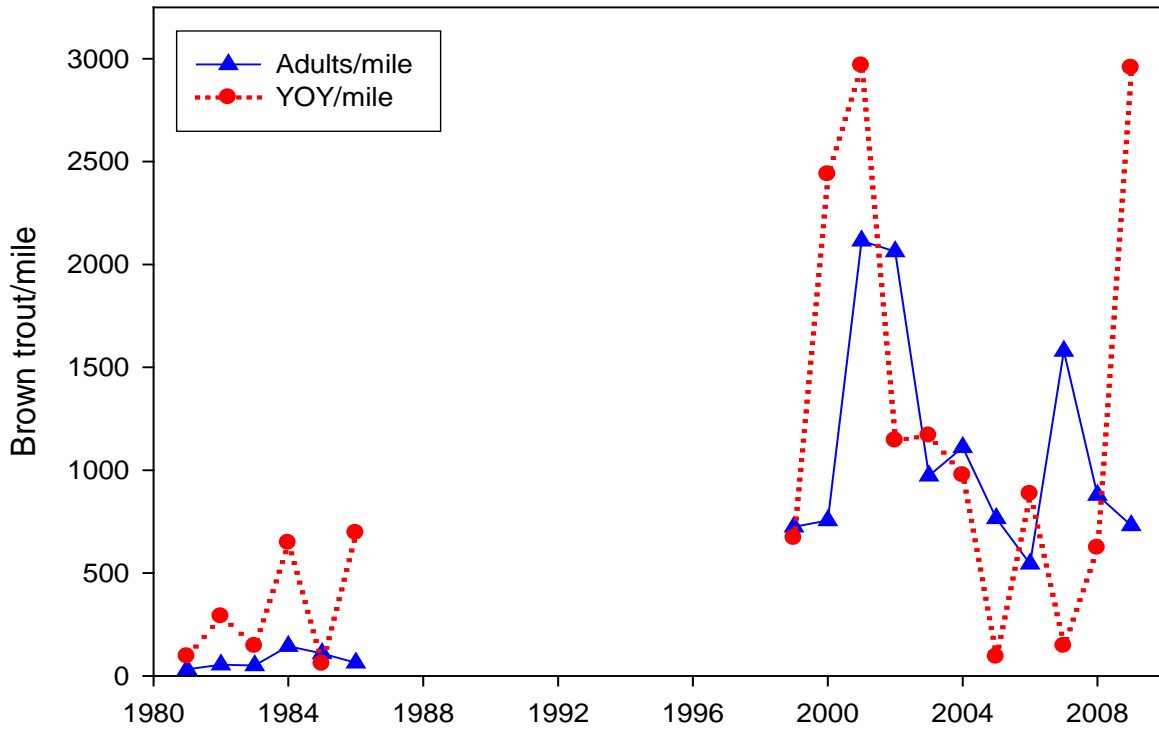


Figure 1. Abundance of brown trout adults and recruits (YOY) in West Indian Creek, fall 1981-2009

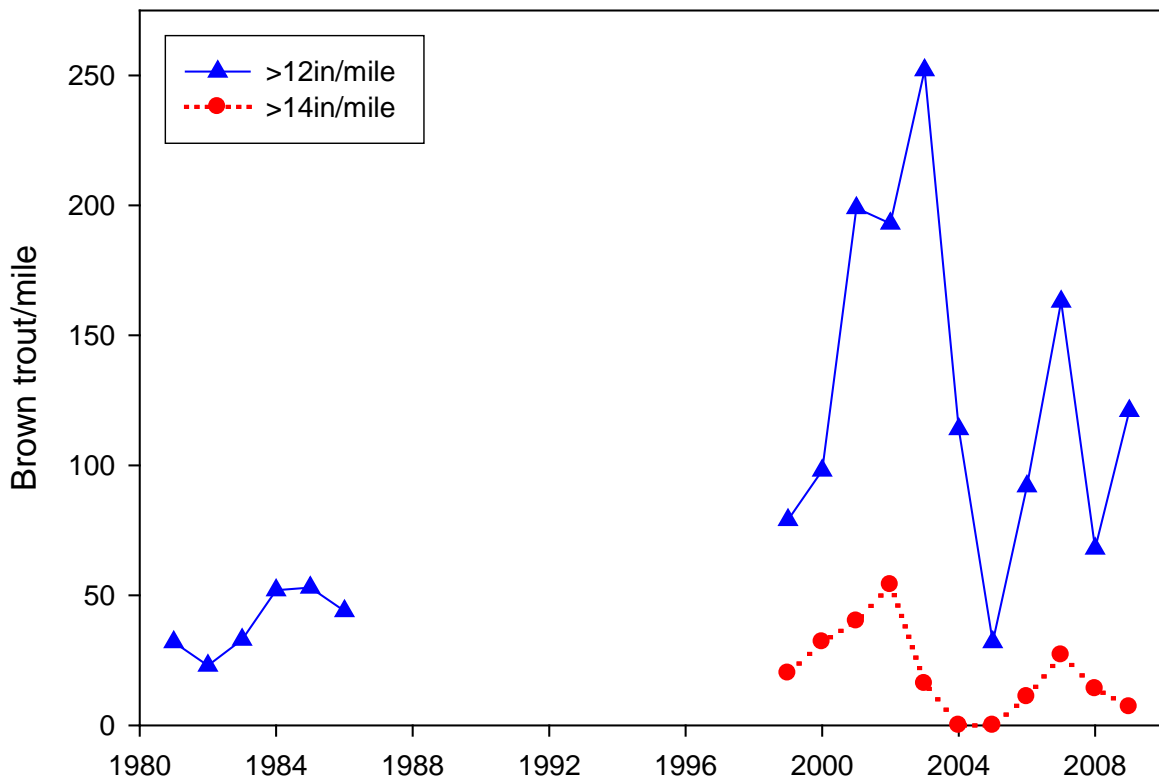


Figure 2. Abundance of brown trout ≥12 inches and ≥14 inches in West Indian Creek, fall 1981-2009

West Indian Creek

M-34-17

Date: December 10, 2009
 Map For: Population Assessment
 Prepared By: Jim Melander
 Fisheries Office: Lanesboro
 Mouth TRS: 110-11-31
 Source TRS: 109-11-21
 Counties: Wabasha

Reach Code			
	1		3A
	1A		3B
	1B		4
	1C		5
	2		6
	2A		7
	2B		8
	3		



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 Division of Fisheries

Electrofishing Station Location.



0 0.4 0.8 1.2 Miles

