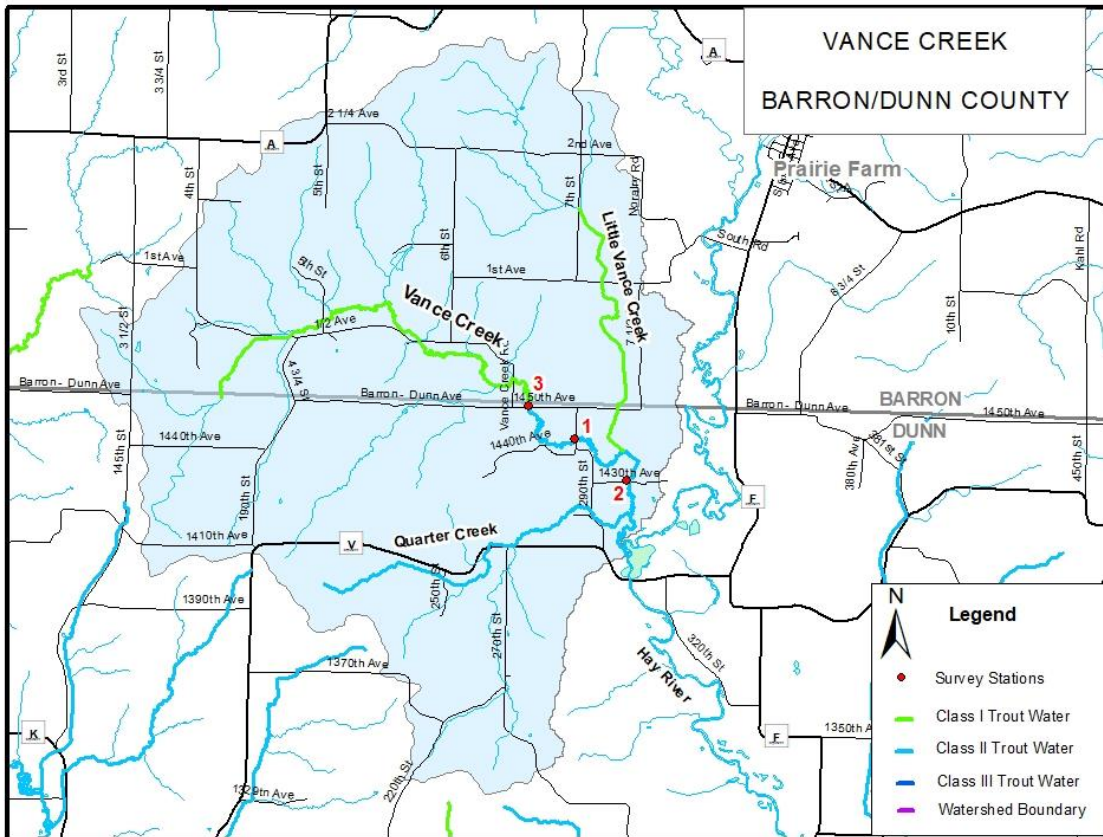


WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fisheries Survey Report for Vance Creek, Dunn and Barron Counties,

Wisconsin 2021

WATERBODY IDENTIFICATION CODE 2077100



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Introduction

Vance Creek is a medium sized coldwater tributary to the Hay River flowing south from Barron County into Dunn County. Vance Creek enters the Hay River just west of the Village of Ridgeland. The stream consists of 4.3 miles of Class I trout water in Barron County and 3.2 miles of Class II trout water in Dunn County. As part of the Hay River watershed, Vance Creek drains mostly forested and agricultural land and to a lesser extent, grassland and wetlands. During a 2018 assessment of the stream, Vance Creek in Dunn County was listed as Impaired due to high phosphorus levels. Vance Creek also ranked High for nonpoint source characteristics of runoff impacts on groundwater.

The fishery in the Dunn County portion of the stream has been historically dominated by Brook Trout. No stocking has occurred in Dunn County and the fishery has been fully supported by natural reproduction. Annual stocking of Brown Trout yearlings occurred from 1972 to 2002 with no stocking since then. Tributaries to Vance Creek include Little Vance Creek (Class I), Quarter Creek (Class II) along with several unnamed and unclassified streams. Vance Creek, Little Vance Creek and Quarter Creek are included as candidate streams within the Brook Trout Reserves program with a classification of Vulnerable with an opportunity for rehabilitation. Fishing pressure is likely low throughout the stream and access is limited to road bridge crossings other than a recently acquired streambank easement located north of 1430th Avenue in Dunn County. The following survey focuses on the Class II, Dunn County portion of the stream.

Methods

A total of 3 stations were sampled on Vance Creek in 2021. Sampling was conducted between June 15th and September 15th using a backpack stream shocking unit with a single electrode and a stream barge electrofishing unit with 2 electrodes. Length of stations was determined by multiplying the mean stream width by 35. Stations were located upstream of 290th St (Station 1), upstream of 1430th Avenue (Station 2) and upstream of the Barron/Dunn County Line Road (Station 3). All fish species were collected at all stations and were counted and identified to species. All trout were identified to species and measured to the nearest 10th of an inch. Catch rates of Brook Trout were compared to other Class II Brook Trout streams in the North Central Hardwoods ecoregion and percentiles were determined.

The Index of Biotic Integrity (IBI) was used as a measure of biological attributes that are influenced by human activities to assess the overall health of the stream. The index uses the species assemblage present to assess water quality and thermal regimes within a waterbody. Coldwater IBI's range in score from 0 to 100 with a high score (90-100) interpreted as an Excellent Integrity rating and 10-20 interpreted as a Poor Integrity rating.

Study Sites

Station 2 was the furthest downstream station sampled on Vance Creek. Habitat was not quantitatively evaluated during the surveys; however, anecdotally, the stream flowed through a heavily wooded corridor at this station with the majority of instream habitat existing in the form tag alders and small amount of large woody debris. Vance Creek has a relatively low gradient which made pools and riffles limited. The substrate was largely composed of sand and silt. Station 1 was located upstream of Station 2. It also ran through a heavily wooded

corridor with similar habitat characteristics and substrates. Station 3 was the furthest upstream station sampled. The stream at this location ran through a heavily grazed pasture with no canopy cover. Substrate contained sand, silt and some small gravel. Bank erosion was moderate and aquatic macrophytes were abundant.

Results

Brook Trout were the dominant and only trout species found at all stations other than a single 6.3-inch Brown Trout captured at Station 1. Brook Trout were in high densities at all stations when compared with other Class II trout streams in the North Central Hardwoods ecoregion. Relative abundance of Brook Trout at all stations ranged from 854-1690 total trout per mile which resulted in the 85th and 95th percentiles, respectively (Table 1; Figure 1). The maximum size of Brook Trout captured was 11 inches between all stations (Figure 2). Average length of adult Brook Trout was 6.2 inches, 7.1 inches and 6.4 inches at Station 1, 2, and 3, respectively (Figure 2). Adult Brook Trout (≥ 4.5 inches) ranged in relative abundance from 474 adults/mile (80th percentile) at Station 1 to 977 adults/mile (90th percentile) at Station 2. The number of adults larger than 8 inches was greatest at Station 2 as well, with 279 fish larger than 8 inches per mile (90th percentile).

Natural reproduction of Brook Trout was high at all stations. Relative abundance of young-of-year Brook Trout ranged from 268 young-of-year/mile (85th percentile) at Station 2 to 998 young-of-year per mile (95th percentile) at Station 3 (Figure 2). No natural reproduction of Brown Trout was documented.

Coldwater IBI ratings resulted in a score of 90 with a rank of Excellent for Station 1 and 70 for Station 2 which ranked as Good, and a score of 100 or Excellent for Station 3. The lower score at Station 2 was due to several more tolerant species present at this station, including White Sucker and Creek Chub. Pearl Dace, Longnose Dace, Blacknose Dace and Mottled Sculpin were also collected at this station (Table 2). The high scores at the remaining 2 stations were due to very few non-salmonid species and very few tolerant species collected. Non-salmonid species collected at these stations included Mottled Sculpin and Longnose Dace (Table 2).

Discussion

The Dunn County portion of Vance Creek contains a strong and naturally reproducing Brook Trout population. Trout abundance at all stations has remained relatively stable throughout the years according to past surveys. While only 2 surveys have been completed at Station 2, Brook Trout abundance at this station was much improved since the 2008 survey, when only 290 total fish/mile were captured, and very little natural reproduction (43 young-of-year/mile) was found. Brook Trout abundance at Station 1 was similar to the long-term average for this site of 907 total trout/mile. Trout populations within Vance Creek likely experience low angling pressure due to limited access and difficulty of fishing in densely wooded stream corridors. Habitat within most of the stream has also likely remained fairly stable throughout the years with much of the stream flowing through low gradient forested and wetland areas that are difficult to farm or develop. Impacted areas also occur throughout the stream due to overgrazing and poor farming practices which have led to significant bank erosion and sedimentation. Brook Trout abundances at Station 1 were the

lowest between all three stations sampled. This station was also the most degraded in terms of bank erosion, siltation and lack of habitat. Natural reproduction was high at all stations in terms of relative abundance of young-of-year Brook Trout and was highest at Station 3. This station contained the highest amount of aquatic vegetation because of the lack of canopy cover at this site. The station also included the most optimal spawning substrates between all the sites. Abundance of Brook Trout larger than 8 inches has remained relatively stable through the years as well and was higher than the average for 2 of the 3 stations sampled with densities in the 90th percentiles for similar streams. Because of low angling pressure, excellent habitat and subsequent natural reproduction, size structures have remained stable throughout the years and the potential for trophy Brook is present.

The Coldwater IBI ranking for each site resulted in good and excellent scores indicating minimal negative impacts to water quality and excellent thermal regimes within the watershed. The Excellent ranking for Stations 2 and 3 were due to the abundance of Brook Trout at these sites in addition to very few non-game fish species present. Non-game fish species that were present at these sites included a single Brown Trout, Mottled Sculpin and Longnose Dace, all of which are relatively intolerant species. More tolerant species including Creek Chub and White Sucker were collected at Station 2 which resulted in the rank of Good. This was likely due to the more degraded habitat at this site. Contrarily, Brook Trout abundance was also highest at this site which was likely due to the presence of deeper pool habitat and an abundance of large woody debris within the station.

The Dunn County portion of Vance Creek is currently classified as Class II trout stream and the Barron County portion of the stream as Class I. The Dunn County classification is incorrect based on the results of this survey. It should be reclassified as Class I trout stream to the confluence with the Hay River. Natural reproduction of Brook Trout was strong at all stations sampled and multiple year classes of trout were present. Young-of-year catch rates were in the 85th to 95th percentiles compared to other Class II trout streams in the North Central Hardwoods ecoregion. Total relative abundance of Brook Trout ranged in the 85th to 95th percentiles as well, indicating more than enough trout present to occupy available habitat. Trout populations have remained stable throughout the years according to previous surveys. Streambank Easement acquisition is a high priority within the watershed to enhance protections to the stream and improve habitat where possible.

Table 1. Relative abundance (catch per effort; number per mile) of Brook Trout at 3 stations on Vance Creek, summer 2021. (. Indicates no survey)

Year	St. 1		St. 2		St.3	
	Juv.	Adult	Juv.	Adult	Juv.	Adult
1994	1121	323	.	.	.	.
2002	158	583	.	.	.	.
2008	300	441	43	247	1304	467
2016	411	348	.	.	.	.
2021	379	474	268	977	998	692

Table 2. Total number of each species captured at 3 stations on Vance Creek, summer 2021.

Species	St. 1	St. 2	St. 3
Brook Trout	54	116	105
Brown Trout	1	0	0
Mottled Sculpin	20	5	13
Blacknose Dace	0	3	0
Longnose Dace	0	1	1
Pearl Dace	0	13	0
White Sucker	0	29	0
Creek Chub	0	15	0

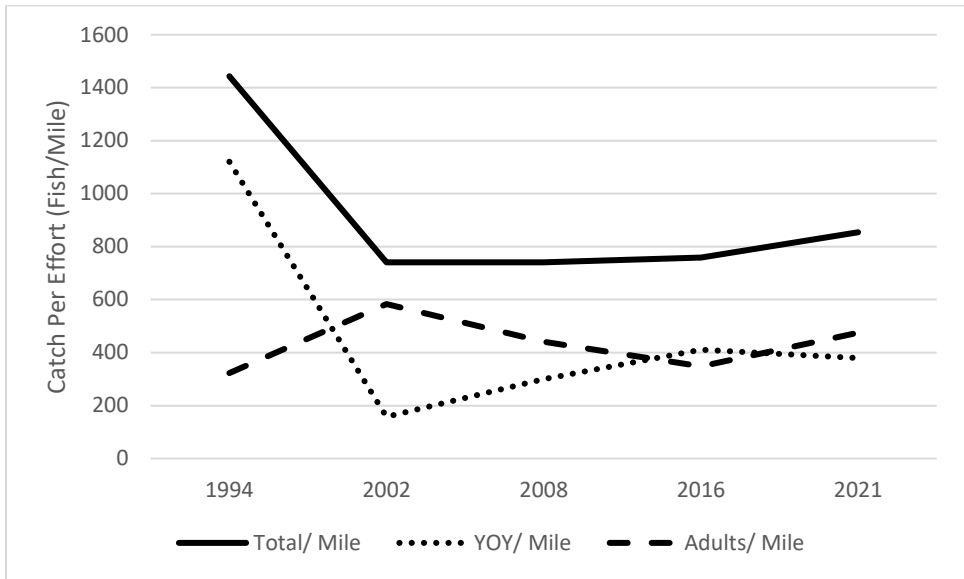


Figure 1. Relative abundance (Catch per effort; fish per mile) of Brook Trout at Station 1 on Vance Creek from 1994 to 2021.

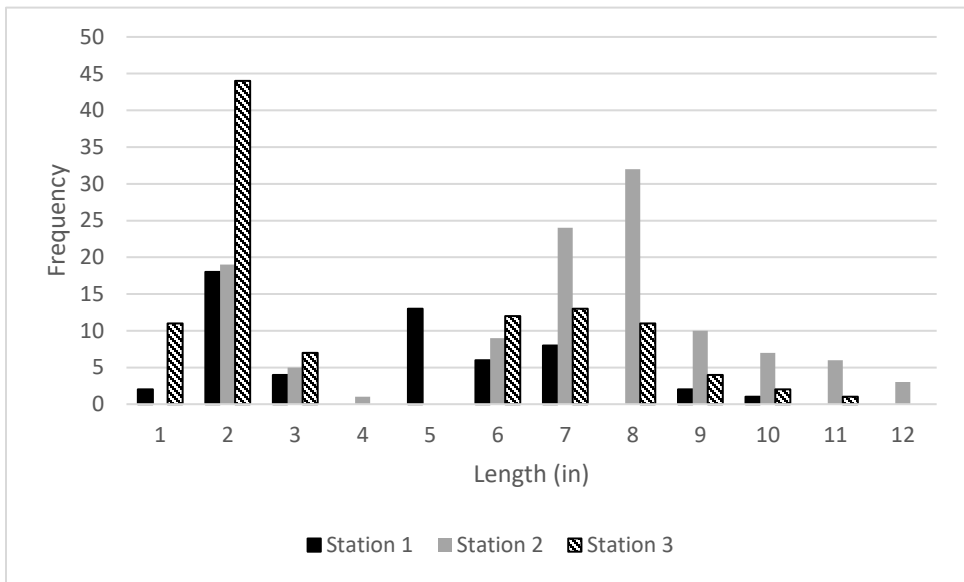


Figure 2. Length frequency distribution of Brook Trout at 3 stations on Vance Creek, summer 2021.