WISCONSIN DEPARTMENT OF NATURAL RESOURCES

2021 Stream Survey Trend Report
North Branch Embarrass River, Shawano County
301300

Introduction And Objectives

The North Branch Embarrass River consists of 34.75 miles of Class I, II and II trout water. The North Branch Embarrass River originates in the northwest corner of Shawano Count, flows southeast through Bowler and eventually converges with the South Branch Embarrass River at Caroline to form the Embarrass River. Eighteen public road crossings along with 40 acres of DNR public land abutting the river provide fishing access to the North Branch Embarrass River. The river is managed as a mixed brook and brown trout fishery, with brook trout as the dominant gamefish. Warmer summer temperatures are a limiting factor in the lower reaches from Bowler downstream to Tilleda. Objectives of the trend survey are to monitor relative abundance and size structure over time.

DNR Contact

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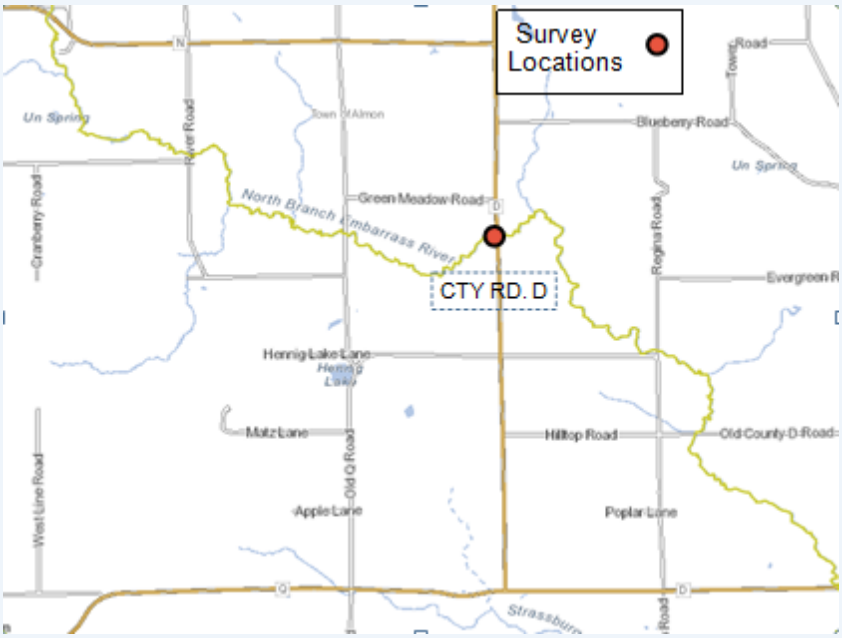
Regulations

Category: Green
Daily Bag and Size Limit:
Five and no size

SURVEY INFORMATION

Station	Survey Date	Station Length	Temperature (°F)	GPS (Start/Finish)	Gear	Dippers
CTH D Trend Site	07/30/2019	2,000 ft.	59	44.9034,-89.0344 44.9056,-89.0366	Towed Barge Shocker	3

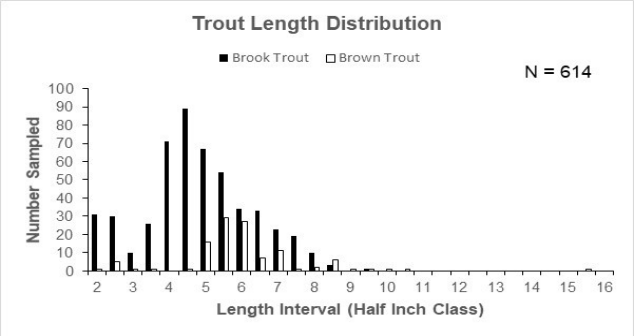


Survey Method

- All streams are sampled according to DNR wadeable streams monitoring protocols.
- All sampling stations are electrofished with either a towed barge shocker or backpack shocker.
- Sampling distance is at least 35 times the mean stream width or a minimum of 330 feet (i.e., 100 meters).
- All trout are counted and measured and all other species are counted in order to calculate an Index of Biotic Integrity (IBI) score.
- Metrics used to describe trout populations include average length, catch per unit effort (CPUE) and length frequency distribution.

Metric Descriptions

- **Catch per unit effort (CPUE)** is a method of quantifying fish population relative abundance. For all trout surveys, we typically quantify CPUE as the number of a given size class of trout captured per mile of stream. CPUE indexes are compared to other trout streams throughout Wisconsin by what percentile (PCTL) they fall out in. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state. CPUE percentiles can also be used to categorize trout abundance as low density (<33rd percentile), moderate density (33rd - 66th percentile), high density (66th - 90th percentile) and very high density (>90th percentile).
- **Length frequency distribution** is a graphical representation of the number or percentage of fish captured by half inch or one inch size intervals.
- **Index of Biotic Integrity (IBI)** is a rating of environmental quality based on the fish assemblage. Scores of 90 - 100 indicate excellent stream quality, while scores less than 30 indicate poor stream quality. Our analysis utilizes the IBI for Wisconsin coldwater streams. Coldwater streams in Wisconsin are those in which the maximum daily mean water temperature is usually <22°C (71.6°F). A coolwater stream IBI may also be used when a stream doesn't fit the temperature criteria for a coldwater stream.



SIZE AND ABUDANCE (CPUE) METRICS - BROOK TROUT									
Year	Average Length (inches)	Length Range (inches)	Number Sampled	CPUE (No. per Mile) Statewide Percentile in Parentheses					
				Total CPUE (PCTL)	YOY CPUE	≥5" CPUE (PCTL)	≥8" CPUE (PCTL)	≥10" CPUE (PCTL)	≥12" CPUE (PCTL)
2008	5.6	(1.9 - 9.5)	596	1501 (90th)	264	809 (95th)	65 (80th)	0	0
2009	4.8	(1.5 - 10.0)	880	2217 (95th)	481	1073 (95th)	53 (75th)	3 (60th)	0
2010	5.2	(1.9 - 10.0)	604	1521 (90th)	413	997 (95th)	40 (70th)	3 (60th)	0
2011	6.0	(2.0 - 10.3)	793	1997 (95th)	249	1537 (95th)	139 (90th)	5 (65th)	0
2012	6.2	(0.7 - 10.4)	1136	2861 (95th)	161	2166 (95th)	418 (95th)	5 (65th)	0
2013	6.3	(2.1 - 10.8)	510	1285 (90th)	252	919 (95th)	272 (95th)	20 (85th)	0
2014	5.7	(1.5 - 10.6)	583	1467 (90th)	85	1015 (95th)	133 (90th)	5 (65th)	0
2015	6.1	(2.0 - 9.3)	352	929 (85th)	92	800 (95th)	79 (80th)	0	0
2016	5.7	(1.8 - 10.3)	477	1259 (90th)	277	934 (95th)	116 (90th)	3 (60th)	0
2017	6.0	(2.0 - 12.3)	716	1890 (95th)	292	1554 (95th)	127 (90th)	10 (75th)	3 (85th)
2018	5.3	(1.9-10.5)	767	2025 (95th)	211	1290 (95th)	71 (80th)	3 (60th)	0
2019	6.1	(2.0-11.7)	444	1172 (85th)	216	950 (95th)	103 (85th)	3 (60th)	0
2021	5.0	(2.0 - 9.5)	501	1323 (90th)	256	644 (92nd)	37 (67th)	0	0

SIZE AND ABUNDANCE (CPUE) METRICS - BROWN TROUT									
Year	Average Length (inches)	Length Range (inches)	Number Sampled	CPUE (No. per Mile) Statewide Percentile in Parentheses					
				Total CPUE (PCTL)	YOY CPUE	≥6" CPUE (PCTL)	≥8" CPUE (PCTL)	≥10" CPUE (PCTL)	≥12" CPUE (PCTL)	≥15" CPUE (PCTL)
2008	6.6	(2.0-12.5)	37	93 (40th)	28	65 (60th)	35 (45th)	13 (40th)	3 (40th)	0
2009	7.0	(2.2-13.9)	107	270 (60th)	15	186 (65th)	58 (50th)	23 (50th)	5 (40th)	0
2010	7.6	(2.3-14.8)	61	154 (50th)	23	123 (60th)	58 (50th)	35 (55th)	5 (40th)	0
2011	7.6	(2.5-14.6)	91	229 (60th)	13	204 (70th)	55 (50th)	35 (55th)	8 (45th)	0
2012	8.4	(3.0-17.9)	178	448 (70th)	10	368 (80th)	242 (80th)	131 (80th)	35 (70th)	5 (70th)
2013	7.8	(1.9-13.7)	102	257 (60th)	28	212 (70th)	113 (65th)	58 (65th)	18 (60th)	0
2014	7.2	(1.9-14.3)	176	443 (65th)	3	293 (75th)	134 (70th)	45 (60th)	15 (55th)	0
2015	8.4	(2.4 - 14.1)	46	121(45th)	8	97 (55th)	79 (60th)	24 (50th)	11 (50th)	0
2016	7.0	(2.2-13.4)	116	306 (65th)	11	256 (75th)	37 (45th)	13 (40th)	8 (45th)	0
2017	7.3	(2.0 - 15.4)	90	237 (60th)	32	195 (65th)	69 (55th)	26 (50th)	3 (35th)	3 (65th)
2018	6.7	(2.4-10.8)	72	190 (55th)	8	129 (60th)	26 (40th)	5 (25th)	0	0
2019	5.7	(1.9-12.3)	33	87 (40th)	45	42 (35th)	21 (35th)	13 (40th)	3 (35th)	0
2021	6.3	(2.5 - 15.8)	113	298 (64th)	21	156 (64th)	34 (46th)	8 (33rd)	3 (39th)	3 (66th)

Summary

- Results from the 2021 survey showed that brook trout continue to be the dominant trout species in this section of the North Branch Embarrass River, making up just over 82% of the total trout catch. Smaller sized brook trout have remained at high density levels for years, of concern is the declining numbers of brook trout 8 inches and larger.
- Brook trout young of year (YOY) relative abundance has remained stable, ranging between 211 and 292 YOY per mile of electrofishing over the last four years. Continued consistent recruitment should ensure a good brook trout fishery into the future.
- Total brown trout CPUE and CPUE of all adult size classes (i.e., ≥ 6 inches) of brown trout in 2021 were average for the trend site over the past 12 years. Interestingly, catch rates of YOY brown trout in 2021 were near the average over the past 12 years for this particular site.
- The North Branch Embarrass River would be a good stream to focus on easement acquisition and future habitat development. Culvert replacement at several road crossings would improve movement of trout and other fish species. A review of the trout regulations might benefit the brook trout and help restore the abundance of Brook Trout 8 inches and larger.