



Stream Classification Report

KINNICKINNIC RIVER

WBIC: 2601800
 Pierce and St. Croix County
 Category 2 and 5 Trout Fishing Regulation
 Class I Trout Stream



STREAM DESCRIPTION:

Length: 25 miles of Class I trout water.
 Mean Stream Width: Lower River-16.3 m; Upper River-9.3 m
 Gradient: 1.1 m/km
 Base Flow Stream Discharge: 3.52 cms
 Stream Character: Cool-Cold Mainstem
 Stream Order: 5
 Habitat Rating: Fair to Good
 Coldwater IBI Rating: Fair to Good
 Ecoregion: Western Corn Belt Plains

STOCKING RECORDS: The Kinnickinnic River is a naturally reproducing brown and brook trout stream.

The **KINNICKINNIC RIVER** is an Outstanding Resource Water located in St. Croix and Pierce Counties. It is considered one of the best brown trout streams in the Midwest. This medium to large size stream is often referred to as the “Kinni”. It originates from a series of springs upstream of Interstate 94 in central St. Croix County and flows through the City of River Falls into Pierce County and eventually enters the St. Croix River south of the City of Hudson in Kinnickinnic State Park. The watershed upstream of River Falls (Upper Kinni) is primarily in row crop agriculture with scattered wetlands and wooded hills. This area is becoming increasingly residential. As the Kinnickinnic River flows through River Falls it is subject to urban impacts such as storm water runoff, sewage treatment plant discharge and the effects of two shallow impoundments which have power generating dams. Downstream of River Falls (Lower Kinni) the gradient increases and the river changes character, flowing through a deep canyon with steep wooded bluffs. Classified trout water ends approximately 0.7 miles upstream (at Devil’s Den near Station 1) where the stream becomes sluggish before entering the St. Croix River.

Fish Habitat Ratings varied from Fair to Good throughout the river. The sites with Fair ratings tended to have more fine sediments, fewer riffles and sometimes less fish cover. The Upper Kinni sites rated Fair also had more bank erosion.

The Kinnickinnic River is fed by many springs and tributaries throughout the watershed. Classified and named tributaries include Parker Creek (WBIC: 2604700), Kelly Creek (WBIC:2604600), Nye Creek (WBIC:2604500), Ted Creek (WBIC:2604400), South Fork Kinnickinnic River (WBIC:2603100) and Rocky Run (WBIC:2602400). There are numerous classified unnamed tributaries that drain directly into the main stem.

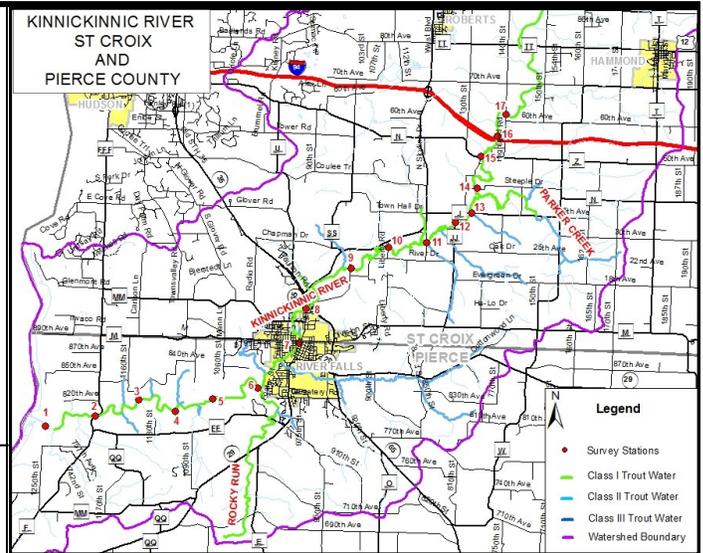
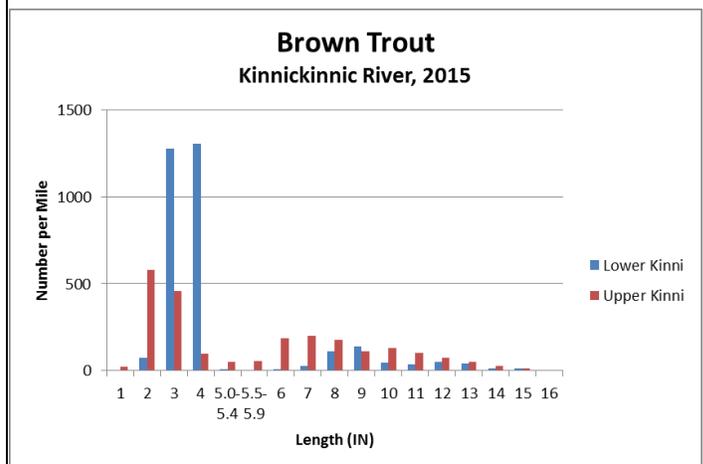


Figure 1 Length distribution



FISHERY:

The Kinnickinnic River contains an exceptionally high quality and high density brown trout population throughout the main stem. Brook trout populations are primarily concentrated in the headwaters and tributaries. During the past decade, brown trout densities and the number of quality (trout 12 inches and greater) size trout have been consistently above the 95 percentile for the State of Wisconsin. However, droughts during 2012 and 2013 followed by prolonged severe flooding in 2014 decimated age 2 and 3 year classes. Therefore, adult (5.5 inches and greater) brown trout densities during 2015 are lower than nor-

mal. Other streams in this area showed similar lower populations due to the recent drought followed by severe flooding. Brown trout sampled in this survey ranged from 1.4 to 17.3 inches in length. (Fig. 1). The average length of adult brown trout in the Upper Kinni was 9.1 inches and the average length in the Lower Kinni was 10.3 inches. Brown trout Catch Per Unit Effort (CPE) during 2015 was highly variable throughout the river as is trout habitat. Total brown trout CPE ranged from 5,466 per mile at Station 6 to 654 per mile at Station 11 (Table 1). Given the above normal precipitation during 2014 and a mild winter with limited runoff, reproduction was particularly strong this year. Young-of-year brown trout CPE varied from 4,527 per mile at Station 6 to 119 per mile at Station 11. The percentage of trout sampled that were young-of-year ranged from 93% at Station 2 to 18% at Station 11.

Overall, the Upper Kinni has moderate to high densities of adult brown trout (averaged 1,066 per mile). During 2015, it was in the 84 – 95th percentile (based on whether it falls within the large or medium streams category). Adult brown trout CPE is lowest at Stations 10 and 11 with densities of 407-530 per mile and highest at the headwater stations with CPE of 1,810-2,865 per mile. Long term trend data from Stations 8 and 12 during 1996 –2014 show adult densities consistently greater than the 95th percentile.

During 2015 the Lower Kinni had low densities (53 per mile) of adult brown trout at Station 2 which ranked it at the 44th percentile of large streams in this ecoregion. Station 6 has much better habitat. This station ranked in the 78th percentile for adult brown trout CPE (937 per mile). Seven percent of the trout sampled fell into the protected slot size of 10-14 inches. Long term trend data from Stations 2 and 6 during 1996 –2014 show adult densities consistently greater than the 95th percentile at Station 6. Station 2 has always been a transitional site from classified trout water to unclassified water and normally adult densities remain below the 95 percentile. Strong reproduction during 2015 indicate adult populations will rebound from the drought and flooding impacts of 2012-2014 within a couple of years.

No brook trout reproduction was evident in the Lower Kinnickinnic River during this survey (Table 2). Few brook trout were sampled in the Lower Kinni (3 per mile), all at Station 6 (Table 2). These fish likely came from Rocky Run or Mann's Valley of which both have small brook trout populations. The two brook trout sampled at Station 6 were in the 9 inch range. A low density brook trout population was also found in the Upper Kinni with higher numbers at the headwater stations. Brook trout were found up to 11.3 inches in length. CPE ranged from zero to 245 per mile. A small population (CPE= 65 per mile) was found at Station 8 just upstream of River Falls. A few juveniles were also found here and are most likely a product of Unnamed Creek 36-1 which drains into Station 8. Farther upstream only scattered individuals were found until Station 15. From this point upstream both juvenile and adult brook trout were common but still a minor part of the overall trout fishery. Long term data also indicated little has changed since 1996 other than lower than normal catch rates in 2015.

The Kinnickinnic is dominated by brown trout throughout much of the river. Large warmwater river species from the St. Croix River can also be found in the Lower Kinni. Fish species other than trout are rare in the upper river. A natural waterfall and two hydroelectric dams in the City of River Falls prevent fish passage between the upper and lower river sections. Coldwater Index of Biotic Integrity (IBI) scores were collected at two sites (Table 3) on the Upper Kinni, Stations 11 (Fair) and 17 (Good). Because naturalized (exotic) brown trout have displaced the native brook trout community throughout much of the river, IBI scores are lower than expected for a high quality spring fed coldwater system.

FUTURE MANAGEMENT:

The Kinnickinnic River is currently an outstanding Class I trout stream. Based on this survey this classification is correct. It has excellent natural reproduction most years and sustains a population of brown and brook trout near carrying capacity despite having high fishing pressure from the greater Twin Cities metropolitan area. Bank erosion, flooding and subsequent fine sediments are the major factors causing habitat impairments on the Upper Kinni. Continued increasing demand for groundwater through high cap irrigation wells may present a future threat. The Lower Kinni suffers flooding, runoff from impervious surfaces in River Falls and impoundments that increase water temperature.

The Kinnickinnic River is a very popular trout fishing destination in the mid-west. User conflicts are increasing as development in the watershed continues and other water activities such as kayaking become more popular. The Upper Kinni lies within the Kinnickinnic River Fishery Area (KRFA) which allows the DNR to purchase land and

Table 1 Abundance of brown trout (number per mile) at twelve stations on Kinnickinnic River.
 (-) indicates stations that were not surveyed.

Year	St. 2		St. 6		St. 8		St. 9		St. 10		St. 11		St. 12		St. 13		St. 14		St. 15		St. 16		St. 17			
	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult
1990	-	-	11	1438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	188	1030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	150	1739	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	197	857	2141	3324	1449	5427	2118	3655	839	3247	293	1302	745	3368	1273	2957	1138	3274	2388	968	956	2974	4171	1103	-	-
1999	-	-	-	-	-	-	-	-	-	-	-	-	722	4183	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	334	3493	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	357	2405	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	357	2944	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	576	3502	-	-	-	-	-	-	-	-	-	-	-	-
2004	541	1285	3155	5324	1942	5744	-	-	-	-	-	-	608	3191	-	-	-	-	-	-	-	1419	1483	-	-	-
2005	92	1500	1352	6316	1755	5316	-	-	-	-	-	-	218	2874	-	-	-	-	-	-	-	-	-	-	-	-
2006	396	1455	2986	4786	3079	6330	-	-	-	-	-	-	343	3250	-	-	-	-	-	-	-	-	-	-	-	-
2007	190	1868	1513	4086	975	5449	-	-	-	-	-	-	210	3881	-	-	-	-	-	-	-	-	-	-	-	-
2008	1012	951	4741	3203	2241	5003	-	-	-	-	-	-	361	2496	-	-	-	-	-	-	-	-	-	-	-	-
2009	159	1372	1386	3632	863	4827	-	-	-	-	-	-	110	3296	-	-	-	-	-	-	-	-	-	-	-	-
2010	881	923	5853	3880	1068	3226	-	-	-	-	-	-	224	3003	-	-	-	-	-	-	-	-	-	-	-	-
2011	413	822	3612	3649	1471	3885	-	-	-	-	-	-	443	2569	-	-	-	-	-	-	-	-	-	-	-	-
2012	276	1229	3601	6801	1608	5442	-	-	-	-	-	-	526	3511	-	-	-	-	-	-	-	-	-	-	-	-
2013	282	1048	785	5740	579	3892	-	-	-	-	-	-	78	1614	-	-	-	-	-	-	-	-	-	-	-	-
2014	73	638	344	2698	634	3507	-	-	-	-	-	-	69	1755	-	-	-	-	-	-	-	-	-	-	-	-
2015	817	53	4527	940	2895	874	1760	1262	270	420	119	535	430	805	751	1369	2096	1204	675	751	1425	3260	1516	2062	-	-

Table 2 Abundance of brook trout (number per mile) at twelve stations on Kinnickinnic River. (-) indicates stations that were not surveyed.

Year	St. 2		St. 6		St. 8		St. 9		St. 10		St. 11		St. 12		St. 13		St. 14		St. 15		St. 16		St. 17		
	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	
1990	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	0	0	0	0	9	21	0	6	0	0	0	0	3	0	6	41	112	170	299	346	205	487	100	-	
1999	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-
2004	0	0	3	14	22	36	-	-	-	-	-	-	9	-	-	-	-	-	-	357	56	-	-	-	
2005	0	0	3	6	4	36	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2006	0	0	0	3	22	29	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2007	0	0	0	3	0	22	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2008	0	0	3	11	0	29	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2009	0	0	6	14	4	43	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	
2010	0	0	0	6	18	25	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	
2011	0	0	0	28	0	79	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	
2012	0	0	0	51	0	126	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2013	0	0	0	25	0	97	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2014	0	0	0	3	0	50	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	
2015	0	0	0	6	7	58	0	0	0	0	5	0	5	0	5	0	6	56	118	72	72	101	144	-	

conservation easements for public access, stream bank protection and trout stream restoration. Approximately 11 miles of stream are protected by state owned lands, fishing easements, and leases. Additional stream bank protection and public access are provided throughout the river corridor by the City of River Falls, the School District of River Falls, Kinnickinnic State Park, the Western Wisconsin Prairie Habitat Restoration Area (HRA) and the Kinnickinnic River Land Trust. Some major tributaries are also part of the KRFA or HRA and are protected through fee title ownership or easements including Parker Creek, South Fork Kinnickinnic, and Nye Creek. Most of the classified water on Rocky Run is owned by the City of River Falls.

Major trout habitat improvement work has been implemented on the Upper Kinni beginning around the 1940-50's. Bank stabilization, cattle exclusion fencing, brushing and instream habitat improvement are some of the work that has been done over the years. Both woody and non woody invasive plant growth are a major problem on the Upper Kinni. Habitat and parking area maintenance is on going and new work is scheduled for the 2016 field season.

Trend and rotational monitoring should continue using the wadable cold water stream protocol to assess trout populations and species composition. Acquisition from willing sellers and habitat work should continue where possible. As development continues, buffer zones along the stream bank and infiltration ponds to recharge groundwater will be increasingly important for the Kinni. Best Management Practices should be encouraged throughout the watershed.

Table 3 Relative abundance of fish species found in Kinnickinnic River in 2015.

Species	St. 2	St. 6	St. 8	St. 9	St. 10	St. 11	St. 12	St. 13	St. 14	St. 15	St. 16	St. 17
Brook Trout	0	2	18	0	0	1	1	1	1	34	18	34
Brown Trout	312	1937	1048	704	156	143	270	432	603	279	582	498
Largemouth Bass	1	-	-	-	-	0	-	-	-	-	-	0
Brook Stickleback	-	-	-	-	-	2	-	-	-	-	-	3
Fathead Minnow	-	-	-	-	-	30	-	-	-	-	-	9
Mottled Sculpin	-	-	-	-	-	2	-	-	-	-	-	12
White Sucker	-	-	-	-	-	30	-	-	-	-	-	0

For more information on Kinnickinnic River, you can contact the following persons:

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