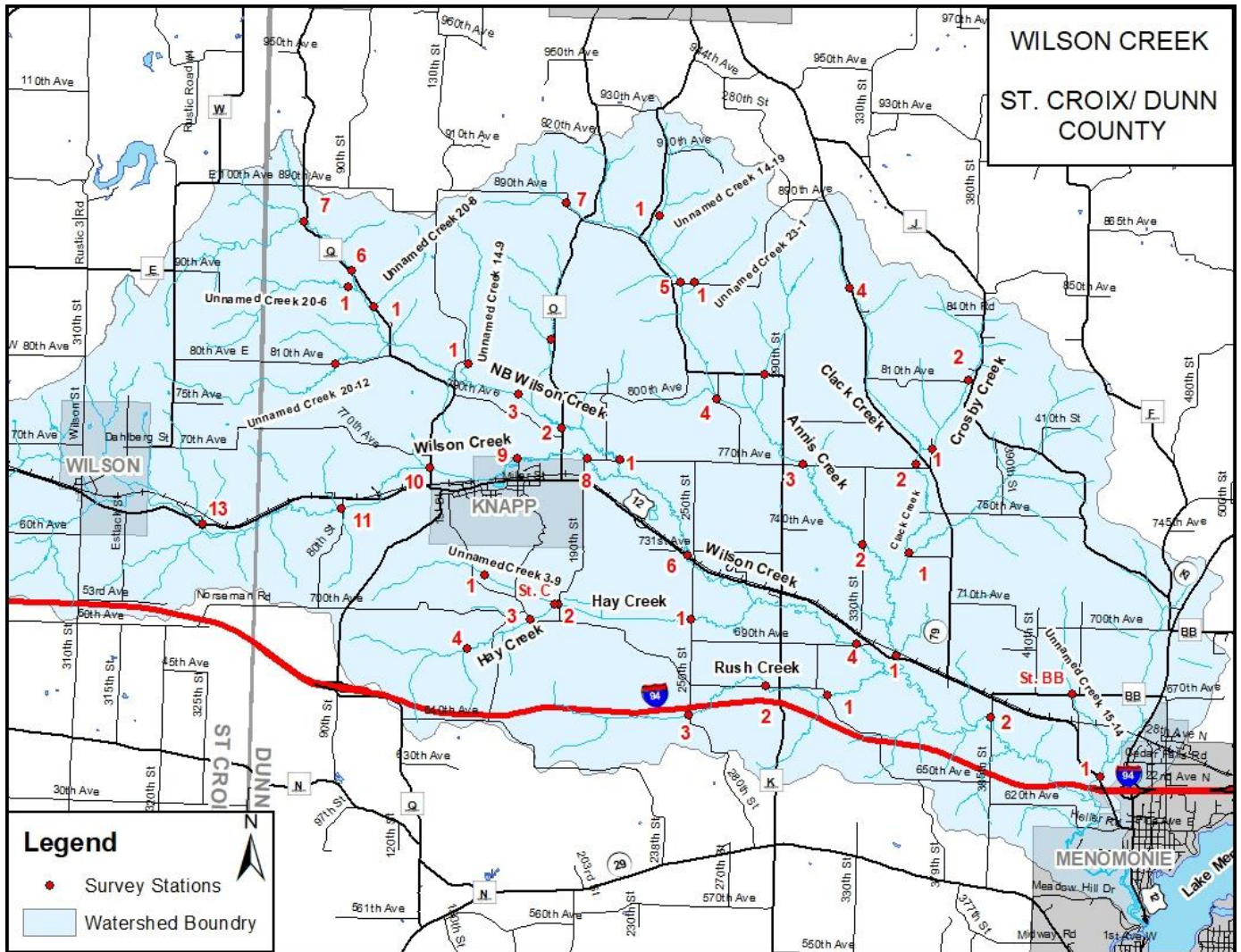


WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Wilson Creek Watershed Fisheries Survey Report

HUC 10 WATERSHED 0705000710, Dunn and St. Croix Counties



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December 2024

Table Of Contents

Executive Summary	3
Management Recommendations	3
Watershed Location.....	3
Purpose of Survey	4
Dates of Fieldwork.....	4
Fish Species Observed In The Survey	4
Introduction	4
Stocking.....	5
Regulations.....	5
Habitat Improvement.....	5
Public Access.....	6
Land Use.....	6
Methods.....	6
Survey Effort.....	6
Results	8
Wilson Creek.....	8
Annis Creek.....	12
Clack Creek.....	15
Crosby Creek.....	1Error! Bookmark not defined.
Hay Creek and Unnamed Creek 3-9.....	16
Rush Creek.....	18
North Branch Wilson Creek and Tributaries.....	19
Discussion.....	22
Management Recommendations	25
References.....	26
Appendix A. IBI Survey Interpretation.....	27
Appendix B. Trout CPUE Maps.....	28

Executive Summary

The Wilson Creek sub-watershed is located in west central Dunn County and drains into the Red Cedar River. The streams contain a naturally reproducing brook and brown trout fishery. While annual sampling occurs at two stations on Wilson Creek, previous comprehensive surveys of the streams within the watershed are dated and occurred in 2019 on Wilson Creek, 2016 on the North Branch of Wilson Creek, 2013 on Annis Creek and 2016 on Rush Creek and 2021 on Hay Creek. Some of the small unnamed tributaries had not been surveyed since 1995. To successfully manage the fishery, recent data is needed to understand the current status of brook and brown trout populations. Therefore, we surveyed the sub-watershed in 2024 to gather information that will aid in future management decisions. Evaluation of brook and brown trout natural reproduction, survival and size structure will aid in understanding the impacts of harvest regulations, stocking and habitat improvements. A total of 43 stations were surveyed on 17 streams within the sub watershed. Overall, brook trout populations have increased from previous surveys in most streams. Brown trout are a minor component of the fishery but are increasing in abundance within the headwaters of Wilson Creek. Coldwater stream conditions have improved at most sites surveyed and stocking is no longer needed to maintain the fishery within these streams. Due to improved conditions and trout populations, several streams warranted reclassifications to Class I status. Habitat improvement work, changes in stocking regimes and improvements in land use have all resulted in these trout population improvements.

MANAGEMENT RECOMMENDATIONS

- Maintain current fishing regulations within the watershed and consider more liberal angling regulations that promote brown trout harvest and protect brook trout if brown trout populations continue to increase.
- Continue to monitor brook trout populations within lower Wilson Creek in the absence of stocking.
- Continue to annually monitor trout populations within upper Wilson Creek in light of increasing brown trout populations and declining brook trout densities.
- Focus streambank easement acquisition on Wilson Creek and its tributaries to improve angler access and habitat project implementation.
- Continue to improve riparian habitats within habitat improvement project areas that will enhance trout habitat.
 - Continue tree planting within the riparian corridor to provide shading and maintain cold water stream habitat.
- Continue trout habitat improvement projects within the watershed with a focus on maintaining or improving habitat for brook trout specifically.
- Consider a brown trout removal project on upper Wilson Creek upstream of Knapp, WI if brown trout densities continue to increase and brook trout densities continue to decline.
- Reclassify Clack Creek and Hay Creek from Class II to Class I status.
 - Classify the currently unclassified stream, Unnamed Creek 15-14, as Class II.
 - Declassify Unnamed Creek 27-7.

WATERSHED LOCATION

The Wilson Creek watershed is located in west central Dunn County, west of the city of Menomonie, WI. The headwaters begin near the St. Croix and Dunn County line and flow east where the stream drains into Lake Menomin above the dam on the Red Cedar River at Menomonie. Wilson Creek's

major tributary, Annis Creek, flows in a southerly direction along CTH K and enters near the intersection of CTH K and STH 12.

PURPOSE OF SURVEY

The purpose of this survey was to evaluate the status and health of the fishery within Wilson Creek and its tributaries. This survey documented trout species presence, relative abundance and the size structure of the population. Natural reproduction and survival of trout was assessed to inform management activities including trout regulation effectiveness and appropriateness, habitat improvement needs and stocking within the watershed. Trout stream classifications were also evaluated during the survey and unclassified streams were also surveyed to identify potential classifications. Index of Biotic Integrity (IBI) surveys were conducted at selected stations throughout the survey period to assess overall stream health.

DATES OF FIELDWORK

All surveys within the Wilson Creek watershed occurred from June 19th through July 18th 2024.

SPECIES SAMPLED

- Brook trout
- Brown trout
- Mottled sculpin
- White sucker
- Walleye
- Brook lamprey ammocete
- Brook stickleback
- Creek chub
- Bluegill
- Longnose dace
- Pearl dace
- Fathead minnow
- Central mudminnow
- Blacknose Dace

Introduction

The Wilson Creek watershed drains 245 square miles in eastern St. Croix County and west central Dunn County. The watershed is largely composed of agricultural (37%) and forested land (31%) with a mix of grassland and other uses to a lesser extent. Wilson Creek is the primary waterway within the watershed and major tributaries include North Branch Wilson Creek, Hay Creek, Annis Creek and Rush Creek. The headwaters of Wilson Creek begin in St. Croix County and flow through steep, forested terrain. The headwaters feature a high gradient limestone stream with coarse substrate that transitions to a lower gradient, sand dominated stream near the Village of Knapp, WI. The Wilson Creek sub watershed contains a total of 66.9 miles of classified trout water of which 6.9 miles are Class I and 11 miles are Class II on the mainstem of Wilson Creek. Class I tributaries are located on the North Branch of Wilson Creek and include Unnamed Creek 20-12 and Unnamed Creek 20-6. Class II tributaries include Annis Creek, Clack Creek, Crosby Creek, Hay Creek, Rush

Creek, North Branch Wilson Creek, Unnamed Creeks 25-3, 3-9, 27-7 and 20-8. The Class I portion of Wilson Creek located near the St. Croix and Dunn County line contains a limestone-based stream with gravel and cobble as the dominant substrate type. The stream then transitions to a lower gradient sandstone-based stream for the remainder of its length. Bank erosion is prominent throughout Wilson Creek and its tributaries due to heavy grazing and row crop agriculture within the riparian corridor.

Wilson Creek historically contained an exclusive native brook trout fishery prior to mid-century. Similar to many other streams throughout the Driftless Region, habitat degradation and water quality impacts resulted in a loss or decline of brook trout fisheries. Brook trout and brown trout were then stocked in the 1960s and 70s and stocking of both species continued until 1999 when brown trout stocking ceased. Today, brook trout remain as the dominant trout species throughout most of the mainstem of Wilson Creek and all of its tributaries with the exception of the limestone-based headwaters area of Wilson Creek in which brown trout are the dominant species. Habitat, water quality and stream temperatures have improved since midcentury and the fish community has shifted from a warmwater mainstem to a cold-water mainstem that supports a brook trout fishery. Excluding trend surveys that occur annually on Wilson Creek, previous fishery surveys occurred on the mainstem of Wilson Creek in 1995, 2003, 2007 and 2019. The North Branch was last surveyed in 2012, Annis Creek in 2013, Hay Creek in 2021, Clack Creek in 2011 and Rush Creek in 2016.

STOCKING

Yearling brown trout were stocked annually in Wilson Creek from the 1960s to 1999. Brook trout were stocked annually from the 1960s to 1977 and then from 1998 through 2016. The strain of brook trout stocked changed from domestic strain to Northwest Feral strain in 2017 which have been stocked annually as yearlings since that time into lower Wilson Creek. However, no stocking occurred in 2021, 2022 and 2024. Annis and Rush creeks were stocked with yearling brook trout in 1976 and 1978. Hay Creek was stocked with yearling brook trout from 1978 to 1999.

REGULATIONS

The current regulations on Wilson Creek and all tributaries is 5 fish in total with no minimum length limit.

HABITAT IMPROVEMENT

The first DNR implemented trout habitat improvement project on Wilson Creek was completed in 2012 on the Dahlke easement located upstream of CTH O and north of Knapp, WI. The project featured integrated bank treatment and habitat installation for 2,080 feet of stream. Box elder and willow trees were removed from the riparian zone and plunge pools, spawning riffles, root wads, boulders and 35 LUNKER structures were installed in the stream for habitat. Habitat improvement work continued on the mainstem of Wilson Creek in 2019 on the Klingman easement for a continuation of the work completed in 2012. This project is located downstream of CTH O and runs downstream to the bridge at 770th Ave. This project featured stream improvements on 5,450 feet of stream and included one plunge pool, root wads and bank boulders. The project included less stream narrowing than the 2012 project to provide a higher diversity of habitats focused on multiple year classes of trout and non-game species. Native tree saplings were planted along the stream in 2023 and species included tamarack, burr oak, swamp white oak, silver maple and cottonwood. In 2018, a habitat improvement project was completed on the Ruenger easement on

Hay Creek located south of Knapp and upstream of 190th Street. This project included the confluence and a portion of Unnamed Creek 3-9. Stream banks were sloped to a 2-1 slope and habitat was installed in the form of Elevated Riparian Optimizing structures, root wads and boulders for a total of 3,281 feet of stream improvements.

PUBLIC ACCESS

Public access to Wilson Creek and its tributaries is available through 110 acres of DNR owned fee title property located on the North Branch of Wilson Creek near the intersection of CTH Q and 130th Street. An additional five acres of fee title is located on Wilson Creek off of STH 12. Approximately 6.2 miles of streambank easements provide additional public fishing access along Wilson, North Branch Wilson, Annis, Rush, and Hay creeks. There are currently two DNR designated parking lots which are located on CTH O and STH 12.

LAND USE

The majority of land use within the watershed is agricultural and consists of row crops and grazing. The riparian corridors within DNR fee title or easement properties are managed as savannah type landscapes with a grass understory and large native shade trees to provide thermal benefits to the stream. This type of landscape provides benefits for angler access, bank stabilization and wildlife and trout habitat.

Methods

A total of 43 stations were surveyed on Wilson Creek and its tributaries in 2024 (Table 1). Tributaries surveyed included the North Branch, Annis, Rush, Hay, Crosby, Clack and several unnamed tributaries (Table 2). Sampling was conducted between June 15th and September 15th using a backpack stream electrofishing unit with a single electrode and a stream barge electrofishing unit with up to three electrodes. The length of stations was determined by multiplying the mean stream width by 35. Stations were located upstream of all road crossings if possible. All fish species were collected at selected predetermined stations and were counted and identified to species. All trout were identified to species and measured to the nearest 10th of an inch. Relative abundance as measured by catch rates and expressed as Catch Per Unit Effort (CPUE; fish per mile) of brown trout and brook trout were compared to other Class I and II trout streams within the Driftless Area and percentiles were assigned for each length or age class. Brook and brown trout less than 5 inches in length are considered young-of-year (YOY) or fish that hatched the previous spring and are an indicator of natural reproduction in the absence of small fingerling stocking. GIS maps were developed to allow for visualization of YOY and adult trout densities throughout the watershed.

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. IBI sampling was completed at 26 stations.

SURVEY EFFORT

A total of 5,472 feet of stream was surveyed within the Wilson Creek watershed in 2024 which included nine stations on the mainstem, six stations on Annis Creek, three stations on Clack Creek, two stations on Crosby Creek, three stations on Hay Creek, 5 stations on North Branch Wilson Creek, three stations on Rush Creek and 12 stations on unnamed tributaries (Table 1). Unnamed Creek 15-14 is a direct tributary to Wilson Creek located on the edge of the City of Menomonie. Unnamed Creek 3-9 is a tributary to Hay Creek. Unnamed Creeks 25-3, 23-1 and 14-9 are tributaries to Annis Creek. Unnamed Creeks 27-7, 28-5, 20-12, 20-8 and 20-6 are tributaries to North Branch Wilson Creek. Stations 6 and 11 are trend stations. Stations 2, 4, 9, 10, 11 and 13 on Wilson Creek were located within wooded riparian corridors and exhibited varying degrees of bank erosion. Stations 11 and 13 flow through a limestone-based section on stream with gravel and cobble substrates. The remainder of stations on Wilson Creek feature relatively low gradients and sand dominated substrates. Station 6 is located within a heavily grazed pasture and features heavy bank erosion. Station 8 is located within the 2019 trout habitat improvement project area and features an open grassland corridor. Station Hay Creek 190th Street is located within the 2018 trout habitat improvement section and also features an open grassland corridor. The stations on Unnamed Creeks 14-9 and 15-14 flowed trout a reed canary choked section of stream that was likely previously grazed. The majority of stations throughout the remainder of the watershed were located within wooded or pasture stream corridors.

Table 1. Number and location of stations surveyed in the Wilson Creek watershed in Dunn County in 2024.

STATION	STATION LOCATION	STATION LENGTH (M)	MEAN STREAM WIDTH (M)
Wilson 2	390 th Street	247	8.6
Wilson 4	690 th Avenue	248	7.1
Wilson 6	STH 12	315	9.0
Wilson 8	770 th Avenue	171	4.8
Wilson 9	3 rd Avenue	122	3.5
Wilson 10	CTH Q	196	5.6
Wilson 11	80 th Street	150	4.0
Wilson 13	STH 12	100	-
Unnamed Creek 15-14 St. 1	STH 12	100	-
Unnamed Creek 15-14 St. BB	CTH BB	100	-
Hay 1	250 th Street	100	3.0
Hay 190 th St.	190 th Street	100	3.2
Hay 3	672 nd Avenue	100	1.3
Hay 4	Park Rd	100	0.9
Unnamed Creek 3-9 St. 1	171 st Street	100	1.0
Unnamed Creek 3-9 St. C	Confluence	100	2.3
Annis 1	STH 12	210	6
Annis 2	330 th Street	133	3.8
Annis 3	770 th Avenue	100	2.0
Annis 4	265 th Avenue	100	1.9
Annis 5	280 th Street	100	2.5
Annis 7	890 th Avenue	100	1.3
Clack 1	730 th Avenue	100	3.0
Clack 2	770 th Avenue	100	2.7

Clack 4	STH 79	100	0.7
Crosby 1	360 th Street	100	2.0
Crosby 2	810 th Street	100	0.9
Unnamed Creek 25-3 St. 1	CTH K	100	1.3
Unnamed Creek 23-1 St. 1	280 th Street	100	1.2
Unnamed Creek 14-9 St. 1	CTH K	100	0.7
North Branch Wilson 1	770 th Avenue	140	4.0
North Branch Wilson 2	CTH O	100	2.2
North Branch Wilson 3	790 th Avenue	144	4.1
North Branch Wilson 6	CTH Q	100	2.2
North Branch Wilson 7	CTH Q	100	1.2
Unnamed Creek 27-7 St. 1	Field Crossing	100	0.7
Unnamed Creek 28-5 St. 1	Field Rd	100	1.1
Unnamed Creek 20-12 St. 1	810 th Avenue	100	2.0
Unnamed Creek 20-8 St. 1	CTH Q	100	1.1
Unnamed Creek 20-6 St. 1	Field	100	1.3
Rush 1	650 th Avenue	100	3.0
Rush 2	670 th Avenue	100	1.5
Rush 3	250 th Street	100	2.0

Results

WILSON CREEK

Trout were detected at all stations surveyed on Wilson Creek in 2024 with the exception of Station 2. Total brook trout densities ranged from moderate to high for Class II trout streams within the Class II section of stream (Table 2). Brown trout were present in low to moderate densities within the mid to lower reaches of Wilson Creek and were present in high densities within the Class I section of stream upstream of the Village of Knapp (Table 3; Appendix B). Brook trout have remained as the dominant trout species within most of Wilson Creek with the exception of the portion of stream that is currently classified as Class I. Based on the trend data collected from Station 11, brown trout abundance has increased since the mid-2000s while brook trout abundance has simultaneously declined (Figure 2 & 4). Densities of brook trout within the Class II section of stream appear stable and are at or above the long-term average. Total brook trout densities ranged from 195 per mile at Station 4 (65th percentile) to 1052 per mile (85th percentile) at Station 11 (Figure 4). The long-term average of total brook trout abundance at the Station 6 trend site is 212 brook trout per mile while the 2024 abundance estimate resulted in 361 brook trout per mile. Total brook trout abundance at the Station 11 trend site averages 248 per mile while the 2024 catch rate was 1052 per mile. Brook trout were detected at both stations surveyed on Unnamed Creek 15-14 for the first time in this stream's survey history (Table 2). Brook trout were present in moderate densities at these stations.

Table 2. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 8 stations on Wilson Creek and 2 stations on Unnamed Creek 15-14 in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 4.5 INCHES)	CPUE ≥ 8 INCHES	CPUE ≥ 10 INCHES
Wilson 2	0	0	0	0	0
Wilson 4	195 (65)	7 (40)	188 (65)	110 (85)	45 (90)
Wilson 6	361 (75)	76 (65)	284 (75)	132 (85)	31 (85)
Wilson 8	887 (90)	160 (75)	762 (90)	226 (90)	66 (95)
Wilson 9	436 (65)	119 (55)	317 (60)	79 (75)	26 (80)
Wilson 10	616 (75)	361 (75)	255 (55)	74 (70)	25 (80)
Wilson 11	1052 (85)	569 (85)	483 (70)	107 (80)	0
Wilson 13	544 (70)	256 (70)	288 (55)	48 (65)	0
15-14 St. 1	81 (40)	0	81 (45)	16 (45)	0
15-14 St. BB	113 (50)	0	113 (50)	0	0

Brown trout appear to be a minor component of the fishery within most of Wilson Creek. Total brown trout densities ranged from 20 per mile (10th percentile) at Station 6 to 987 per mile (70th percentile) at Station 11 (Table 3). Natural reproduction of brown trout was documented at Stations 6 through 13 and no YOY were detected at Stations 2 and 4. Natural reproduction of brown trout appears to be strongest within the headwaters area upstream of Knapp (Figure 1; Table 3). YOY densities ranged from 9 per mile (40th percentile) at Station 8 to 665 per mile (85th percentile) at Station 11. Natural reproduction of brown trout has increased in the upper reaches of Wilson Creek during the previous decade (Figure 1). Adult brown trout were present at all stations except for Station 2 in low to moderate densities. Adult brown trout larger than 12 inches \geq were only detected at Stations 9, 10 and 11 and no brown trout larger than 15 inches were sampled. No brown trout were detected in Unnamed Creek 15-14.

Table 3. Relative abundance of total, young-of-year (YOY), adult (≥ 5.5 inches), ≥ 12 inch, and ≥ 15 -inch brown trout at 7 stations on Wilson Creek in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I and II brown trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 5.5 INCHES)	CPUE ≥ 12 INCHES	CPUE ≥ 15 INCHES
Wilson 2	0	0	0	0	0
Wilson 4	26 (15)	0	26 (15)	0	0
Wilson 6	20 (10)	10 (40)	10 (10)	0	0
Wilson 8	57 (25)	9 (40)	47 (25)	0	0
Wilson 9	251 (35)	185 (65)	66 (15)	13 (40)	0
Wilson 10	329 (40)	99 (55)	230 (35)	58 (70)	0
Wilson 11	987 (70)	665 (85)	322 (45)	54 (65)	0
Wilson 13	48 (10)	48 (40)	0	0	0

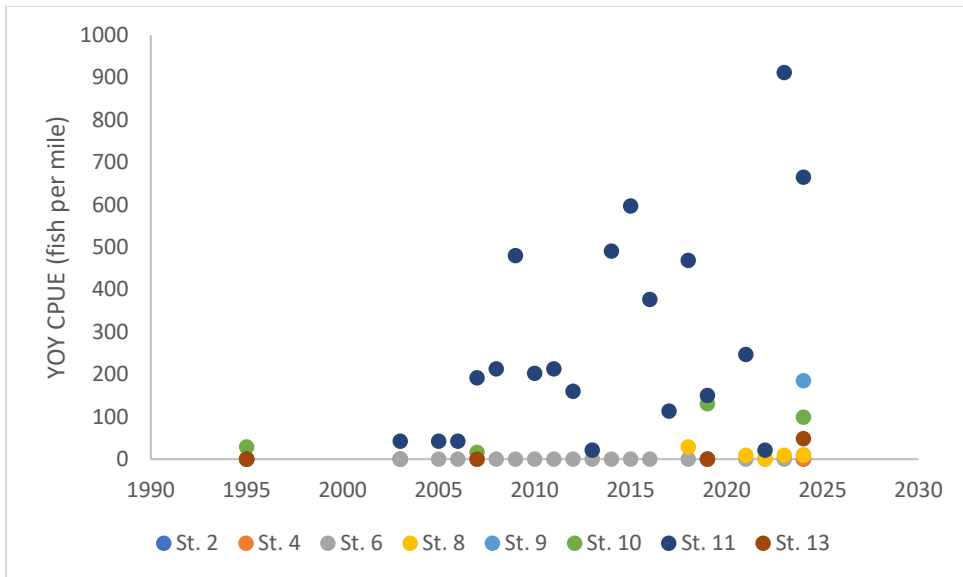


Figure 1. Relative abundance of young-of-year (YOY) brown trout (≤ 5.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 8 stations in Wilson Creek from 1995 to 2024.

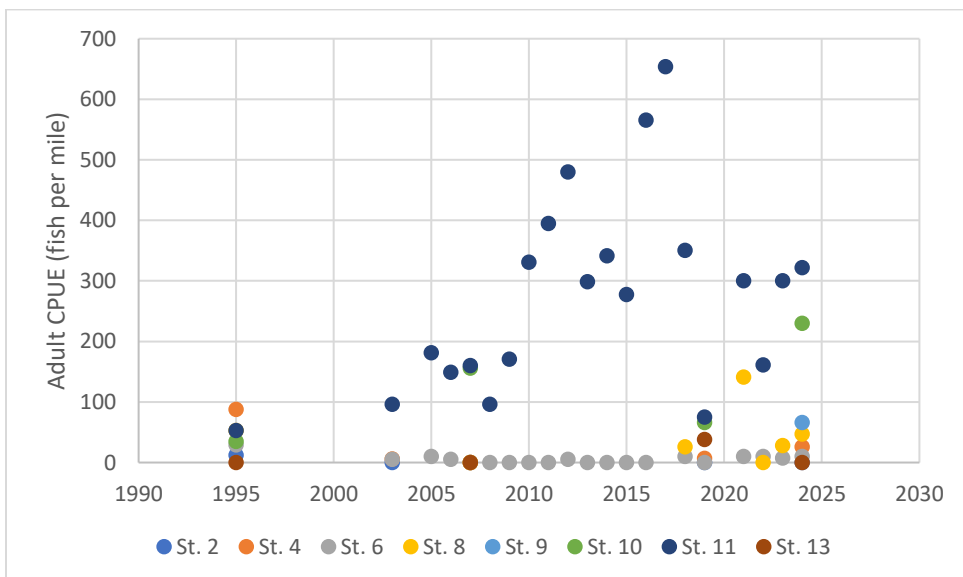


Figure 2. Relative abundance of adult brown trout (≥ 5.5 inches) as expressed by catch per effort (CPE; fish per mile) collected from 8 stations in Wilson Creek from 1995 to 2024.

Natural reproduction of brook trout was documented at all stations that trout were detected at on Wilson Creek and was highest in the mid to upper reaches (Table 2). YOY brook trout were present in moderate to high densities and catch rates ranged from 7 per mile (40th percentile) at Station 4 to 569 per mile (85th percentile) at Station 11 (Figure 3). Natural reproduction appears to be stable at most stations except for Station 11 in which YOY densities have declined and have been at below average levels since 2015. No natural reproduction of brook trout was detected in Unnamed Creek 15-14.

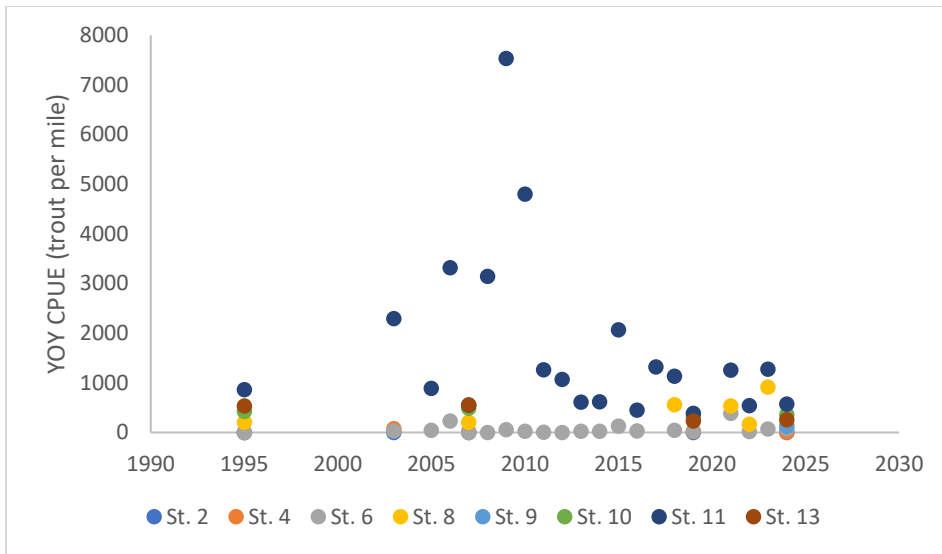


Figure 3. Relative abundance of young-of-year (YOY) brook trout as expressed by catch per effort (CPUE; fish per mile) collected from 8 stations in Wilson Creek from 1995 to 2024.

Adult brook trout were present in moderate to high densities with the lowest catch rates at Station 4 (188 per mile; 65th percentile) and highest catch rates at Station 8 (762 per mile; 90th percentile; Table 1). Adult densities were above the long-term average within the lower stations on Wilson Creek and were below average within the upper stations (Figure 4). Adult brook trout densities have been above the long-term average at the Station 6 trend site for the past five years. Adults larger than 8 inches were also detected at all stations except for Station 2 and ranged in moderate to high densities (Table 2). Stations 4, 6, 8 and 11 contained densities of brook trout larger than 8 inches above the 80th percentile. Brook trout larger than 10 inches were found at five of the eight stations surveyed and were not detected in the two upstream most stations. Fish ≥ 10 inches were present in high densities at these stations (Table 2). The largest brook trout surveyed in Wilson Creek in 2024 was 11.8 inches. Unnamed Creek 15-14 contained adult brook trout in moderate densities at both stations surveyed. Brook trout ranged in length from 6 to 8 inches at Station 1 and 6 to 7 inches at Station BB.

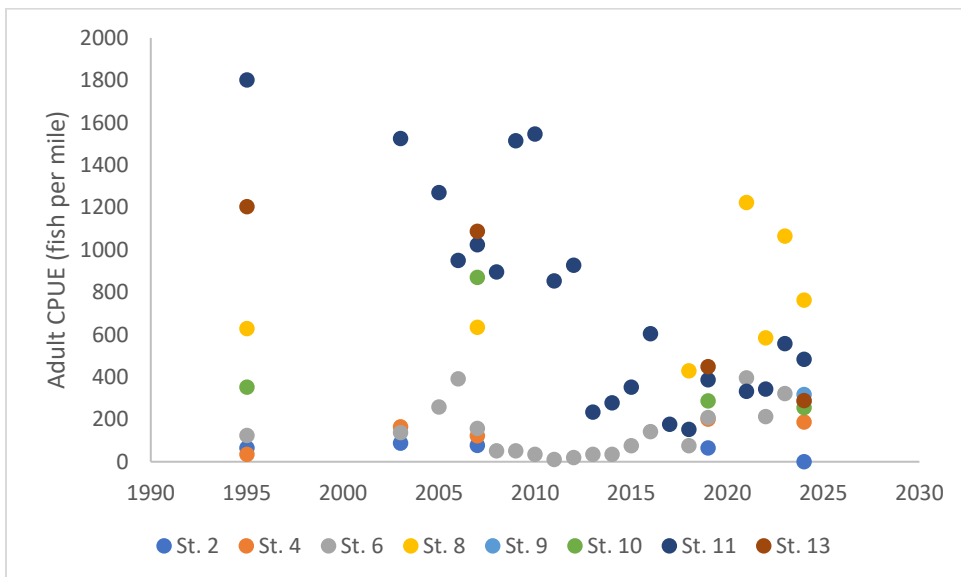


Figure 4. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 8 stations in Wilson Creek from 1995 to 2024.

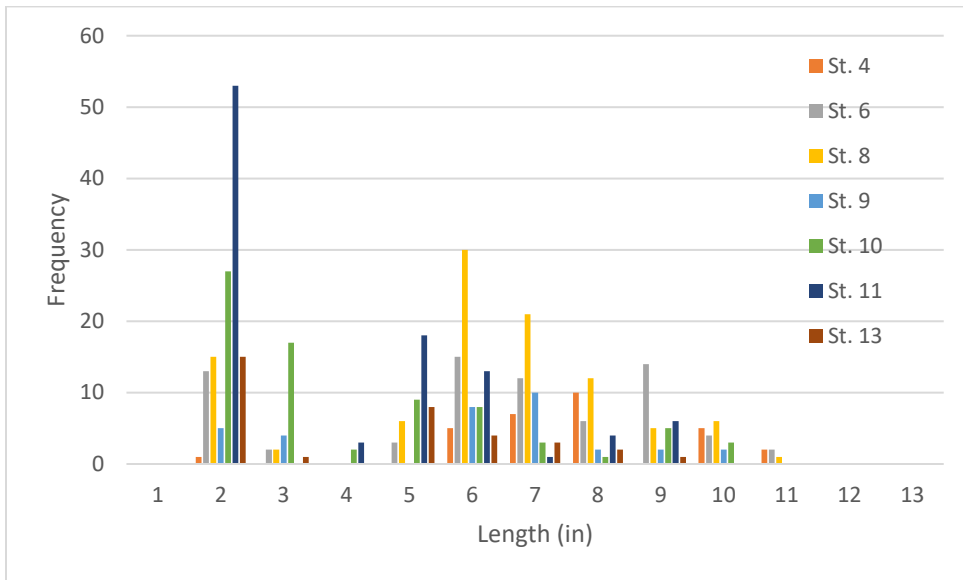


Figure 5. Length distribution of brook trout collected from Wilson Creek in eight stations in 2024.

IBI surveys conducted at Stations 2, 8, 9 and 10 resulted in ratings ranging from Very Poor with a score of 0 at Station 2 to Excellent with a score of 90 at Station 10. Station 2 did not contain trout but did contain several warmwater species (Table 4). Stations 8 and 9 received ratings of Good with scores of 70 and 80. The IBI survey at Station 1 on Unnamed Creek 15-14 resulted in a Fair rating with a score of 50.

Table 4. Total number of each species captured at 8 stations on Wilson Creek and 2 stations on Unnamed Creek 15-14, summer 2024. (. Indicates species were not targeted).

SPECIES	2	4	6	8	9	10	11	13	15-14 ST. 1	15-14 ST. BB
Brook Trout	0	30	71	98	33	75	98	34	5	7
Brown Trout	0	4	4	6	19	40	92	3	0	0
Mottled Sculpin	0	.	.	271	.	70	.	71	0	0
Bluegill	1	.	.	0	.	0	.	0	0	0
Walleye	0	3	.	0	.	0	.	0	0	0
White Sucker	9	.	.	18	.	0	.	0	5	0
Brook Lamprey	0	.	.	19	.	2	.	0	0	0
Brook Stickleback	0	.	.	7	.	0	.	0	2	2
Creek Chub	0	.	.	2	.	0	.	0	0	4
Central Mudminnow	0	.	.	1	.	0	.	0	1	0
Pearl Dace	0	.	.	0	.	0	.	0	13	0
Blacknose Dace	0	.	.	0	.	0	.	0	3	0

ANNIS CREEK

Brook trout were present at all stations surveyed on Annis Creek in 2024 in moderate to high densities (Table 5). No brown trout were sampled throughout the surveys. Total brook trout catch rates ranged from 230 per mile (65th percentile) at Station 1 to 902 per mile (90th percentile) at Station 4 (Table 5). Trout densities have increased in all stations from previous surveys conducted

in 2013 and 1995 (Figures 6 & 7). Brook trout densities were moderate in Unnamed Creek 14-9 and were within the 60th percentile for Class II trout streams statewide. Unnamed Creeks 25-3 and 23-1 contained high densities of brook trout within the 90th and 85th percentiles (Table 5).

Evidence of natural reproduction of brook trout was found at all stations surveyed on Annis Creek and its direct tributaries with the exception of Stations 1 and 3 in which no YOY trout were found (Table 5). Within Annis Creek, catch rates of YOY ranged from 24 per mile (55th percentile) at Station 2 to 225 per mile (80th percentile) at Station 4 (Figure 6). The unnamed tributaries contained YOY brook trout in high densities with catch rates above the 75th percentile at all stations. Relative to the previous survey conducted in 2013, YOY densities were higher at Stations 5 and 7, while the other stations exhibited similar or decreased catch rates of YOY.

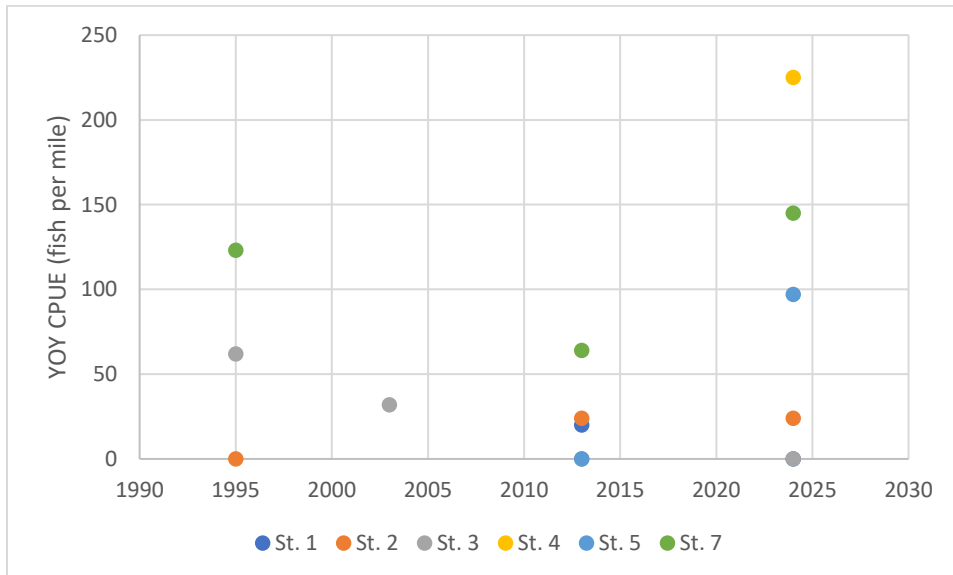


Figure 6. Relative abundance of young-of-year (YOY; ≤ 4.5 inches) brook trout as expressed by catch per effort (CPUE; fish per mile) collected from 6 stations on Annis Creek from 1995 to 2024.

Adult brook trout were present at all stations surveyed on Annis Creek is moderate to high densities for Class II trout streams statewide. Adult densities ranged from 129 per mile (55th percentile) at Station 7 to 676 per mile at Station 4 (90th percentile) (Table 5). Adult brook trout densities were higher in 2024 relative to the previous survey in 2013 at all stations that were surveyed (Figure 7). Brook trout larger than 8 inches were found at all stations on Annis Creek except for Station 7. Catch rates of brook trout ≥ 8 inches ranged from 48 per mile (65th percentile) at Station 5 to 242 per mile (95th percentile) at Station 4 (Table 5). Brook trout larger than 10 inches were only detected at Stations 1, 2 and 3 and densities ranged from 23 per mile (80th percentile) at Station 1 to 61 per mile (90th percentile) at Station 3. The largest brook trout surveyed on Annis Creek in 2024 was 12.3 inches (Figure 8). Adult trout were found at all stations surveyed on the unnamed tributaries of Annis Creek in low to moderate densities. Brook trout larger than 8 inches were only found in Unnamed Creek 14-9 in moderate densities of 16 per mile (40th percentile). No trout larger than nine inches were detected in Unnamed Creek 14-9.

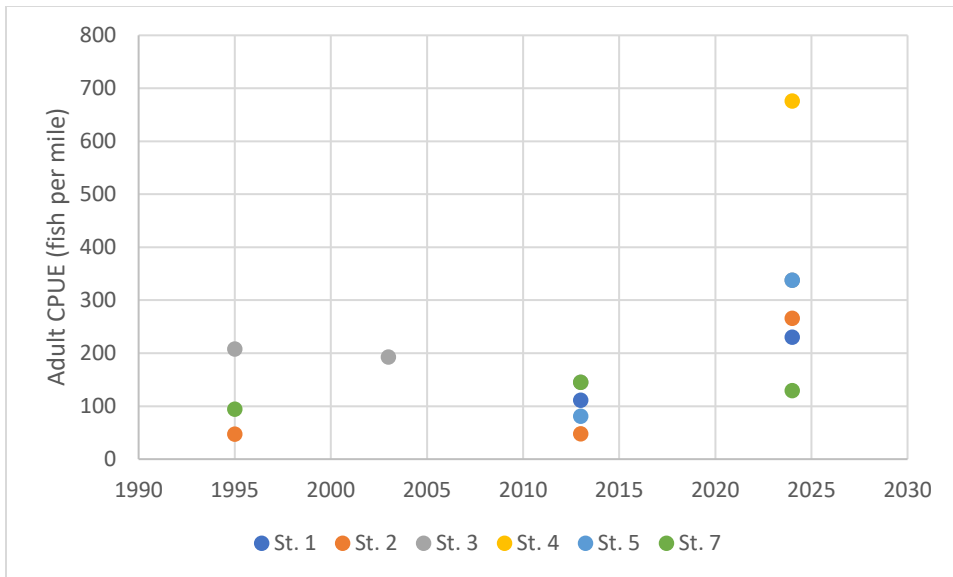


Figure 7. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 6 stations on Annis Creek from 1995 to 2024.

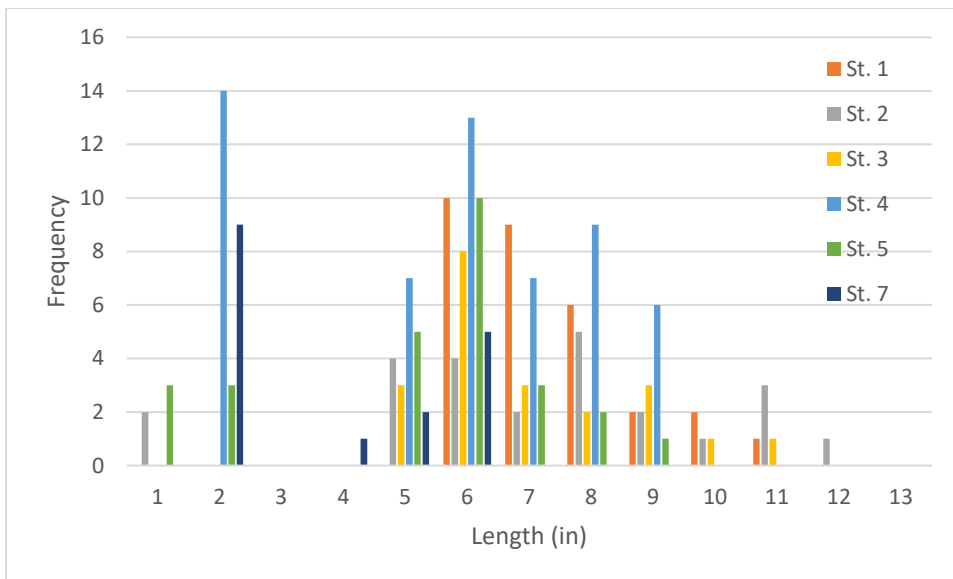


Figure 8. Length distribution of brook trout collected from Annis Creek in 6 stations in 2024.

Table 5. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 7 stations on Annis Creek and 3 stations on Unnamed Tributaries in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 4.5 INCHES)	CPUE ≥ 8 INCHES	CPUE ≥ 10 INCHES
Annis 1	230 (65)	0	230 (70)	84 (75)	23 (80)
Annis 2	291 (70)	24 (55)	266 (75)	145 (85)	61 (90)
Annis 3	338 (75)	0	338 (80)	113 (85)	32 (85)
Annis 4	902 (90)	225 (80)	676 (90)	242 (95)	0
Annis 5	435 (80)	97 (70)	338 (80)	48 (65)	0
Annis 7	274 (70)	145 (75)	129 (55)	0	0
Unnamed Creek 25-3	708 (90)	499 (90)	209 (65)	0	0
Unnamed Creek 23-1	580 (85)	483 (90)	97 (45)	0	0
Unnamed Creek 14-9	193 (60)	161 (75)	32 (25)	16 (40)	0

IBI surveys conducted at Stations 1, 3 and 5 resulted in ratings ranging from Good with a score of 70 at Station 1 to Excellent with a score of 100 at Stations 3 and 5. The IBI survey at on Unnamed Creek 14-9 resulted in a rating of Excellent with a score of 90. Unnamed Creek 25-3 also received a rating of Excellent with a score of 100.

Table 6. Total number of each species captured at 6 stations on Annis Creek and 3 stations on unnamed tributaries, summer 2024. (.) Indicates species were not targeted).

SPECIES	1	2	3	4	5	7	25-3	23-1	14-9
Brook Trout	30	24	21	56	27	17	44	36	12
Brown Trout	0	0	0	0	0	.	0	.	
Longnose Dace	5	.	0	.	0	.	0	.	
Mottled Sculpin	21	.	4	.	10	.	14	.	
Bluegill	6	.	0	.	0	.	2	.	
White Sucker	7	.	0	.	0	.	0	.	

CLACK CREEK

Clack Creek continues to be a high-quality tributary to Annis Creek in terms of brook trout production. Brook trout were found at all stations surveyed in moderate to high densities (Table 7). Total brook trout catch rates ranged from 225 per mile (65th percentile) to 1095 per mile (95th percentile). Brook trout abundance has increased from the previous survey in 2011 in which only 129 trout per mile were captured at Station 1. Densities have remained stable at Station 2 and have increased at Station 4. No trout were found at Station 4 in 2011.

Stations 2 and 4 contained YOY brook trout in high densities indicating adequate levels of natural reproduction (Table 7). YOY catch rates have increased from the previous survey at these stations. Station 1 did not contain YOY trout which was consistent with the previous survey in 2011.

Multiple year classes of trout were found at all stations surveyed. Adult brook trout were found at all stations surveyed and were present in high densities at Stations 1 and 2 (90th percentile) and in low densities at Station 4 (25th percentile). Brook trout larger than 8 and 10 inches were found in high densities at Station 1 (Table 7). No brook trout larger than 8 inches were found at Station 4 and none larger than 10 inches were found at Station 2.

IBI surveys were conducted at all stations on Clack Creek and resulted in ratings of Excellent at Stations 1 and 2 and Good at Station 4. Other than trout, white sucker and mottled sculpin were the only other species surveyed and only brook stickleback were found at Station 4.

Table 7. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 7 stations on Clack Creek in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 4.5 INCHES)	CPUE ≥ 8 INCHES	CPUE ≥ 10 INCHES
Clack 1	724 (90)	0	724 (90)	354 (95)	48 (90)
Clack 2	1095 (95)	338 (85)	757 (90)	177 (90)	0
Clack 4	225 (65)	193 (80)	32 (25)	0	0

CROSBY CREEK

Surveys on Crosby Creek revealed brook trout in high densities (90th percentile) at Station 1 and moderate densities at Station 2 (45th percentile) (Table 8). Trout abundance has increased dramatically since the previous surveys at Station 1 during which 158 trout per mile were sampled in 1995 and 64 trout per mile were sampled in 2016. No trout were sampled in 1995 at Station 2.

Natural reproduction was evidenced at Station 1 by the presence of YOY in moderately high densities (Table 8). Catch rates of YOY were higher during 2024 than past surveys. No YOY trout were sampled at Station 2 which is similar to past findings at this location. Multiple year classes of adult brook trout were present at both stations. No trout larger than 9 inches were surveyed.

The IBI survey completed at Station 1 resulted in an Excellent rating with a score of 100. Fish species sampled other than trout in Crosby Creek included mottled sculpin.

Table 8. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 7 stations on Crosby Creek in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (\geq 4.5 INCHES)	CPUE \geq 8 INCHES	CPUE \geq 10 INCHES
Crosby 1	805 (90)	161 (75)	644 (90)	129 (85)	0
Crosby 2	97 (45)	0	97 (45)	0	0

HAY CREEK AND UNNAMED TRIBUTARY 3-9

Hay Creek represents a high-quality tributary to Wilson Creek in terms of brook trout productivity. Brook trout were present in moderate to high densities and multiple year classes of trout were found at all stations surveyed (Table 9). All stations contained brook trout in densities that were above the 90th percentile for Class II trout stream statewide, except for Station 4 in which total brook trout abundance was within the 65th percentile. Catch rates of brook trout were higher at all stations relative to previous surveys (Figures 9 & 10). Sampling on Unnamed Creek 3-9 also revealed brook trout populations in moderate to high densities. Catch rates were higher in 2024 than in the previous 1995 survey at Station 1 (Figures 9 & 10).

Natural reproduction of brook trout was documented at all stations on Hay Creek and Unnamed Creek 3-9 and YOY were present in moderate to high densities. Catch rates of YOY brook trout ranged from 64 per mile at Station 1 of Unnamed Creek 3-9 to 435 per mile at Station 3 on Hay Creek (Table 9 & Figure 9). YOY were previously not found at Station 1 prior to 2021 and were only found in low densities in 2021 at 16 per mile (Figure 9). Station 190th St contained YOY in higher densities than in 2018 which was prior to the completion of the trout habitat improvement project at this location. The post-project mean density of YOY brook trout was 187 per mile while densities in 2018 (pre-project) were 96 per mile.

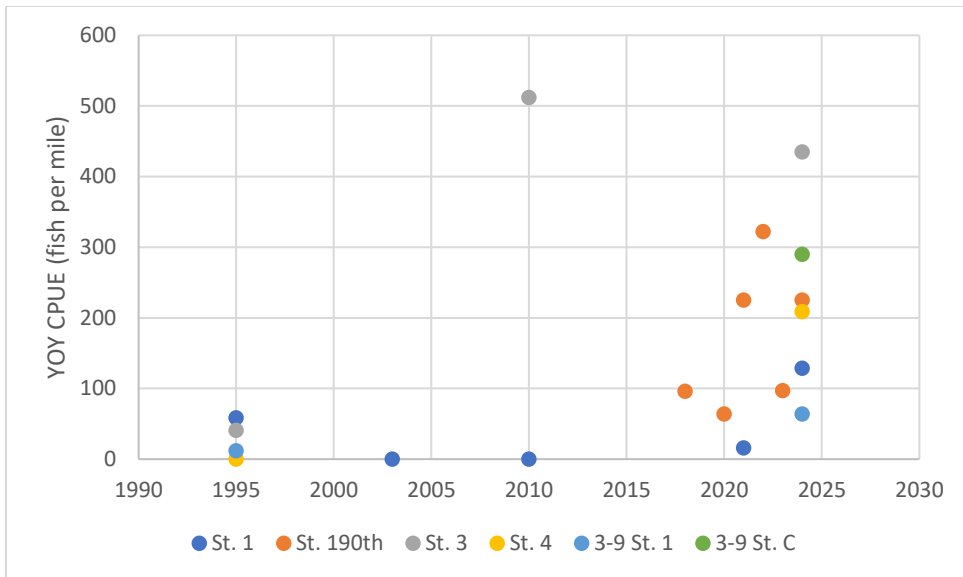


Figure 9. Relative abundance of young of year brook trout (≤ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 6 stations on Hay Creek and Unnamed Tributary 3-9 from 1995 to 2024.

Adult brook trout densities were high at Stations 1, 190th St. and 3 and were low at Station 4 on Hay Creek (Table 9). Brook trout larger than 8 inches were found at all stations on Hay Creek except for Station 4. Trout larger than 8 inches were in high abundance at Stations 1 and 190th St. No trout larger than 7 inches were found at Station 4. Brook trout larger than 10 inches were found at Stations 1 and 190th St, however no fish larger than 12 inches were found. Unnamed Creek 3-9 contained adult brook trout in moderate (50th percentile) to high densities (85th percentile). The maximum size of brook trout within the stations surveyed was 9.3 inches at Station C and no trout larger than 8 inches were found at Station 1.

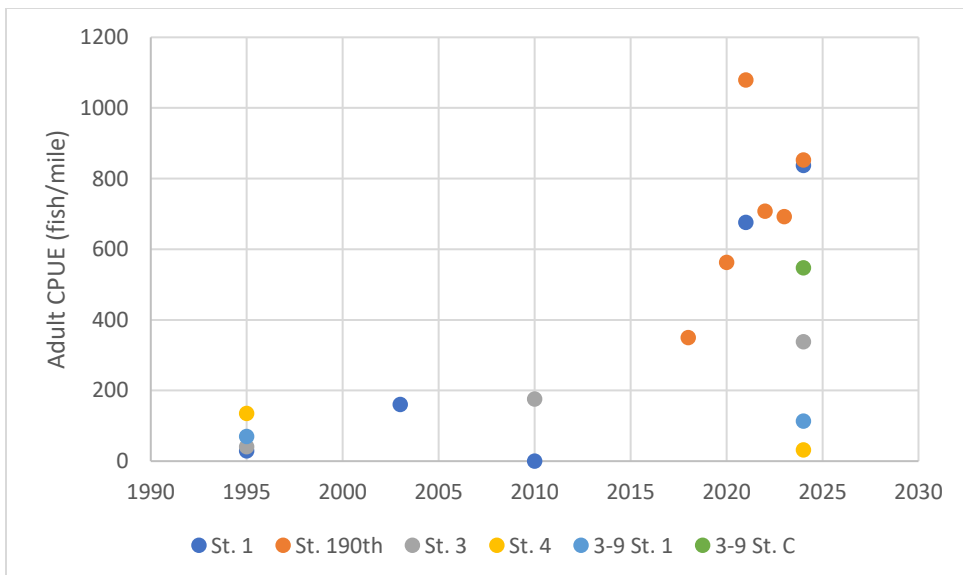


Figure 10. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 6 stations on Hay Creek and Unnamed Tributary 3-9 from 1995 to 2024.

IBI surveys were conducted at Stations 1, 3 and Unnamed Creek 3-9 St. C. All stations resulted in scores of 100 with Excellent ratings. Other species encountered on Hay Creek and the tributary included mottled sculpin and brook stickleback.

Table 9. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 4 stations on Hay Creek and 2 stations on and unnamed tributary (3-9) in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 4.5 INCHES)	CPUE ≥ 8 INCHES	CPUE ≥ 10 INCHES
Hay 1	966 (90)	129 (75)	837 (90)	322 (95)	113 (95)
Hay 190 th St	1079 (95)	225 (80)	853 (90)	258 (95)	32 (85)
Hay 3	773 (90)	435 (90)	338 (80)	16 (40)	0
Hay 4	242 (65)	209 (80)	32 (25)	0	0
Unnamed Creek 3-9 St. C	837 (90)	290 (85)	547 (85)	64 (70)	0
Unnamed Creek 3-9 St. 1	177 (60)	64 (65)	113 (50)	0	0

RUSH CREEK

All stations on Rush Creek contained multiple year classes of brook trout. No brown trout were found. Brook trout were present in high densities at all stations and above the 75th percentile for relative abundance of brook trout in Class II trout streams in Wisconsin (Table 10). Brook trout abundance was higher at Stations 1 and 2 compared to previous surveys in 1995, 2003 and 2016 and was similar to catch rates in 2016 at Station 3 (Figures 11 & 12).

Natural reproduction of brook trout was apparent at all stations on Rush Creek with YOY catch rates ranging from 32 per mile (55th percentile) at Station 2 to 467 per mile (90th percentile) at Station 3. YOY catch rates were considerably higher relative to 2016 surveys in which catch rates at Station 1 was 0 per mile, 29 per mile at Station 2 and 64 per mile at Station 3 (Figure 11).

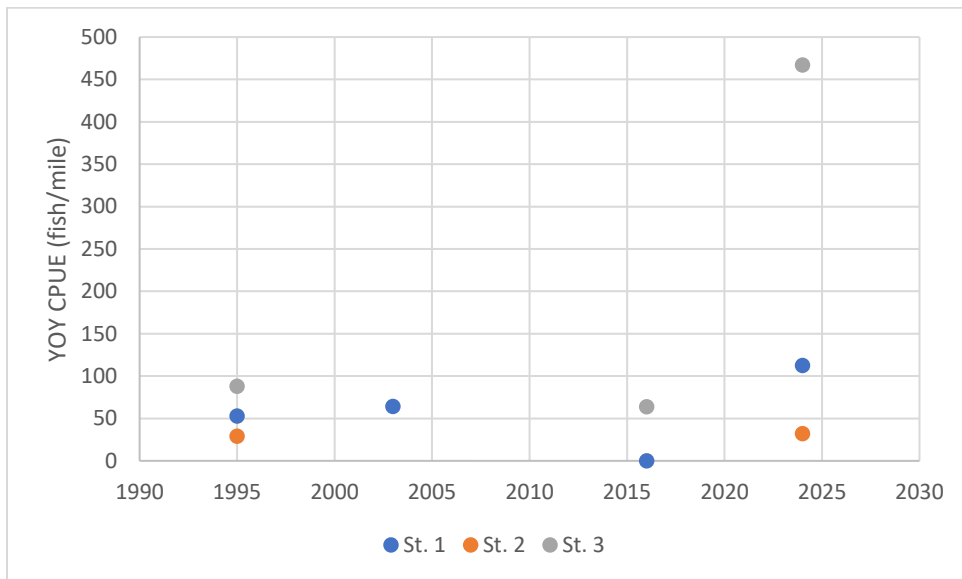


Figure 11. Relative abundance of young of year brook trout (≤ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 3 stations on Rush Creek from 1995 to 2024.

Adult brook trout were also present at all stations in moderate to high densities with the highest densities at Station 2. Brook trout larger than 8 inches were found in moderate to high densities at Station 1 and 2 and no trout larger than 8 inches were found at Station 3. The largest brook trout

sampled in Rush Creek was 11.4 inches in Station 2. Catch rates of larger trout have declined since previous surveys at all stations (Figure 12).

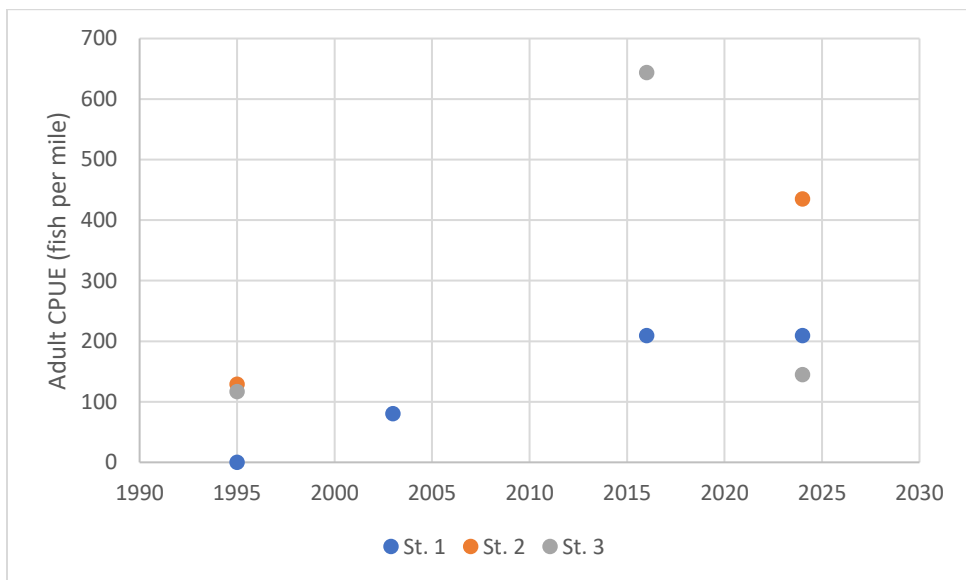


Figure 12. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 3 stations on Rush Creek from 1995 to 2024.

IBI surveys conducted at Stations 1 and 2 indicated healthy stream conditions for trout and other cold-water species. Station 1 rated as Good with a score of 80 while Station 2 received a rating of Excellent with a score of 100. Non-game species surveyed in Rush Creek in 2024 included brook stickleback, mottled sculpin and pearl dace.

Table 10. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 3 stations on Rush Creek in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 4.5 INCHES)	CPUE ≥ 8 INCHES	CPUE ≥ 10 INCHES
Rush 1	322 (75)	113 (70)	209 (65)	16 (40)	0
Rush 2	467 (80)	32 (55)	435 (85)	64 (70)	16 (75)
Rush 3	612 (85)	467 (90)	145 (55)	0	0

NORTH BRANCH WILSON CREEK AND UNNAMED TRIBUTARIES

The North Branch of Wilson Creek contains a high-quality brook trout population with moderate to high densities of brook trout throughout the stream (Table 11). Total catch rates of brook trout ranged from 235 per mile (65th percentile) at Station 3 to 1288 per mile (95th percentile) at Station 7. Relative abundance of brook trout in 2024 was substantially higher than abundance during the 2012 survey at all stations except for Station 6. Brown trout were only detected at Station 1 in 2024 in low densities and were not detected in 2012 but were present in 1995 (Table 12). Unnamed tributaries to North Branch Wilson Creek contained low to moderate densities of brook trout with the exception of Unnamed Creek 27-7 in which no trout were sampled.

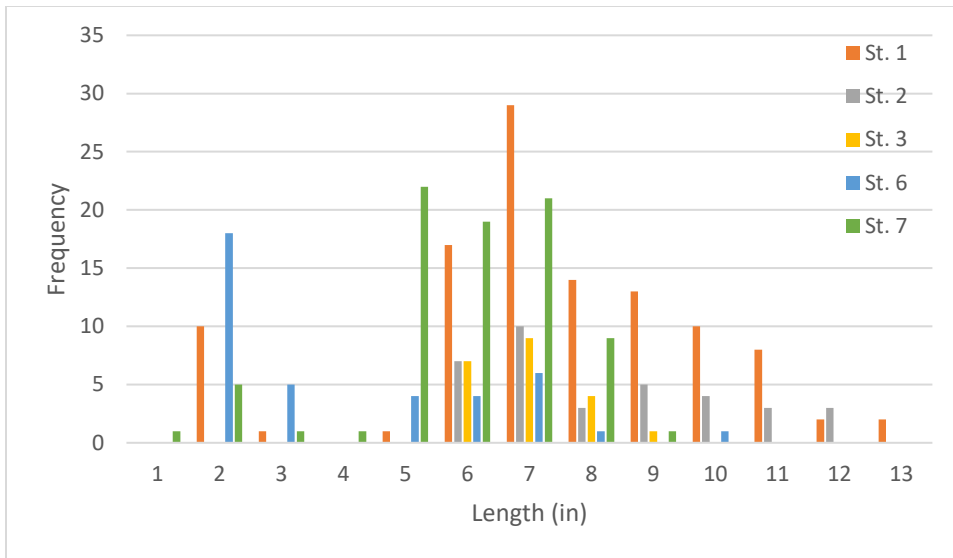


Figure 13. Length distribution of brook trout collected from North Branch Wilson Creek in five stations in 2024.

Natural reproduction of brook trout was found at Station 1, 6 and 7 on the North Branch. YOY catch rates have increased since previous surveys at Station 1 while catch rates have remained stable at Stations 6 and 7 (Table 11 & Figure 14). Stations 2 and 3 have had a history of a lack of YOY during previous surveys which is consistent with the current findings at those locations (Figure 14). Catch rates at the stations that contained YOY brook trout were high and above the 75th percentile. Unnamed tributaries including 20-12, 20-8 and 20-6 contained YOY brook trout in moderate densities while creeks 27-7 and 28-5 did not contain YOY.

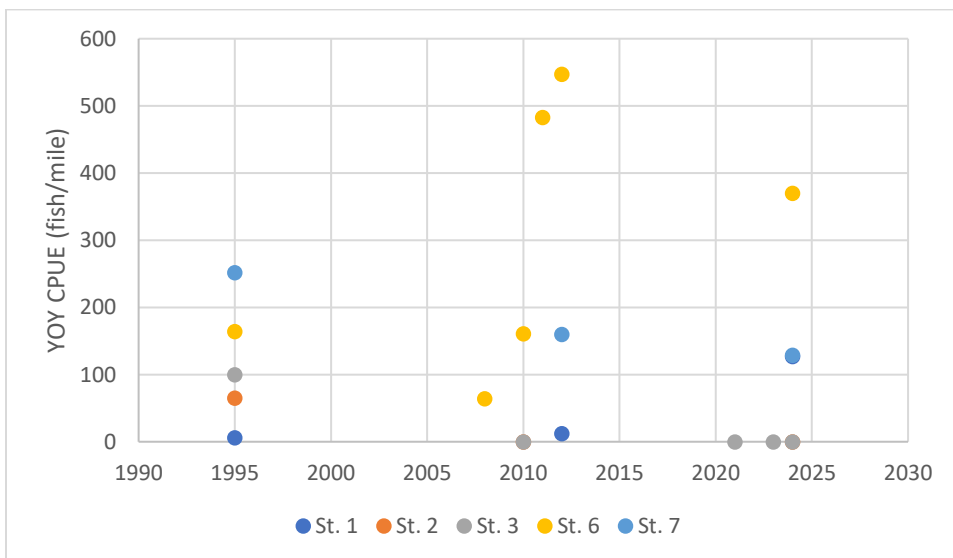


Figure 14. Relative abundance of young of year brook trout (≤ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 5 stations on North Branch Wilson Creek from 1995 to 2024.

Multiple year classes of adult brook trout were present at all stations on the North Branch of Wilson Creek (Figure 13). Adult brook trout densities ranged from 235 per mile at Station 3 (65th percentile) to 1159 per mile (95th percentile) at Station 7. Brook trout larger than 8 inches were present at all stations in high densities ($\geq 75^{\text{th}}$ percentile) except for Station 6 which contained moderate densities within the 55th percentile (Table 11). Brook trout larger than 10 inches were

found at Stations 1, 2 and 6 in high densities. Unnamed tributaries held a range of densities of adult brook trout ranging from low densities at 16 per mile in Unnamed Creek 28-5 to 370 per mile in Unnamed Creek 20-12. No trout were sampled in Unnamed Creek 27-7. Creeks 28-5 and 20-12 contained brook trout larger than 8 inches in moderate and high densities but no trout larger than 10 inches were sampled in any unnamed tributary to North Branch Wilson Creek.

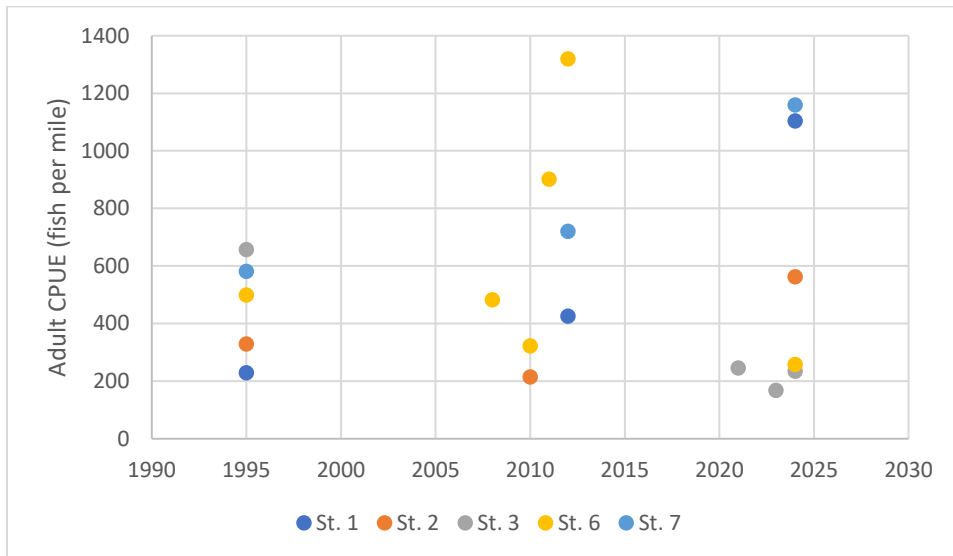


Figure 15. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per effort (CPUE; fish per mile) collected from 5 stations on North Branch Wilson Creek from 1995 to 2024.

IBI surveys conducted at Stations 1, 2, 3, 6 and 7 on the North Branch resulted in Excellent ratings for all stations except for Station 1 which received a rating of Good. Several tolerant species were sampled at Station 1 which resulted in the lower score (Table 12). Unnamed Creek 28-5 received a rating of Fair with a score of 40. Unnamed Creeks 20-6 and 20-12 both received ratings of Excellent with scores of 100 and 27-7 received a score of 20 with a Poor rating due to the lack of trout and presence of intolerant species (Table 12).

Table 11. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 4 stations on North Branch Wilson Creek in Dunn County in 2024. Percentiles of catch rates (fish per mile) are denoted in parentheses. Percentiles were assigned from catch rates of Class I or II brook trout streams in the Driftless Area in Wisconsin.

STATION	TOTAL CPUE	YOY CPUE	ADULT CPUE (≥ 4.5 INCHES)	CPUE ≥ 8 INCHES	CPUE ≥ 10 INCHES
North Branch 1	1231 (95)	127 (75)	1104 (95)	564 (95)	253 (95)
North Branch 2	563 (85)	0	563 (85)	290 (95)	161 (95)
North Branch 3	235 (65)	0	235 (65)	56 (70)	0
North Branch 6	628 (85)	370 (85)	258 (75)	32 (55)	16 (75)
North Branch 7	1288 (95)	129 (75)	1159 (95)	161 (90)	0
Unnamed Creek 27-7	0	0	0	0	0
Unnamed Creek 28-5	16 (15)	0	16 (15)	16 (40)	0
Unnamed Creek 20-12	547 (70)	177 (65)	370 (70)	145 (85)	0
Unnamed Creek 20-8	64 (35)	32 (55)	32 (25)	0	0
Unnamed Creek 20-6	225 (45)	177 (65)	48 (20)	0	0

Table 12. Total number of each species captured at 6 stations in North Branch Wilson Creek, summer 2024. (. Indicates species were not targeted).

SPECIES	1	2	3	6	7
Brook Trout	107	35	21	39	80
Brown Trout	10	0	0	0	0
Mottled Sculpin	39	.	12	17	0
Longnose Dace	3	.	0	0	0
Bluegill	11	.	0	0	0
White Sucker	36	.	0	0	0
Creek Chub	1	.	0	0	0
Pearl Dace	1	.	6	0	0
Fathead Minnow	4	.	2	0	0
Brook Lamprey	4	.	0	0	0
Brook Stickleback	0	.	1	0	1

Discussion

TROUT POPULATION CHANGES

Trout populations within the Wilson Creek watershed have increased in abundance since previous surveys conducted in the past two decades despite reductions in trout stocking within the past 10 years. Specifically, brook trout densities have increased or remained stable in all streams within the watershed including the mainstem of Wilson Creek. Brown trout remain a minor part of the trout fishery except in the headwaters of Wilson Creek where natural reproduction and subsequent adult abundance has increased. Trend surveys at Station 11 have documented a continued increase in brown trout densities while brook trout have simultaneously declined. This appears to be the trend within the reaches of Wilson Creek upstream of the town of Knapp, WI. The habitat within this reach is considerably different from the remainder of the streams within the watershed and contains limestone deposits that feature coarse substrates and high gradient stream reaches while the rest of the watershed features relatively low gradient streams with fine substrates. Brown trout appear to prefer these habitats for spawning (Witzel and MacCrimmon 1983) and displacement of brook trout by brown trout has been documented (Grant et al. 2002).

Natural reproduction of brook has also increased within Wilson Creek and its tributaries. Catch rates of YOY were higher than in previous surveys conducted in Annis, North Branch Wilson, Clack, Crosby, Hay and Rush Creeks. The exception to this increase was also documented at the upper stations on Wilson Creek in which declines in YOY catch rates were apparent. Natural reproduction of brown trout has increased since the mid-2000s and is now at high levels. Increases in natural reproduction and trout populations can likely be attributed to improvements in land use practices within the watershed which has resulted in increased infiltration and higher groundwater to surface water connections. Trout habitat improvements, feral brook trout stocking, reduction in heavy grazing and improved stream buffers have all likely influenced the improvements in stream conditions and subsequent trout populations.

CURRENT STATUS OF TROUT POPULATIONS AND TROUT STREAM CLASSIFICATIONS

Brook trout densities within the mainstem of Wilson Creek have remained stable throughout most of the stream despite the reduction in stocking during the past five years. Catch rates of adult

brook trout were within the mid to upper percentiles when compared to Class II brook trout streams in Wisconsin. Natural reproduction of brook trout is high within the upper reaches and survival to age-1 and older age classes appears to be adequate indicating that the current Class I and II status is appropriate on the mainstem. Brown trout appear to be displacing brook trout within the upper reaches as has been well documented in streams across the Driftless region (Waters 1983; Hoxmeier and Dieterman 2016; Mitro et al. 2019; Jacobson 2024). While brook trout natural reproduction is high, declines are evident in the upper reaches, which coincides with the increase in brown trout reproduction (Grant et al. 2002). Within Wilson's largest tributary, Annis Creek, brook trout densities have increased since past surveys in 1995 and 2013 and are now at moderate to high densities when compared to Class II stream in Wisconsin. Natural reproduction was detected at all stations except for 2 stations which was consistent with previous surveys. Annis Creek's current Class II status is correct based on this survey. This survey documented improvements in the trout populations of several of Annis Creek's tributaries which include Clack, Crosby, Unnamed Creek 25-3 and 23-1. Based on this survey, Clack Creek should be reclassified from Class II to Class I status because of the presence of excellent natural reproduction and multiple year classes of brook trout older than age-1. Fish up to 10 inches were captured indicating annual survival.

Trout populations have also improved in smaller tributaries of Wilson, including Hay Creek, Rush Creek and North Branch Wilson, Unnamed Creeks 25-3, 23-1 and 3-9. Hay Creek is currently classified as Class II and has a long history of brook trout stocking with the latest stocking in 1999. Brook trout densities have increased since past surveys and YOY were present in high densities as well. No brown were present in Hay Creek. The habitat improvement section of stream located upstream of 190th Street contained the highest densities of brook trout throughout the Hay Creek surveys. While only one year of pre-improvement monitoring data exists, densities of brook trout at all size classes have increased after the project was completed and fish larger than 10 inches are now present. Monitoring results at this site indicate that habitat improvements have resulted in improved natural reproduction and overall brook trout densities. Due to increases in adult and YOY brook trout throughout Hay Creek and multiple year classes older than age-1 present at stations surveyed in 2024, Hay Creek should be reclassified to Class I status. Additionally, future habitat improvement work would further benefit the fishery as significant bank erosion and siltation is still present at many locations along the stream. Rush Creek enters Wilson Creek further downstream of the confluence with Hay Creek. Rush Creek is currently classified as a Class II stream which is appropriate based on this survey. However, catch rates of brook trout have increased since previous surveys and IBI survey results indicate excellent stream health. The North Branch of Wilson Creek contained the best size structure of adult brook trout within the sub-watershed, specifically within the lower reaches of the stream. Brown trout were present at the lowermost station near the confluence with Wilson Creek and were removed from the stream during sampling. Brook trout catch rates have increased in most stations on the stream, however natural reproduction of brook trout was limited within the lower reaches and YOY were not present at two stations due to a lack of spawning habitat. Reaches of the stream were previously channelized and have received excessive amounts of siltation due to upstream erosion. Habitat improvement projects are scheduled to occur on the North Branch which should aid in improving spawning and adult habitat conditions. One small tributary (Unnamed Creek 27-7) to the North Branch did not contain trout and should be declassified. Brook trout populations within the two Class I tributaries to the North Branch were in excellent condition and the Class I classifications are appropriate. Unnamed Creek 15-14 is a small tributary to lower Wilson Creek near Menomonie, WI and is currently not classified. However, brook trout were found at the two stations surveyed in

2024 and results indicated that the stream should be classified as a Class II trout stream due to more than 1 adult year class present but no YOY were found. The IBI survey results indicated Fair cold water stream conditions.

REGULATIONS

Trout fishing has been managed by the use of the statewide regulations with the current regulation on all streams within the sub watershed of five fish per day with no size restrictions. The current survey indicates that this relatively liberal harvest regulation has not negatively impacted trout densities or size structure of the trout population even with reduced stocking within the watershed. Recent creel surveys in the Driftless Area have documented very limited angler harvest of trout (Yallaly and Scott 2021) even with liberal harvest regulations. Angler harvest of brown trout specifically is encouraged within the watershed to aid in reduction of negative interactions with brook trout.

STOCKING

Stocking within the watershed has continuously declined as trout populations in many of the streams have improved throughout the past two decades. Trout populations throughout the Driftless region have improved in terms of natural reproduction due to improved water quantity and quality and habitat which has resulted in reduced needs for stocking to supplement and maintain populations. Wilson Creek has received limited yearling brook trout stocking in the lower reaches to boost the fishery that is available to anglers at those locations. In 2017, Northwest Feral strain brook trout stocking replaced the domestic or St. Croix strain of stocked trout in Wilson Creek. The feral strain brook trout have exhibited better performance post-stocking than the domestic strain of brook trout in terms of natural reproduction and establishing naturalized populations. This stocking coupled with habitat improvements and land use within the watershed has likely led to the improvements in the fishery within Wilson Creek documented in this survey.

BROOK TROUT MANAGEMENT AND HABITAT IMPROVEMENTS

Trout management within the Wilson Creek sub watershed should continue to focus on brook trout. Wilson Creek is classified as a Brook Trout Reserve stream in Wisconsin indicating that the stream has the potential to maintain brook trout populations into the future under a warming climate scenario. Western Dunn County remains as a stronghold for natural brook trout populations with few brown trout populations present. Wilson Creek, however, does contain an increasing brown trout population within the headwaters. Brown trout populations have increased in many watersheds throughout the Driftless Area and appear to have the largest increases within limestone-based streams and coarse substrates (Witzel and MacCrimmon 1983; Kocovsky and Carline 2005; Fost 2017). Locally, this includes most streams in Pierce County and the western fringes of central Dunn County where the headwaters of Wilson and Gilbert creeks are located. Brown trout removals have been successful in suppressing brown trout and improving brook trout populations (Olson et al. 2024) and may be necessary on Wilson Creek if brown trout continue to expand.

Trout habitat improvement projects have a history of improving habitat for brown trout specifically. Traditional habitat techniques implemented in stream projects have resulted in narrow, high velocity run and pool habitat which has led to increases in adult brown trout and declines in brook trout. More recent techniques have been altered to attempt to improve habitat

for brook trout. These techniques include variable stream widths to allow for a diversity of depths and substrates. The addition of overhead cover is more limited and is added in the form of rootwads that provide complex woody microhabitats and island complexes are protected, enhanced or added to stream projects to provide further habitat diversity. The habitat improvement projects that have been completed in the watershed have achieved project goals that were set for each project. The 2012 Wilson Creek project located upstream of CTH O resulted in increased brown trout densities and size structure and increased brook trout size structure but did result in declines in brook trout densities. The habitat project located downstream of CTH O in 2019 resulted in increases in brook trout densities and size structure with the use of the more recent techniques that focus on brook trout habitat. The Hay Creek project was also successful in increasing brook trout densities and size structure. However, stream bank erosion and sedimentation is still prevalent within the watershed and the brook trout population would benefit from further improvements.

Management Recommendations

Trout management within the watershed should continue to focus on maintaining and improving the brook trout population. Based on the data collected, brook trout have experienced increases in densities during the past two decades but remain in low to moderate densities in the downstream reaches and reproduction is relatively limited in those areas. However, tributaries appear to provide excellent spawning habitat and production for the mainstem of Wilson Creek. Fishing regulations are appropriate and do not appear to be negatively impacting the fishery and stocking is not needed to maintain the fishery at the current levels. The fishery has responded well to habitat improvement work and further work is needed to reduce bank erosion and sedimentation and increase adult cover. Habitat improvement work with the focus on brook trout habitat is recommended. While a few streambank easements currently exist within the watershed, stream access is otherwise limited to road crossings. Further easement acquisition is recommended to provide additional access, allow for habitat improvement work and perpetual protection of the stream corridor.

1. Maintain current fishing regulations within the watershed and consider more liberal angling regulations that promote brown trout harvest and protect brook trout if brown trout populations continue to increase.
2. Continue to monitor brook trout populations within lower Wilson Creek in the absence of stocking.
3. Continue to annually monitor trout populations within upper Wilson Creek in light of increasing brown trout populations and declining brook trout densities.
4. Focus streambank easement acquisition on Wilson Creek and its tributaries to improve angler access and habitat project implementation.
5. Continue to improve riparian habitats within habitat improvement project areas that will enhance trout habitat.
 - o Continue tree planting within the riparian corridor to provide shading and maintain cold water habitat
6. Continue trout habitat improvement projects within the watershed with a focus on maintaining or improving the brook trout population.
7. Consider a brown trout removal project on upper Wilson Creek upstream of Knapp, WI if trends continue.

8. Reclassify Clack Creek and Hay Creek from Class II to Class I status. Classify the currently unclassified stream, Unnamed Creek 15-14, as Class II. Declassify Unnamed Creek 27-7.

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Appendix A. Guidelines for interpreting cold water Index of Biotic Integrity (IBI) scores (from Lyons et al, 1996).

Overall IBI Score	Biotic Integrity Score	Interpretation and Fish Community Attributes
100 – 90	Excellent	<p>Comparable to the best situations with the least human disturbance: mottled or slimy sculpins are usually common; intolerant, native stenothermal coolwater species such as lampreys or redbreast dace may also be present; brook trout are the primary top carnivores and are present in good numbers; exotic salmonids are absent or uncommon; tolerant species may be present in low to moderate numbers.</p>
80 – 60	Good	<p>Evidence for some environmental degradation and reduction in biotic integrity; either brook trout or sculpins may be uncommon or absent; exotic salmonids often dominate, keeping the abundance of top carnivores high; tolerant species may be common but do not dominate.</p>
50 – 30	Fair	<p>The stream reach has experienced moderate environmental degradation, and biotic integrity has been significantly reduced; total species richness is often relatively high, but intolerant and native stenothermal coldwater species are uncommon or absent; native stenothermal coolwater species and exotic salmonids may be moderately common, but tolerant eurythermal species or warmwater species or both are usually more abundant</p>
20 – 10	Poor	<p>Major environmental degradation has occurred, and biotic integrity has been severely reduced; total species richness may be relatively high, but intolerant species, top carnivores, and salmonids are absent; a few native stenothermal coolwater species such as brassy minnows or brook sticklebacks may persist in low numbers; tolerant eurythermal species or warmwater species or both dominate.</p>
0 or no score	Very Poor	<p>Human disturbances and environmental degradation have decimated the natural cold-water fish assemblage of the reach; either only warmwater and tolerant species remain, or fish abundance is so low (<25 individuals captured) that the IBI cannot be calculated.</p>

Appendix B. Mapping representation of trout species relative abundance (CPE) within the Wilson Creek sub watershed in 2024.

