

STREAM ASSESSMENT



MINNESOTA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FISH AND WILDLIFE

Report Date: December 22, 2008

Region	Area	Stream Name	Tributary No.	Stream Length
3	Lanesboro	West Indian Creek	M-34-17	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: September 22, 2008

Assessment Purpose: 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	55	73	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 879 adults/mile and 622 recruits/mile in this assessment. Number of brown trout ≥12 inches was estimated to be 68/mile, and the number ≥14 inches was estimated at 14/mile, but there were no brown trout ≥16 inches. Total brown trout biomass was estimated at 149.7 lbs/acre.

Brook trout are frequently collected in this station, but estimated numbers of brook trout was only 7 adults/mile and 14 recruits/mile. Brook trout biomass was estimated at 0.92 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 22, 2008		
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	130	51.70				
95% CI	±14.49					
Brook trout	1	0.31				
95% CI	±0					
Rainbow trout	0	0				
95% CI	-					
Total trout	131	52.01				

Population Estimate in Station, Recruits (YOY or yearlings)

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	92	1.90				
95% CI	±10.70					
Brook trout	2	0.02				
95% CI	±0					
Rainbow trout	0	0				
95% CI	-					
Total trout	94	1.92				

Population Estimate in Station, Total

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	222	53.60				
Brook trout	3	0.33				
Rainbow trout	0	0				
Total trout	225	53.93				

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					

Fishery Characteristics – Population Estimates (continued)

Population Estimate Summary

Station	5.4 (LTM)								
Date	September 22, 2008								
Species	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre
Brown trout	1,501	619	149.66						
Adults	879	363	144.36						
≥12 inches	68	28							
95% CI	±0	±0							
≥14 inches	14	6							
95% CI	±0	±0							
≥16 inches	0	0							
95% CI	-	-							
Recruits	622	256	5.30						
Brook trout	20	8	0.92						
Adults	7	3	0.87						
≥10 inches	0	0							
95% CI	-	-							
Recruits	14	6	0.06						
Rainbow trout	0	0	0						
Adults	-	-	-						
≥12 inches	-	-							
95% CI	-	-							
Recruits	-	-	-						
All trout	1,521	627	150.58						
Adults	886	365	145.22						
Recruits	635	262	5.36						

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	-	-							

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Fishery Characteristics – Length Frequency in Station (Actual Catch)

Species	Brown trout	Brook trout	
Station	5.4 (LTM)	5.4 (LTM)	
Date	September 22, 2008	September 22, 2008	
Length Class			
0 – 2.9	1		
3.0 – 3.4	22	2	
3.5 – 3.9	27		
4.0 – 4.4	24		
4.5 – 4.9	8		
5.0 – 5.4	2		
5.5 – 5.9			
6.0 – 6.4	2		
6.5 – 6.9	2		
7.0 – 7.4	6		
7.5 – 7.9	5		
8.0 – 8.4	6		
8.5 – 8.9	3		
9.0 – 9.4	12	1	
9.5 – 9.9	15		
10.0 – 10.4	17		
10.5 – 10.9	17		
11.0 – 11.4	13		
11.5 – 11.9	9		
12.0 – 12.4	6		
12.5 – 12.9	1		
13.0 – 13.4	1		
13.5 – 13.9			
14.0 – 14.9			
15.0 – 15.9	2		
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	201	3	

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Fishery Characteristics – Non-game species

Species Sampled

Station	5.4 (LTM)		
Date	September 22, 2008		
Length (ft)	780		
Mean Width (ft)	20		
Species	Number	Number	Number
Sculpin sp.	456		
Stickleback, Brook	6		

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

Value	Score	Metric	IBI Rating Guidelines	
619		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
1.910828	0	Percent Salmonids as Brook Trout		
74.15186	10	Percent Intolerant Individuals		
100	10	Percent Coldwater Individuals		
0	10	Percent White Suckers		
25.36349	0	Percent Top Carnivores		
390.5461	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	9.5
Instream Zone – Substrate	27	17
Instream Zone – Cover	17	13
Channel Morphology	36	28
	100	Final score 70

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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 16 times in the fall and 17 times in the spring since 1981 (Table 1).

Estimated numbers of adult brown trout in this assessment (879/mile) is higher than the 16-assessment mean of 748/mile. The most adult brown trout estimated in the station occurred in the fall 2001 assessment at 2,115 adult brown trout/mile. Numbers of brown trout recruits in this assessment (622/mile) are below the 16-assessment mean of 814/mile.

Brown trout ≥ 12 inches were estimated at 68/mile, which is below the sixteen-assessment mean of 95 brown trout ≥ 12 inches/mile (Table 1). Estimated number of brown trout ≥ 14 inches was 14/mile, but there were no brown trout collected ≥ 16 inches in this assessment. Total brown trout biomass in this assessment (149.7 lbs/acre) is more than the 16-assessment mean of 136.3 lbs/acre.

The brook trout population was estimated at 7 adults/mile and 14 recruits/mile (Table 2). Total brook trout biomass was estimated at 0.92 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 higher than in 2006 (90) and 2007 (85) (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 70 and reflects the poor land use near the station (row crop agriculture) (Table 3). Little bank erosion was evident with light to moderate shade provided by the surrounding vegetation. Sand was a dominant substrate in pools, and embeddedness was moderate. Moderate amounts of cover were available in all types except boulders. 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 2008, the discharge was 5.4 (Table 4), width to depth ratio was 7.1 (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 water depth > 2 feet (26.25%), and there was 8.08% of overhanging vegetation (Table 7). American brooklime was abundant, reed canary and water buttercup were common, small duckweed and algae were occasional, and spotted touch-me-not and water cress were rare (Table 8).

Credits and Signatures:

Field Crew:

Melissa Konsti, James Melander, Vaughn Snook, Jason Roloff

Report completed by:

Name:	Title:	Date:
Melissa L. Konsti	Fisheries Specialist	December 22, 2008

Approved by:

Area Fisheries Supervisor's Signature	Regional Fisheries Manager's Signature	Date:
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Table 1. Trends in brown trout population metrics for West Indian Creek 1981-2008

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	9/22/2008	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	748	814	95	21	4	136.3
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, 1993-2008

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	9/22/2008	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	1.9
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, 2003-2008

Station	River Mile	Similar Reach	Date	IBI	Land Use	Riparian Zone	Instream Substrate	Instream Cover	Channel Morphology	Final Score
5.4	5.4	2	9/22/2008	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

Station	Date	Discharge (cfs)
5.4	8/20/2008	4.95

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

Station	Date	Bankfull Width	Mean Depth	W/D	Bankfull XS Area	Flood Prone Width	Entrench. Ratio	Slope (water)	Sinuosity	Stream Type
5.4	7/30/2008	10.5	0.68	7.1	15.5	13.9	1.3	0.0023	1.3	F4

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

Station	Date	Shade	Pool Area	Pool Type	Fines	Cover	Erosion	Width	W/D	HQI Total
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

Station	Date	UCB (%)	OHV (%)	WD (%)	OD (%)	BO (%)	SSM (%)	>2' (%)	>3' (%)
5.4	8/20/2008	1.02	8.08	2.72	0	0.24	27	26.25	11.06

UCB = undercut bank, OHV = overhanging vegetation, WD = woody debris, OD = other debris, BO = boulders, SSM = submerged macrophytes

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

Station	Date	American Brooklime	Reed Canary	Small Duckweed	Spotted touch-me-not	Water Buttercup	Water Cress	Algae
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.

West Indian Creek - Brown Trout Abundance

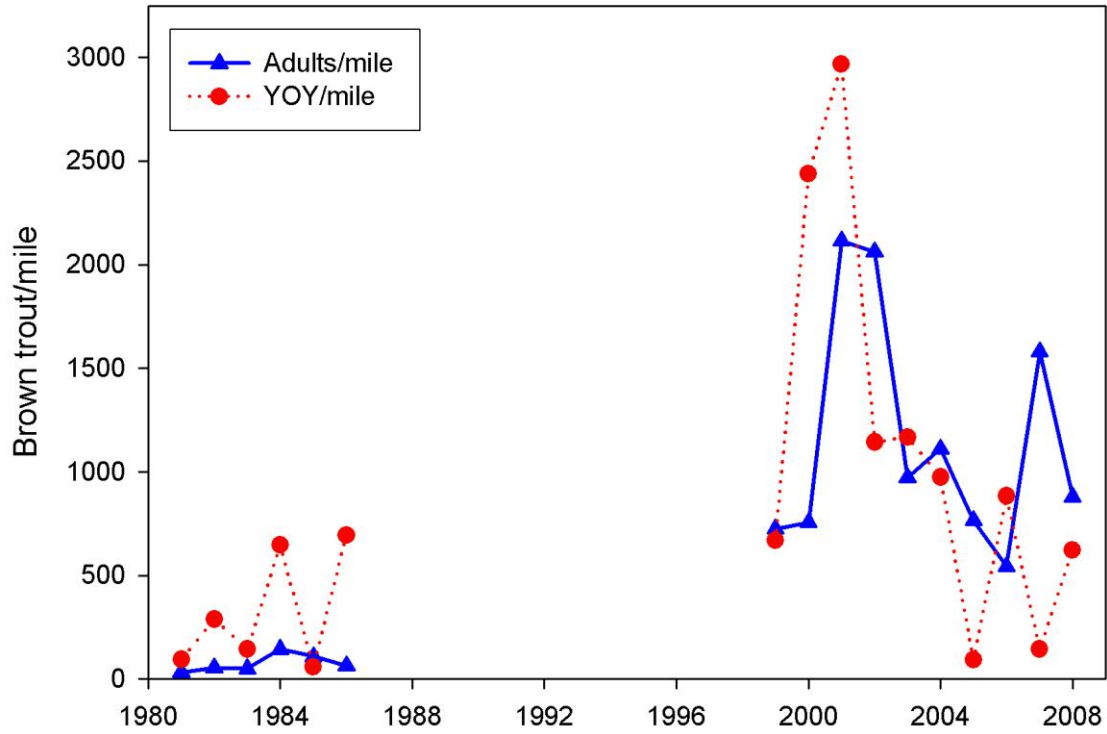


Figure 1. Abundance of brown trout adults and recruits (YOY) in West Indian Creek, fall 1981-2008

West Indian Creek - Brown Trout Abundance

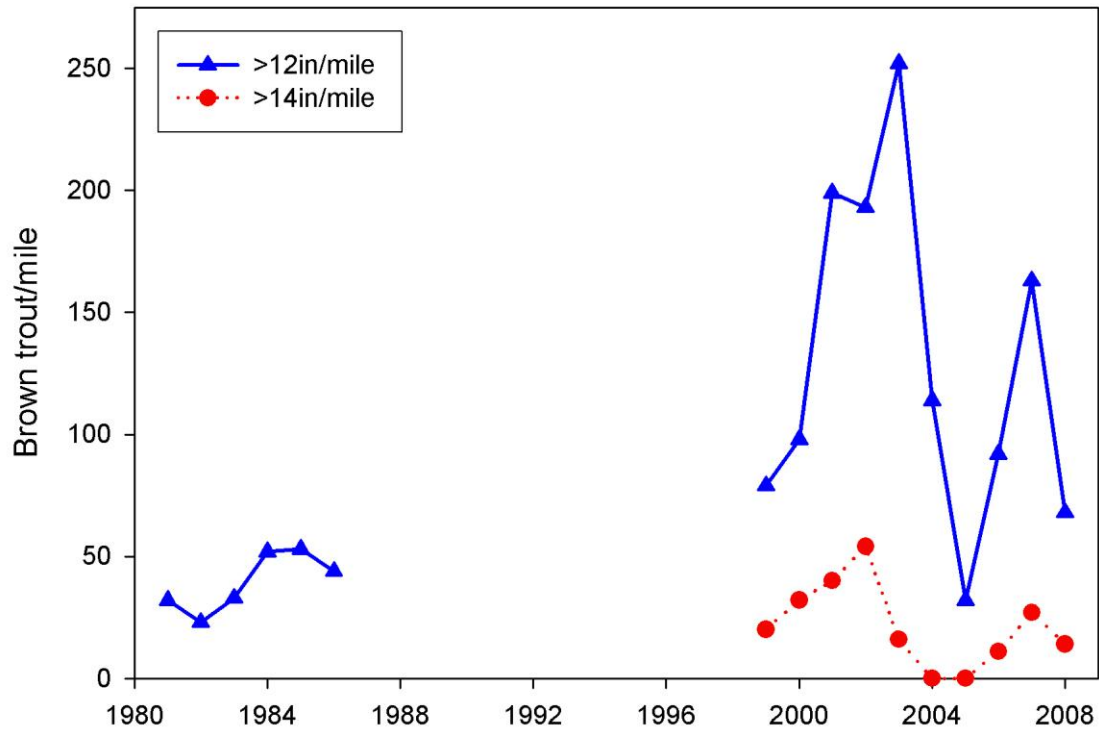
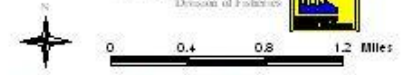
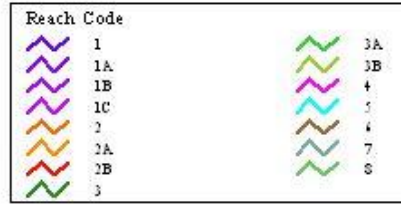


Figure 2. Abundance of brown trout ≥ 12 inches and ≥ 14 inches in West Indian Creek, fall 1981-2008

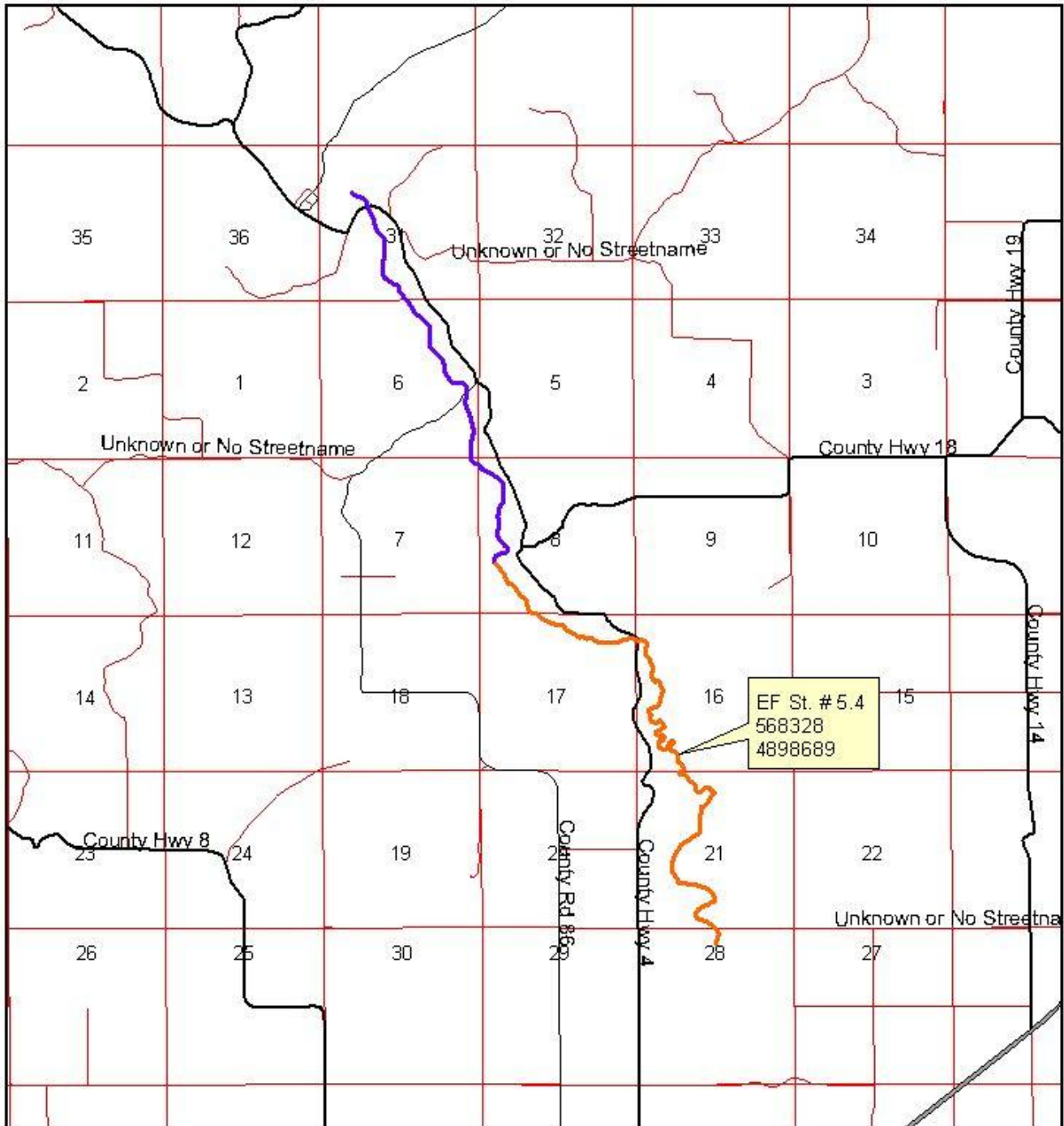
West Indian Creek

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Date: January 05, 2009
 Map For: Population Assessment
 Prepared By: Jim Melander
 Fisheries Office: Lanesboro
 Mouth TRS: 110-11-31
 Source TRS: 109-11-21
 Counties: Wabasha



Electrofishing Station Location.



Map for population assessment maps to the valley a pr