Wisconsin DNR Fisheries Information Sheet

Stream: North Fork Thunder River **County:** Oconto **Year:** 2019

Regulation: Yellow **Size Limit:** 8 inches **Daily Limit:** 3

The North Fork Thunder River originates at the confluence of East and West Thunder Creeks. The river runs in a southeasterly direction through northern Oconto and Marinette County to its junction with the South Fork to form the Thunder River. The total length of the North Fork Thunder River is 14 miles with an average depth of less than 2 feet. Most of the stream is in Oconto County, within the Nicolet National Forest, before entering Marinette County and running completely through private property. Historically, this system had been heavily impacted by beaver activity. Beaver control activities have been ongoing for over 20 years and are still actively practiced today. Only 1 beaver and no dams were removed in 2019.

Brook trout, although native to the system, were stocked intermittently between 1938 and 1959. No brook trout have been stocked since 1959. Brown trout have persisted in low numbers and rainbow trout have been collected in previous surveys.

The Department of Natural Resources assessed the brook and brown trout populations in the North Fork Thunder River, Oconto County, on July 17th, 2019. Barge electrofishing was conducted upstream on a 0.38-mile section of the river from the pipeline crossing off Bucks Ranch Road in the Town of Lakewood (T.33N. -R.17E. Section24) (Figure 1). This station is sampled in alternate years. All brook and brown trout collected were measured to the nearest 0.1-inch total length before being released.

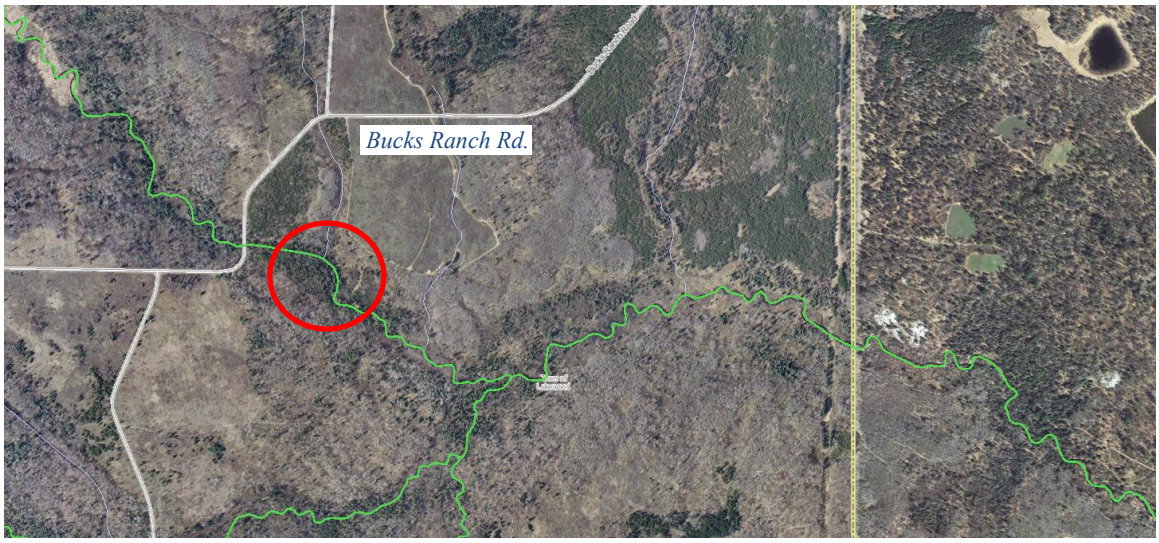

Figure 1. Sampling location on North Fork Thunder River Oconto County, WI.

Catch per Unit Effort (CPUE) and Length Frequency

CPUE is a relative abundance index which is often directly related to absolute abundance. Trout fisheries are routinely quantified using CPUE or the number and/or size of trout per mile. CPUE's can be used to compare streams by ecoregion or statewide. This is done by using percentiles (PCTL). For example, if a CPUE is in the 90th PCTL, CPUE is greater than 90% of the CPUE's in that ecoregion or across the state. CPUE percentiles may also be used to categorize trout abundance; 33rd (low abundance), 66th (moderate abundance), 90th (high abundance), and 95th (very high abundance).

The length frequency of trout describes the size structure of the sample or population and is the number of fish captured per 1-inch length group.

BROOK TROUT

A total of 78 brook trout was collected in the North Fork Thunder River in 2019 (Figure 2). Brook trout ranged in length from 1.6 to 10.6 inches and averaged 6.3 inches (Table 1). Total brook trout CPUE (206/mile) was the lowest since this trend site was established in 2007 (Table 1).

The total number of brook trout collected, and average length decreased between 2017 and 2019 (Table 1). No young-of-the-year (YOY) were collected in 2019 compared to 192 YOY/mile in 2017 (Table 1). Brook trout CPUE ≥ 8 inches was very high in 2017 (99th PCTL) but is currently at the 80th PCTL compared to other streams in the Northern Lakes and Forests ecoregion (Table 1). Overall, 21% of the brook trout collected in 2019 were greater than the 8-inch minimum length limit (MLL).

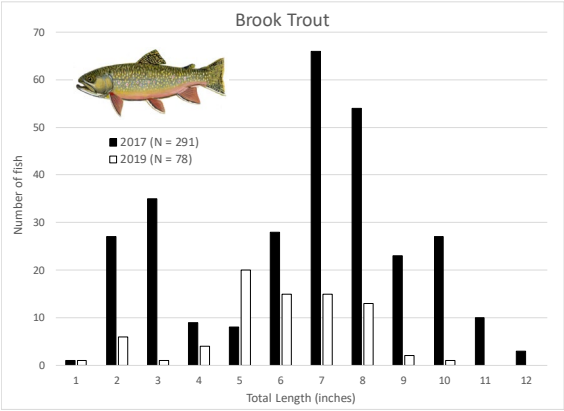

Figure 2. Length frequency of all brook trout collected from the North Fork Thunder River in 2017 and 2019.

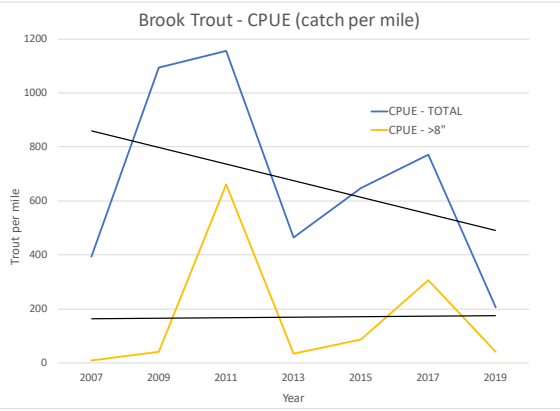

Figure 3. Total CPUE and CPUE of 8" brook trout collected from 2007 through 2019.

Table 1. Brook trout catch per unit effort (CPUE) and percentile (PCTL) by various length groups from 2007 through 2019 in the North Fork Thunder River.

Year	Average Length (in)	Length Range	Number Collected	CPUE = number of **BROOK** trout / mile					
				Total (PCTL)	YOY	> 5" (PCTL)	> 8" (PCTL)	> 10" (PCTL)	> 12" (PCTL)
2007	5.3	1.9 - 8.4	149	393 (65)	92	274 (80)	11 (50)	0	0
2009	4.9	1.9 - 9.4	414	1,093 (90)	576	513 (90)	42 (80)	0	0
2011	8.1	1.8 - 12.8	438	1,156 (90)	39	1,113 (99)	661 (100)	155 (100)	3 (94)
2013	5.6	1.7 - 10.0	176	465 (70)	118	345 (85)	34 (75)	3 (75)	0
2015	5.6	2.0 - 10.5	245	647 (80)	182	463 (90)	87 (90)	8 (80)	0
2017	7.0	1.8 - 12.8	292	771 (85)	192	576 (95)	308 (99)	105 (100)	8 (96)
2019	6.3	1.6 - 10.6	78	206 (50)	0	174 (65)	42 (80)	3 (75)	0

(CPUE = Catch Per Unit Effort; YOY = Young-of-year; PCTL = percentile)

BROWN TROUT

A total of 11 brown trout was collected in the North Fork Thunder River (Figure 4). Brown trout ranged in length from 5.4 to 19.8 inches and averaged 10.8 inches (Table 2). Brown trout abundance fluctuated between 2007 and 2013 but started increasing by 2015. In 2017, total brown trout CPUE (124/mile), and CPUE for every length group, was the highest ever recorded for this site (Table 2). However, in 2019 total brown trout CPUE fell to the lowest at 29/mile. The 2019 total CPUE is similar to what was observed in 2007 and 2009.

These fluctuations in CPUE imply that reproduction and recruitment are not constant (no YOY collected in 2019). From 2007 to 2013 the minimum length limit (MLL) for brown trout was 12 inches. In 2014, the MLL changed to 8 inches. Between 2013 and 2015, CPUE >12 inches fell from 8/mile to 3/mile but increased to 26/mile by 2017. With percentiles greater than 85% for all CPUE length groups in 2019, it's puzzling why no YOY were collected. The most likely scenario is that sampling conditions were less than ideal, resulting in low CPUE. During 2019 high-water conditions, YOY are almost impossible to collect. Brown trout CPUE >12 inches is currently greater than 2013 and 2015; before abundance peaked in 2017. Hopefully recruitment, or the number of YOY collected, will improve since adult abundance appears to be stable.

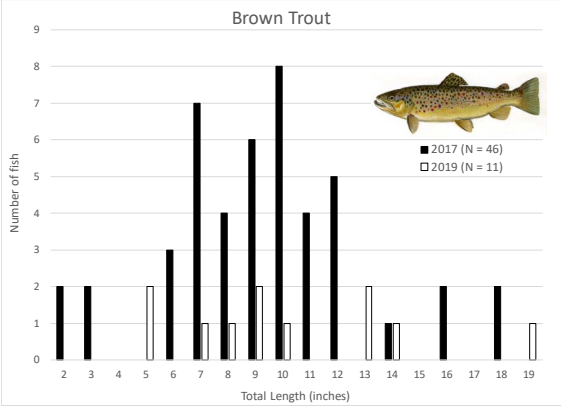

Figure 4. Length frequency of all brown trout collected from the North Fork Thunder River in 2017 and 2019.

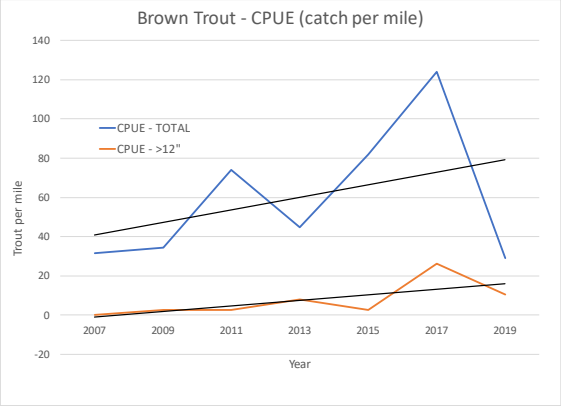

Figure 5. Total CPUE and CPUE of 12" brown trout collected from 2007 through 2019.

Table 2. Brown trout catch per unit effort (CPUE) and percentile (PCTL) by various length groups from 2007 through 2019 in the North Fork Thunder River.

Year	Average Length (in)	Length Range	Number Collected	CPUE = number of **BROWN** trout / mile						
				Total (PCTL)	YOY	> 5" (PCTL)	> 8" (PCTL)	> 10" (PCTL)	> 12" (PCTL)	> 15" (PCTL)
2007	6.7	2.1 - 10.7	12	32 (35)	3	29 (45)	11 (50)	3 (50)	0	0
2009	6.9	4.7 - 14.9	13	34 (35)	3	32 (45)	5 (40)	3 (50)	3 (62)	0
2011	7.9	2.7 - 12.5	28	74 (50)	5	68 (60)	29 (70)	13 (70)	3 (62)	0
2013	8.4	2.3 - 19.8	17	45 (40)	3	42 (55)	18 (60)	11 (65)	8 (76)	3 (80)
2015	7.9	2.5 - 14.3	31	82 (55)	11	71 (60)	45 (75)	8 (60)	3 (62)	0
2017	9.8	2.3 - 18.9	47	124 (60)	13	111 (70)	84 (85)	58 (90)	26 (89)	11 (93)
2019	10.8	5.4 - 19.8	11	29 (35)	0	29 (45)	21 (65)	13 (70)	11 (80)	3 (80)
(CPUE = Catch Per Unit Effort; YOY = Young-of-year; PCTL = percentile)										

SUMMARY & RECOMMENDATIONS

The abrupt changes in trout abundance and size structure can likely be attributed to elevated water levels at the time of sampling. Since these fisheries have been self-sustaining for decades, it seems probable that elevated stream flows didn't allow for the collection of a representative sample. Even though YOY CPUE can be highly variable, high water prevented the sampling crew from collecting any YOY brook or brown trout.

Overall, the brook trout in the North Fork Thunder River appears less abundant. Brown trout abundance was clearly on the rise before 2019. Therefore, a follow-up survey should be conducted in 2020 to assess abundance and year class strength, specifically age-1 brook trout. A follow-up survey would also help determine if our 2019 sample was representative of trout abundance and size structure. Our current results suggest that anglers will find legal-sized brook trout in the immediate future, but not at the same levels as last few years.

The trout fishery in the North Fork Thunder River is stable and continues to offer anglers a respectable trout fishing opportunity. The current fishing regulation (3 fish daily bag; 8-inch MLL for all trout) will continue to sustain the both brook and brown trout populations. Therefore, no change to the fishing regulations or stocking are recommended.

If you have questions regarding fisheries management activities for the North Fork Thunder River, please contact:

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