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DIVISION OF FISHERIES AND WILDLIFE

Gamefish Assessment Report

Spring Gamefish Assessment on the Mississippi River from Little Falls Dam to Blanchard Dam,

May 11, 2012,

River Miles 957 to 966.

By

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ABSTRACT

A special gamefish assessment of the Mississippi River (M-1) from Little Falls Dam to Blanchard Dam was conducted on May 11, 2012. Population data was gathered via boat electrofishing to compare to previous assessments on this stretch of the Mississippi River. An attempt was made to capture all gamefish encountered during sampling. A total of 29 northern pike, three muskellunge, 27 channel catfish, two bluegill, 211 smallmouth bass, and 70 walleye were sampled in two boat electrofishing stations totaling 1.75 hours of electrofishing effort. Catch per unit of effort (CPUE) of channel catfish (15.4/hour), northern pike (16.6/hour), smallmouth bass (120.6/hour) and walleye (40.0/hour) were the highest ever recorded on this section of the Mississippi River. Catch rates for other species captured were within the normal range when compared to previous assessments. Age and length distributions for all gamefish were similar to that observed in prior assessments on this section of the Mississippi River.

STUDY AREA

The Mississippi River from Little Falls Dam to Blanchard Dam covers approximately 9.1 miles (Figure 1). Little Falls and Blanchard Dams are hydroelectric power generating facilities owned by Minnesota Power Company (MP&L). Little Falls Dam is located within the City of Little Falls and Blanchard Dam is located approximately 3.25 miles northwest of Royalton, Minnesota. This stretch of the river flows primarily through residential and agricultural lands. Public access is available at the Pike Creek Landing (state owned) located on the west side of the river approximately 2.1 miles south of Little Falls Dam, and immediately upstream of Blanchard Dam on the east side of the river (MP&L owned). The entire river is accessible by boat with the exception of the first mile of the river below Little Falls Dam. In general, from the Little Falls Dam tailwater downstream one mile, the river is characterized by riffle and run habitat due to significant gradient. Substrates are typically coarse and include boulder, cobble, gravel and sand in this section of the river and granite bedrock is also common. The remainder of the river in this section is deeper and reservoir like. Substrates are primarily sand and gravel. The river in the entire study area is important for recreational activities and is used by anglers, campers, canoeists, hunters, recreational boaters, swimmers and wildlife and nature viewers. Residential development within the riparian zone is moderate to heavy along the entire east bank, and the west bank within the City of Little Falls. The rest of the west bank has light to moderate residential development and moderate agricultural development.

Two major tributaries, Pike Creek and the Swan River, enter the Mississippi River between Little Falls and Blanchard Dams and drain predominately agricultural lands from the west. Soils in the watershed are predominately fine sandy loam and sandy loam types. According to the Ecological Classification System the west portion of the watershed is considered part of the hardwood hills ecoregion, while the east is part of the Anoka sandplain and Mille Lacs uplands ecoregion. Pre-

settlement vegetation types were diverse and included aspen-oak land, big woods hardwoods, oak openings and barrens, mixed white and red pine, and aspen-birch.

METHODS

Two daytime electrofish runs were established in areas known to hold gamefish in the spring (Figure 2). These stations have been replicated in assessments completed from 1994-1997, in even years from 2000 through 2008, and 2012. Timing of electrofishing corresponded to river water temperatures approaching 60° F. Prior surveys have shown that gamefish on the river are vulnerable to boat electrofishing at these temperatures. Stations were established in tailwater areas, the downstream ends of islands, channel backwaters, long runs along banks, and anywhere coarse substrates and a lack of current existed. A Smith-Root GPP 5.0 boom shocker boat rigged with two dropper type anodes and a hull cathode was used to sample fish. An attempt was made to capture all gamefish encountered. Gamefish captured were identified, enumerated and measured, and with the exception of catfish, a scale sample taken for age determination prior to release.

Mississippi River discharge information was obtained from the USGS Water Resources website. Discharge was measured by the USGS at Gaging Station #05267000 located near Royalton, MN. Water temperature data was obtained from HOBO Water Temp Pro (Onset Corporation) temperature recorders deployed from April through October.

RESULTS AND DISCUSSION

Gamefish Assessment

A total of seven different gamefish species were sampled in 1.75 hours of electrofishing effort in two stations combined on May 11 2012 (Table 1). Species captured included: northern pike, muskellunge, channel catfish, bluegill, smallmouth bass, largemouth bass and walleye. Smallmouth bass were the most abundant species in the catch. A total of 211 smallmouth were sampled in 2012 for a CPUE of 120.6/hour. This represented the highest number and catch rate observed on this stretch of the Mississippi River. Catch rates in prior assessments from 1994 through 1997, and even years from 2000 through 2008 ranged from 13.0/hour (n=12) in 1996 to 68.9/hour (n=117) in 2008 (Table 2). High catch rates observed in 2012 may be attributed to ideal flow conditions and precise timing of sampling during peak spawning season. Mean total length of smallmouth bass captured in the 2012 assessment was 14.6 inches and individuals ranged from 3.3 to 20.3 inches in total length (Table 3). Smallmouth bass greater than 16.0 inches comprised 33.2% of the catch. Calculated PSD values for bass have historically been very high ranging from 94 in 1994 to 100 in 1995-1997 and 2000 (Figure 3). The PSD value calculated in 2012 was 85.5, the lowest value calculated for this section of the Mississippi River, and is explained by an increased number of age 2 individuals in the sample. PSD values may be biased high due to sampling during spawning season when mature fish dominate the catch.

Scale samples were taken from a subsample of 124 smallmouth bass for age determination. Fish age 1 through 11 were present in the subsample suggesting that consistent recruitment is characteristic of this stretch of the river. Length at annulus formation is reported in Table 4. In general, smallmouth exceeded quality and preferred size (11.0 and 13.8 inches) in their third and fourth years and attained memorable size (16.9 inches) by age 7. Trophy individuals exceeding 20.0 inches were typically age 10 or older. Length at annulus formation was similar to that seen on other sections of the

Mississippi River and growth is normal to fast when compared to other Midwest smallmouth bass populations.

A total of 70 walleye averaging 12.6 inches and ranging from 4.6 to 24.9 inches were captured during the 2012 assessment (Table 3). CPUE for walleye in 2008 sampling was 40.0/hour, which was the highest catch rate ever observed on this stretch of the river. CPUE in previous assessments ranged from 4.6/hour in 1994 to 36.5/hour in 2008 (Table 2). A total of 39 walleye were aged with ages 2 through 5, 7 and 8 represented in the sample (Table 4). Age 2 through 4 individuals were most common comprising 84.6% of the aged sample. Walleye growth was average for ages 2 and 3 and slow for ages 4 through 8 when compared to area means.

The northern pike catch rate (CPUE=16.6/hour) was the highest catch rate calculated for this stretch of the Mississippi River (Table 2). Catch rates in past surveys ranged from 4.3/hour in 2006 to 9.8/hour in 1996. Twenty-nine northern pike averaging 21.1 inches and ranging from 10.4 to 26.6 inches in total length were sampled (Table 3). Ages 1 through 5 and 7 were represented in the catch in 2012, with ages 3 and 4 comprising 65.5% of the catch (Table 4). Growth rate was in the normal range when compared to area means.

A total of 27 channel catfish were captured during 2012 sampling for a catch rate of 15.4/hour (Table 2). Channel catfish were reported rarely by local anglers and were not sampled during an assessment until 2006. Catfish numbers appear to be increasing in abundance. CPUE in the 2006 and 2008 assessments were 1.4/hour and 2.3/hour respectively. Catfish averaged 24.1 inches in total length and ranged from 18.2 inches to 28.3 inches (Table 3). No aging structures were taken during sampling in 2012.

A total of two bluegill were sampled for a catch rate of 1.1/hour (Table 2). Bluegills are only occasionally sampled on this stretch of the river as flow/habitat conditions do not always allow

spawning success. Bluegill captured averaged 6.4 inches in total length and ranged from 6.0 to 6.7 inches (Table 3).

Muskellunge catch rates (CPUE=1.7/hour, n=3) were within the normal range when compared to prior assessments on this stretch of the Mississippi River (Table 2). Muskellunge have been sampled in low numbers in 8 of 10 assessments with catch rates ranging from 0.0/hour in 1997 and 2004 to 3.5/hour in 2008. Muskellunge captured in 2012 averaged 19.0 inches in total length and ranged from 16.3 inches to 20.6 inches (Table 3). Ages 1 and 2 were present in the sample (Table 4). Muskellunge are self-sustaining in the Mississippi River and the presence of different year classes suggests fairly consistent recruitment has occurred in recent years. In the past, angler diaries have proven to be a better assessment tool for muskellunge on the river than active electrofishing sampling methods.

One largemouth bass (16.9 inches) was captured during the 2012 assessment for a catch rate of 0.6/hour. Largemouth bass have now been observed in the last three assessments in low numbers. Habitat/conditions in this section of the river do not appear to be well suited to this species.

Hydrology

Mississippi River discharge information was obtained from the USGS Water Resources website. Daily discharge has been monitored near Royalton, MN since 1924. Flow measured at Royalton ranged from 254 cfs on November 25, 1936 to 38,200 cfs on April 8, 1997. Discharge in 2012 deviated from historical patterns following fairly normal spring flows. Heavy rains in mid-May and again in mid-June caused extremely high discharge in June and July (Figure 4). Drought conditions developed after mid-June causing flows to fall below normal by the first part of September. Low flows persisted into winter. Peak discharge in 2012 occurred on June 28 (24,800 cfs) while low flows for the year occurred on October 6 (1050 cfs). Discharge during the assessment was 9,390 cfs on May 11.

Table 1. List of species captured, scientific name, and number caught at each electrofishing station, and total number of fish caught on the Mississippi River from Little Falls Dam to Blanchard Dam, 2012.

Species	Scientific Name	Number Caught	
		EF1	EF2
Northern pike	<i>Esox lucius</i>	11	18
Muskellunge	<i>Esox masquinongy</i>	1	2
Channel catfish	<i>Ictalurus punctatus</i>	20	7
Bluegill	<i>Lepomis macrochirus</i>	0	2
Smallmouth bass	<i>Micropterus dolomieu</i>	98	113
Largemouth bass	<i>Micropterus salmoides</i>	1	0
Walleye	<i>Sander vitreus</i>	30	40

Table 2. Gamefish catch per unit effort (CPUE) history on the Mississippi River from Little Falls Dam to Blanchard Dam.

Species	Survey Year									
	2012	2008	2006	2004	2002	2000	1997	1996	1995	1994
Black crappie	0.0	2.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bluegill	1.1	0.6	9.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Channel catfish	15.4	2.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Largemouth bass	0.6	1.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Muskellunge	1.7	3.5	0.7	0.0	1.0	1.4	0.0	2.2	2.0	1.5
Northern pike	16.6	4.6	4.3	6.5	8.5	8.0	7.6	9.8	9.0	6.1
Smallmouth bass	120.6	68.9	67.4	63.2	57.3	39.9	31.1	13.0	29.0	21.4
Walleye	40.0	36.5	20.6	31.6	21.1	30.4	12.1	16.3	32.0	4.6
Total Effort Hours	1.75	1.73	1.41	1.55	1.99	1.38	1.32	0.92	1.00	1.31

Table 3. Length frequency distribution and mean length of gamefish species sampled on the Mississippi River from Little Falls Dam to Blanchard Dam, Morrison County, MN.

Length Group (inches)	Species						
	NOP	MUE	CCF	BLG	SMB	LMB	WAE
<3.0							
3					1		
4							2
5					1		
6				2	2		1
7					3		
8					4		2
9					10		6
10	1				13		6
11					3		13
12					12		14
13	1				9		9
14	1				36		7
15					47		3
16	1	1			30	1	1
17					20		1
18	3		1		14		2
19	2		2		5		2
20	4	2			1		
21							
22	4		3				
23	7		4				
24	1		8				1
25	3		2				
26	1		6				
27							
28			1				
29							
30							
30+							
Total	29	3	27	2	211	1	70
Mean Length (in)	21.1	19.0	24.1	6.4	14.6	16.9	12.6

Table 4. Mean Length at age of capture for smallmouth bass, northern pike, walleye, and muskellunge from the Mississippi River, between Little Falls and Royalton, MN, 2012.

Smallmouth Bass											
	Cohort										
Year Class	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11
Mean Length	5.6	7.6	10.2	12.4	14.3	15.6	16.6	17.2	18.0	19.0	18.6
N=	1	8	22	14	24	28	9	7	5	5	1
Range	5.6	6.8-8.9	8.7-12.4	10.9-14.7	12.4-15.7	12.0-16.9	14.3-18.2	15.6-18.2	16.9-18.7	17.8-19.8	18.6
Northern Pike											
	Cohort										
Year Class	2011	2010	2009	2008	2007	2006	2005				
	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7				
Mean Length	12.6	17.6	21.2	22.1	24.3	n.a.	25.6				
N=	2	3	9	10	4	0	1				
Range	10.4-14.8	13.8-20.7	16.0-26.6	18.0-24.4	23.0-25.5	n.a.	n.a.				
Walleye											
	Cohort										
Year Class	2011	2010	2009	2008	2007	2006	2005	2004			
	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8			
Mean Length	n.a.	11.3	11.9	13.6	14.6	n.a.	18.0	18.9			
N=	0	9	17	7	3	0	2	1			
Range	n.a.	8.9-13.1	9.8-14.8	12.6-14.5	13.3-15.7	n.a.	16.3-19.6	n.a.			
Muskellunge											
	Cohort										
Year Class	2011	2010	2009								
	Age 1	Age 2	Age 3								
Mean Length	n.a.	16.3	20.3								
N=	0	1	2								



Mississippi River - Little Falls Dam to Blanchard Dam Study Area



Major Watershed 1, Mississippi River
Kittle Number M-1, Mississippi River
Clearwater, Hubbard, Beltrami, Cass, Itasca, Aitkin,
Crow Wing, Morrison, Benton, and Stearns
Counties

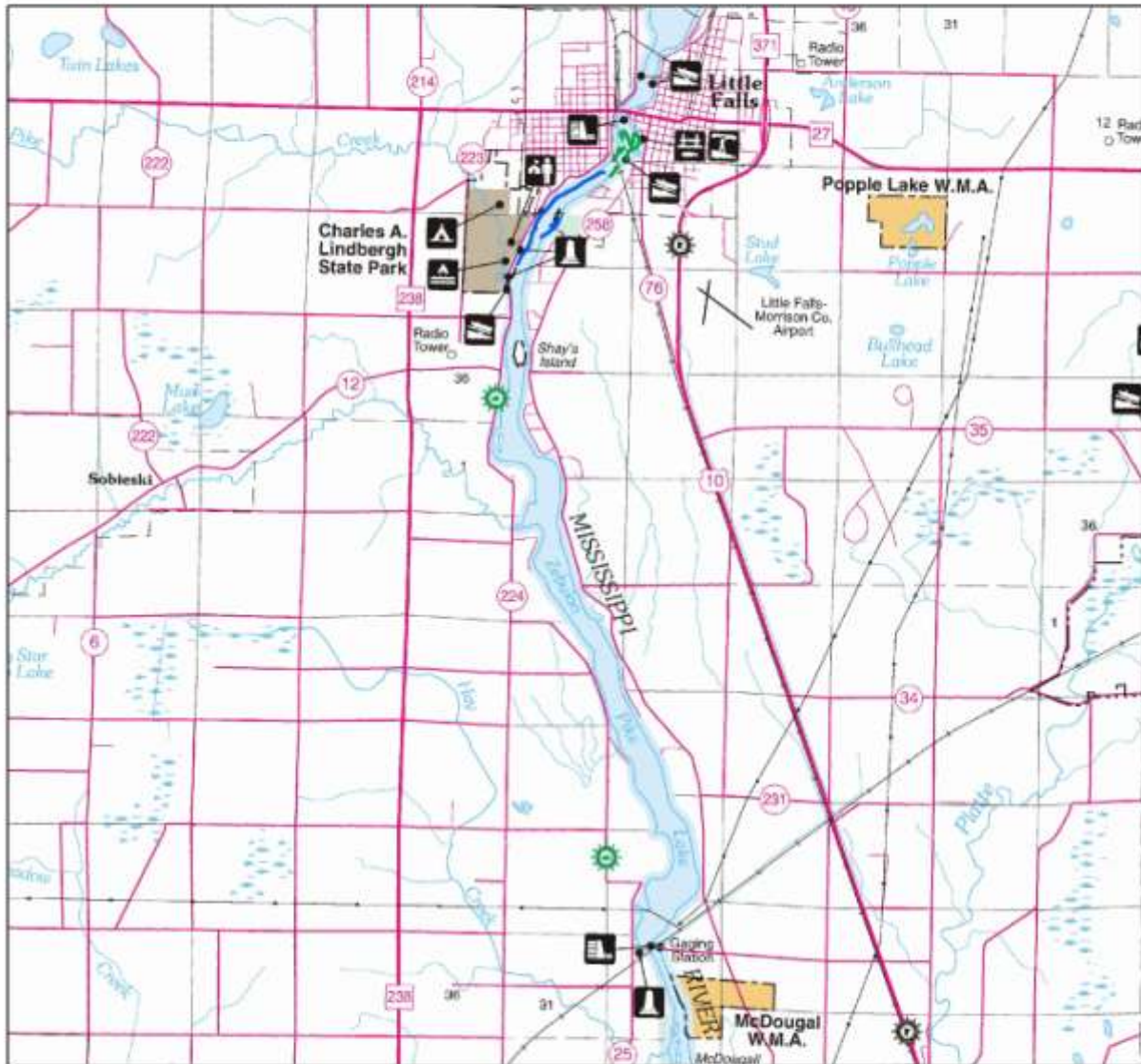


Legend

DNR PRIM Map showing the section of the Mississippi River from Little Falls Dam to Blanchard Dam, 2012.



Mississippi River - Little Falls Dam to Blanchard Dam Electrofishing Stations



Major Watershed 1. Mississippi River
Kittle Number M-1, Mississippi River
Clearwater, Hubbard, Beltrami, Cass, Itasca, Aitkin,
Crow Wing, Morrison, Benton, and Stearns
Counties



0 0.25 0.5 1 1.5 2 Miles

Legend

- Zeb_EF1
- Zeb_EF2

DNR PRIM Map showing electrofishing sampling stations on the Mississippi River from Little Falls Dam to Blanchard Dam, May 2012.

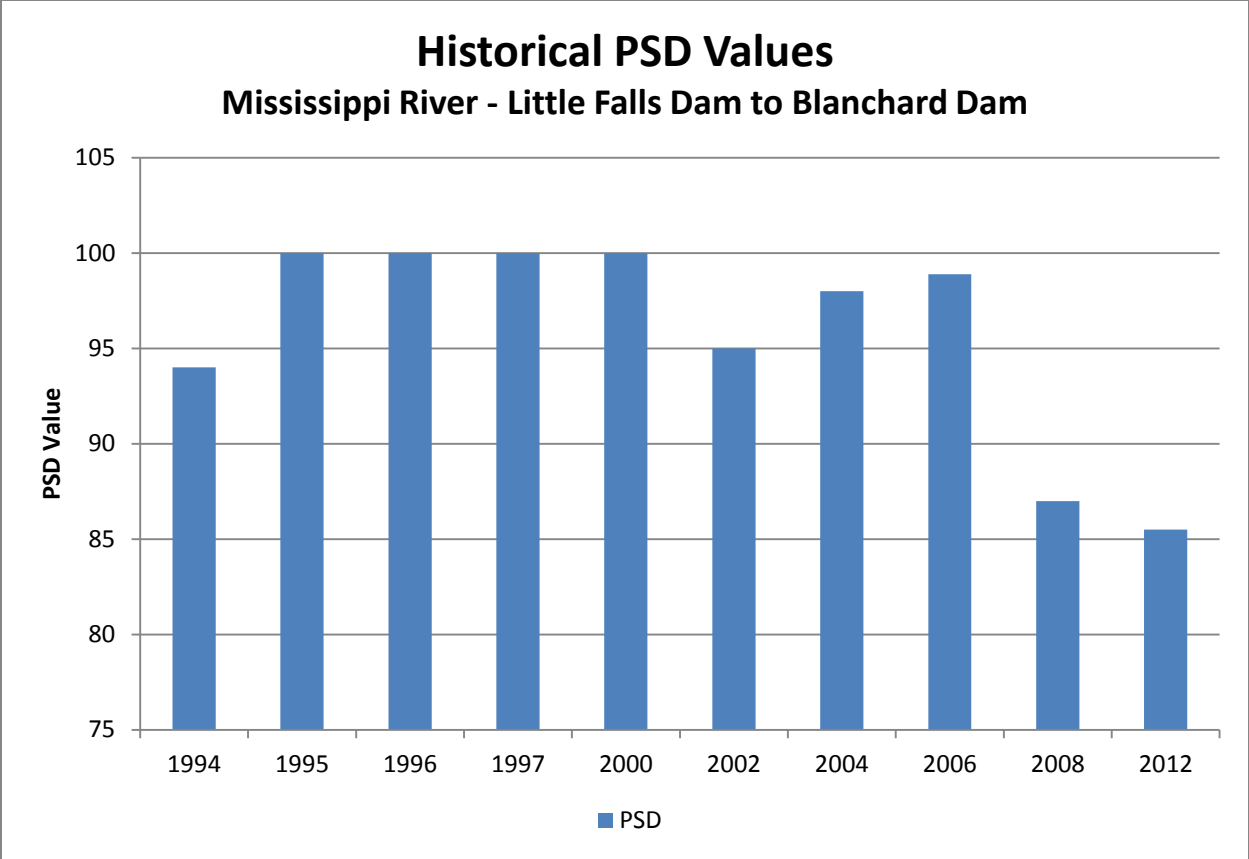


Figure 3. Calculated PSD values from smallmouth bass assessments completed on the Mississippi River from Little Falls Dam to Blanchard Dam from 1994 through 2012.

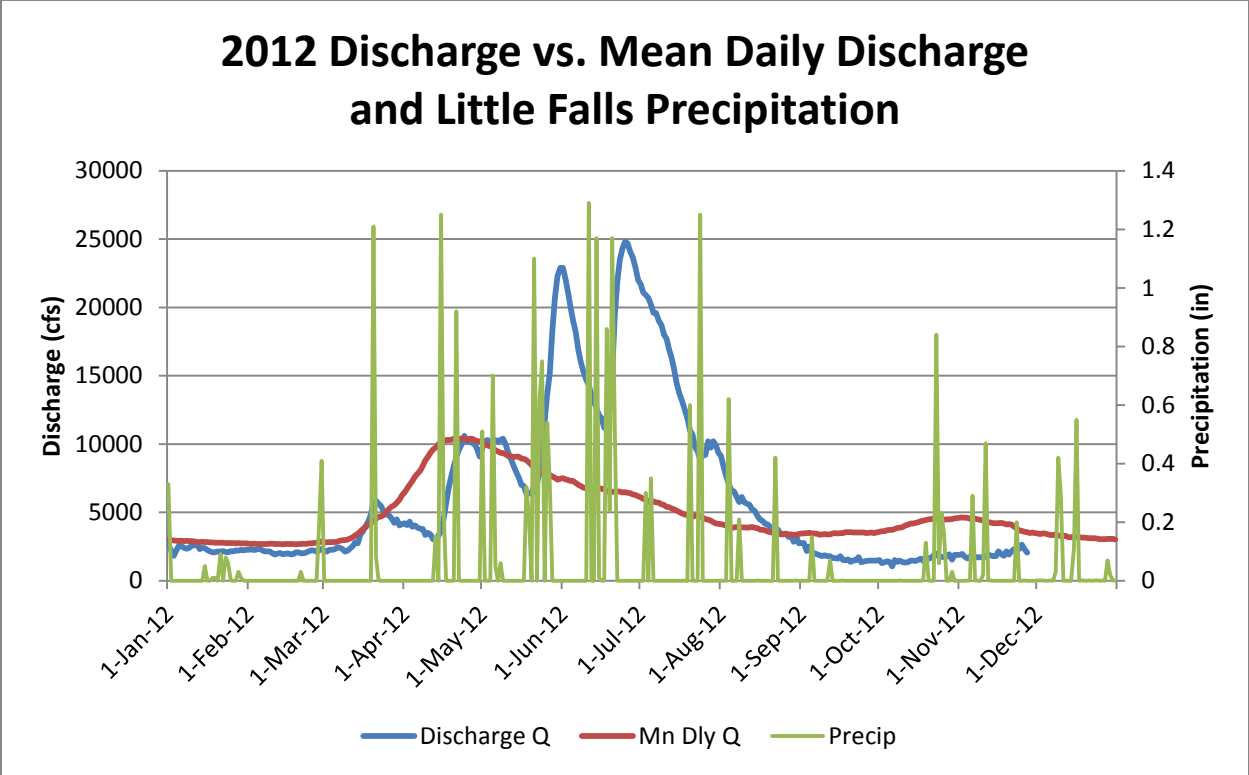


Figure 4. Discharge measured at the USGS Gage Station near Royalton, MN (#05267000) in 2012 vs. Mean Daily Discharge and 2012 precipitation measured at Little Falls, MN.