



Department of
Environmental
Conservation

An Evaluation of New York's Inland Trout Stream Catch and Release Season

ANGLER USE AND WILD TROUT YOUNG OF YEAR RECRUITMENT 2021-2024

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Executive Summary

In 2021 DEC created a statewide catch and release (artificial lures only) season (Oct 16 - March 31) for trout in inland trout streams. Angler concerns regarding the potential impact of fishing on wild trout populations during the spawning season prompted a study to evaluate the new regulation. Angling pressure and young of year (YOY) trout abundance was estimated on a sample of 19 wild trout streams across New York State from 2021 through 2024 to determine if the catch and release season impaired reproductive success.

Angling pressure was generally low and no decline in YOY trout abundance was found in the sample streams. For the two stream reaches with highest angling pressure during the study (Muscoot River and the West Branch of the Delaware River), YOY trout abundance was analyzed individually and additional historical data from comparable reaches was included to test for any change associated with the new regulation. No significant change in abundance was detected. The results of this study reveal that the new regulation is not a detriment to wild trout reproduction.

Introduction

The New York State Trout Stream Management Plan (TSMP) (NYSDEC, 2020) established a statewide catch-and-release (artificial lures only) season from October 16-March 31, allowing for year-round fishing. Previously, the trout fishing season for most inland trout streams was closed from October 16-March 31 as a precaution to protect spawning wild trout. However, the long term sustainability of high quality wild trout fisheries on streams open to fishing year round in New York State and elsewhere led DEC to reexamine the necessity of this closure as summarized in Appendix 1 of the TSMP (NYSDEC, 2020).

The available evidence suggested that angler participation in a winter catch-and-release season on inland trout streams would be modest and that the risk to wild trout populations was negligible. On this basis, the regulation was adopted to provide additional fishing opportunities for New York's trout anglers. Nonetheless, concerns persisted for some anglers that the reproductive success of wild trout could be reduced due to catching and handling spawning trout and increased mortality of incubating trout eggs impacted by wading anglers.

In response to these concerns, this statewide study (NYSDEC, 2021) was designed to quantify the level of angling pressure during the autumn portion of the formerly closed season and to detect any population level impacts on the reproductive success of fall spawning wild trout.¹

¹ The study focuses on fall spawners because springtime rainbow trout spawning and egg incubation in New York State typically extends well beyond the previous April 1 opening date of trout season. (Smith, 1985)

The study addresses three specific objectives:

- Estimate angling pressure on a sample of trout stream reaches across the state during the fall period formerly closed to fishing under statewide regulation.
- Determine if the angling pressure on wild stream reaches during the catch-and-release/spawning season negatively impacts young of year (YOY) trout production.
- Assess the extent of localized differences in the impact of angling during the period formerly closed to fishing under statewide regulation.

Methods

Selecting Study Reaches

The sample for this study comprises 19 wild trout stream reaches selected according to the following criteria:

- reaches support naturally reproducing brook trout and/or brown trout, categorized as *Wild*, *Wild-Quality* or *Wild-Premier*,
- reaches anticipated to attract significant angler use from October 16-March 31 (e.g. high use during traditional season, opportunity to catch large mature trout, easy public access, proximity to population center, etc.),
- reaches that are low use but easily included in a creel route along with nearby high use reaches to produce a more informative “cluster” of angler use pattern data,
- angler counts that can be readily completed from the road or vantage points accessible with a short walk from vehicle,
- reaches where two count runs per day can be reasonably completed (or cluster of nearby reaches) during daylight hours from October 16 through December 15.
- reaches that have spawning and YOY habitat that can be effectively sampled in late summer using backpack or towed barge electrofishing gear.

The streams included in the sample are summarized by region below (Table 1). Full reach descriptions, maps, sampling sites and additional details are provided in the plan for this study (NYSDEC, 2021).

Table 1 Wild trout streams included in the sample for the catch and release season evaluation study.

Stream	Region	Management Category
Swan River	1	Wild
West Branch Outlet	3	Wild-Quality
Muscoot River (Amawalk Outlet)	3	Wild-Quality
Esopus Creek ²	3	Wild-Quality
Woodland Creek	3	Wild
Fox Hollow Creek	3	Wild
Mongaup Creek	3	Wild-Quality
West Branch Delaware River	4	Wild-Premier
East Branch Delaware River	4	Wild-Premier
Bush Kill	4	Wild-Quality
Indian River	5	Wild
Camden Creek	5	Wild
Crystal Creek	6	Wild-Quality
Fish Creek	6	Wild
Old Chenango Canal	7	Wild-Premier
Oriskany Creek	7	Wild-Premier
Oatka Creek	8	Wild-Quality
Wiscoy Creek	9	Wild-Premier
North Branch Wiscoy Creek	9	Wild-Quality

Estimating Angling Pressure

- Over three consecutive years (2021-2023), angler counts were conducted on 1 randomly selected weekday and 1 randomly selected weekend day per week (Pollock, Jones, & Brown, 1994) between October 16 and December 15.
- Two count runs were completed per day (Between 9 AM and Sunset³) (Pollock, Jones, & Brown, 1994).
- Estimates of angling pressure during the sampling period were calculated from the angler count data according to the methods of Pollock, Jones and Brown (1994). Based on an analysis of the sample variance of angler counts conducted on Esopus Creek⁴ between October 1 and November 30, 2012, the total of 18 sampling days was deemed sufficient to provide an estimate of angling effort with a 95% confidence interval approximating 40% of the point estimate value (McCormick & Meyer, 2017).
- Angling pressure was also calculated for a 21-acre segment of the larger West Branch Delaware reach (335 acres) between the Men's Club and Airport Road. This analysis was added to original study plan because anglers pointed out that angling effort was concentrated in this area which has also been documented as important brown trout spawning habitat. During the study, 35 to 45 percent of all anglers counted on the West Branch were observed in this area. Therefore, breaking out this segment from the rest of the West Branch Delaware for analysis was important to ensure that any impact to this intensively fished area was detected.

² A full season creel survey was conducted on Esopus Creek from Chimney Hole upstream to Lost Clove Road in 2022 and 2023. However, based on the selection criteria, the portion of Esopus creek selected for this study extends from the Shandaken Portal upstream to Lost Clove Road.

³ Recent creel survey data from Esopus Creek 2012 and Cattaraugus Creek 2019 document negligible angling activity prior to 9 AM during the fall period.

⁴ Esopus Creek data was used as a proxy due to its extended fishing season under special regulation and because its trout fishery draws heavy participation from the NYC metropolitan area (Alexiades, Marcy-Quay, Sullivan, & Kraft, 2014). Creel data from 2011 was not used due to the disruption of the fishery due to Hurricane Irene.

Estimating YOY Relative Abundance

At least 2 YOY survey sites (minimum length 300 feet) were established for each study reach. YOY survey sites were selected to represent high-quality spawning and nursery habitat (stable channel, abundant gravel substrate, emergent vegetation) (McRae & Diana, 2005). YOY trout were sampled by electrofishing as follows:

- Sampling was completed once annually in late August or early September from 2021 through 2024,
- At least 2 electrofishing passes (depletion) were completed, collecting trout only⁵,
- Trout <125mm were the only fish collected. No blocker seine used (McRae & Diana, 2005),
- All trout were counted and a sample of at least 25 YOY and all yearling or older trout were measured to the nearest millimeter and returned to the water after the final pass.

Electrofishing catch per hour of YOY trout was calculated to index YOY trout abundance. Additionally, the number of YOY trout per acre was estimated using the Binomial Depletion Model (Sullivan & Boomer, 2003). For the most intensively fished streams the CPUE of YOY trout was compared to historical estimates on comparable stream reaches. Because flood events have been shown to heavily influence brown trout survival to YOY (Lobon-Cervia, 2009), the best available source(s) of relevant precipitation and/or stream discharge data were identified for each reach and extreme events were noted. In addition, temperature loggers were installed to collect hourly thalweg water temperatures from June 1 through the date of the electrofishing survey to identify any periods of extreme thermal stress.

Results

Angling Pressure

Angler counts were completed as planned with the following exceptions: Camden Creek and Indian River (no counts in 2022) and Mongaup Creek and Swan River (no counts in 2023). These data allowed for the calculation of 53 estimates of angling pressure (Appendix 1). Estimates of zero hours/acre resulted for a subset of 11 angler count surveys in which no anglers whatsoever were observed.

Out of the sample of 19 wild trout stream reaches, the three-year average angling pressure did not exceed 20 hours/acre with the exceptions of the Muscoot River (54 angler hours/acre), Camden Creek (25 angler hours/acre) and the Men's Club to Airport Road segment of the West Branch of the Delaware River (22 angler hours/acre) (Figure 1). For the entire sample, angling pressure averaged 8 hours/acre in 2021, 10 hours/acre in 2022, and 8 hours/acre in 2023.

Angling pressure varied greatly among stream reaches and years. While the level of pressure was relatively consistent among years for most reaches, some demonstrated high interannual variability; notably Camden Creek, Indian River, and Oatka Creek. No anglers were observed on Fox Hollow Creek and on the Swan River during the study.

⁵ Survey sites were fished bank to bank except for the East and West Branch Delaware sites where electrofishing was focused on a 6-foot-wide strip adjacent to bank.

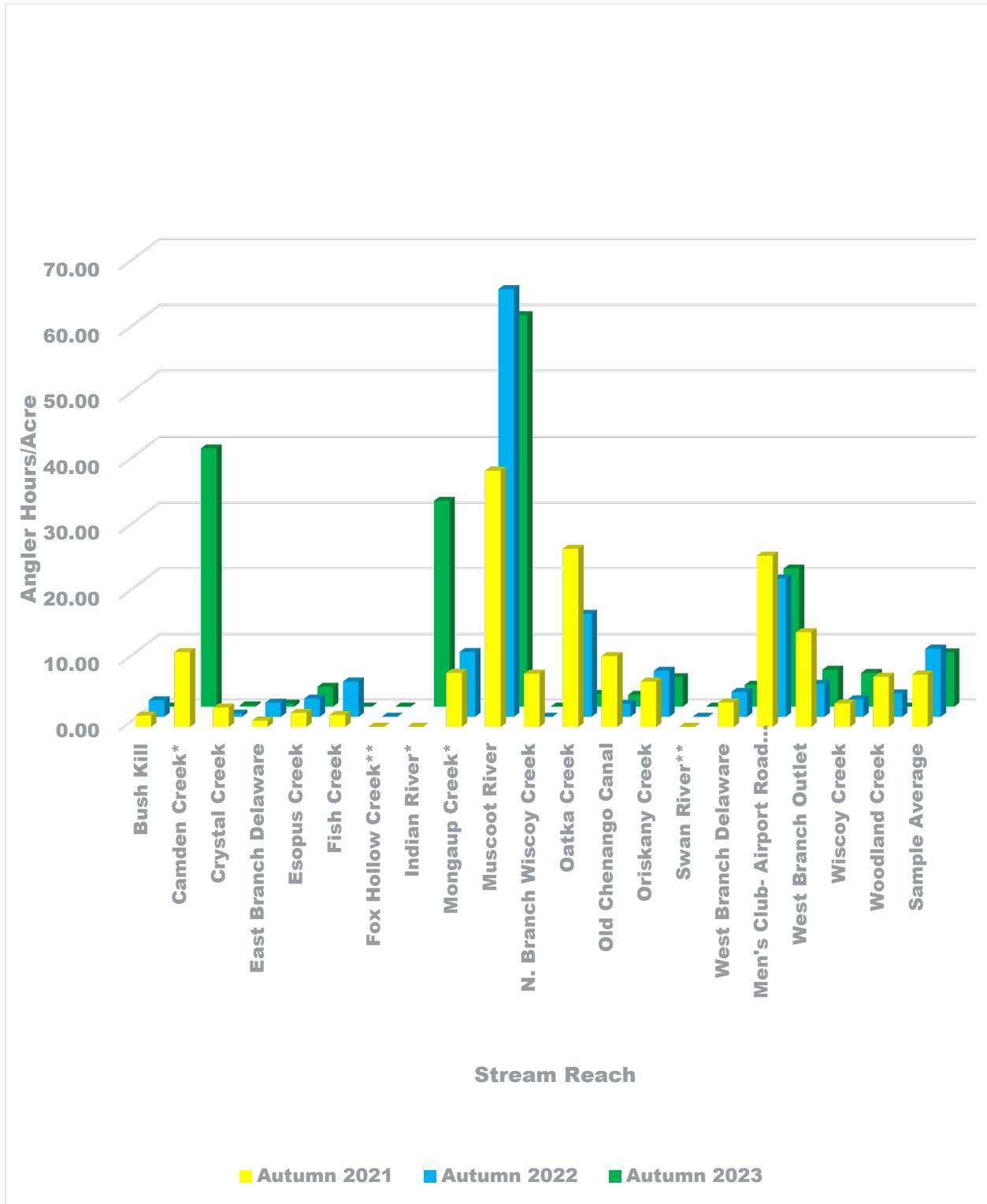


Figure 1 Estimated angling pressure (hours/acre) from October 16 - December 15 on nineteen wild trout streams. A single asterisk denotes a missing year. A double asterisk denotes zero anglers observed.

YOY Relative Abundance

Statewide Results

Seventy electrofishing surveys were completed as planned while five surveys could not be completed. Sites could not be sampled on the West Branch Outlet and Esopus Creek in 2021 and the Muscoot River in 2023 because persistent high water created unsafe working conditions. In 2021, the Oatka Creek survey could not be completed due to an equipment breakdown. Finally, one site on Crystal Creek could not be sampled because access to the stream was blocked by construction to repair a flood damaged bridge.

Electrofishing efficiencies were generally good, though episodic high flows compromised capture probabilities for some sampling events. The mean capture probability for the entire set of population estimates was 63% and the mode was 79%. Capture probability was less than 20% due to inadequate depletion at only 7 out of 163 site-specific sampling events.

Results from the sampling indicate that YOY abundance was stable over the course of the study. There is no statistically significant trend in YOY catch/hour ($P = 0.22$) (Figure 2).

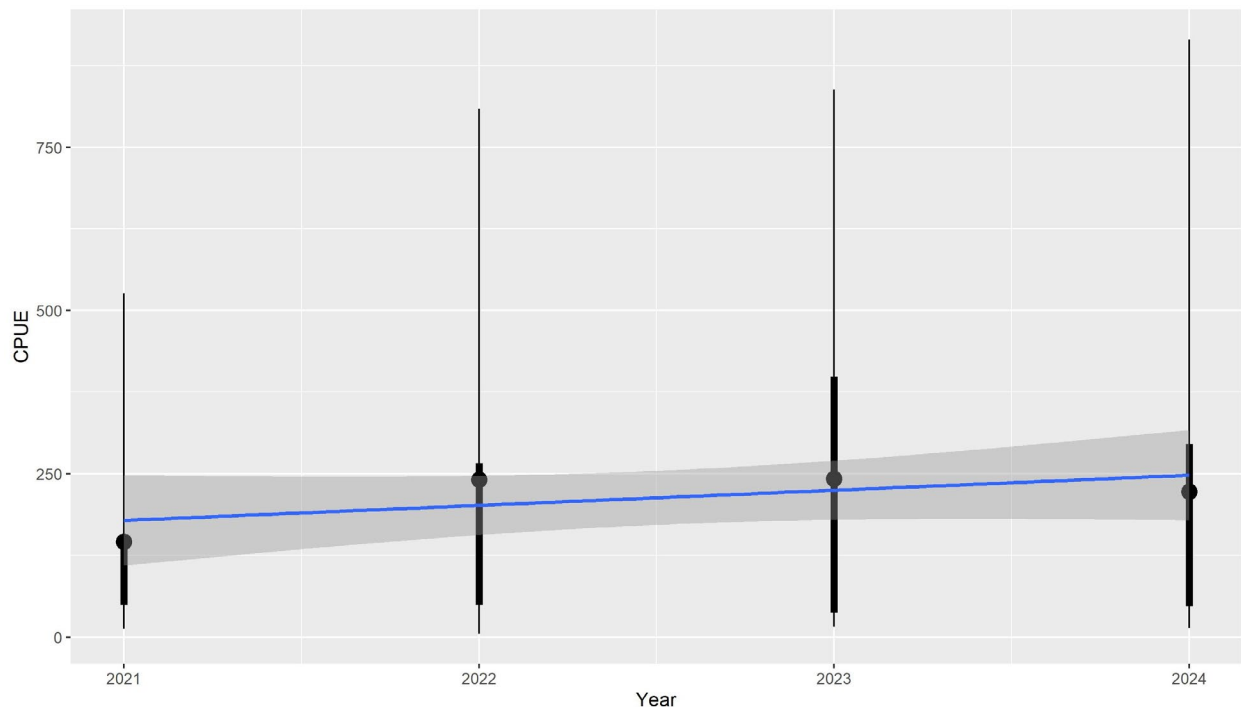


Figure 2. Young of year (YOY) trout abundance indexed by mean electrofishing catch per unit effort (CPUE). Mean CPUE is shown for all sampling sites 2021-2024. The mean and quartiles are represented in bold, and the light lines depict the full range of values for YOY trout captured per hour of electrofishing. The blue line is the maximum likelihood estimate linear regression model, and the gray shading depicts the 95% confidence interval. R squared = 0.009 and P value = 0.22

While no impact of the C&R season can be detected in the electrofishing catch rate, another analysis was conducted for due diligence. The same electrofishing data were used to calculate YOY trout population estimates. Then a Bayesian hierarchical model was fit with different combinations of year, angling pressure, and water, with YOY abundance as the dependent variable. The best supported model predicted YOY abundance as a function of year and water. Fishing pressure from October 16 through

December 15 was not a useful predictor of YOY abundance the following year. These findings suggest that year to year fluctuations in the environment exert the greatest influence on YOY abundance.

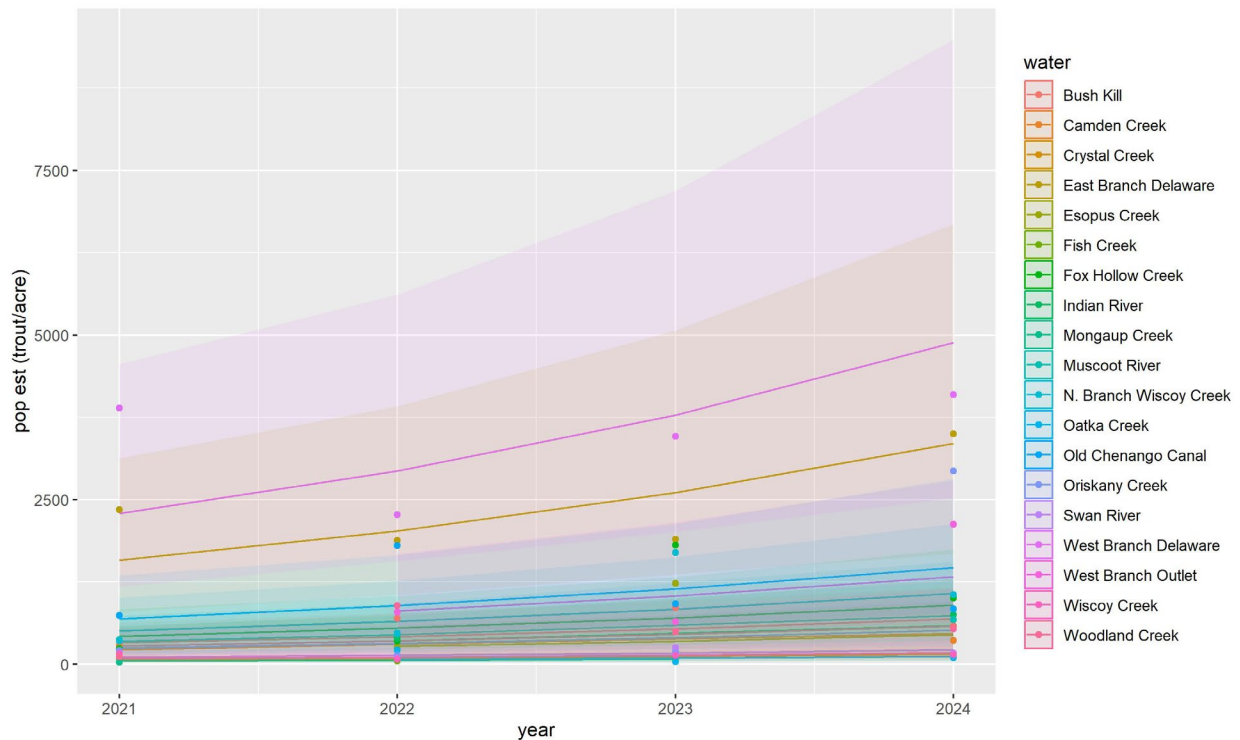


Figure 3 Bayesian hierarchical model relating YOY trout abundance (estimated YOY trout per acre) as a function of year and water. Points represent mean abundance; lines represent the best fit mean across years with shading representing the 95% confidence limits.

Given the consistently high angling pressure observed on the Muscoot River and on the portion of the West Branch of the Delaware between the Men’s Club and Airport Road relative to the other stream reaches in the study, individual results are presented for these two stream segments.

Muscoot River

The Muscoot River data collected during this study are visually summarized for the 2 sampling sites in Figure 4. Angling pressure estimates ranged from 39 hours/acre in 2021 to 65 hours/acre in 2022, the highest estimate in the study. YOY abundance at Site 1 ranged from 643 trout/acre to 1138 trout/acre in 2021 and 2024 respectively. Site 2 was substantially less productive with YOY abundance ranging from 4 trout/acre in 2022 to 209 trout/acre in 2024. Spawning and incubation of YOY trout sampled in 2021 occurred during the closed season while the production of all subsequent year classes occurred under the catch and release season.

To further investigate the apparent trend of increasing YOY abundance, additional YOY data from an electrofishing survey completed at Site 1 in 2020 was added to the analysis resulting in 2 estimates during the closed season and 2 estimates after the C&R season took effect. The abundance estimate for Site 1 from the 2020 survey was 236 YOY trout/acre. The pre (440) and post regulation (1018) mean estimates were compared with a two-tailed student t-test ($t=2.46$, $df=2$). The resulting P value of 0.13 falls short of statistical significance at the typical α value of 0.05. In other words, the probability of observing this difference by chance alone is 13%.

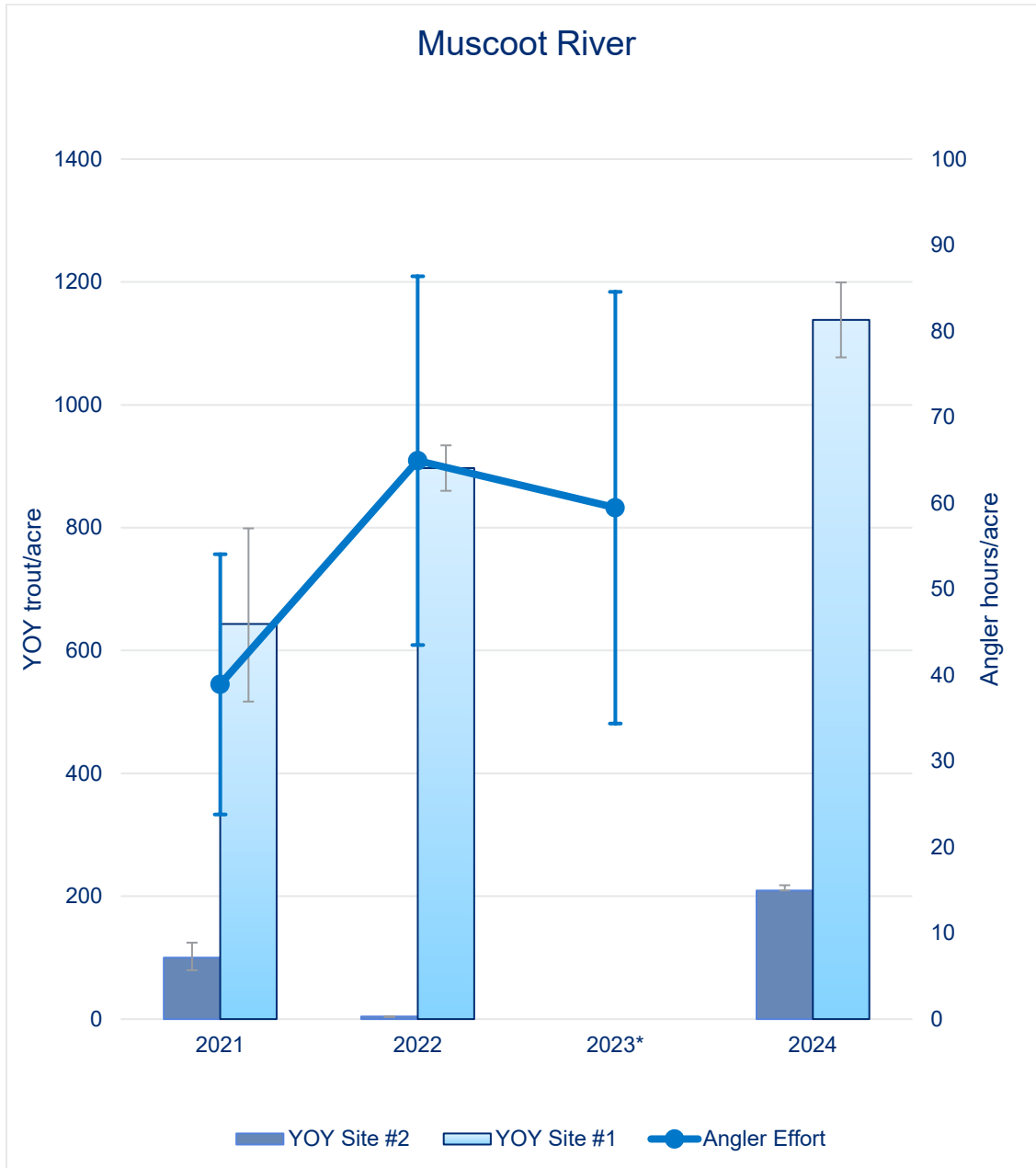


Figure 4 Young of year trout abundance and fishing pressure (October 16-December 15) at two sampling sites on the Muscoot River 2021-2024. Error bars display the 95% confidence interval for all series. A population estimate could not be completed in 2023 because persistent high flows precluded electrofishing.

As an additional step, YOY abundance at sampling site #1 was plotted against year and a linear regression model was fitted to test for a significant trend over time (Figure 5). The probability that the observed increase in YOY abundance from 2020 to 2024 is due to chance alone is 4%.

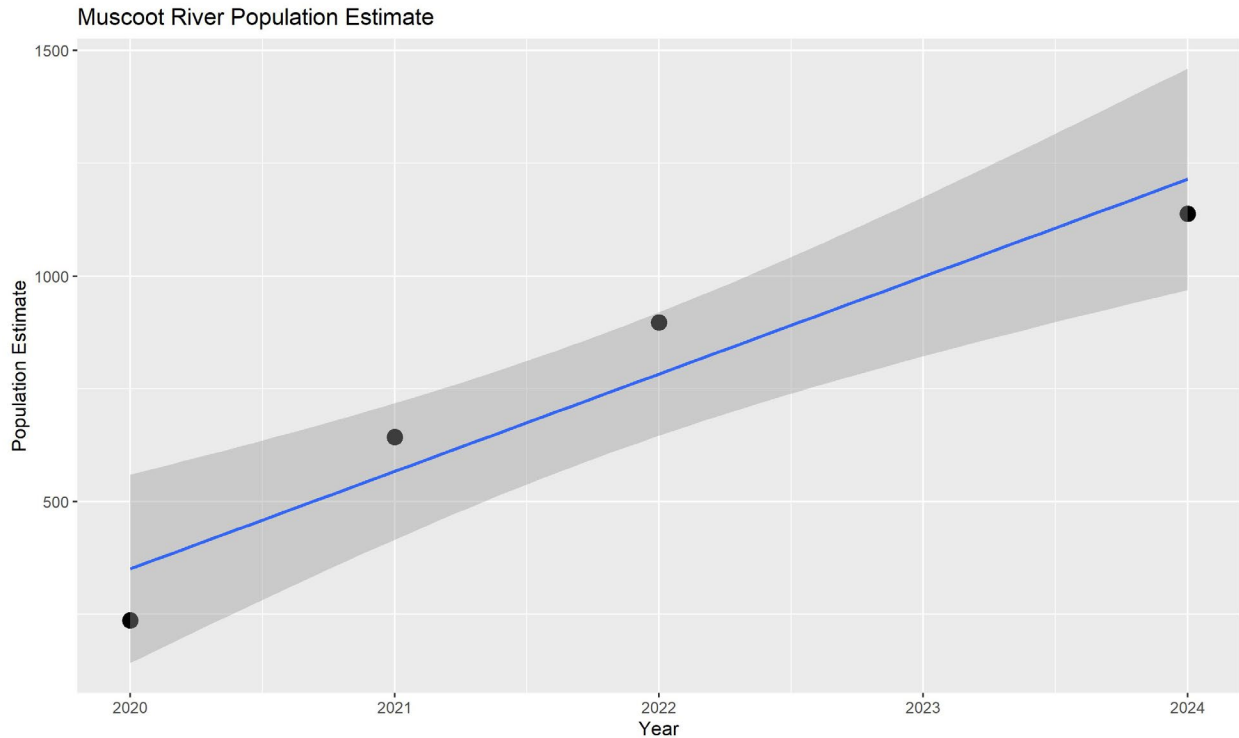


Figure 5. Young of year trout abundance at Site #1, Muscoot River, from 2020 to 2024. The blue line is the maximum likelihood estimate linear regression model, and the gray shading depicts the 95% confidence interval. R squared = 0.915 P value = 0.04

West Branch Delaware River

The data collected during this study from the West Branch of the Delaware River from the Men’s Club to Airport Road are visually summarized for the 2 sampling sites in Figure 6. Angling pressure estimates for the area visible to the observers from the two sites ranged from 21 hours/acre in 2022 and 2023 to 26 hours/acre in 2021. YOY abundance at the Men’s Club site ranged from 1261 trout/acre in 2021 to 5890 trout/acre in 2023. At the Airport Road site YOY abundance ranged from 1898 trout/acre in 2023 to 9253 trout/acre in 2021. Spawning and incubation of YOY trout sampled in 2021 occurred during the closed season while the production of all subsequent year classes occurred under the catch and release season.

It is important to recognize that, while most survey sites in the study were electrofished bank to bank, this approach was impractical for this reach at typical late summer flows under the *Flexible Flow Management Plan* (Office of the Delaware River Master, 2017). Instead, a six-foot-wide strip adjacent to the bank was electrofished at these sites. As reflected by the 95% confidence intervals, YOY depletion was sufficient to support satisfactory population estimates for the area sampled. However, because the area sampled was optimal YOY habitat, it is not surprising that the YOY densities are the highest in the study. YOY density estimates from this method are valid for comparison over time within the same habitat type. However, it is not valid to compare them to YOY densities estimated from bank-to-bank electrofishing. Neither should they be used to infer YOY densities for the entire channel acreage of the reach.

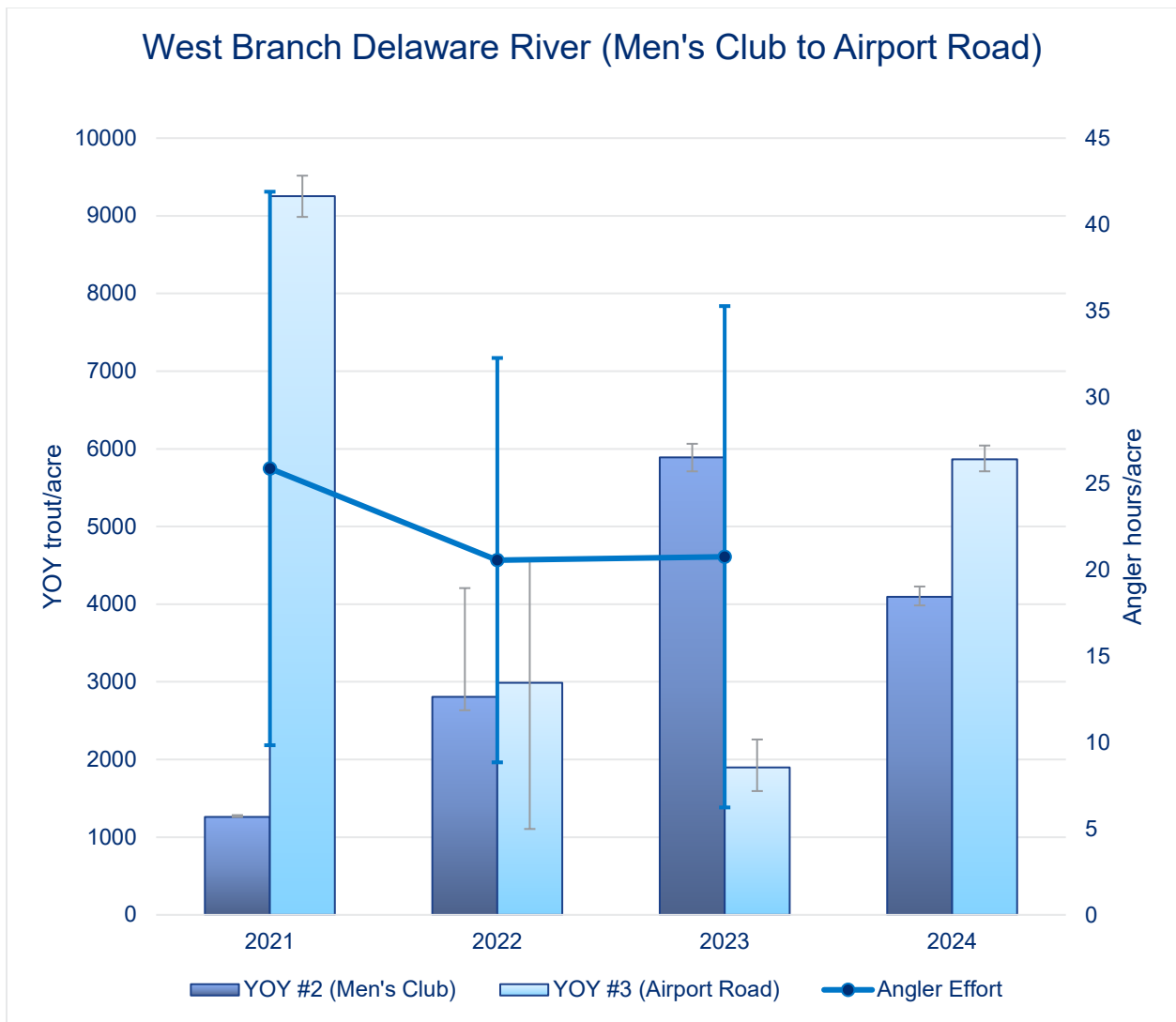


Figure 6 Young of year trout abundance and fishing pressure (October 16-December 15) at two sampling sites on the West Branch of the Delaware River 2021-2024. Error bars display the 95% confidence interval for all series.

Taking advantage of YOY catch rate data from electrofishing surveys completed in 2019 and 2020 at a site opposite the Men’s Club with similar habitat, a two-tailed t-test was performed to test the hypothesis that the mean number of YOY trout caught per hour of electrofishing in 2019, 2020, and 2021 was different from the mean for the post-regulation years of 2022, 2023 and 2024. The pre-regulation mean was 365 YOY trout/hour and the post-regulation mean was 381 YOY trout/hour. The result ($t=0.14$, $df=4$) is not statistically significant ($P=0.89$) meaning that the probability of observing this difference purely by chance is 89%

As an additional step, YOY catch/hour at the Men’s Club (sampling site #2) was plotted against year and a linear regression model was fitted to test for a significant trend over time (Figure 7). Because the electrofishing data from 2019 and 2020 used a single pass method, only the first pass CPUE could be compared. The regression model does not support the hypothesis of a significant trend over time (P value = 0.93).

West Branch Delaware River YOY Site 02 Rep 1



Figure 7. First pass electrofishing catch of YOY trout from 2019 to 2024 at Men’s Club (Site #2). Catch per unit effort (CPUE) is expressed in YOY trout captured per hour of electrofishing. The turquoise points represent year classes recruited prior to the new catch and release season while red points represent year classes recruited under the new season. The blue line is the maximum likelihood estimate linear regression model, and the gray shading depicts the 95% confidence interval. R squared = 0.002, P value = 0.93

Discussion

Angling Pressure

The level of angling pressure observed between October 16 and December 15 in this study was very low compared to the level of angling pressure observed on some well-known wild trout stream reaches during the April 1 through October 15 regular season (Table 2). For example, in contrast to the 21 to 26 hours of angling pressure per acre estimated on the West Branch of the Delaware River between Men’s Club to Airport Road, estimates for the same area during the regular seasons of 2018 and 2019 were 470 and 571 hours/acre respectively. Angling pressure on the West Branch of the Delaware River (Hancock to Stilesville) ranged from 3 to 4 hours/acre in this study compared to 276 to 326 hours/acre during the regular seasons of 2018 and 2019 (NYSDEC and PFBC, 2023). Angling pressure on the East Branch of the Delaware River ranged from 1 to 2 hours/acre in this study compared to 110 to 112 hours/acre during the regular seasons of 2018 and 2019 (NYSDEC and PFBC, 2023). The catch and release season may constitute a greater proportion of total effort for stream reaches that are less intensively fished overall. On Esopus Creek upstream of the Shandaken Portal, angling pressure ranged from 2 to 3 hours/acre (Appendix 1) while angling pressure during the regular season ranged from 10 to 13 hours/acre.

Table 2 Angling pressure from October 16 through December 15 compared to angling pressure from April 1 to October 15 on four wild trout stream reaches with recent creel survey data.

Stream Reach	April-October (hours/acre)	C&R Season (hours/acre)	C&R Season pressure as a percent of April-Oct pressure
Delaware W Branch (Men’s Club)	470-571	21-26	4% -5%
Delaware W Branch (Entire)	276-325	3 - 4	1%
Delaware E Branch (Entire)	110-112	1-2	1% - 2%
Esopus Creek (upstream of Portal)	10-13	2-3	20% -23%

Given the prevalence of uncomfortable and adverse fishing conditions in late autumn, it is not surprising that angling pressure was generally low and highly variable among count days. However, contrary to expectations from the Esopus Creek data used to design this study, the 95% confidence intervals for angler effort exceeded 40% of the point estimate for all but three non-zero estimates (Appendix 1). This resulted from higher sample variances in this study than in the Esopus Creek data used to inform the sampling design (McCormick & Meyer, 2017). Additional count days would be needed to achieve tighter confidence intervals for fishing pressure estimates during this season. However, given the low angling pressure and lack of evidence for a negative impact on wild trout reproduction, the benefit of tighter confidence intervals is outweighed by the opportunity cost of the staff time required. Regardless, the data collected in this study provide a realistic reference to inform the design of any future estimations of angler effort on an inland trout stream during the catch and release season. The temperature, weather, turbidity, and flow condition observations collected in conjunction with angler counts are available to interested researchers and may have some value in predicting zero angler count days.

Implications for Wild Trout Reproduction

In combination with the challenge of catching wild trout on an artificial lure in cold water and benefit of cold temperatures in minimizing handling stress (Mitro, 2015) (Roth, et al., 2019), it is doubtful that the low level of angling pressure observed on most stream reaches in this study could impair reproduction. Indeed, as discussed in Appendix 1 of the New York State Trout Stream Management Plan (NYSDEC, 2020), the catch and release season was implemented based on the demonstrated sustainability of wild trout populations managed without a closed season in western New York and other locales. At a statewide scale, the results of this study offer no evidence of impaired reproduction.

The greatest misgivings about the catch and release season were founded on the premise that the benign outcomes observed elsewhere might not accurately predict the outcome for high profile wild trout streams closer to the New York City metropolitan region where higher angling pressure would be expected. This is a reasonable premise, and in this study, higher angling pressure was consistently observed on two tailwater trout stream reaches:

- The Muscoot River (Amawalk Outlet) – From Muscoot Reservoir upstream to Amawalk Reservoir in Westchester County
- The West Branch of the Delaware River (Men’s Club to Airport Road) – downstream of Cannonsville Reservoir in Delaware County

The wild trout population in both reaches is dominated by fall-spawning brown trout. In the case of the West Branch reach, redd counts have confirmed extensive brown trout spawning activity in the same area intensively fished by wading anglers. Therefore, allowing angling during the formerly closed season is more likely to result in decreased YOY abundance in these two reaches than any other reaches in the study. No such impact is evident either from comparing the pre- and post-regulation mean abundances or from the lack of a significant declining trend through 2024.

In the case of the most heavily fished water, the Muscoot River, a non-significant but increasing trend is apparent. Because stocking was terminated after 2020, this may be the result of wild trout benefiting from the absence of stocked trout. While it is not reasonable to infer that the Muscoot River trout population somehow benefited from the catch and release season, it is reasonable to infer that factors other than angling pressure during the fall exert a much stronger influence on recruitment for this population.

In conclusion, the results of this study are entirely consistent with the research and management experience cited in Appendix 1 of the New York State Trout Stream Management Plan (NYSDEC, 2020) to justify the catch and release season. For the Muscoot River and West Branch of the Delaware River, as with the other streams in the study, there is no discernable impairment of wild trout reproduction under the new regulation.

Management Conclusions

- On a statewide basis, angler participation in the catch and release season is very limited.
- Precise estimation of angling pressure during this season is difficult and costly due to the low level of pressure and high variance among counts.
- Evidence that the catch and release season impairs wild trout reproduction is lacking.
- As intended, the season provides additional fishing opportunities for a subset of hardcore anglers when fishing conditions allow.
- The statewide catch and release season from October 16 – March 31 that was implemented under the New York State Trout Stream Management Plan in 2021 should continue without modification.

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Appendix 1. Estimated angling effort 2021-2023 (listed in chronological order) for stream reaches included in the Catch and Release Season Evaluation

DEC Region	Study Reach	Weekend Pressure (Hours)	Weekday Pressure (Hours)	Total Pressure (Hours)	95%CI Pressure (+/- hours)	Reach Area (Acres)	Pressure per Acre (Hrs/Acre)	95%CI (+/- Hrs/Acre)	Upper 95% CI (Hrs/Acre)	CI as % of estimate
4	Bush Kill	0	36	36	70	21	2	3	5	196
4	Bush Kill	9	44	53	95	21	3	5	7	181
4	Bush Kill	0	0	0	0	21	0	0	0	NA
5	Camden Creek	12	0	12	24	1.07	11	22	34	196
5	Camden Creek	0	42	42	88	1.07	39	82	122	210
6	Crystal Creek	32	73	105	146	35.8	3	4	7	139
6	Crystal Creek	17	0	17	25	35.8	0	1	1	145
6	Crystal Creek	8	0	8	16	35.8	0	0	1	196
4	East Branch Delaware	78	22	100	113	108	1	1	2	114
4	East Branch Delaware	60	171	230	211	108	2	2	4	92
4	East Branch Delaware	8	42	50	57	108	0	1	1	113
3	Esopus Creek (study)	72	36	108	85	51	2	2	4	79
3	Esopus Creek (study)	59	81	140	150	51	3	4	7	100
3	Esopus Creek (study)	95	60	155	133	51	3	3	6	86
6	Fish Creek	12	24	36	53	20.1	2	3	4	147
6	Fish Creek	34	73	107	20	20.1	5	1	6	19
6	Fish Creek	0	0	0	0	20.1	0	0	0	NA
3	Fox Hollow Creek	0	0	0	0	3.3	0	0	0	NA
3	Fox Hollow Creek	0	0	0	0	3.3	0	0	0	NA
3	Fox Hollow Creek	0	0	0	0	3.3	0	0	0	NA
5	Indian River	0	0	0	0	1.23	0	0	0	NA
5	Indian River	16	23	39	57	1.23	31	46	77	147
3	Mongaup Creek	27	0	27	37	3.3	8	11	20	139
3	Mongaup Creek	14	18	33	46	3.3	10	14	24	142
3	Muscoot River	344	147	490	191	12.6	39	15	54	39
3	Muscoot River	360	458	818	270	12.6	65	21	86	33
3	Muscoot River	348	401	749	316	12.6	59	25	85	42

DEC Region	Study Reach	Weekend Pressure (Hours)	Weekday Pressure (Hours)	Total Pressure (Hours)	95%CI Pressure (+/- hours)	Reach Area (Acres)	Pressure per Acre (Hrs/Acre)	95%CI (+/- Hrs/Acre)	Upper 95% CI (Hrs/Acre)	CI as % of estimate
9	N. Branch Wiscoy Creek	12	58	70	116	8.7	8	13	21	166
9	N. Branch Wiscoy Creek	0	0	0	0	8.7	0	0	0	NA
9	N. Branch Wiscoy Creek	0	0	0	0	8.7	0	0	0	NA
8	Oatka Creek	210	258	468	222	17.3	27	13	40	47
8	Oatka Creek	164	106	271	203	17.3	16	12	27	75
8	Oatka Creek	15	19	33	43	17.3	2	2	4	128
7	Old Chenango Canal	15	48	63	97	5.9	11	16	27	153
7	Old Chenango Canal	11	0	11	25	5.9	2	4	6	219
7	Old Chenango Canal	11	0	11	21	5.9	2	4	5	196
7	Oriskany Creek	74	53	128	87	18.6	7	5	12	68
7	Oriskany Creek	21	109	130	120	18.6	7	6	13	93
7	Oriskany Creek	8	76	84	103	18.6	4	6	10	123
1	Swan River (study)	0	0	0	0	0.82	0	0	0	NA
1	Swan River (study)	0	0	0	0	0.82	0	0	0	NA
4	West Branch Delaware	447	788	1235	760	335	4	2	6	62
4	West Branch Delaware	419	846	1265	715	335	4	2	6	57
4	West Branch Delaware	249	865	1113	783	335	3	2	6	70
3	West Branch Outlet	89	82	171	140	11.9	14	12	26	82
3	West Branch Outlet	41	18	59	66	11.9	5	6	11	111
3	West Branch Outlet	48	19	67	96	11.9	6	8	14	143
9	Wiscoy Creek	59	232	291	219	82	4	3	6	75
9	Wiscoy Creek	128	89	217	152	82	3	2	5	70
9	Wiscoy Creek	167	253	421	242	82	5	3	8	58
3	Woodland Creek	99	65	164	164	21.5	8	8	15	101
3	Woodland Creek	58	18	76	80	21.5	4	4	7	105
3	Woodland Creek	0	0	0	0	21.5	0	0	0	NA

Appendix 2 Estimated Young of Year Trout/Acre 2021-2024, P =Capture Probability

Region	Name	YOY sample year	Survey #	Site	Min 95% CI	YOY trout/acre	Max 95% CI	P
4	Bush Kill	2021	421034	1	235	260	288	0.50
4	Bush Kill	2021	421034	2	82	84	89	0.67
4	Bush Kill	2021	421034	3	95	95	102	0.71
4	Bush Kill	2022	422052	1	2554	2621	2687	0.55
4	Bush Kill	2022	422052	2	845	865	887	0.63
4	Bush Kill	2022	422052	3	493	519	546	0.55
4	Bush Kill	2023	423052	1	909	963	1021	0.46
4	Bush Kill	2023	423052	2	1062	1087	1113	0.63
4	Bush Kill	2023	423052	3	499	528	529	0.50
4	Bush Kill	2024	424039	1	1038	1071	1100	0.62
4	Bush Kill	2024	424039	2	458	471	482	0.68
4	Bush Kill	2024	424039	3	196	200	211	0.68
5	Camden Creek	2021	521068	1	338	361	394	0.58
5	Camden Creek	2021	521068	2	205	205	214	0.88
5	Camden Creek	2022	522038	1	17649	23425	24407	0.01
5	Camden Creek	2022	522038	2	10117	13477	13800	0.01
5	Camden Creek	2023	523026	1	517	549	583	0.58
5	Camden Creek	2023	523026	2	476	550	635	0.27
5	Camden Creek	2024	542055	1	399	476	571	0.26
5	Camden Creek	2024	542055	2	225	238	256	0.60
6	Crystal Creek	2021	621012	1	148	170	196	0.36
6	Crystal Creek	2021	621012	2	85	95	109	0.51
6	Crystal Creek	2021	621012	3	63	65	75	0.60
6	Crystal Creek	2022	622014	1	104	124	149	0.32
6	Crystal Creek	2022	622014	2	102	135	181	0.23
6	Crystal Creek	2022	622014	3	11	11	11	0.79
6	Crystal Creek	2023	623014	1	128	130	139	0.82
6	Crystal Creek	2023	623014	2	59	59	59	0.93
6	Crystal Creek	2023	623014	3	47	47	56	0.77

Region	Name	YOY sample year	Survey #	Site	Min 95% CI	YOY trout/acre	Max 95% CI	P	
6	Crystal Creek	2024	624010	1	167	171	182	0.81	
6	Crystal Creek	2024	624010	2	Inaccessible due to construction				
6	Crystal Creek	2024	624010	3	70	89	117	0.50	
4	East Branch Delaware	2021	421033	1	885	984	1085	0.55	
4	East Branch Delaware	2021	421033	2	2058	2183	2324	0.91	
4	East Branch Delaware	2021	421033	3	3652	3860	4073	0.56	
4	East Branch Delaware	2022	422053	1	1173	1232	1306	0.62	
4	East Branch Delaware	2022	422053	2	753	772	819	0.66	
4	East Branch Delaware	2022	422053	3	3497	3623	3763	0.62	
4	East Branch Delaware	2023	423045	1	933	1022	1133	0.44	
4	East Branch Delaware	2023	423045	2	1644	1690	1756	0.68	
4	East Branch Delaware	2023	423045	3	2867	2966	3067	0.64	
4	East Branch Delaware	2024	424038	1	465	465	465	0.73	
4	East Branch Delaware	2024	424038	2	2236	2280	2324	0.73	
4	East Branch Delaware	2024	424038	3	7703	7747	7791	0.82	
3	Esopus Creek	2021	canceled due to high water						
3	Esopus Creek	2022	322030	1	181	186	198	0.79	
4	Esopus Creek	2022	322030	2	296	332	375	0.41	
3	Esopus Creek	2023	323024	2	1191	1228	1266	0.54	
3	Esopus Creek	2024	324027	1	103	111	128	0.69	
3	Esopus Creek	2024	324027	2	126	163	213	0.18	
6	Fish Creek	2021	621013	1	59	59	59	0.78	
6	Fish Creek	2021	621013	2	105	111	123	0.58	
6	Fish Creek	2021	621013	3	105	113	129	0.55	
6	Fish Creek	2022	622014	1	40	40	44	0.67	
6	Fish Creek	2022	622014	2	56	65	79	0.46	
6	Fish Creek	2022	622014	3	33	33	38	0.68	
6	Fish Creek	2023	623015	1	77	104	141	0.40	
6	Fish Creek	2023	623015	2	80	104	134	0.50	
6	Fish Creek	2023	623015	3	42	42	46	0.84	

Region	Name	YOY sample year	Survey #	Site	Min 95% CI	YOY trout/acre	Max 95% CI	P
6	Fish Creek	2024	624008	1	30	30	30	0.89
6	Fish Creek	2024	624008	2	192	205	223	0.59
6	Fish Creek	2024	624008	3	67	67	67	0.95
3	Fox Hollow Creek	2021	321031	1	334	341	377	0.79
3	Fox Hollow Creek	2021	321031	2	122	122	122	0.99
3	Fox Hollow Creek	2022	322028	1	391	413	437	0.67
3	Fox Hollow Creek	2022	322028	2	266	288	312	0.54
3	Fox Hollow Creek	2023	323022	1	1717	1810	1907	0.66
3	Fox Hollow Creek	2024	324025	1	1381	1429	1495	0.75
3	Fox Hollow Creek	2024	324025	2	540	573	613	0.70
5	Indian River	2021	521067	1	202	228	263	0.46
5	Indian River	2021	521067	2	167	168	176	0.85
5	Indian River	2022	522027	1	362	390	426	0.71
5	Indian River	2022	522027	2	373	394	414	0.76
5	Indian River	2023	523027	1	253	280	310	0.50
5	Indian River	2023	523027	2	359	379	399	0.59
5	Indian River	2024	542056	1	886	905	924	0.72
5	Indian River	2024	542056	2	575	601	634	0.55
3	Mongaup Creek	2021	321010	1	20	20	24	0.72
3	Mongaup Creek	2021	321010	2	34	33	34	0.87
3	Mongaup Creek	2022	322027	1	78	78	82	0.70
3	Mongaup Creek	2022	322027	2	83	84	89	0.81
3	Mongaup Creek	2023	323020	1	157	186	218	0.35
3	Mongaup Creek	2023	323020	2	29	29	32	0.79
3	Mongaup Creek	2024	324026	1	859	887	918	0.71
3	Mongaup Creek	2024	324026	2	305	334	365	0.53
3	Muscoot River	2021	321029	1	517	643	799	0.16
3	Muscoot River	2022	322026	1	860	897	934	0.70
3	Muscoot River	2023	canceled due to high water		1			
3	Muscoot River	2024	324023	1	1077	1138	1199	0.59

Region	Name	YOY sample year	Survey #	Site	Min 95% CI	YOY trout/acre	Max 95% CI	P
3	Muscoot River	2021	321029	2	80	100	124	0.37
3	Muscoot River	2022	322026	2	4	4	4	0.99
3	Muscoot River	2023	canceled due to high water		2			
3	Muscoot River	2024	324023	2	209	209	218	0.86
9	N. Branch Wiscoy Creek	2021	921009	1	366	422	484	0.40
9	N. Branch Wiscoy Creek	2021	921009	2	283	284	298	0.73
9	N. Branch Wiscoy Creek	2022	922012	1	454	460	471	0.74
9	N. Branch Wiscoy Creek	2022	922012	2	484	484	494	0.78
9	N. Branch Wiscoy Creek	2023	923018	1	561	597	639	0.52
9	N. Branch Wiscoy Creek	2023	923018	2	2768	2793	2827	0.78
9	N. Branch Wiscoy Creek	2024	924005	1	596	607	624	0.72
9	N. Branch Wiscoy Creek	2024	924005	2	1417	1495	1563	0.56
8	Oatka Creek	2021	Canceled due to electrofishing equipment failure					
8	Oatka Creek	2022	822022	1	169	187	208	0.32
8	Oatka Creek	2022	822022	2	212	231	252	0.37
8	Oatka Creek	2023	823027	1	55	62	69	0.61
8	Oatka Creek	2023	823027	2	23	23	24	0.85
8	Oatka Creek	2023	823027	3	25	26	27	0.80
8	Oatka Creek	2024	824026	1	195	228	266	0.18
8	Oatka Creek	2024	824026	2	54	56	62	0.73
8	Oatka Creek	2024	824026	3	19	19	21	0.81
7	Old Chenango Canal	2021	721026	1	684	737	793	0.61
7	Old Chenango Canal	2021	721026	2	668	741	825	0.48
7	Old Chenango Canal	2022	722054	1	2505	2611	2721	0.58
7	Old Chenango Canal	2022	722054	2	938	987	1041	0.69
7	Old Chenango Canal	2023	723018	1	986	1068	1153	0.52
7	Old Chenango Canal	2023	723018	2	720	760	805	0.69
7	Old Chenango Canal	2024	724017	1	1033	1089	1144	0.66
7	Old Chenango Canal	2024	724017	2	564	588	612	0.79
7	Oriskany Creek	2021	721027	1	201	255	318	0.39

Region	Name	YOY sample year	Survey #	Site	Min 95% CI	YOY trout/acre	Max 95% CI	P
7	Oriskany Creek	2021	721027	2	144	153	166	0.73
7	Oriskany Creek	2022	722055	1	215	237	261	0.68
7	Oriskany Creek	2022	722055	2	26	26	26	0.99
7	Oriskany Creek	2023	723019	1	256	332	430	0.29
7	Oriskany Creek	2023	723019	2	60	60	60	0.89
7	Oriskany Creek	2024	724038	1	3779	5826	8349	0.01
7	Oriskany Creek	2024	724038	2	42	42	45	0.79
1	Swan River	2021	121014	1	68	68	70	0.90
1	Swan River	2021	121014	2	115	123	137	0.72
1	Swan River	2021	121014	3	199	199	204	0.90
1	Swan River	2022	122019	1	50	50	50	0.96
1	Swan River	2022	122019	2	81	81	81	0.91
1	Swan River	2022	122019	3	150	150	155	0.88
1	Swan River	2023	123016	1	105	105	105	0.87
1	Swan River	2023	123016	2	368	368	368	0.93
1	Swan River	2023	123016	3	281	282	300	0.84
1	Swan River	2024	124024	1	211	260	309	0.53
1	Swan River	2024	124024	2	184	233	282	0.54
1	Swan River	2024	124024	3	9	9	10	0.79
4	West Branch Delaware	2021	421032	1	996	1152	1328	0.67
4	West Branch Delaware	2021	421032	2	1261	1261	1284	0.70
4	West Branch Delaware	2022	422051	2	2634	2807	4207	0.52
4	West Branch Delaware	2022	422051	1	952	1012	1107	0.59
4	West Branch Delaware	2023	423046	2	5710	5890	6065	0.61
4	West Branch Delaware	2024	424037	2	3984	4095	4228	0.55
4	West Branch Delaware	2023	423046	1	2523	2588	2678	0.69
4	West Branch Delaware	2021	421032	3	8986	9253	9517	0.50
4	West Branch Delaware	2022	422051	3	1106	2988	4581	0.29
4	West Branch Delaware	2024	424037	1	2169	2324	2479	0.53
4	West Branch Delaware	2023	423046	3	1594	1898	2258	0.26

Region	Name	YOY sample year	Survey #	Site	Min 95% CI	YOY trout/acre	Max 95% CI	P	
4	West Branch Delaware	2024	424037	3	5710	5865	6042	0.63	
3	West Branch Outlet	2021	canceled due to high water						
3	West Branch Outlet	2022	322025	1	344	381	422	0.47	
3	West Branch Outlet	2022	322025	2	1149	1190	1233	0.63	
3	West Branch Outlet	2023	323026	1	615	641	667	0.69	
3	West Branch Outlet	2024	324019	1	1512	1561	1610	0.62	
3	West Branch Outlet	2024	324019	2	2610	2691	2773	0.55	
9	Wiscoy Creek	2021	921007	1	173	187	202	0.57	
9	Wiscoy Creek	2021	921007	2	136	137	144	0.71	
9	Wiscoy Creek	2022	922011	1	64	86	112	0.35	
9	Wiscoy Creek	2022	922011	2	52	55	65	0.57	
9	Wiscoy Creek	2023	923017	1	224	229	240	0.70	
9	Wiscoy Creek	2023	923017	2	36	36	36	0.91	
9	Wiscoy Creek	2024	924004	1	164	164	164	0.84	
9	Wiscoy Creek	2024	924004	2	112	116	124	0.65	
3	Woodland Creek	2021	321032	1	86	103	121	0.55	
3	Woodland Creek	2021	321032	2	115	119	128	0.78	
3	Woodland Creek	2022	322029	1	855	888	921	0.64	
3	Woodland Creek	2023	323023	1	455	492	532	0.50	
3	Woodland Creek	2024	324024	1	388	415	442	0.58	
3	Woodland Creek	2024	324024	1	622	652	683	0.72	