

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Gilbert Creek Watershed Fisheries Survey Report

HUC 12 WATERSHED 070500071004, Dunn County



Photo Credit: Kasey Yallaly



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Executive Summary

The Gilbert 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 within the watershed, previous comprehensive surveys of the streams within the watershed are dated and occurred in 2012 on Gilbert Creek, 2013 on the North Branch of Gilbert Creek, 2017 on the Middle Branch and in 2014 on the South Branch. 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 17 stations were surveyed on six streams within the sub watershed. Overall, brook trout populations have declined within the mainstem but have remained stable in most of the headwater reaches. Brown trout are now the dominant trout species in the mainstem and exist in moderate to high densities with excellent size structure. Brown trout use of the headwaters and branches for spawning has also increased. Trout habitat improvements have resulted in higher trout densities within impacted reaches. Due to improved conditions and trout populations, several streams warranted reclassifications to Class I status. Habitat improvement, changes in stocking regimes and improvements in land use have all resulted in these trout population improvements.

MANAGEMENT RECOMMENDATIONS

- Consider trout regulation change to focus angler harvest on brown trout and increase protections for brook trout.
- Conduct a trout creel survey to quantify angler effort, catch and harvest on Gilbert Creek.
- Conduct trout habitat improvement projects on lower Gilbert Creek downstream of 270th Street to aid in bank stabilization and erosion reduction.
- Trout habitat improvement projects should incorporate new techniques including island creation, root wads and variable stream narrowing.
- Focus streambank easement outreach on the mainstem of Gilbert Creek to increase angler access and on the headwaters to enhance protection.
- Continue annual trend site monitoring.
- Reclassify Gilbert Creek, North Branch and South Branch from Class II to Class I status.

WATERSHED LOCATION

The Gilbert Creek sub 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 the Red Cedar River at Menomonie. Gilbert Creek is formed by three main branches that come together near the

intersection of CTH Q, CTH N and STH 29 to form the main branch of Gilbert Creek that then flows parallel with STH 29 for the remainder of its length.

PURPOSE OF SURVEY

The purpose of this survey was to evaluate the status and health of the fishery within Gilbert Creek and its major 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 harvest 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 stations were surveyed between June 11th and July 18th of 2024.

SPECIES SAMPLED

- Brook trout
- Brown trout
- White sucker
- Mottled sculpin
- Brook stickleback
- Bluegill
- Longnose dace
- Fathead minnow
- Brook lamprey

Introduction

The Gilbert Creek sub watershed is located within the Wilson Creek watershed which drains 245 square miles in St. Croix and Dunn counties. The watershed is largely composed of agricultural (37%) and forested land (31%) with a mix of grassland and other uses to a lesser extent. The North, Middle and South Branches come together to form the mainstem of Gilbert Creek which is the primary waterway within the sub watershed. The headwaters of the North, Middle and South Branches of Gilbert Creek are located in east central St. Croix County in forested land are considered coldwater streams with high spring and groundwater influence. The Gilbert Creek sub watershed contains a total of 23.8 miles of classified trout water of which 7.6 miles are Class I water and 16.2 miles are Class II water. In addition to the North, South and Middle branches, there are two Class I tributaries which are Unnamed Creek 17-10 (tributary to the North Branch) and Unnamed Creek 30-1 (tributary to the Middle Branch). The

headwaters and western tributaries feature spring fed, high gradient streams with coarse substrate that transition to a lower gradient, sand dominated mainstem with large woody debris and undercut banks as the dominant form of overhead cover.

Historically, the trout fishery within Gilbert Creek was dominated by brook trout. However, during the midcentury, brook trout populations had declined significantly likely due to habitat and water quality degradation and brown trout were stocked in an effort to provide a fishery. Brown trout have been documented in fisheries surveys within the watershed since the 1950s as a result of these stocking efforts and have exhibited more significant increases within the stream in the recent decade. Along with this increase in brown trout densities, brook trout densities have simultaneously declined and brown trout are the dominant species throughout much of the mainstem and portions of tributaries. Habitat, water quality and stream temperatures have improved since midcentury and the fish community has shifted from a warmwater mainstem to a coldwater mainstem that supports a robust mixed species trout fishery. Excluding trend surveys that occur annually, previous fishery surveys occurred on the mainstem of Gilbert Creek in 1995, 2003 and 2012. The North Branch was last surveyed in 2013, the Middle Branch in 2017 and the South Branch in 2014.

STOCKING

Yearling domestic or St. Croix strain brook and brown trout were stocked annually in Gilbert Creek throughout the 1970s through the early 2000s. The last brown trout stocking was in 2002. 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 Gilbert Creek.

REGULATIONS

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

HABITAT IMPROVEMENT

Intensive trout habitat improvement projects have occurred on several miles of Gilbert Creek. One of the first intensive trout habitat projects in the local area occurred on the North Branch in 2003 and 2004 between 120th St and CTH Q. This project was 2,905 feet in length. The stream was narrowed, banks were sloped and armored and in stream habitat was installed in the form of boulders, 72 LUNKER structures, plunge pools, logs and root wads. Continuation of this project occurred downstream of CTH Q in 2004 which included 2,300 feet of stream with similar practices completed. Similar habitat improvement work continued downstream on the North Branch again in 2005 for another 2,375 feet of stream. Work then moved to the South Branch in 2006 with extensive bank grading and shaping, 36 LUNKER structures installed, plunge pools, log weirs, root wads and boulders for an additional 3,764 feet of stream. This project occurred downstream of CTH Q. In 2007,

work continued downstream to the confluence with the North Branch for an additional 1,850 feet which included 200 feet of the mainstem of Gilbert Creek near CTH N. Work continued in 2009 which completed continuous habitat improvement work down to STH 29. Habitat improvement work continued in 2015 on the mainstem of Gilbert Creek on DNR fee title land downstream of STH 29 which included 2,400 feet of intensive improvements. In 2021 and 2022, work continued upstream of the DNR fee title land up to STH 29 which connected the work that was completed in 2009. An additional project occurred on the South Branch in 2022 and 2023 on DNR fee title land near the intersection of STH 29 and CTH Q (south). The projects occurring from 2021 to 2024 included bank sloping, bank armoring, installation of root wads, boulders, weirs and altering the width of the stream to provide a diversity of habitats. All projects included the removal of dense box elder trees within the riparian corridor and native tree species have been planted along the stream in the recent project areas to provide future shading.

PUBLIC ACCESS

Public access to Gilbert Creek is available through 304 acres of DNR owned fee title property located on the mainstem, on the South Branch and where the South Branch and North Branch meet at the intersections of CTH Q, CTH N and STH 29. Approximately 4 miles of streambank easements provide additional public fishing access along the stream. There are currently 6 DNR designated parking lots on the various properties, 3 of which are located on STH 29, 2 on CTH Q and 1 on CTH N.

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 17 stations were surveyed on Gilbert Creek and its tributaries in 2024 (Table 1). Tributaries surveyed included the North Branch, Middle Branch, South Branch, Unnamed Creek 17-10 and Unnamed Creek 20-16. 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 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 five 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.

The Coldwater 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. Stations 3, 5 and 7 included Coldwater IBI sampling.

SURVEY EFFORT

A total of 2,764 feet of stream was surveyed within the Gilbert Creek watershed in 2024 which included six stations on the mainstem, three stations on the North Branch, two stations on the Middle Branch, four stations on the South Branch and two stations on unnamed tributaries (Table 1; Figure 1). Stations 1, 3, 5, 6 and 8 on Gilbert Creek were located within wooded riparian corridors within steep valley walls. Substrate throughout these lower stations is dominated by sand with few gravel sandbars. Station 8 contained considerable gravel substrates and was wider and shallower overall compared to the other stations nearby. Gilbert 9 and North Branch T are both trend stations and are located within previous trout habitat improvement sections that were completed in 2009 and 2003, respectively. These sections contain a grass or savannah type habitat in the riparian zone. North Branch 1 is located within an active cattle pasture and features an incised stream with very little overhead cover and silt as the dominant substrate. The North Branch 3 and Unnamed Creek 17-10 Station 1 are both located within wooded corridors and are high gradient, coarse substrate sections of stream. Middle Branch 1 is also located within a cattle pasture and is incised but large woody debris and deep pools are present. Middle Branch 561st Street is located within a wooded corridor and substrates are composed of gravel and sand at this location. The South Branch 1 is located within an actively grazed pasture and South Branch 2 is located within a wooded corridor. The stream at this location is uncharacteristically wide with substrates ranging from silt and sand to gravel and riprap that was the result of previous bank protection work. The South Branch DNR Land station is located within the habitat improvement project that was completed in 2023. South Branch 3 and Unnamed Creek 20-16 Station 1 were located within wooded riparian corridors.

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

STATION	STATION LOCATION	STATION LENGTH (M)	MEAN STREAM WIDTH (M)
Gilbert 1	CTH P	256	7.3
Gilbert 3	550 th Avenue	252	7.2
Gilbert 5	330 th Street	245	7.0

Gilbert 6	CTH K	208	5.9
Gilbert 8	200 th Street	217	6.2
Gilbert 9	STH 29	151	4.3
North Branch T	120 th Street	255	3.8
North Branch 1	CTH Q	100	2.1
North Branch 3	CTH N	140	4
Unnamed Creek 17-10 St. 1	CTH N	100	1.9
Middle Branch 1	CTH Q	100	1.8
Middle Branch 561 st St	561 st Street	100	1.8
South Branch 1	561 st Street	100	1.9
South Branch 2	STH 29	140	4.0
South Branch 3	Private Driveway	100	3.0
South Branch DNR Land	DNR Land, Intersection of STH 29 and CTH Q	100	2.3
Unnamed Creek 20-16 St. 1	330 th Street	100	2.5

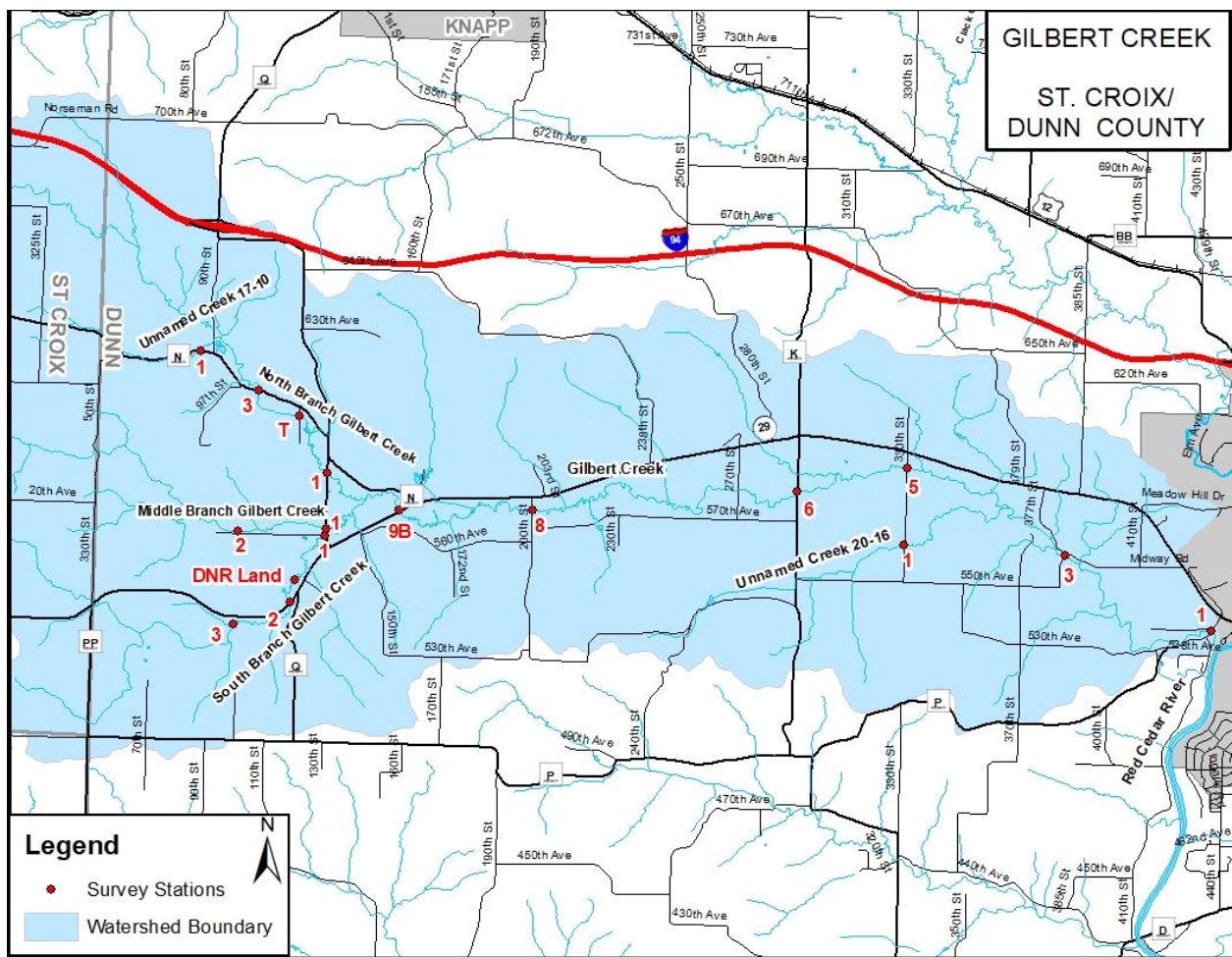


Figure 1. Map of survey station locations within the Gilbert Creek sub watershed in 2024.

Results

GILBERT CREEK

Trout were found in moderate to high densities at all stations surveyed on the mainstem of Gilbert Creek in 2024. Both brook trout and brown trout were found at all stations with brown trout in higher densities than brook trout at all stations with the exception of Station 8. Compared to previous surveys, brook trout densities have declined at most stations except for Stations 1 and 8 in which they remain stable (Figure 1). Total brown trout abundance has increased since the previous rotation survey in 2012 while brook trout have declined. Trend surveys at Station 3 have documented a steady increase in brown trout abundance since approximately 2016 (Figure 2). Brook trout were present in low to high densities within the mainstem of Gilbert Creek and total catch rates in 2024 ranged from 70 per mile at Station 3 to 1528 per mile at Station 8 (Table 2). Brown trout were present in moderate to high densities at all stations and catch rates ranged from 470 per mile at Station 3 to 1703 per mile at Station 6 (Table 3).

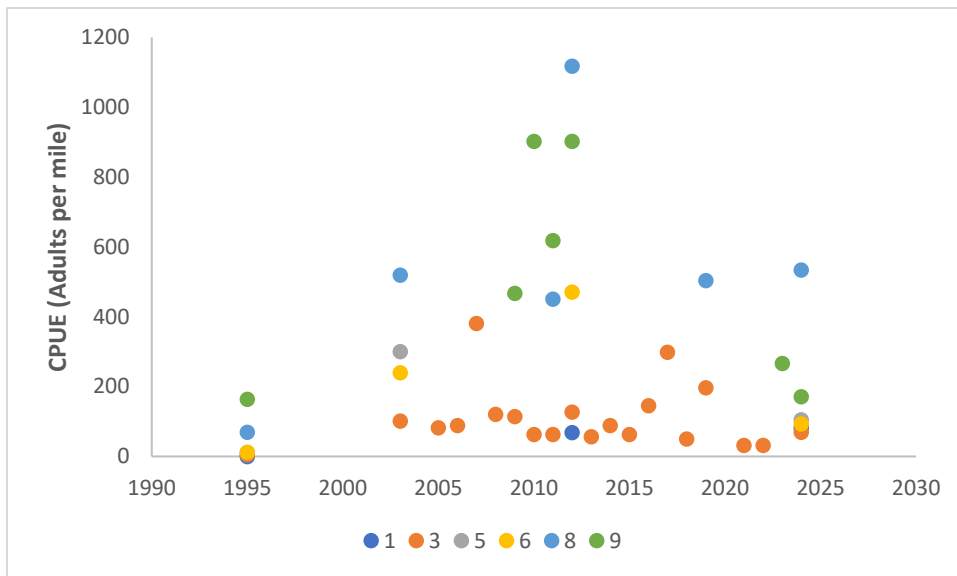


Figure 1. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per unit effort (CPUE; fish per mile) collected from 6 stations on Gilbert Creek from 1995 to 2024.

Adult brook trout were present in moderate densities throughout all stations on Gilbert Creek with catch rates ranging from 70 per mile (40th percentile) at Station 3 to 691 per mile (90th percentile) at Station 8 (Table 2). Adult brook trout densities have declined in Gilbert Creek at all stations surveyed while adult brown trout densities have simultaneously increased (Figure 1). Adult brown trout were present in high densities with catch rates ranging from 463 per mile (70th percentile) at Station 3 to 1053 per mile at Station 6 (90th percentile). Adult densities began to increase since approximately 2016 according to trend site data at Station 3 and densities are higher at all stations relative to previous survey data from 2012.

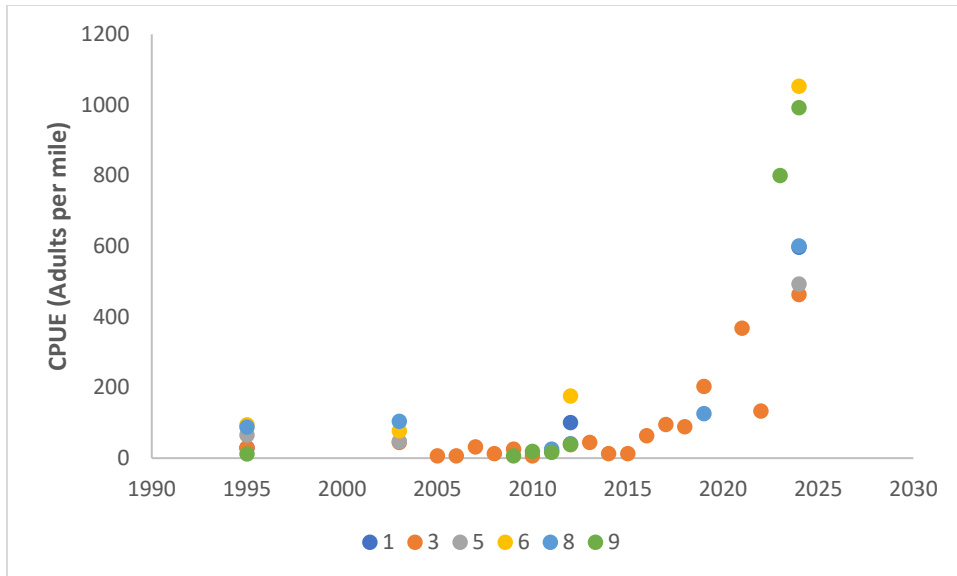


Figure 2. Relative abundance of adult brown trout (≥ 5.5 inches) as expressed by catch per unit effort (CPUE; fish per mile) collected from 6 stations on Gilbert Creek from 1995 to 2024.

The size structure of brook trout was excellent at the lower stations and highest at the uppermost station (Station 9) on the mainstem (Table 2). The largest brook trout captured was 14.4 inches. Brook trout larger than 10 inches were present in moderate densities at all stations on the mainstem ($\geq 55^{\text{th}}$ percentile; Table 2). Adult brown trout size structure was also excellent on the mainstem of Gilbert Creek with fish up to 25 inches in length. Brown trout larger than 15 inches were present at all stations surveyed on the mainstem except for Station 8 (Table 3). Densities of brown trout ≥ 15 inches were high at all stations and above the 95^{th} percentile for Class II trout streams across the state. Station 9 contained the highest size structure of adult brown trout with this being the only station within a habitat improvement site.

Natural reproduction of trout was evidenced at all stations in 2024 by the presence of YOY trout in low to high densities. No YOY brook trout were collected at the two lowermost stations but YOY brown trout were present at these locations in low to moderate densities (Table 3). When present, brook trout YOY catch rates were moderate to high and ranged from 16 per mile (50^{th} percentile) at Station 6 to 994 per mile (95^{th} percentile) at Station 8 (Table 2; Figure 3). Natural reproduction of brook trout appeared to be at average levels at Station 8 which contains excellent spawning and rearing habitat. A decline in natural reproduction of brook trout was documented at stations 6 and 9 (Figure 3). Habitat at Station 9 was converted from spawning and rearing habitat to excellent adult trout habitat during the trout habitat improvement project in 2009. Natural reproduction of brown trout on the mainstem has increased dramatically at two of the stations surveyed in which YOY brown trout were present in high densities (above the 90^{th} percentile; Figure 4). Natural reproduction of brown trout at the remaining stations has remained at low levels.

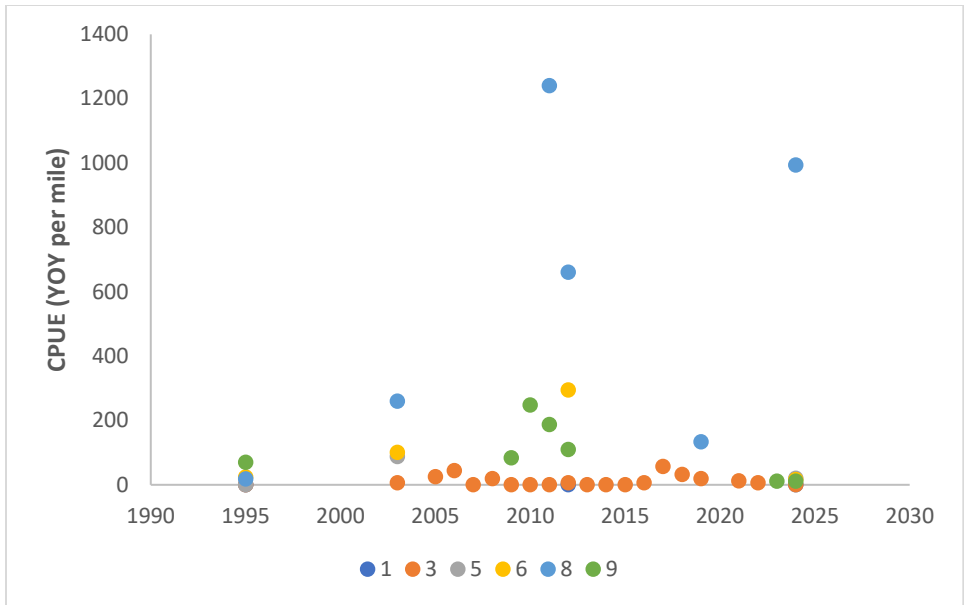


Figure 3. Relative abundance of young-of-year (YOY) brook trout as expressed by catch per unit effort (CPUE; fish per mile) collected from 6 stations on Gilbert Creek from 1995 to 2024.

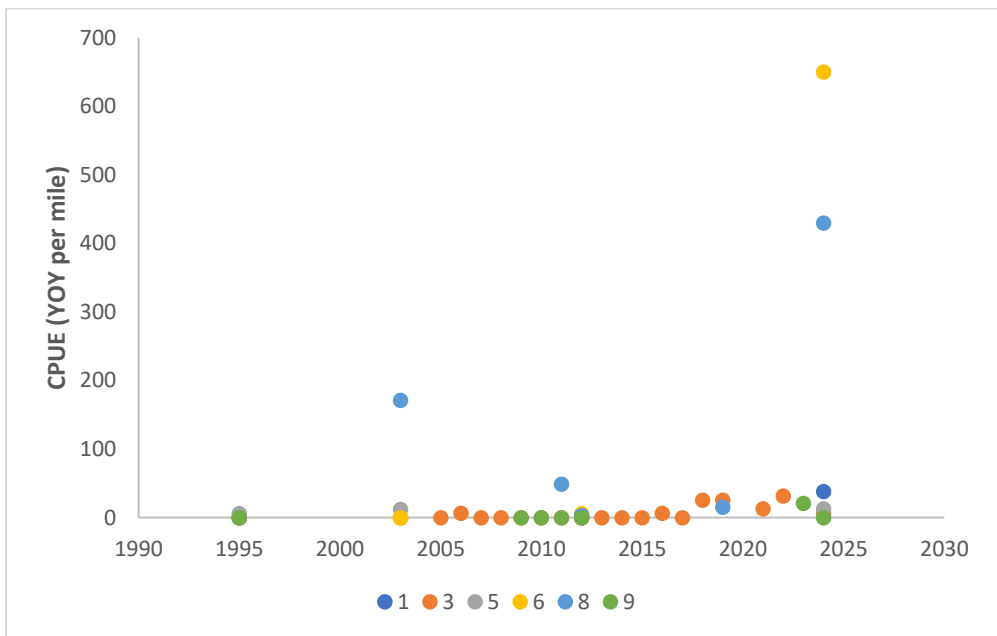


Figure 4. Relative abundance of young-of-year (YOY) brown trout (≤ 5.5 inches) as expressed by catch per unit effort (CPUE; fish per mile) collected from 6 stations on Gilbert Creek from 1995 to 2024.

Table 2. Relative abundance of total, young-of-year (YOY), adult (≥ 4.5 inches), ≥ 8 inch, and ≥ 10 -inch brook trout at 17 stations in the Gilbert Creek sub watershed 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
Gilbert 1	82 (40)	0	82 (45)	50 (60)	19 (75)

Gilbert 3	70 (35)	0	70 (40)	51 (60)	13 (65)
Gilbert 5	125 (50)	20 (55)	105 (50)	40 (55)	13 (65)
Gilbert 6	108 (45)	16 (50)	93 (45)	39 (55)	8 (55)
Gilbert 8	1528 (95)	994 (95)	691 (90)	104 (75)	7 (55)
Gilbert 9	181 (60)	11 (45)	171 (65)	107 (80)	75 (95)
North Branch T	1017 (95)	97 (70)	920 (90)	97 (75)	12 (65)
North Branch 1	113 (50)	0	113 (55)	0	0
North Branch 3	897 (85)	426 (80)	472 (75)	46 (55)	0
Unnamed Creek 17-10 St. 1	724 (80)	451 (85)	274 (60)	0	0
Middle Branch 1	145 (40)	16 (40)	129 (45)	16 (40)	0
Middle Branch 561 st St	580 (75)	354 (80)	225 (60)	0	0
South Branch 1	368 (80)	32 (60)	336 (80)	64 (65)	16 (70)
South Branch 2	576 (85)	230 (80)	391 (80)	65 (65)	0
South Branch 3	596 (90)	129 (75)	467 (85)	193 (90)	0
South Branch DNR Land	1320 (95)	242 (80)	1079 (95)	242 (90)	0
Unnamed Creek 20-16 St. 1	0	0	0	0	0

Table 3. Relative abundance of total, young-of-year (YOY), adult (≥ 5.5 inches), ≥ 12 inch, and ≥ 15 -inch brown trout at 17 stations in the Gilbert Creek watershed 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
Gilbert 1	635 (75)	38 (55)	597 (75)	170 (90)	69 (95)
Gilbert 3	470 (65)	6 (35)	463 (70)	121 (85)	44 (95)
Gilbert 5	506 (70)	13 (40)	493 (70)	210 (95)	72 (95)
Gilbert 6	1703 (95)	650 (95)	1053 (90)	170 (90)	47 (95)
Gilbert 8	1031 (85)	430 (90)	601 (75)	45 (60)	0
Gilbert 9	992 (85)	0	992 (85)	651 (95)	299 (95)
North Branch T	509 (70)	218 (80)	291 (55)	24 (45)	0
North Branch 1	32 (15)	16 (45)	16 (10)	0	0
North Branch 3	1127 (70)	1035 (95)	92 (15)	0	0
Unnamed Creek 17-10 St. 1	145 (15)	129 (55)	16 (5)	0	0
Middle Branch 1	16 (0)	0	16 (5)	0	0
Middle Branch 561 st St	242 (25)	242 (65)	0	0	0
South Branch 1	32 (15)	0	32 (15)	16 (40)	16 (80)
South Branch 2	173 (45)	138 (75)	35 (15)	0	0
South Branch 3	129 (40)	129 (75)	0	0	0
South Branch DNR Land	483 (70)	386 (90)	97 (30)	16 (40)	0
Unnamed Creek 20-16 St. 1	0	0	0	0	0

IBI surveys conducted at stations 1, 5 and 8 resulted in Good, Excellent and Excellent ratings, respectively with scores ranging from 80 to 90. Other fish species collected at these stations included mottled sculpin, longnose dace, white sucker, bluegill and brook lamprey (Table 4).

Table 4. Total number of each species captured at 6 stations on the mainstem of Gilbert Creek, summer 2024. (".") indicates species were not targeted).

SPECIES	1	3	5	6	8	9
Brown Trout	101	74	77	220	139	93
Brook Trout	13	11	19	14	206	17
Mottled Sculpin	21	.	4	.	99	.
Longnose Dace	15	.	0	.	0	.
Bluegill	22	.	4	.	11	.
White Sucker	6	.	3	.	2	.
Brook Lamprey	0	.	0	.	4	.

GILBERT CREEK BRANCHES AND TRIBUTARIES

Trout were found in moderate to high densities within the branches of Gilbert Creek and its tributaries with the exception of Unnamed Creek 20-16 in which no trout were found (Tables 2 & 3). Trout were not found in any previous surveys of Unnamed Creek 20-16 which is therefore an unclassified tributary. The North Branch of Gilbert Creek contained a mixed fishery of brook and brown trout in high densities at Stations T and 3 and low densities at Station 1. Catch rates of adult brook trout ranged from 113 per mile (55th percentile) at Station 1 to 920 per mile at Station T (90th percentile) while adult brown trout catch rates ranged from 16 per mile (10th percentile) at Station 1 to 291 per mile (55th percentile) at Station T (Table 2). Brook trout densities have declined at the Station T trend site since 2010 (Figure 5). Brook trout larger than 10 inches were only found at Station T on the North Branch. The largest brown trout sampled on the North Branch was 13 inches at Station T.

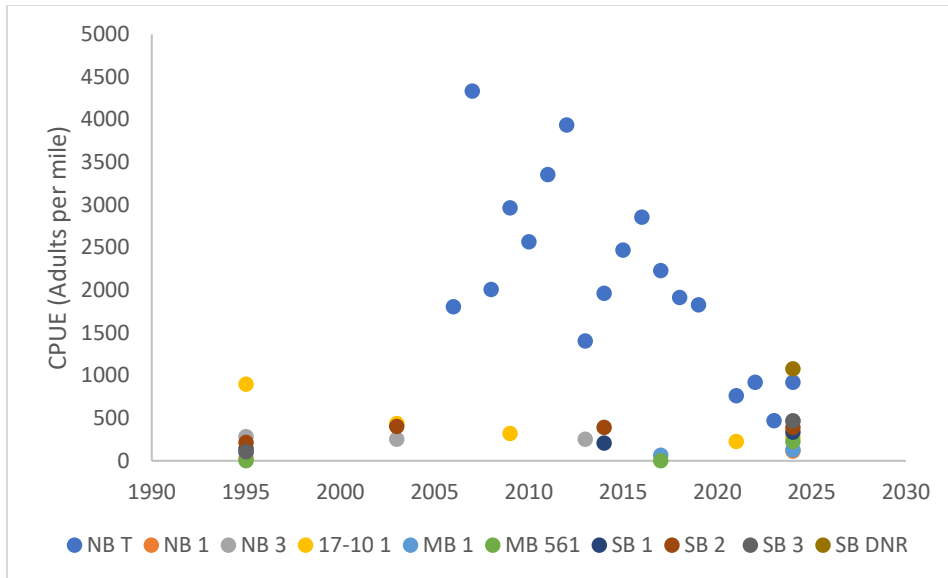


Figure 5. Relative abundance of adult brook trout (≥ 4.5 inches) as expressed by catch per unit effort (CPUE; fish per mile) collected from 10 stations on the North Branch (NB), Middle Branch (MB), South Branch (SB) of Gilbert Creek and the Unnamed Tributary 17-10 from 1995 to 2024.

Unnamed Creek 17-10 contained brook trout in high densities with a total catch rate in the 80th percentile (Table 3) and brown trout in low densities (15th percentile). This stream was dominated by juvenile trout and no trout larger than 8 inches were captured (Figure 5 & 7). The Middle Branch of Gilbert Creek was dominated by brook trout with brown trout present in low densities (Tables 2 & 3). Brook trout up to 8 inches were found in low abundance at Station 1 and only a single adult brown trout was found throughout the two stations surveyed. The South Branch of Gilbert Creek was also dominated by brook trout with total catch rates ranging from 368 per mile (80th percentile) at Station 1 to 1320 per mile (95th percentile) at Station DNR Land (Table 2). Brown trout were present in low densities at all stations and adult brown trout were only present at Stations 1 and 2 in low densities. Adult brook trout catch rates were also high throughout the South Branch stations. Brook trout larger than 10 inches were only found at the lowermost station but brook trout up to 8 inches were found at all stations surveyed with moderate to high catch rates (Table 2). Catch rates of brook trout larger than 8 inches were highest at the DNR Land station with 242 per mile (90th percentile).

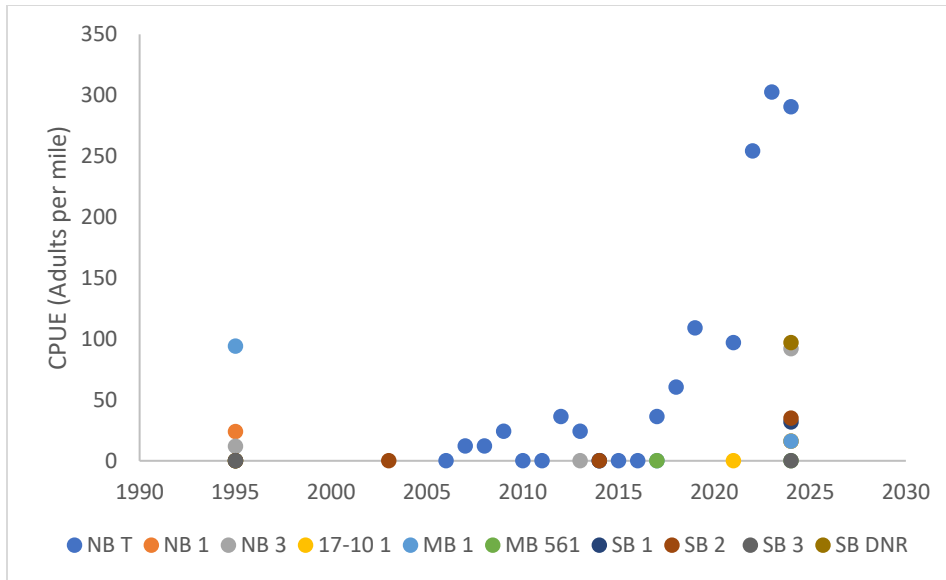


Figure 6. Relative abundance of adult brown trout (≥ 5.5 inches) as expressed by catch per unit effort (CPUE; fish per mile) collected from 10 stations on the North Branch (NB), Middle Branch (MB), South Branch (SB) of Gilbert Creek and the Unnamed Tributary 17-10 from 1995 to 2024.

Table 6. Total number of each species captured at 11 stations on the branches and tributaries of Gilbert Creek, summer 2024. (“.” indicates species were not targeted).

SPECIES	NB T	NB 1	NB 3	17-10	MB 1	MB 561	SB 1	SB 2	SB 3	SB DNR	20-16
Brown Trout	42	2	98	9	1	15	2	15	8	30	0
Brook Trout	84	7	78	45	9	36	23	54	37	82	0
Mottled Sculpin	.	8	66	25	4	.	0	12	.	.	0
Longnose Dace	.	0		0	0	.	0	0	.	.	0
Bluegill	.	0	1	0	0	.	0	0	.	.	0
White Sucker	.	0		0	0	.	0	0	.	.	0
Brook Lamprey	.	0	18	0	0	.	0	0	.	.	0
Brook Stickleback	.	0	1	0	27	.	0	0	.	.	1
Fathead Minnow	.	0	0	0	0	.	1	0	.	.	0

Natural reproduction of brook and brown trout was evidenced in all branches of Gilbert Creek and its tributaries except for Unnamed Creek 20-16. Catch rates of YOY brook trout were high in all branches and in Unnamed Creek 17-10 (Table 2) and ranged from 16 per mile (40th percentile) on the Middle Branch at Station 1 to 451 per mile (85th percentile) on Unnamed Creek 17-10. YOY brook trout were not found at Station 1 on the North Branch. Based on trend survey data collected on the North Branch at Station T and data collected from previous rotation surveys, natural reproduction of brook trout has declined on the North Branch but has remained stable within the remainder of the tributaries (Figure 7). Brown trout natural

reproduction has improved at most stations compared to past surveys and has increased annually at the North Branch trend site. (Figure 8). YOY brown trout were found at all stations, except for Station 1 on the Middle Branch and Station 1 on the South Branch, in moderate to high densities compared to Class II brown trout streams in Wisconsin. The highest densities of YOY brown trout were found at Station 3 on the North Branch. The highest densities of YOY brown trout on the South Branch were found at the DNR Land station with catch rates in the 90th percentile.

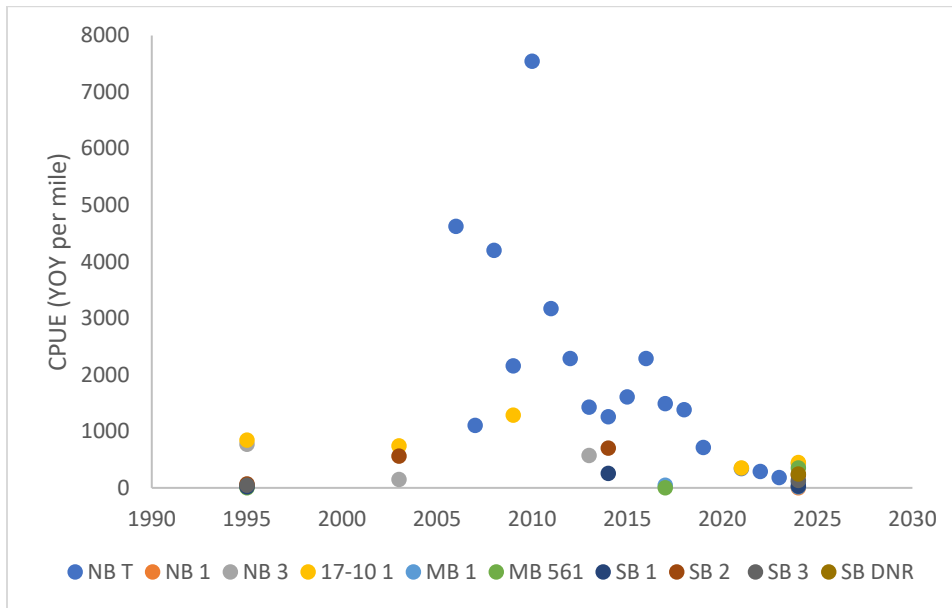


Figure 7. Relative abundance of young-of-year (YOY) brook trout as expressed by catch per unit effort (CPUE; fish per mile) collected from 10 stations on the North, South and Middle Branches of Gilbert Creek and Unnamed Tributary 17-10 from 1995 to 2024.

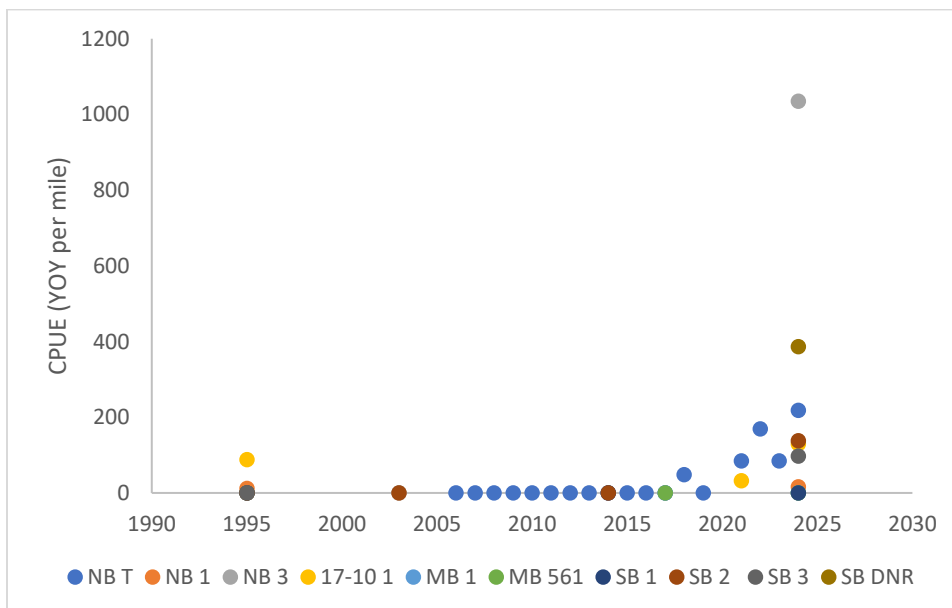


Figure 8. Relative abundance of young-of-year (YOY) brown trout (≤ 5.5 inches) as expressed by catch per unit effort (CPUE; fish per mile) collected from 10 stations on the North, South and Middle Branches of Gilbert Creek and Unnamed Tributary 17-10 from 1995 to 2024.

IBI survey results indicated that Excellent coldwater stream conditions on the North Branch, Unnamed Creek 17-10 and at the South Branch Station 2. The Middle Branch Station 1 and South Branch Station 1 both received ratings of Good while Unnamed Creek 20-16 received a Poor rating due to the lack of trout and intolerant species.

Discussion

TROUT POPULATION CHANGES

Trout abundance within the Gilbert Creek drainage has increased throughout the past couple decades similar to neighboring watersheds across the Driftless Area. However, with the increase in overall densities, shifts in trout species dominance have occurred. Historically, brook trout were the dominant trout species in the Gilbert Creek watershed. Brown trout were then introduced in the 1960s to restock streams following habitat degradation. Brown trout stocking ceased in 2002 but browns have established naturalized populations and natural reproduction has increased substantially within the past five years. Brown trout are now the dominant trout species throughout the mainstem of Gilbert Creek. The branches and tributaries of Gilbert Creek continue to support strong brook trout populations but brown trout use of these areas for spawning has increased. 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).

CURRENT STATUS OF TROUT POPULATIONS AND TROUT STREAM CLASSIFICATIONS

Trout populations in Gilbert Creek exhibit moderate to high abundance and excellent size structure in the mainstem. The branches and tributaries contain high densities of YOY trout and appear to contain excellent spawning and rearing habitat. Brook trout densities have declined in the mainstem and are currently in moderate densities when compared to other Class II trout streams with the exception of Station 8 in which they were in high density, mostly due to YOY brook trout. Brown trout densities have increased in all stations on the mainstem and are in high density based on the current survey when compared to other Class II trout streams in Wisconsin with catch rates at above the 75th percentile. Brown trout natural reproduction has increased within the branches during the past five years as evidenced by the increase in YOY catch rates. Brook trout natural reproduction within the branches has remained stable in most reaches of the headwaters; however, the trend site on the North Branch has documented a decline in YOY and adult brook trout densities. The Middle Branch represents a high-quality tributary in terms of brook trout production and remains dominated by brook trout, however, brown trout reproduction was documented in the upper reaches. Brook trout populations have remained stable within most of the South Branch and have increased at two stations. Brown trout YOY were present at all stations and adult brown trout were present at all stations except

for the uppermost station, whereas historically brown trout were not present in the South Branch.

The size structure of brown trout was excellent at most stations on the mainstem and was highest within the habitat improvement section at Station 9. Survival and recruitment of brown trout has improved in recent years and trout appear in excellent condition indicating ample forage availability. Densities of trout have increased but trout are not overabundant and density dependence does not appear to be negatively influencing the population.

Based on survey results, the mainstem of Gilbert Creek, North Branch and the South Branch should be reclassified from Class II to Class I status. These reaches of streams contain self-sustaining populations of trout. Spawning habitat, YOY and multiple year classes of adults are present in densities that utilize the available habitat without supplemental stocking.

REGULATIONS

The current trout fishing regulation throughout the watershed is five trout per day with no size restrictions. Trout exhibited excellent size structure during the survey which likely indicates that harvest is not negatively influencing size structure of the population. Trout densities are moderate to high, but not overabundant which may be due to harvest pressure. Anecdotal evidence indicates that fishing pressure is high on Gilbert Creek throughout the harvest season which may aid in influencing densities and maintaining good size structure of trout. However, a creel survey is needed to confirm catch and harvest dynamics. With brook trout densities declining in many reaches of the Gilbert Creek sub watershed and brown trout densities increasing, a regulation change may be warranted to afford additional protections for brook trout to aid in maintaining populations. Increasing brown trout densities have resulted in declining brook trout populations in many Driftless Area streams and have resulted in almost complete extermination of brook trout in some instances (Jacobson 2024). Therefore, a regulation that would focus angler harvest on brown trout while protecting brook trout may be beneficial to maintain vulnerable brook trout. Additionally, Gilbert Creek is classified as a Brook Trout Reserve stream which indicates that brook trout have a higher likelihood of surviving within this sub watershed into mid-century under a warming climate scenario, which prioritizes the need for maintain sustainable brook trout streams. The regulation of five in total but all brook trout must be released and no minimum length limit for brown trout may be appropriate for Gilbert Creek.

STOCKING

Currently, yearling brook trout are stocked annually into lower Gilbert Creek. Stocked brook trout appear to have minimal influence on the trout population with the existing brown trout fishery firmly established within these reaches. Adult brook trout densities average 90 fish per mile within the stocked reaches, which appears to

be a low return of these stocked fish. Brown trout catch rates within these reaches averages 670 fish per mile. The existing brown trout population likely reduces survival of stocked brook trout and ultimate success of stocked brook trout within lower Gilbert Creek. However, the brown trout population provides an excellent fishery without stocking. Minimal brook trout natural reproduction still occurs within lower Gilbert Creek and is high within Station 8 and the branches and tributaries. Therefore, continued stocking of yearling brook trout is not recommended at this time. Continued monitoring of the populations are recommended to identify future stocking needs.

BROOK TROUT MANAGEMENT AND HABITAT IMPROVEMENTS

Brook trout continue to be the dominant trout species within the headwaters of Gilbert Creek but populations have experienced declines throughout the mainstem and lower reaches with the increase in brown trout populations. Trout habitat improvement projects within Gilbert Creek have been successful at providing and increasing the amount of adult trout habitat, especially for brown trout. Adult brown trout densities have increased within improvement reaches while brook trout densities have declined. Specifically, within Station 9 (upstream of STH 29), prior to habitat improvement work, the reach contained high densities of YOY and adult brook trout. However, trout populations have changed dramatically 15 years after project completion with this portion of stream now containing high densities of large adult brown trout and low densities of adult brook trout with very little natural reproduction. Currently, the habitat within this reach is deep and narrow and features excellent adult trout cover in the form of plunge pools, root wads and LUNKER structures. Very little spawning or rearing habitat is present which is reflected in trout surveys.

More recent trout habitat improvement projects have attempted to focus on creating a diversity of in stream habitats to allow for brook trout to persist along with providing habitat for multiple year classes of trout. These projects are located downstream of STH 29 and on the South Branch upstream of CTH Q. These projects consist of varying widths of the stream which in turn provides a diversity of depths and substrates within the stream. Rootwads are used in place of LUNKER structures as a form of overhead cover which provides a more complex woody habitat with microhabitats associated with the rootwad. Island complexes are also used to provide side channels and additional microhabitats within the stream channel. The 2023 trout habitat improvement project on the South Branch contained the highest densities of YOY and adult brook trout on the South Branch in 2024. Continued monitoring of the site is recommended to document long term trout responses. Depending on location of future project sites, a mixture of techniques is recommended in order to maintain or improve brook trout populations within the watershed. It is not recommended to conduct trout habitat improvement work within Station 8 on Gilbert Creek because of existing brook trout spawning habitat and high densities of YOY brook trout within this reach of stream.

Over five miles of intensive trout habitat improvement work has been completed on Gilbert Creek and its branches. This work has likely resulted in the increase in trout populations within the watershed as a whole and is partially responsible for the reclassification of Gilbert Creek to Class I status. Future habitat work should focus on reducing erosion and improving bank stabilization within downstream reaches and providing additional access to these locations via the acquisition of streambank easements.

Management Recommendations

The majority of Gilbert Creek has transitioned from a brook trout to brown trout dominated fishery but brook trout populations remain strong within the headwaters. Future management should focus on maintaining or improving existing brook trout populations in the form of habitat improvements. Implementing habitat techniques including island complexes, rootwads and varying stream widths has shown maintain or increase brook trout densities in projects on neighboring streams. A regulation change to protect brook trout while focusing harvest on brown trout may also be beneficial in protecting the declining brook trout population. Additionally, with the increase in overall trout abundance and natural reproduction within the mainstem of Gilbert Creek, North Branch and South Branch, reclassification of these portions of stream from Class II to Class I is warranted. Continued stocking of brook trout is not recommended because of the well-established brown trout population in lower Gilbert Creek. Returns on stocked fish are low and adult brown trout are abundant and provide an excellent fishery.

1. Consider trout regulation change to focus angler harvest on brown trout and increase protections for brook trout.
2. Conduct a trout creel survey to quantify angler effort, catch and harvest on Gilbert Creek.
3. Conduct trout habitat improvement projects on lower Gilbert Creek downstream of 270th Street to aid in bank stabilization and erosion reduction.
4. Trout habitat improvement projects should incorporate new techniques including island creation, root wads and variable stream narrowing.
5. Focus streambank easement outreach on the mainstem of Gilbert Creek to increase angler access and on the headwaters to enhance protection.
6. Continue annual trend site monitoring.
7. Reclassify Gilbert Creek, North Branch and South Branch from Class II to Class I status.

References

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Appendix A. Guidelines for interpreting coldwater 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 sunfish 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 coldwater 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>

