



Department of
Environmental
Conservation



2019 PROGRESS REPORT: PIT TAG SURVEY

**Delaware Tailwaters Fisheries Investigation Plan: A
Joint Project of the New York State Department of
Environmental Conservation and the Pennsylvania
Fish and Boat Commission 2018-2020**

May 18, 2020

Delaware Tailwaters Fisheries Investigation Plan, 2018 - 2020
West Branch Delaware River PIT Tag Plan, 2018 - 2020
2019 Progress PIT Tag Survey
January 22, 2020

The New York City (NYC) reservoir tailwaters in the upper Delaware River Basin (Delaware Tailwaters) are an increasingly popular destination water for wild trout fishing. The New York State Department of Environmental Conservation (NYSDEC) and Pennsylvania Fish and Boat Commission (PFBC) have agreed supporting a Joint Fisheries Investigation Plan¹ (Plan). This Plan identifies information most urgently needed to inform a new fisheries management plan and a set of strategies to collaboratively obtain that information over the next three years, 2018 – 2020. Passive integrated transponder (PIT) tags were implanted into trout during the 2018 and 2019 sampling season to document trout movements in the West Branch tailwaters and select tributaries². Findings within this progress report are considered provisional and subject to modification pending additional analysis, scrutiny and review over the duration of the Plan lifespan.

In 2018 & 2019, approximately 2,000 adult sized brown trout (BT) and rainbow trout (RT) 12 inches in length or larger were to be tagged with 23mm PIT tags at the four monthly (April- October) night-time adult trout electrofishing sample sites. Additionally, up to 2,000 yearling sized BT and RT were to be PIT tagged at the four night-time adult electrofishing sites and 17 monthly day-time (July-October) fingerling electrofishing sites.

In total, 1218 trout were PIT tagged in 2018 (Table 1a) and 2030 trout were PIT tagged in 2019 (Table 1b) at all electrofishing sites. Essentially every untagged yearling and adult trout encountered at the four monthly night time adult electrofishing sites and 17 monthly day-time fingerling electrofishing sites were PIT tagged. In 2018, a total of 177 (15.72%) fish PIT tagged in 2018 only were recaptured at all sites combined (Table 2a). In 2019, a total of 331 (17.06%) fish PIT tagged in 2019 only were recaptured at all sites combined (Table 2b). All but three fish were recaptured at the original tagging site in 2018 and the same for 2019. In 2018 a total of 14 recaptured trout (4.00% of total recaptured fish that were tagged in 2017 & 18) rejected the PIT tag at an unknown time after tagging (Table 3a). In 2019 a total of 71 recaptured trout (9.8% of total recaptured fish that were tagged in 2017, 18 & 19) rejected the PIT tag at an unknown time after tagging (Table 3b). These fish were identified by an adipose clip and/or PIT tag scar at time of recapture. Additional analysis (growth rates etc.) is on hold as scales are pressed and read.

Homemade in-house small-scale PIT tag arrays were to be placed in tributaries (Sands Creek, Roods Creek, Sherman Creek, Shehawken Creek, Balls Creek and Cold Spring Creek) to the West Branch during the fall brown trout spawning period (Sept 1st through Nov 31st) in 2018. Unfortunately, high water and technical difficulties limited array deployment to one Oregon RFID stream wide array in Sands Creek and one small scale array in Roods Creek. No fish were detected by the installed arrays during the fall of 2018. In 2019, we deployed one Oregon RFID stream wide array in each of the tributaries mentioned previously. Due to technical issues the Cold Spring Creek unit was moved to Sherman Creek. Arrays were deployed late July and retrieved early December, except for the Sherman Creek array which began collecting data on August 21st. A total of 52 trout (44 brown trout, 8 rainbow trout) were detected at all tributaries combined in 2019. In total, 33 out of 36 trout were detected in the same tributary they were tagged in. A total of 16 trout (15 brown trout, 1 rainbow trout) tagged in the West Branch were detected in the tributaries from August 9th through November 26th. Of the 52 detections, 5 were tagged in 2017, 6 in 2018 and 41 in 2019. A total of 19 fish were categorized as movers and are depicted in Figure 1.

¹ <http://www.dec.ny.gov/outdoor/112782.html>

² http://www.dec.ny.gov/docs/fish_marine_pdf/dfippitag.pdf

Table 1a. Total brown (BT) and rainbow trout (RT) PIT tagged by month and water in Delaware Tailwaters, 2018*

	April		May		June		July		August		September		October	
	BT	RT	BT	RT	BT	RT	BT	RT	BT	RT	BT	RT	BT	RT
West Branch			162	8	231	4	298	27			51	16	241	4
West Branch YOY							0	6						
Sands Creek							17	14	4	0	4	4	2	1
Roods Creek							13	13	3	0	6	1	4	0
Sherman Creek							21	2			9	1	3	0
Cold Spring Creek							12	4	1	0			1	1
Balls Creek							2	0			1	0	5	0
Shehawken Creek							16	2					3	0
Total			162	8	231	4	379	68	8	0	71	22	259	6

*as captured during electrofishing sampling. Blanks indicate not sampled, zeros indicate no fish tagged.

Table 1b. Total trout PIT tagged by month and water in Delaware Tailwaters, 2019*.

	April		May		June		July		August		September		October	
	BT	RT	BT	RT	BT	RT	BT	RT	BT	RT	BT	RT	BT	RT
West Branch	224	43	127	34	180	26	232	20	237	31	238	24	235	19
West Branch YOY							19	0	0	0	0	0	0	0
Sands Creek							31	12	6	4	5	1	2	0
Roods Creek							38	5	16	1	2	0	5	0
Sherman Creek							51	7	25	2	18	0	6	1
Cold Spring Creek							1	0	14	4	9	3	4	2
Balls Creek							12	4	5	1	1	0	3	0
Shehawken Creek							18	3	9	2	3	0	5	0
Total	224	43	127	34	180	26	402	51	312	45	276	28	260	22

*as captured during electrofishing sampling. Blanks indicate not sampled, zeros indicate no fish tagged.

Table 2a. Frequency of recaptured PIT tagged trout in Delaware Tailwaters, 2018*.

Water	# tagged	# recaps w/ tags	%recap %	movers	Tag Size	Notes
West Branch	427	43	10.10%	0.00%	12 mm	All at tagging location
West Branch	521	108	20.70%	2.80%	23 mm	All but three at tagging location
West Branch YOY sites	6	0	0.00%		12 mm	
Sands Creek	48	5	10.40%	0.00%	12 mm	All at tagging location
Roods Creek	42	7	16.70%	0.00%	12 mm	All at tagging location
Sherman Creek	36	11	30.60%	0.00%	12 mm	All at tagging location
Cold Spring Creek	17	0	0.00%		12 mm	All at tagging location
Balls Creek	8	1	12.50%	0.00%	12 mm	All at tagging location
Shehawken Creek	21	2	9.50%	0.00%	12 mm	All at tagging location
Total	1126	177	15.70%	1.70%		

*includes fish tagged in 2018, only. Movers are defined as fish tagged at one location and recaptured at another.

Table 2b. Frequency of recaptured PIT tagged trout in Delaware Tailwaters, 2019*.

Water	# tagged	# recaps		movers	Tag Size	Notes
		w/ tags	% recap %			
West Branch	917	76	8.29%	0.00%	12 mm	All at tagging location
West Branch	753	156	20.72%	1.28%	23 mm	All but two at tagging location
West Branch YOY sites	19	1	5.26%	0.00%	12 mm	All at tagging location
Sands Creek	61	14	22.95%	0.00%	12 mm	All at tagging location
Roods Creek	67	24	35.82%	0.00%	12 mm	All at tagging location
Sherman Creek	110	27	24.55%	3.70%	12 mm	All but one at tagging location
Cold Spring Creek	37	15	40.54%	0.00%	12 mm	All at tagging location
Balls Creek	26	4	15.38%	0.00%	12 mm	All at tagging location
Shehawken Creek	40	14	35.00%	0.00%	12 mm	All at tagging location
Total	2030	331	16.31%	0.91%		

*includes fish tagged in 2019, only. Movers are defined as fish tagged at one location and recaptured at another.

Table 3a. Frequency of retention rates of PIT tagged trout in Delaware Tailwaters, 2018.

Water	# recaps w/ tags	# recaps w/o tags*	% recap w/o tags*	Tag Size
	+ # recaps w/o tags*			
West Branch	265	11	9.20%	23 mm
West Branch	53	0	0.00%	12 mm
West Branch YOY sites	0	0		12 mm
Sands Creek	5	0	0.00%	12 mm
Roods Creek	10	1	12.50%	12 mm
Sherman Creek	16	2	15.40%	12 mm
Cold Spring Creek	0	0		12 mm
Balls Creek	1	0	0.00%	12 mm
Balls Creek	1	0	0.00%	23 mm
Shehawken Creek	2	0	0.00%	12 mm
Total	353	14	4.0%	

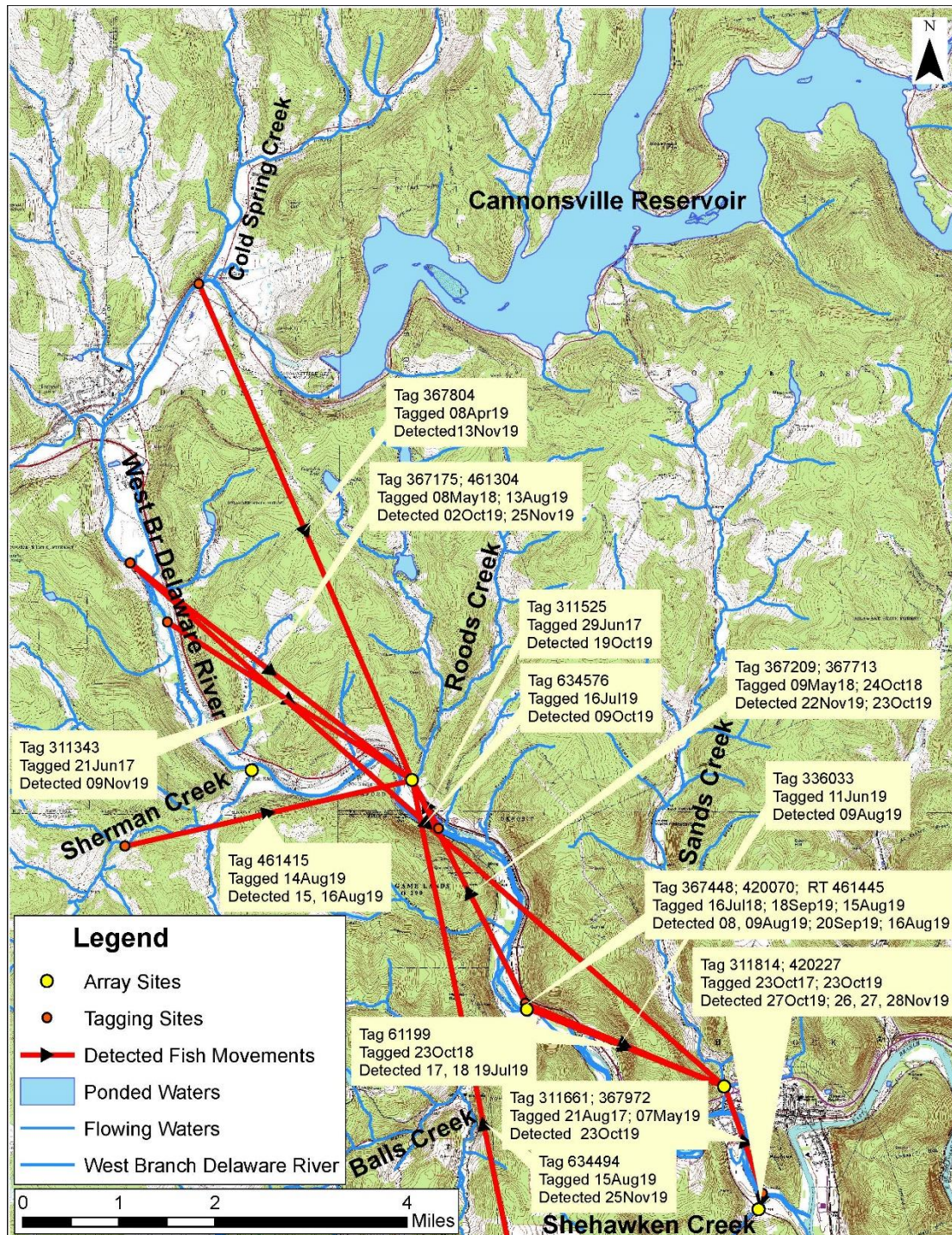
*Previously tagged trout were identified by an adipose clip and/or tag scar. Recaps include fish tagged in 2017 & 18.

Table 3b. Frequency of retention rates of PIT tagged trout in Delaware Tailwaters, 2019.

Water	# recaps w/ tags	# recaps w/o tags*	% recap w/o tags*	Tag Size
	+ # recaps w/o tags*			
West Branch	410	46	11.2%	23 mm
West Branch	189	15	7.9%	12 mm
West Branch YOY sites	1	0	0.0%	12 mm
Sands Creek	17	3	17.6%	12 mm
Roods Creek	28	0	0.0%	12 mm
Sherman Creek	35	3	8.6%	12 mm
Sherman Creek	1	0	0.0%	23 mm
Cold Spring Creek	18	1	5.6%	12 mm
Balls Creek	4	0	0.0%	12 mm
Shehawken Creek	20	3	15.0%	12 mm
Total	723	71	9.8%	

*Previously tagged trout were identified by an adipose clip and/or tag scar. Recaps include fish tagged in 2017, 18 & 19.

Figure 1. Movements of 18 brown trout and one rainbow trout detected in tributaries using Oregon RFID stream-wide arrays, Sands Creek deployed July 16th, Roods Creek July 24th; Balls Creek and Shehawken Creek July 25th; Sherman Creek August 21st; all were retrieved on December 10, 2019.



Observations

- Fin clipping necessary to determine tag retention and ease in identification of recaptures.
- Home-made small-scale arrays do not perform well in high flows.
- Installing arrays can be problematic during higher autumn flows.
- PIT tag retention rate is highly satisfactory.