1   APPENDICES

2   Table S1. Latitudinal/longitudinal coordinates for stream mouths of the 14 study brook trout populations at Cape Race, Newfoundland

3   (see also Figure S1), as well as estimates of census population sizes (N) per year of estimation, and effective number of breeders (N_b)

4   estimated per population, based on methodology described and reported by Wood et al. (2014). Sample sizes for N_b represent the

5   number of individuals screened at 13 polymorphic microsatellite loci per cohort. SNP n = the number of individuals screened in the

6   2011 cohort at 237 single nucleotide polymorphisms.

| Population	Coordinates	2010 N (95% CI)	2011 N (95% CI)	N_b	C	N_b sample size	SNP n
Upper Whelan's	46°43'29.73"N, 53°13.53.34"W	NS	3588 (3206-4107)	249 (114-∞)[b]	1	74	30
Freshwater	46°38'45.91"N, 53°13'17.96"W	4550 (4171-5028)	5385 (5076-5743)	101 (81-452)	3	45, 95, 114	37
Lower Coquita	46°38'45.12"N, 53°13'17.23"W	316 (229-452)[a]	278 (173-483)	30 (26-36)	3	48, 59, 42	31
Upper Coquita	46°39'08.73"N, 53°12'45.88"W	76 (50-99)[a]	79 (43-196)	15 (15-16)	2	19[c], 25[c]	22
Hermitage Pond Brook	46°38'57.64"N, 53°12'43.11"W	83 (65-111)[d]	73 (51-117)[d]	11[e]	1	24	21
Bella's Brook	46°38'46.25"N, 53°12'39.09"W	NS	510 (309-1169)	59 (39-105)[b]	1	48	28
Bob's Cove	46°38'12.03"N, 53°12'58.78"W	6132 (4500-9739)[a]	4527 (4052-5167)	117 (69-423)	3	62, 95, 105	37
Still There By Chance	46°38'07.41"N, 53°12'36.57"W	1081 (696-1600)	1405 (1211-1696)	18 (7-72)	3	93, 42, 40	32
Whale Cove	46°38'02.44"N, 53°12'20.08"W	1101 (857-1539)[a]	735 (626-936)	44 (35-87)	3	66, 48, 108	36
Ditchy	46°38'56.85"N, 53°11'30.03"W	107 (76-161)	179 (132-265)[a]	29 (26-34)	2	26[f], 35[f]	28
Upper Ouananiche Beck	46°38'56.38"N, 53°11'10.54"W	2233 (1651-3247)	3835 (3355-6269)	135 (93-231)	3	67, 36, 93	38
Watern Cove	46°37'58.05"N, 53°09'32.61"W	6223 (5049-8434)	8416 (7225-10255)	130 (119-137)	3	59, 96, 133	38
Blackfly	46°38'04.72"N, 53°09'32.02"W	966 (806-1237)	1731 (1148-2238)	45 (30-64)	3	46, 54, 52	33
Cripple Cove	46°38'45.73"N, 53°06'09.27"W	1683 (992-2927)	2412 (2231-2632)	46 (28-101)	3	80, 76, 71	35

7 *Notes:* N_b reported is the weighted harmonic mean of point estimates across cohorts within a population following methodology in
8 Waples and Do (2008). The range of point estimates are in parentheses. NS = not sampled. Point estimates of N_b and corresponding
9 95% CI) for individual cohorts within each population can be found in Appendix B1 of Wood et al. (2014).
10 C = number of cohorts sampled. Unless otherwise stated; cohort sample sizes screened at 13 microsatellite loci are listed in this order
11 (3 = 2009, 2010, 2011; 2 = 2010, 2011; 1 = 2011).
12 [a]Schnabel method used for N estimation.
13 [b](95%CI reported if only one cohort sampled).
14 [c]2009 and 2010 cohorts, respectively
15 [d]2012 and 2013 estimates (discovered in 2012)
16 [e]Estimated due to very low levels of polymorphism across different marker loci, based on the relationship between N_b and N across all
17 Cape Race populations (see main text for more detail).
18 [f]2010 and 2011 cohorts, respectively.
19

20   Table S2. Model results for the relationship between pairwise estimated neutral F_{ST} and population size, represented by either the

21   effective number of breeders (N_b) or adult census population size (N). Neutral pairwise F_{ST} estimates were corrected for effects of

22   pairwise geographic distance and adjusted to a common distance. For each of the two models, the fixed continuous covariates of

23   population size for population one (pop1), population two (pop2), the interaction of both population sizes were tested for significance

24   by a backwards selection procedure.

| Model	Fixed terms	Term	DF / DDF	*F*	P
1 N	N_pop1 * N_pop2	N_pop1	1 / 12	1.8	0.205
		N_pop2	1 / 12	1.8	0.204
		N_pop1:N_pop2	1 / 154.6	2.7	0.104
2 N	N_pop1 + N_pop2	N_pop1	1 / 12	1.8	0.207
		N_pop2	1 / 12	1.8	0.206
1 N_b	N_b_pop1 * N_b_pop2	N_b_pop1	1 / 12	2.9	0.114
		N_b_pop2	1 / 12	3.0	0.109
		N_b_pop1:N_b_pop2	1 / 154.4	0.9	0.344
2 N_b	N_b_pop1 + N_b_pop2	N_b_pop1	1 / 12	3.0	0.111
		N_b_pop2	1 / 12	3.0	0.110

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26   Figure S1. Map of the general location of the study area and specific locations of each study population at Cape Race, Newfoundland.

27   Population codes: (1) Upper Whelan's; (2) Freshwater; (3) Lower Coquita; (4) Upper Coquita; (5) Hermitage Pond Brook; (6) Bella's

28   Brook; (7) Bob's Cove; (8) Still There By Chance; (9) Whale Cove; (10) Ditchy; (11) Upper Ouananiche Beck; (12) Watern Cove;

29   (13) Blackfly; (14) Cripple Cove. Note that only Cape Race stream drainages within brook trout populations included in the present

30   study are included in the map.

North
America

Newfoundland

1

Cape Race

5 km

12   14

2

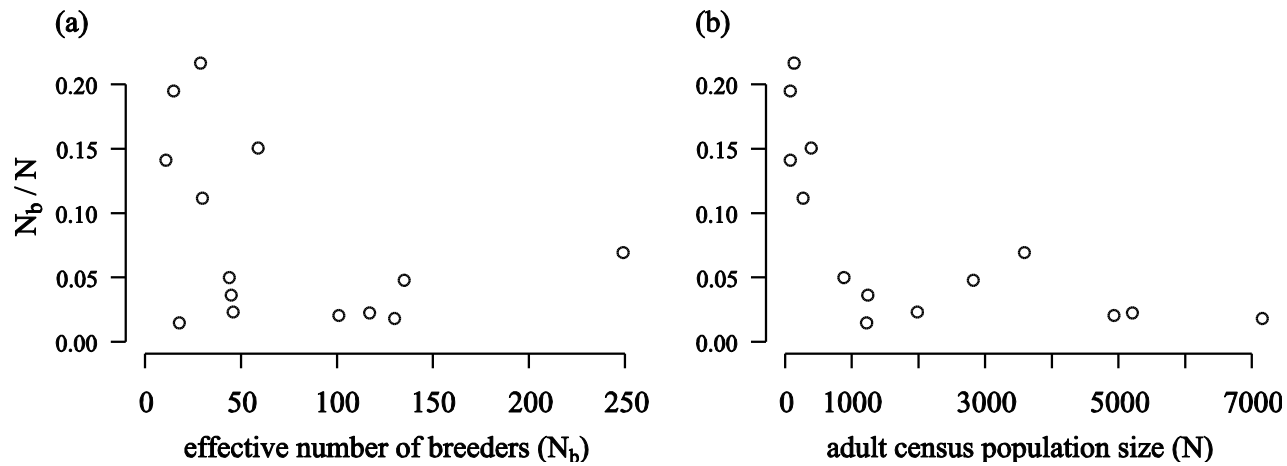10 11
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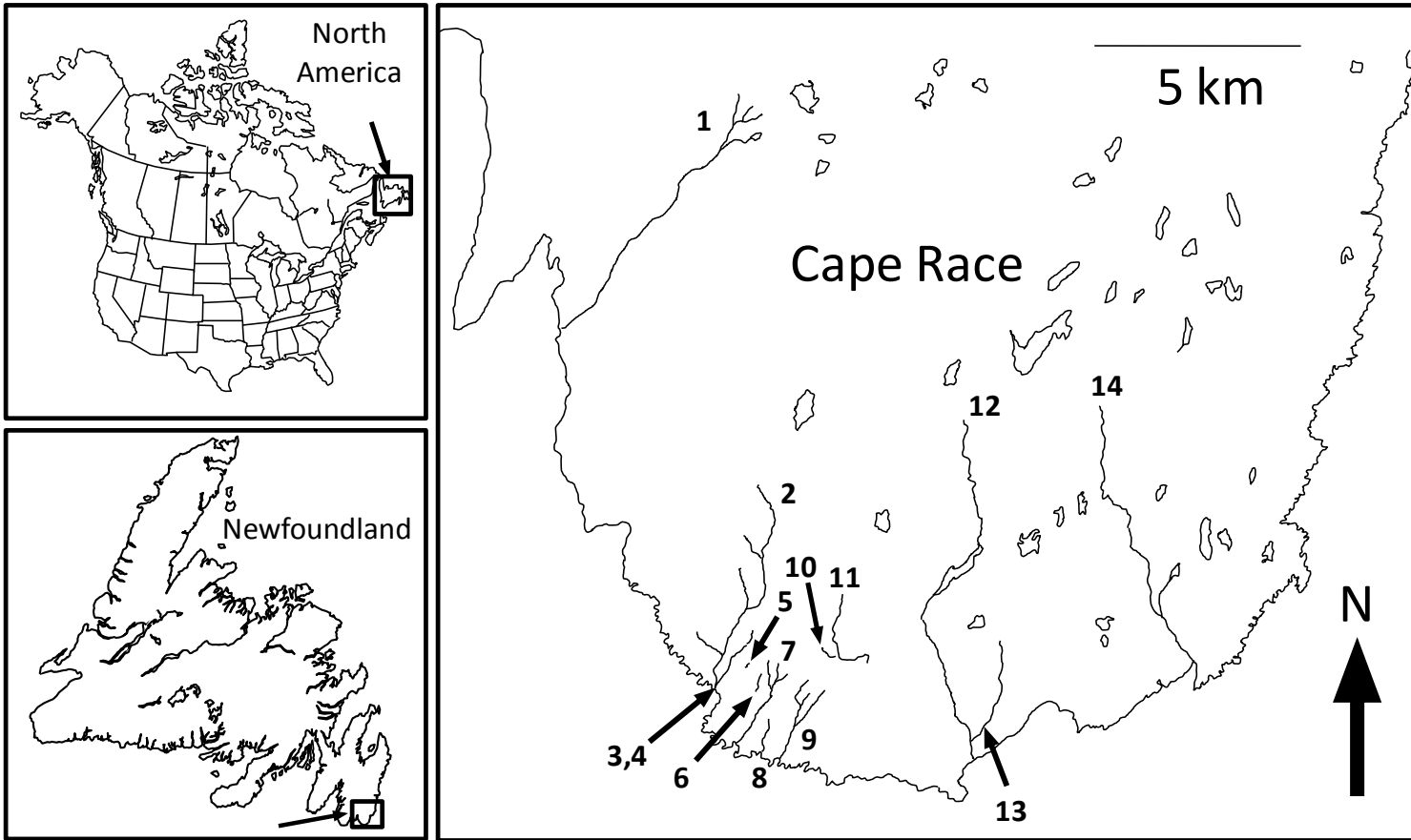
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33   Figure S2. Pairwise F_{ST} as a function of both population size measures for population pairs, represented by either the effective number

34   of breeders (**a**) or adult census population size (**b**). Neutral pairwise F_{ST} estimates were corrected for effects of pairwise geographic

35   distance and adjusted to a common distance. The shading of the bar corresponds to F_{ST} values of the plotted area.

36
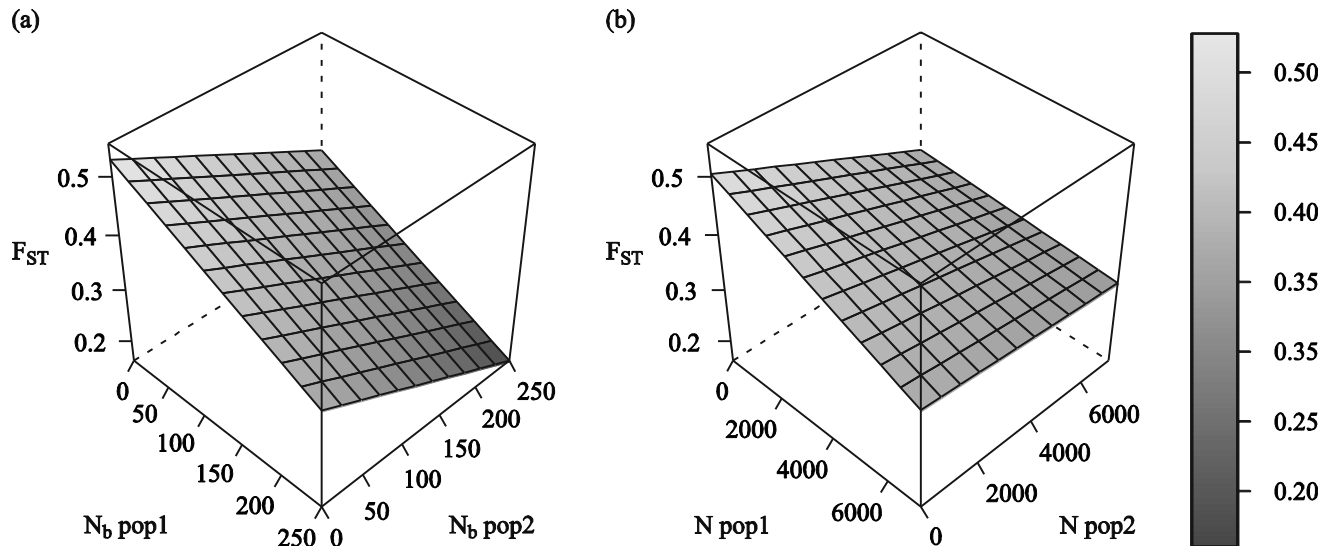
37   Figure S3. The association between either the effective number of breeders (N_b) or adult census population size (N) and the ratio of

38   N_b/N among 14 brook trout populations. Note that these are not 'true' N_b/N ratios (population size measures to not correspond to

39   identical time periods, see Palstra and Fraser 2012): they are shown here to demonstrate that a population's rank in our analyses was

40   not necessarily the same for N_b and N because of variation in N_b/N ratios.

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