

Monocacy & Saucon Creeks

Northampton County

August 2024 Trout Slot Limit Evaluation

Pennsylvania Fish and Boat Commission (PFBC) biologists returned to Monocacy Creek, Section 07 and Saucon Creek, Section 05, for monitoring population size distributions managed under the Trout Slot Limit, Artificial Lures Only regulations, initiated in 2023. The 2024 season represents the third year of monitoring, with the 2022 sampling forming the baseline condition. It is anticipated selected harvest by anglers from the slot limit (i.e., ≥ 7 -inches to < 12 -inches total length) would reduce density-compensatory competition, enabling greater occurrences of large-sized (i.e., ≥ 14 -inches to < 18 -inches) and trophy-sized (i.e., ≥ 18 -inches) trout.

A total of 140 and 251 wild Brown Trout were captured from the Monocacy Creek and Saucon Creek, respectively (Table 1). No Rainbow Trout or Brook trout were captured at either monitoring site. Calculation of biomass (kg/ha) is suggestive of a lower Brown Trout abundance in both the Monocacy Creek (25.8 kg/ha) and Saucon Creek (70.8 kg/ha; Figure 1) relative to prior years' survey findings. Direct causative effects remain speculative, but natural reproducing populations typically experience widely varied annual peaks and troughs. Two principal influences on population abundance are juvenile recruitment and the creeks' carrying capacity. Generally strong juvenile production (i.e., young-of-the-year (YOY)) generally translates into increased abundance of adult-sized trout as they grow in subsequent years. Whereas, carrying capacity refers to instream habitat-types ability to support various trout life cycle requirements (e.g., spawning, nursery, forage, and refugia grounds). Regardless, the observed low Brown Trout abundance will not result in a regulatory reclassification, rather it reflects annual variation.

Carrying capacity for either creek is concerning. Within the Monocacy Creek site, most of the adult trout (i.e., > 5 -inch total length) catch was found on the sparse occurrences of undercut banks or the crib dam plunge pool. Occurrences of the few large woody debris observed in the 2023 season was conspicuously absent during the 2024 survey. Whereas within the Saucon Creek site, large-sized (i.e., ≥ 14 -inch to < 18 -inch total length) or trophy-sized (≥ 18 -inch total length) trout, were principally caught in the "Canyon" (i.e., an exceptionally deep pool). Other holding habitat-types for adult-sized trout in Saucon Creek were the deep water behind the remnant jack dam, undercut stone walls of the stream channelization and the few occurrences of large-woody debris. In either creek, extensive fine sediment and gravel beds were pervasive. Overall, both creeks demonstrated degraded habitat, typical of urban drainages.

Observed size distributions exemplified self-sustaining wild trout populations. The prevalence of young-of-the-year (YOY; < 5 -inch total length) were consistently caught throughout either creek monitoring sites indicative of their strong presence (Monocacy Creek: 64.2%; Saucon Creek: 47.2%) (Table 1). The remainder of the catch from Monocacy Creek demonstrated two modal groups at the 8-inch to 9-inch and 12-inch sizes; whereas, two modal groups were also observed in the Saucon Creek but at the 11-inch and 14-inch sizes. Occurrences of large-sized (≥ 14 -inch to < 18 -inch total length) and trophy-sized trout (≥ 18 -inch total length) trout were rare in the Monocacy Creek, 2.9% and 1.4%, respectively; but large-sized trout were prevalent in the Saucon Creek (20%), but not trophy-sized trout ($< 1\%$). Occurrences of trout specifically within the slot limit (i.e., ≥ 7 -inch and < 12 -inch) were common in either creek, representing 38.6% and 14.3% of the total catches for Monocacy Creek and Saucon Creek, respectively (Figure 2).

Establishment of size distribution annual variation predicates insight to the evaluation of the slot limit success. The initial three years of observation, suggest consistent YOY production, with persistent modal groups both within and larger than the slot limit. Graphical evidence of modal growth is modestly evident in the Saucon Creek with the apparent modal growth among the 2022 and 2023 size distributions. Highly encouraging, within the Monocacy Creek, was the apparent growth of 8-inch to 9-inch Brown Trout observed in 2023 into 12-inch trout observed in the 2024 season. Yet, clear graphical evidence demonstrating consistent modal growth of trout into sizes greater than the slot limit is confounded by the slowing growth rates of large trout, which are not easily identified without exceedingly strong year-class recruitment. Annual monitoring is anticipated to

continue to further characterize temporal variation of trout size distributions for either creek. Additionally, causative influences of selective angler harvest from slot-sized trout are unknown. We remain encouraged by the consistency of YOY production, which continues to recruit into adult-sized fishes as they age. Regardless, both the Monocacy Creek and Saucon Creek offer exceptional opportunities for trout angling experiences.

Figure 1. Estimate of annual abundance (kg/ha) of wild Brown Trout within the Trout Slot Limit, Artificial Lures Only sections of Monocacy Creek and Saucon Creek, August 2024 compared to the baseline condition (i.e., 2022 catches). The horizontal red line represents the minimum Class A designation (40 kg/ha).

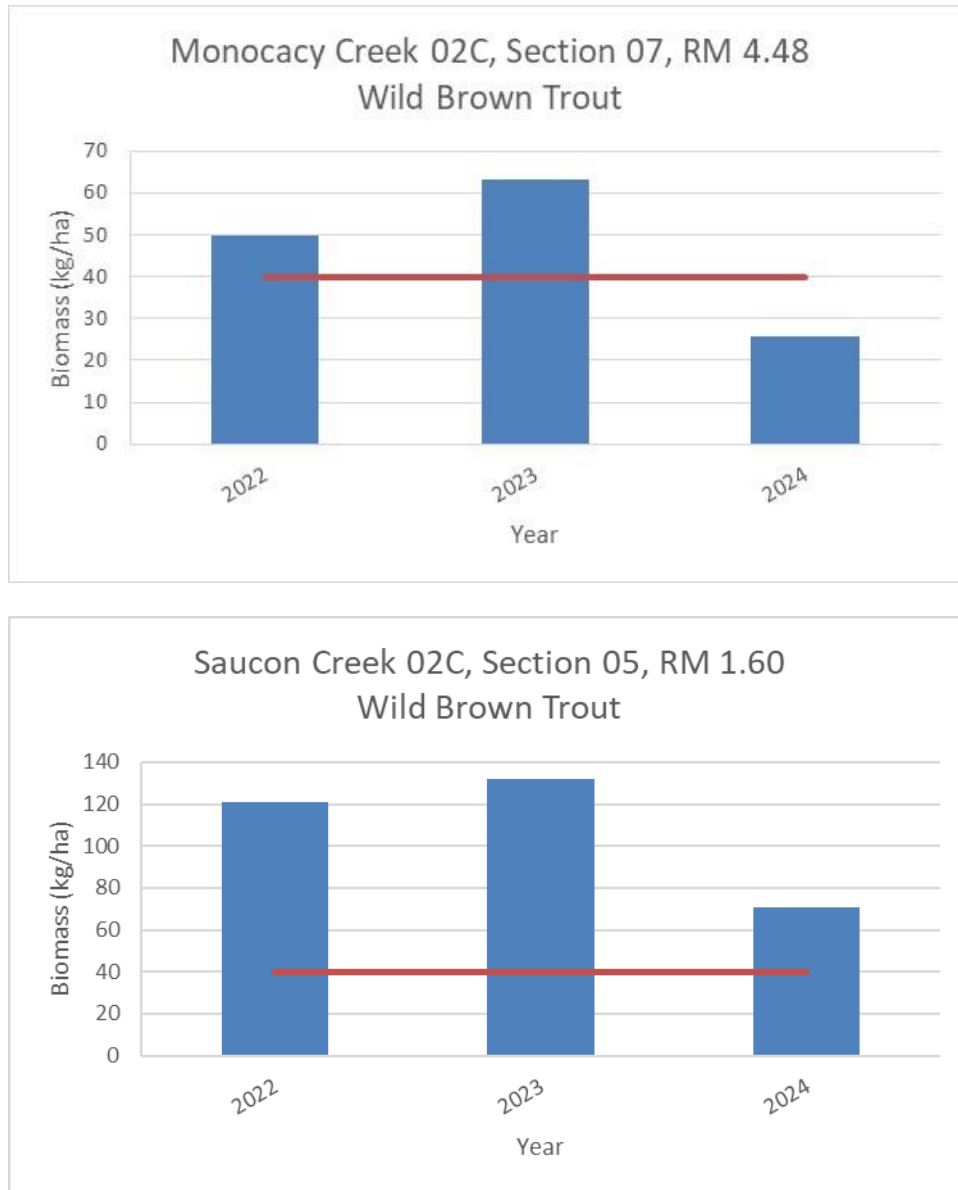
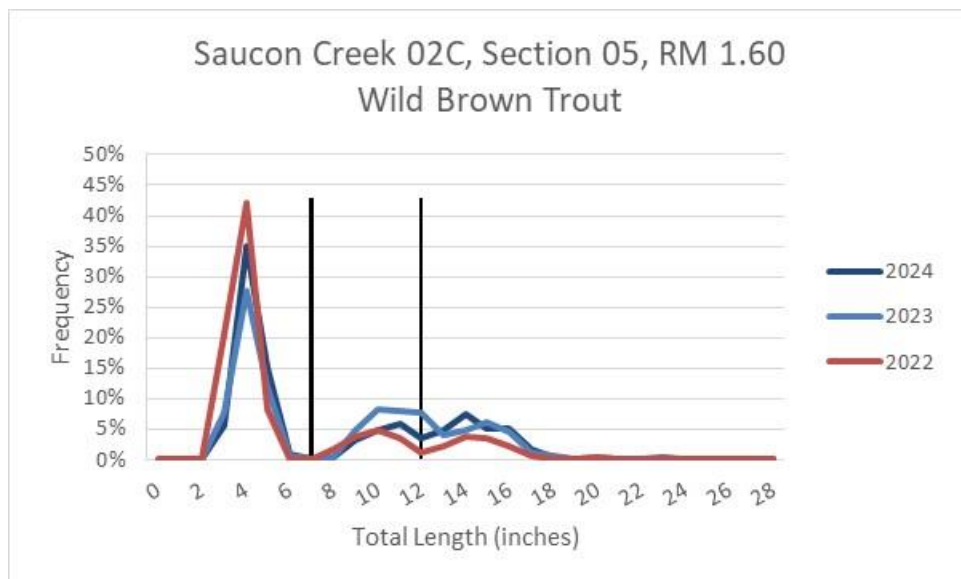
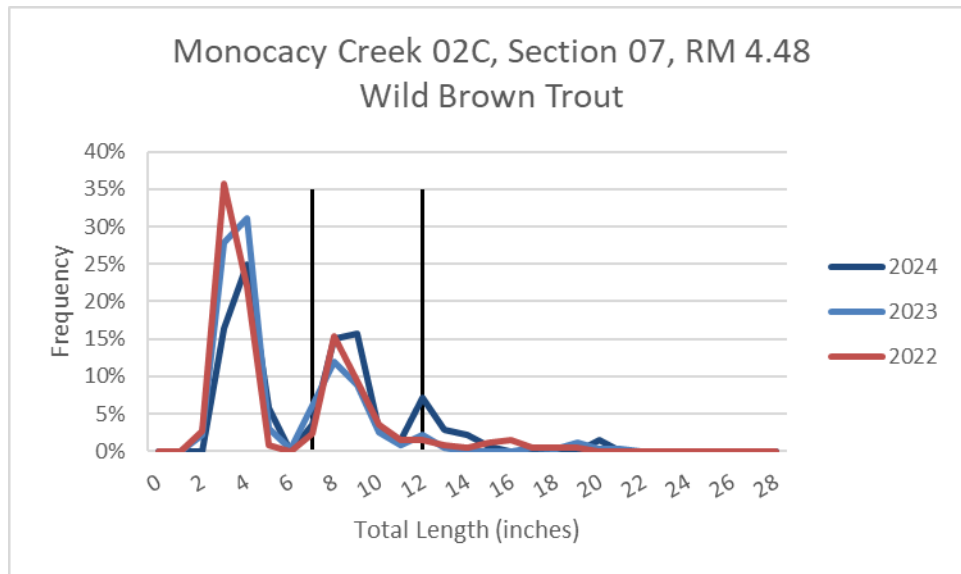


Table 1. Capture numbers of wild Brown Trout that were marked on the first day (i.e., Mark), number of unmarked trout caught on the second day (i.e., Catch), and number of recaptured trout on the second day that were initially marked (i.e., Recapture) on the first day used to calculate total estimate Brown Trout within the site (i.e., Peterson) and site biomass (i.e., Biomass), from the August 26-27, 2024 evaluation at Monocacy Creek, Section 07 and Saucon Creek, Section 05. The size distribution (i.e., Frequency) of trout by size class (Mark + Catch – Recapture) are represented as the percentage of total trout caught (Mark + Catch – Recapture).

Size Class (in.)	Monocacy Creek, Section 07						Saucon Creek, Section 05					
	Mark (N)	Catch (N)	Recapture (N)	Peterson (N)	Biomass (kg/ha)	Frequency (%)	Mark (N)	Catch (N)	Recapture (N)	Peterson (N)	Biomass (kg/ha)	Frequency (%)
0	0	0	0	0	0.00	0.00%	0	0	0	0	0.00	0.00%
1	0	0	0	0	0.00	0.00%	0	0	0	0	0.00	0.00%
2	0	0	0	23	0.20	0.00%	0	0	0	0	0.00	0.00%
3	11	12	0	72	1.38	16.43%	7	12	5	17	0.15	5.58%
4	17	23	5	8	0.28	25.00%	44	67	23	128	2.45	35.06%
5	3	5	0	0	0.00	5.71%	29	27	18	44	1.55	15.14%
6	0	0	0	6	0.54	0.00%	4	1	3	3	0.15	0.80%
7	5	3	3	31	4.04	3.57%	0	0	0	0	0.00	0.00%
8	16	10	5	27	4.80	15.00%	1	1	1	1	0.13	0.40%
9	19	11	8	4	0.97	15.71%	8	3	3	9	1.62	3.19%
10	4	2	2	2	0.63	2.86%	9	10	7	14	3.35	4.78%
11	3	0	1	10	4.06	1.43%	11	10	6	19	5.96	5.98%
12	7	4	1	5	2.56	7.14%	7	6	4	11	4.54	3.59%
13	3	4	3	3	1.90	2.86%	11	9	8	13	6.82	4.78%
14	2	1	0	1	0.77	2.14%	23	7	11	16	10.13	7.57%
15	1	1	1	0	0.00	0.71%	13	6	6	14	10.82	5.18%
16	0	0	0	0	0.00	0.00%	12	3	2	13	12.08	5.18%
17	0	0	0	0	0.00	0.00%	2	3	1	4	4.61	1.59%
18	0	0	0	0	0.00	0.00%	1	0	0	1	1.40	0.40%
19	1	0	1	2	3.68	0.00%	0	0	0	0	0.00	0.00%
20	1	1	0	0	0.00	1.43%	1	0	0	1	1.84	0.40%
21	1	0	1	0	0.00	0.00%	0	0	0	0	0.00	0.00%
22	0	0	0	0	0.00	0.00%	0	0	0	0	0.00	0.00%
23	0	0	0	0	0.00	0.00%	1	0	0	1	3.17	0.40%
24	0	0	0	0	0.00	0.00%	0	0	0	0	0.00	0.00%
Total	94	77	31	194	25.81		184	165	98	309	70.77	

Figure 2. Size distribution (inches) of wild Brown Trout captured within the Trout Slot Limit, Artificial Lures Only sections of Monocacy Creek and Saucon Creek, August 2024 compared to the baseline condition (i.e., 2022 catches). The vertical black lines represent the slot limits. Trout must be at least 7-inches but less than 12-inches in total length to be harvested.



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