Range-wide Assessment of Brook Trout at the Catchment Scale: A Summary of Findings



"Conserving the health of your waters"

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Brief Introduction

In response to a need for guidance in setting wild Brook Trout conservation priorities in the species historic eastern range, the EBTJV completed a range-wide assessment of wild Brook Trout distribution and status at the subwatershed-level (HUC 12) in 2006 (Hudy et. al. 2008). While this initial assessment provided Brook Trout resource managers, decision-makers, and the public with an essential understanding of the current "state" of wild Brook Trout in the eastern portion of its U.S. range, many EBTJV partners felt that an assessment at a finer scale would yield better guidance in establishing a more workable set of wild Brook Trout conservation priorities, objectives, and strategies. Therefore, the EBTJV conducted a second range-wide assessment of wild Brook Trout at the catchment scale, which was completed in 2015 (Hudy et. al. 2013; Coombs and Nislow 2015).

This report summarizes the data generated from the EBTJV's catchment scale assessment of eastern wild Brook Trout.

Range-Wide Results

Catchment Findings

There were 271,949 catchments assessed within the <u>EBTJV geographic boundary</u> (Table 1; <u>Appendix Table I</u>). Each catchment was classified based on the presence/absence of wild trout (Brook Trout, Brown Trout, and Rainbow Trout). The number of catchments containing wild Brook Trout (classification codes 1.1, 1.2, 1.3, and 1.4) was 61,148, which is 22.5% of the catchments assessed. The number of catchments that contained any species of wild trout (classification codes 1.1, 1.2, 1.3, 1.4, 0.2, 0.3, and 0.4) was 93,671 or, 34.4% of the total number of catchments assessed.

There are 41,070 catchments classified as allopatric Brook Trout, 13,099 classified as Brook Trout sympatric with Brown Trout, 1,688 classified as Brook Trout sympatric with Rainbow Trout, and 5,291 classified as Brook Trout sympatric with Brown Trout & Rainbow Trout (Table 1). The number of catchments classified as wild Brown Trout is 21,155, 5,440 classified as wild Rainbow Trout, and 5,928 classified as wild Brown Trout & Rainbow Trout.

Table 1. Catchment Assessment Metrics

	# of
Catchment Classification (Code)	Catchments
Allopatric Brook Trout (1.1)	41,070
Brook Trout Sympatric with Brown Trout (1.2)	13,099
Brook Trout Sympatric with Rainbow Trout (1.3)	1,688
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	5,291
Brown Trout (0.2)	21,155
Rainbow Trout (0.3)	5,440
Brown Trout & Rainbow Trout (0.4)	5,928
Stocked Brook Trout (0.5) & No Salmonids (0.0)	178,278
Totals	271,949

Patch Metrics

The analysis of catchment data also entailed identifying wild trout patches and classifying them using the Catchment Classification protocol (allopatric Brook Trout; Brook Trout sympatric with Brown Trout; Brook Trout sympatric with Rainbow Trout; Brook Trout sympatric with Brown Trout and Rainbow Trout; Brown Trout; Rainbow Trout; and, Brown Trout and Rainbow Trout). A "patch" is defined as a group of contiguous catchments occupied by wild trout (Hudy et. al. 2013). Patches are not connected physically (i.e., they are separated by a dam, unoccupied warm water habitat, downstream invasive species, etc.) and are generally assumed to be genetically isolated.

There were 10,654 wild trout patches identified within the EBTJV's geographic boundaries, with a combined area of 265,177 km² (<u>Appendix II</u>). The mean patch size was 25 km² and the minimum size was 0.001 km² while the maximum was 4,082 km².

There were 9,860 Brook Trout patches with a combined area of 190,473 km² (Table 2). Six thousand twenty-two (6,022) of these patches were allopatric Brook Trout (1.1) with a combined area of 108,528 km². The mean allopatric Brook Trout patch was 18 km², the minimum patch size was 0.002 km² and the maximum size was 4,082 km². The number of Brook Trout sympatric with Brown Trout patches (1.2) was 2,210 and these patches had a combined area of 45,575 km². Their mean size was 20 km² and the minimum and maximum patch sizes were 0.001 km² and 458 km², respectively. Brook Trout sympatric with Rainbow Trout (1.3) patches numbered 370 and their combined area was 6,049 km². The mean size of these patches was 16 km², their minimum size was 0.02 km² and their maximum size was 349 km². There were 1,258 Brook Trout sympatric with Brown Trout and Rainbow Trout (1.4) patches that total 30,321 km² in their combined area. Their mean patch size was 24 km² and the minimum and maximum patch sizes were 0.001 km² and 631 km², respectively.

Allopatric Brook Trout patches (1.1) occurred in all seventeen states contained within the EBTJV's geographic range (Table 3). New York had the highest number (1,025) of allopatric Brook Trout patches, followed by Maine (994), though the combined area of allopatric Brook Trout patches in Maine was more than five times larger than their total area in New York (59,118 km² vs. 10,893 km²). Brook Trout sympatric with Brown Trout patches (1.2) occurred in fourteen states, with the highest number occurring in Pennsylvania (787) followed by New York (703) (Table 4). Brook Trout sympatric with Rainbow Trout patches (1.3) occurred in twelve states; North Carolina had the highest number (115) though Virginia had the greatest amount of combined patch area (1,325 km²) (Table 5). Brook Trout sympatric with Brown Trout and Rainbow Trout patches occurred in thirteen states, though New York had far and away the largest number (855) and highest combined area (15,586 km²) (Table 6).

There were 2,466 Brown Trout and/or Rainbow Trout patches with a combined area of 36,566 km² (Table 7). One thousand three hundred sixty-nine (1,369) patches were Brown Trout (0.2) with a combined area of 19,468 km². The mean Brown Trout patch was 14 km², the minimum patch size was 0.02 km² and the maximum size was 202 km². The number of Rainbow Trout patches (0.3) was 695 and these patches had a combined area of 5,658 km². Their mean size was 8 km² and the minimum and maximum patch sizes were 0.002 km² and 125 km², respectively.

Brown Trout & Rainbow Trout (0.4) patches numbered 402 and their combine area was 11,440 km². The mean size of these patches was 28 km², their minimum size was 0.01 km² and their maximum size was 264 km².

Brown Trout patches (0.2) occurred in thirteen states (Table 8). New York had the highest number (571) of these patches, followed by Pennsylvania (337), though the combined area of Brown Trout patches in Pennsylvania was larger than their total area in New York (7,687 km² vs. 7,591 km²). Rainbow Trout patches (0.3) also occurred in thirteen states, with the highest number occurring in New York (262) followed by North Carolina (234) (Table 9). Likewise, Brown Trout & Rainbow Trout patches (0.4) occurred in thirteen states; New York had the highest number (162) though Pennsylvania had the greatest amount of combined patch area (5,976 km²) (Table 10).

Table 2. Range-wide Brook Trout Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	6,022	108,528	18	0.002	4,082
1.2	2,210	45,575	20	0.001	458
1.3	370	6,049	16	0.02	349
1.4	1,258	30,321	24	0.001	631
Totals	9,860	190,473	NA	NA	NA

Table 3. Allopatric Brook Trout Patch Metrics

State	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
CT	317	1,957	6	0.058	44
GA	53	239	5	1.036	18
ME	994	59,118	59	0.008	4,082
MD	103	820	8	0.006	45
MA	563	3,870	7	0.169	126
NH	439	5,567	13	0.201	167
NJ	65	394	6	0.098	23
NY	1,025	10,893	11	0.029	160
NC	643	2,615	4	0.002	38
ОН	6	14	2	0.783	6
PA	786	8,318	11	0.127	170
RI	111	752	7	0.074	38
SC	18	80	4	1.517	14
TN	86	492	6	0.004	47
VT	244	4,182	17	0.004	286
VA	288	5,564	19	0.079	183
WV	281	3,653	13	0.007	118
Totals	6,022	108,528	18	0.002	4,082

Table 4. Brook Trout Sympatric with Brown Trout Patch Metrics

				Minimum	Maximum
	Number of	Total Patch	Mean Patch	Patch Size	Patch Size
State	Patches	Area (km²)	Size (km²)	(km²)	(km²)
CT	228	4,663	11	0.023	110.1
GA	1	31	31	30.980	31.0
ME	1	6	6	6.329	6.3
MD	42	558	13	1.921	132.8
MA	139	1,886	14	0.015	82.2
NH	20	710	36	0.424	124.4
NJ	35	443	13	0.908	64.8
NY	703	12,980	18	0.001	293.5
NC	70	587	8	1.373	40.3
PA	787	16,797	21	0.049	245.7
TN	1	45	45	45.405	45.4
VT	120	4,843	40	0.005	448.1
VA	14	1,086	78	2.129	458.5
WV	49	940	19	0.661	90.8
Totals	2,210	45,575	20	0.001	458.5

Table 5. Brook Trout Sympatric with Rainbow Trout Patch Metrics

				Minimum	Maximum
	Number of	Total Patch	Mean Patch	Patch Size	Patch Size
State	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
GA	7	21	3	1.79	6
ME	2	310	155	21.53	288
MD	2	4	2	0.25	4
MA	7	97	14	1.63	50
NH	29	834	29	1.23	124
NY	70	817	12	0.02	173
NC	115	966	8	0.85	64
PA	16	337	21	1.04	140
TN	30	380	13	0.15	52
VT	35	767	22	1.49	120
VA	46	1,325	29	0.98	349
WV	11	191	17	2.61	55
Totals	370	6,049	16	0.02	349

Table 6. Brook Trout Sympatric with Brown Trout & Rainbow Trout Patch Metrics

	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
State	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
GA	7	21	3	2.08	5
ME	1	422	422	421.86	422
MD	2	21	10	9.41	11
MA	23	489	21	0.50	70
NH	7	522	75	18.74	209
NJ	7	115	16	6.27	33
NY	855	15,586	18	0.001	631
NC	74	1,313	18	0.58	242
PA	147	5,229	36	0.43	210
TN	2	36	18	17.28	19
VT	93	4,477	48	0.63	318
VA	23	908	39	0.08	175
WV	17	1,183	70	1.66	283
Totals	1,258	30,321	24	0.001	631

Table 7. Range-Wide Brown Trout and/or Rainbow Trout Patch Metrics

Patch				Minimum	Maximum
Classification	Number of	Total Patch	Mean Patch	Patch Size	Patch Size
Code	Patches	Area (km²)	Size (km²)	(km ²)	(km^2)
0.2	1,369	19,468	14	0.02	202
0.3	695	5,658	8	0.002	125
0.4	402	11,440	28	0.01	264
Totals	2,466	36,566	NA	NA	NA

Table 8. Brown Trout Patch Metrics

State	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
CT	88	566	6	0.07	42
GA	2	12	6	3.23	9
ME	7	26	4	0.38	8
MD	56	521	9	0.57	39
MA	76	499	7	0.04	47
NH	33	308	9	0.23	63
NJ	47	478	10	0.15	46
NY	571	7,591	13	0.03	167
NC	73	468	6	0.65	92
PA	337	7,687	23	0.02	202
VT	5	21	4	0.32	8
VA	13	244	19	1.81	81
WV	61	1,047	17	0.48	145
Totals	1,369	19,468	14	0.02	202

Table 9. Rainbow Trout Patch Metrics

State	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
GA	27	347	13	1.449	39
ME	3	18	6	0.483	13
MD	3	8	3	0.050	8
MA	15	62	4	0.466	16
NH	7	102	15	0.924	42
NJ	3	21	7	1.748	12
NY	262	1,887	7	0.002	61
NC	234	1,384	6	0.003	57
PA	26	490	19	1.078	125
TN	72	748	10	0.760	81
VT	1	6	6	6.224	6
VA	34	416	12	0.201	48
WV	8	168	21	1.901	82
Totals	695	5,658	8	0.002	125

Table 10. Brown Trout & Rainbow Trout Patch Metrics

State	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
State	Patches	Area (km²)	Size (km²)	(km²)	(km²)
GA	16	216	13	1.75	45.9
ME	2	11	5	3.10	7.9
MD	1	0.2	0.2	0.19	0.2
MA	9	83	9	0.01	35.6
NH	5	73	15	2.48	42.3
NJ	4	57	14	3.18	31.1
NY	162	3,645	23	0.03	264.0
NC	54	958	18	0.20	106.0
PA	119	5,976	50	0.35	254.9
TN	5	44	9	1.13	24.9
VT	11	67	6	0.65	26.1
VA	6	58	10	1.66	30.4
WV	8	250	31	3.49	71.1
Totals	402	11,440	28	0.01	264.0

State-Level Results

State of Maine

Maine has 17,698 catchments containing allopatric Brook Trout populations that have a combined area of 58,210 km² (Table 11). The number of catchments containing Brook Trout sympatric with Brown Trout, Brook Trout sympatric with Rainbow Trout and sympatric with Brown Trout and Rainbow Trout total 30 and their combined area iss 133 km². The number of catchments containing only wild Brown Trout or wild Rainbow Trout or both wild Brown Trout and Rainbow Trout is 46, with a combined area that totals 158 km².

Maine has 1,010 wild trout patches, 994 are classified as allopatric Brook Trout (Table 12). Allopatric Brook Trout patches represent 98.7% of the State's total patch area. Map of Maine's Wild Brook Trout Patches.

Table 11. State of Maine Catchment Assessment Summary

		Area (km²) of
	# of	the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	17,698	58,210
Brook Trout Sympatric with Brown Trout (1.2)	1	6
Brook Trout Sympatric with Rainbow Trout (1.3)	21	93
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	8	34
Brown Trout (0.2)	7	26
Rainbow Trout (0.3)	30	115
Brown Trout & Rainbow Trout (0.4)	9	17
Totals	17,774	58,501

Table 12. State of Maine Patch Metrics

Patch	N. I. C	T (I D (I	M D ()	Minimum	Maximum
Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Patch Size (km²)	Patch Size (km²)
1.1	994	59,118	59	0.01	4,082
1.2	1	6	6	6.3	6.3
1.3	2	310	155	21.5	288
1.4	1	422	422	421.9	422
0.2	7	26	4	0.4	8
0.3	3	18	6	0.5	13
0.4	2	11	5	3.1	7.9
Totals	1,010	59,911	NA	NA	NA

State of New Hampshire

New Hampshire has 2,799 catchments containing allopatric Brook Trout populations that have a combined area of 9,020 km² (Table 13). The number of catchments classified as Brook Trout sympatric with Brown Trout is 277 and the total area of these catchments is 807 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 192, with a total area of 823 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 26, which total 210 km² in area. The number of catchments classified as wild Brown Trout is 271 and the total area of these catchments is 588 km². There are 98 catchments classified as wild Rainbow Trout, with a total area of 303 km², while catchments classified as wild Brown Trout & Rainbow Trout number 142, which total 370 km² in area.

New Hampshire has 520 wild trout patches, 410 are classified as allopatric Brook Trout (Table 14). Allopatric Brook Trout patches represent 78.8% of the State's total patch area. Map of New Hampshire's Wild Brook Trout Patches.

Table 13. State of New Hampshire Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	2,799	9,020
Brook Trout Sympatric with Brown Trout (1.2)	277	807
Brook Trout Sympatric with Rainbow Trout (1.3)	192	823
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	26	210
Brown Trout (0.2)	271	588
Rainbow Trout (0.3)	98	303
Brown Trout & Rainbow Trout (0.4)	142	370
Totals	3,805	12,121

Table 14. State of New Hampshire Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
Code	Patches 410	Area (km²)	Size (km²) 12.4	(km²)	(km²)
1.1	410	5,082		0.2	168
1.2	21	651	31	0.4	110
1.3	28	860	31	1.2	124
1.4	16	1,623	101	11.2	310
0.2	33	308	9	0.2	63
0.3	7	102	15	0.9	42
0.4	5	73	15	2.5	42
Totals	520	8,699	NA	NA	NA

State of Massachusetts

Massachusetts has 1,935 catchments containing allopatric Brook Trout populations that have a combined area of 5,718 km² (Table 15). The number of catchments classified as Brook Trout sympatric with Brown Trout is 625 and the total area of these catchments 2,014 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 25, with a total area of 92 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 57, which total 184 km² in area. The number of catchments classified as wild Brown Trout is 530 and the total area of these catchments is 1,168 km². There are 100 catchments classified as wild Rainbow Trout, with a total area of 193 km², while catchments classified as wild Brown Trout & Rainbow Trout numbered 65, which total 169 km² in area.

Massachusetts has 787 wild trout patches, 504 are classified as allopatric Brook Trout (Table 16). Allopatric Brook Trout patches represent 43.7% of the State's total patch area. A Map of Massachusetts's Wild Brook Trout Patches.

Table 15. State of Massachusetts Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	1,935	5,718
Brook Trout Sympatric with Brown Trout (1.2)	625	2,014
Brook Trout Sympatric with Rainbow Trout (1.3)	25	92
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	57	184
Brown Trout (0.2)	530	1,168
Rainbow Trout (0.3)	100	193
Brown Trout & Rainbow Trout (0.4)	65	169
Totals	3,337	9,538

Table 16. State of Massachusetts Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	504	3,310	7	0.17	126
1.2	144	2,186	15	0.02	135
1.3	10	144	14	1.63	38
1.4	29	1,294	45	0.50	220
0.2	76	499	7	0.04	47
0.3	15	62	4	0.47	16
0.4	9	83	9	0.01	36
Totals	787	7,578	NA	NA	NA

State of Vermont

Vermont has 1,564 catchments containing allopatric Brook Trout populations that have a combined area of 7,638 km² (Table 17). The number of catchments classified as Brook Trout sympatric with Brown Trout is 565 and the total area of these catchments is 3,372 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 407, with a total area of 1,567 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 423, which total 2,354 km² in area. The number of catchments classified as wild Brown Trout is 107 and the total area of these catchments is 434 km². There are 64 catchments classified as wild Rainbow Trout, with a total area of 128 km², while catchments classified as wild Brown Trout & Rainbow Trout numbered 189, which total 873 km² in area.

Vermont has 441 wild trout patches, 221 are classified as allopatric Brook Trout (Table 18). Allopatric Brook Trout patches represent 26.5% of the State's total patch area. A Map of Vermont's Wild Brook Trout Patches.

Table 17. State of Vermont Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	1,564	7,638
Brook Trout Sympatric with Brown Trout (1.2)	565	3,372
Brook Trout Sympatric with Rainbow Trout (1.3)	407	1,567
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	423	2,354
Brown Trout (0.2)	107	434
Rainbow Trout (0.3)	64	128
Brown Trout & Rainbow Trout (0.4)	189	873
Totals	3,319	16,366

Table 18. State of Vermont Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
Code	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
1.1	221	3,933	18	0.04	286
1.2	105	4,817	46	0.01	448
1.3	22	487	22	1.49	121
1.4	76	6,076	80	0.63	883
0.2	5	21	4	0.32	8
0.3	1	6	6	6.22	6
0.4	11	67	6	0.65	26
Totals	441	15,407	NA	NA	NA

State of Connecticut

Connecticut has 1,280 catchments containing allopatric Brook Trout populations that have a combined area of 3,705 km² (Table 19). The number of catchments classified as Brook Trout sympatric with Brown Trout is 1,014 and the total area of these catchments is 2,239 km². Connecticut doesn't have any catchments classified as Brook Trout sympatric with Rainbow Trout or Brook Trout sympatric with Brown Trout & Rainbow Trout. The number of catchments classified as wild Brown Trout is 1,101 and the total area of these catchments is 2,226 km². There are no catchments classified as wild Rainbow Trout or wild Brown Trout & Rainbow Trout.

Connecticut has 633 wild trout patches, 317 are classified as allopatric Brook Trout (Table 20). Allopatric Brook Trout patches represent 27.2% of the State's total patch area. Map of Connecticut's Wild Brook Trout Patches.

Table 19. State of Connecticut Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	1,280	3,705
Brook Trout Sympatric with Brown Trout (1.2)	1,014	2,239
Brook Trout Sympatric with Rainbow Trout (1.3)	0	0
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	0	0
Brown Trout (0.2)	1,101	2,226
Rainbow Trout (0.3)	0	0
Brown Trout & Rainbow Trout (0.4)	0	0
Totals	3,476	8,279

Table 20. State of Connecticut Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
Code	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
1.1	317	1,957	6	0.06	29
1.2	228	4,663	20	0.02	220
1.3	0	0	0	0.00	0
1.4	0	0	0	0.00	0
0.2	88	566	6	0.07	45
0.3	0	0	0	0.00	0
0.4	0	0	0	0.00	0
Totals	633	7,186	NA	NA	NA

State of Rhode Island

Rhode Island has 52 404 catchments containing allopatric Brook Trout populations that have a combined area of 1,019 km² (Table 21). The number of catchments classified as Brook Trout sympatric with Brown Trout is 23 and the total area of these catchments is 54 km². Rhode Island doesn't have any catchments classified as Brook Trout sympatric with Rainbow, whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 2, which total 4 km² in area. The number of catchments classified as wild Brown Trout is 60 and the total area of these catchments is 83 km². There is 1 catchment classified as wild Rainbow Trout, with a total area of 9 km², while catchments classified as wild Brown Trout & Rainbow Trout number 5, which total 14 km² in area.

Rhode Island has 109 wild trout patches, 108 are classified as allopatric Brook Trout (Table 22). Allopatric Brook Trout patches represent 90.8% of the State's total patch area. <u>A Map of Rhode Island's Wild Brook Trout Patches</u>.

Table 21. State of Rhode Island Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	404	1,019
Brook Trout Sympatric with Brown Trout (1.2)	23	54
Brook Trout Sympatric with Rainbow Trout (1.3)	0	0
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	2	4
Brown Trout (0.2)	60	83
Rainbow Trout (0.3)	1	9
Brown Trout & Rainbow Trout (0.4)	5	14
Totals	495	1,183

Table 22. State of Rhode Island Patch Metrics

Patch Classification	Number of	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
Code 1.1	Patches 108	690	Size (kiii-)	0.6	30
1.2	1	70	70	0.0	70
1.3	0	0	0	0.0	0
1.4	0	0	0	0.0	0
0.2	0	0	0	0.0	0
0.3	0	0	0	0.0	0
0.4	0	0	0	0.0	0
Totals	109	760	NA	NA	NA

State of New York

New York has 6,116 catchments containing allopatric Brook Trout populations that have a combined area of 18,120 km² (Table 23). The number of catchments classified as Brook Trout sympatric with Brown Trout is 4,386 and the total area of these catchments is 13,744 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 313, with a total area of 774 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 3,526, which total 8,565 km² in area. The number of catchments classified as wild Brown Trout is 7,136 and the total area of these catchments is 19,174 km², which are higher than the allopatric Brook Trout catchment metrics. There are 1,522 catchments classified as wild Rainbow Trout, with a total area of 3,609 km², while catchments classified as wild Brown Trout & Rainbow Trout numbered 1,594, which total 4,358 km² in area.

New York has 3,153 wild trout patches, 785 are classified as allopatric Brook Trout (Table 24). Allopatric Brook Trout patches represent 12.4% of the State's total patch area. <u>A Map of New York's Wild Brook Trout Patches.</u>

Table 23. State of New York Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	6,116	18,120
Brook Trout Sympatric with Brown Trout (1.2)	4,386	13,744
Brook Trout Sympatric with Rainbow Trout (1.3)	313	774
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	3,526	8,565
Brown Trout (0.2)	7,136	19,174
Rainbow Trout (0.3)	1,522	3,609
Brown Trout & Rainbow Trout (0.4)	1,594	4,358
Totals	24,593	68,344

Table 24. State of New York Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size (km²)	Maximum Patch Size (km²)
Code 1.1	Patches 785	Area (km²) 8,270	Size (km²)	0.03	160
1.2	551	17,526	32	0.03	334
1.3	50	581	12	0.02	55
1.4	772	26,884	35	0.001	1,689
0.2	571	7,591	13	0.03	168
0.3	262	1,887	17	0.002	61
0.4	162	3,645	23	0.03	264
Totals	3,153	66,504	NA	NA	NA

State of New Jersey

New Jersey has 183 catchments containing allopatric Brook Trout populations that have a combined area of 545 km² (Table 25). The number of catchments classified as Brook Trout sympatric with Brown Trout is 113 and the total area of these catchments is 470 km². There is only 1 catchment classified as Brook Trout sympatric with Rainbow Trout, with a total area of 6 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 11, which total 65 km² in area. The number of catchments classified as wild Brown Trout is 391 and the total area of these catchments is 994 km², which are higher than the allopatric Brook Trout metrics. There are 46 catchments classified as wild Rainbow Trout, with a total area of 92 km², while catchments classified as wild Brown Trout & Rainbow Trout numbers 27, which total 79 km² in area.

New Jersey has 160 wild trout patches, 63 are classified as allopatric Brook Trout (Table 26). Allopatric Brook Trout patches represent 22.5% of the State's total patch area. <u>A Map of New Jersey's Wild Brook Trout Patches</u>.

Table 25. State of New Jersey Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	183	545
Brook Trout Sympatric with Brown Trout (1.2)	113	470
Brook Trout Sympatric with Rainbow Trout (1.3)	1	6
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	11	65
Brown Trout (0.2)	391	994
Rainbow Trout (0.3)	46	92
Brown Trout & Rainbow Trout (0.4)	27	79
Totals	772	2,251

Table 26. State of New Jersey Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	63	379	6	0.1	23
1.2	36	627	17	0.9	88
1.3	0	0	0	0.0	0
1.4	7	117	17	6.3	33
0.2	47	478	10	0.2	46
0.3	3	22	7	1.8	12
0.4	4	57	14	3.2	31
Totals	160	1,681	NA	NA	NA

State of Pennsylvania

Pennsylvania has 5,134 catchments containing allopatric Brook Trout populations that have a combined area of 14,105 km² (Table 27). The number of catchments classified as Brook Trout sympatric with Brown Trout is 6,082 and the total area of these catchments is 15,068 km², which are higher than the allopatric Brook Trout catchment metrics. Catchments classified as Brook Trout sympatric with Rainbow Trout numbers 94, with a total area of 238 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 910, which total 2,089 km² in area. The number of catchments classified as wild Brown Trout is 10,905 and the total area of these catchments is 24,298 km², which are also higher than the allopatric Brook Trout catchment metrics. There are 951 catchments classified as wild Rainbow Trout, with a total area of 1,963 km², while catchments classified as wild Brown Trout & Rainbow Trout numbers 2,836, which total 6,472 km² in area.

Pennsylvania has 1,658 wild trout patches, 513 are classified as allopatric Brook Trout (Table 28). Allopatric Brook Trout patches represent 8.6% of the State's total patch area. A Map of Pennsylvania's Wild Brook Trout Patches.

Table 27. State of Pennsylvania Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	5,134	14,105
Brook Trout Sympatric with Brown Trout (1.2)	6,082	15,068
Brook Trout Sympatric with Rainbow Trout (1.3)	94	238
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	910	2,089
Brown Trout (0.2)	10,905	24,298
Rainbow Trout (0.3)	951	1,963
Brown Trout & Rainbow Trout (0.4)	2,836	6,472
Totals	26,912	64,233

Table 28. State of Pennsylvania Patch Metrics

Patch				Minimum	Maximum
Classification	Number of	Total Patch	Mean Patch	Patch Size	Patch Size
Code	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
1.1	513	5,431	11	0.13	170
1.2	454	17,581	39	0.15	433
1.3	12	114	10	1.04	28
1.4	197	25,593	130	0.56	912
0.2	337	7,687	23	0.02	202
0.3	26	490	19	1.08	125
0.4	119	5,976	50	0.35	255
Totals	1,658	62,873	NA	NA	NA

State of Maryland

Maryland has 376 catchments containing allopatric Brook Trout populations that have a combined catchment area of 1,470 km² (Table 29). The number of catchments classified as Brook Trout sympatric with Brown Trout is 125 and the total area of these catchments is 420 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 5, with a total area of 10 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 35, which total 65 km² in area. The number of catchments classified as wild Brown Trout is 440 and the total area of these catchments is 1,239 km². There are 32 catchments classified as wild Rainbow Trout, with a total area of 74 km², while catchments classified as wild Brown Trout & Rainbow Trout numbers 35, which total 99 km² in area.

Maryland has 187 wild trout patches, 100 are classified as allopatric Brook Trout (Table 30). Allopatric Brook Trout patches represent 35.2% of the State's total patch area. A Map of Maryland's Wild Brook Trout Patches.

Table 29. State of Maryland Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	376	1,470
Brook Trout Sympatric with Brown Trout (1.2)	125	420
Brook Trout Sympatric with Rainbow Trout (1.3)	5	10
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	35	65
Brown Trout (0.2)	440	1,239
Rainbow Trout (0.3)	32	74
Brown Trout & Rainbow Trout (0.4)	35	99
Totals	1,048	3,377

Table 30. State of Maryland Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
Code	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
1.1	100	805	8	0.02	45
1.2	21	773	37	4.25	170
1.3	3	28	9	0.25	24
1.4	3	151	50	9.41	130
0.2	56	521	9	0.57	39
0.3	3	8	3	0.05	8
0.4	1	0.2	0.2	0.19	0.2
Totals	187	2,285	NA	NA	NA

State of West Virginia

West Virginia has 1,611 catchments containing allopatric Brook Trout populations that have a combined catchment area of 4,912 km² (Table 31). The number of catchments classified as Brook Trout sympatric with Brown Trout is 320 and the total area of these catchments is 849 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 72, with a total area of 198 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 178, which total 668 km² in area. The number of catchments classified as wild Brown Trout is 707 and the total area of these catchments is 1,625 km². There are 102 catchments classified as wild Rainbow Trout, with a total area of 276 km², while catchments classified as wild Brown Trout & Rainbow Trout numbers 316, which total 649 km² in area.

West Virginia has 397 wild trout patches, 248 are classified as allopatric Brook Trout (Table 32). Allopatric Brook Trout patches represent 38.9% of the State's total patch area. A Map of West Virginia's Wild Brook Trout Patches.

Table 31. State of West Virginia Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	1,611	4,912
Brook Trout Sympatric with Brown Trout (1.2)	320	849
Brook Trout Sympatric with Rainbow Trout (1.3)	72	198
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	178	668
Brown Trout (0.2)	707	1,625
Rainbow Trout (0.3)	102	276
Brown Trout & Rainbow Trout (0.4)	316	649
Totals	3,306	9,177

Table 32. State of West Virginia Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
Code	Patches	Area (km²)	Size (km²)	(km ²)	(km ²)
1.1	248	3,238	13	0.01	118
1.2	39	1,209	31	0.66	189
1.3	11	307	28	9.85	84
1.4	22	2,099	95	1.66	284
0.2	61	1,047	17	0.48	145
0.3	8	168	21	1.90	82
0.4	8	251	31	3.49	71
Totals	397	8,319	NA	NA	NA

State of Virginia

Virginia has 2,103 catchments containing allopatric Brook Trout populations that have a combined catchment area of 7,529 km² (Table 33). The number of catchments classified as Brook Trout sympatric with Brown Trout is 249 and the total area of these catchments is 842 km². Catchments classified as Brook Trout sympatric with Rainbow Trout numbers 271, with a total area of 697 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 129, which total 363 km² in area. The number of catchments classified as wild Brown Trout is 184 and the total area of these catchments is 337 km². There are 370 catchments classified as wild Rainbow Trout, with a total area of 809 km², while catchments classified as wild Brown Trout & Rainbow Trout number 56, which total 144 km² in area.

Virginia has 380 wild trout patches, 248 are classified as allopatric Brook Trout (Table 34). Allopatric Brook Trout patches represent 54.4% of the State's total patch area. A Map of Virginia's Wild Brook Trout Patches.

Table 33. State of Virginia Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	2,103	7,529
Brook Trout Sympatric with Brown Trout (1.2)	249	842
Brook Trout Sympatric with Rainbow Trout (1.3)	271	697
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	129	363
Brown Trout (0.2)	184	337
Rainbow Trout (0.3)	370	809
Brown Trout & Rainbow Trout (0.4)	56	144
Totals	3,362	10,721

Table 34. State of Virginia Patch Metrics

Patch Classification	Number of	Total Patch	Mean Patch	Minimum Patch Size	Maximum Patch Size
Code 1.1	Patches 254	Area (km²) 5,388	Size (km²) 21	(km²) 0.1	(km²) 183
1.2	12	1,045	87	3.9	465
1.3	38	1,462	39	1.1	349
1.4	23	1,291	56	1.0	175
0.2	13	244	19	1.8	81
0.3	34	416	12	0.2	48
0.4	6	58	10	1.7	30
Totals	380	9,904	NA	NA	NA

State of North Carolina

North Carolina has 1,863 catchments containing allopatric Brook Trout populations that have a combined catchment area of 4,102 km² (Table 35). The number of catchments classified as Brook Trout sympatric with Brown Trout is 162 and the total area of these catchments is 601 km². Catchments classified as Brook Trout sympatric with Rainbow Trout numbers 306, with a total area of 846 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 171, which total 419 km² in area. The number of catchments classified as wild Brown Trout is 729 and the total area of these catchments is 1,517 km². There are 1,632 catchments classified as wild Rainbow Trout, with a total area of 3,822 km², while catchments classified as wild Brown Trout & Rainbow Trout number 726, which total 1,440 km² in area.

North Carolina has 933 wild trout patches, 330 are classified as allopatric Brook Trout (Table 36). Allopatric Brook Trout patches represent 9.9% of the State's total patch area. A Map of North Carolina's Wild Brook Trout Patches.

Table 35. State of North Carolina Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	1,863	4,102
Brook Trout Sympatric with Brown Trout (1.2)	162	601
Brook Trout Sympatric with Rainbow Trout (1.3)	306	846
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	171	419
Brown Trout (0.2)	729	1,517
Rainbow Trout (0.3)	1,632	3,822
Brown Trout & Rainbow Trout (0.4)	726	1,440
Totals	5,589	12,747

Table 36. State of North Carolina Patch Metrics

Patch	Name I and C	T-4-LD-4-L	Mary Datab	Minimum	Maximum Datak Sina
Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Patch Size (km²)	Patch Size (km²)
1.1	330	1,177	4	0.002	33
1.2	43	660	15	2.35	46
1.3	86	1,245	14	0.85	85
1.4	113	6,053	54	0.58	388
0.2	73	468	6	0.65	92
0.3	234	1,384	6	0.003	57
0.4	54	958	18	0.20	106
Totals	933	11,945	NA	NA	NA

State of South Carolina

South Carolina has 65 catchments containing allopatric Brook Trout populations that have a combined catchment area of 158 km² (Table 37). The number of catchments classified as Brook Trout sympatric with Brown Trout is 6 and the total area of these catchments is 23 km². There is only 1 catchment classified as Brook Trout sympatric with Rainbow Trout, with an area of 4 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 2, which total 8 km² in area. The number of catchments classified as wild Brown Trout is 45 and the total area of these catchments is 73 km². There are 22 catchments classified as wild Brown Trout & Rainbow Trout, with a total area of 37 km², while catchments classified as wild Brown Trout & Rainbow Trout number 21, which total 37 km² in area.

South Carolina has 18 wild trout patches, 17 are classified as allopatric Brook Trout (Table 38). Allopatric Brook Trout patches represent 88.1% of the State's total patch area. <u>A Map of South Carolina's Wild Brook Trout Patches</u>.

Table 37. State of South Carolina Catchment Assessment Summary

Catchment Classification (Code)	# of Catchments	Area (km²) of the Catchments
Allopatric Brook Trout (1.1)	65	158
Brook Trout Sympatric with Brown Trout (1.2)	6	23
Brook Trout Sympatric with Rainbow Trout (1.3)	1	4
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	2	8
Brown Trout (0.2)	45	73
Rainbow Trout (0.3)	22	37
Brown Trout & Rainbow Trout (0.4)	21	37
Totals	162	340

Table 38. State of South Carolina Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	17	74	4	2	14
1.2	0	0	0	0	0
1.3	0	0	0	0	0
1.4	1	10	10	10	10
0.2	0	0	0	0	0
0.3	0	0	0	0	0
0.4	0	0	0	0	0
Totals	18	84	NA	NA	NA

State of Georgia

Georgia has 139 catchments containing allopatric Brook Trout populations that have a combined catchment area of 302 km² (Table 39). The number of catchments classified as Brook Trout sympatric with Brown Trout is 3 and the total area of these catchments is 8 km². Catchments classified as Brook Trout sympatric with Rainbow Trout number 6, with a total area of 11 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 6, which total 14 km² in area. The number of catchments classified as wild Brown Trout is 15 and the total area of these catchments is 21 km². There are 228 catchments classified as wild Rainbow Trout, with a total area of 478 km², while catchments classified as wild Brown Trout & Rainbow Trout numbers 140, which total 282 km² in area.

Georgia has 104 wild trout patches, 37 are classified as allopatric Brook Trout (Table 40). Allopatric Brook Trout patches represent 16.7% of the State's total patch area. <u>A Map of Georgia's Wild Brook Trout Patches</u>.

Table 39. State of Georgia Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	139	302
Brook Trout Sympatric with Brown Trout (1.2)	3	8
Brook Trout Sympatric with Rainbow Trout (1.3)	6	11
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	6	14
Brown Trout (0.2)	15	21
Rainbow Trout (0.3)	228	478
Brown Trout & Rainbow Trout (0.4)	140	282
Totals	537	1,116

Table 40. State of Georgia Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	37	168	5	1	18
1.2	0	0	0	0	0
1.3	12	177	15	2	84
1.4	9	57	6	2	19
0.2	2	12	6	3	9
0.3	28	378	13	1	39
0.4	16	216	13	2	46
Totals	104	1,008	NA	NA	NA

State of Tennessee

Tennessee has 468 catchments containing allopatric Brook Trout populations that have a combined catchment area of 941 km² (Table 41). The number of catchments classified as Brook Trout sympatric with Brown Trout is 16 and the total area of these catchments is 42 km². Catchments classified as Brook Trout sympatric with Rainbow Trout numbers 158, with a total area of 302 km², whereas the number of catchments classified as Brook Trout sympatric with Brown Trout & Rainbow Trout is 31, which total 75 km² in area. The number of catchments classified as wild Brown Trout is 56 and the total area of these catchments is 100 km². There are 803 catchments classified as wild Rainbow Trout, with a total area of 1,419 km², while catchments classified as wild Brown Trout & Rainbow Trout number 209, which total 376 km² in area.

Tennessee has 161 wild trout patches, 45 are classified as allopatric Brook Trout (Table 42). Allopatric Brook Trout patches represent 8.3% of the State's total patch area. A Map of Tennessee's Wild Brook Trout Patches.

Table 41. State of Tennessee Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	468	941
Brook Trout Sympatric with Brown Trout (1.2)	16	42
Brook Trout Sympatric with Rainbow Trout (1.3)	158	302
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	31	75
Brown Trout (0.2)	56	100
Rainbow Trout (0.3)	803	1,419
Brown Trout & Rainbow Trout (0.4)	209	376
Totals	1,741	3,255

Table 42. State of Tennessee Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	45	205	5	0.004	23
1.2	1	45	45	45.4	45
1.3	26	700	27	0.8	111
1.4	12	717	60	33.2	122
0.2	0	0	0	0.0	0
0.3	72	748	10	0.8	81
0.4	5	44	9	1.1	25
Totals	161	2,459	NA	NA	NA

State of Ohio

Ohio has 6 catchments containing allopatric Brook Trout populations that have a combined catchment area of 12 km² (Table 43). There are no catchments classified as Brook Trout sympatric with Brown Trout, Brook Trout sympatric with Rainbow Trout or Brook Trout sympatric with Brown Trout & Rainbow Trout. The number of catchments classified as wild Brown Trout is 50 and the total area of these catchments is 96 km². There are no catchments classified as wild Rainbow Trout, while catchments classified as wild Brown Trout & Rainbow Trout number 48, which total 132 km² in area.

Ohio has 6 wild trout patches, all of them are classified as allopatric Brook Trout (Table 44). Allopatric Brook Trout patches represent 100% of the State's total patch area. A Map of Ohio's Wild Brook Trout Patches.

Table 43. State of Ohio Catchment Assessment Summary

	# of	Area (km²) of the
Catchment Classification (Code)	Catchments	Catchments
Allopatric Brook Trout (1.1)	6	12
Brook Trout Sympatric with Brown Trout (1.2)	0	0
Brook Trout Sympatric with Rainbow Trout (1.3)	0	0
Brook Trout Sympatric with Brown Trout & Rainbow Trout (1.4)	0	0
Brown Trout (0.2)	50	96
Rainbow Trout (0.3)	0	0
Brown Trout & Rainbow Trout (0.4)	48	132
Totals	104	240

Table 44. State of Ohio Patch Metrics

Patch Classification Code	Number of Patches	Total Patch Area (km²)	Mean Patch Size (km²)	Minimum Patch Size (km²)	Maximum Patch Size (km²)
1.1	6	14	2	0.8	6
1.2	0	0	0	0.0	0
1.3	0	0	0	0.0	0
1.4	0	0	0	0.0	0
0.2	0	0	0	0.0	0
0.3	0	0	0	0.0	0
0.4	0	0	0	0.0	0
Totals	6	14	NA	NA	NA