Appendix

Table S1. Sample sizes for comparisons of the densely rakered (DR) and the large sparsely rakered (LSR) whitefish morphs, and between littoral (lit LSR) and profundal caught LSR (prof LSR). Groups were compared in respect to habitat distribution (Habitat), stomach content (SC), stable isotope ratios (SIA), gill raker number (GR), fork length (FL), sex ratio (Sex), and genetic diversity (Genetics).

Lake	Group	Habitat	SC	SIA	GR	FL	Sex	Genetics
Lahpojavri	DR	227	105	26	48	-	-	23
	LSR	79	82	46	66	-	-	46
	lit LSR	-	65	25	46	73	72	25
	prof LSR	-	15	21	20	10	10	21
Suopatjavri	DR	92	72	25	65	-	-	25
	LSR	91	81	48	109	-	-	48
	lit LSR	-	48	26	55	48	47	26
	prof LSR	-	14	22	21	23	23	22
Vuolgamasj.	DR	32	29	24	29	-	-	25
	LSR	115	99	53	101	-	-	48
	lit LSR	-	51	28	50	62	62	26
	prof LSR	-	42	25	44	49	49	22

Table S2. Details of the 16 microsatellite loci used for discriminating whitefish groups. Four PCR multiplex assays for *Coregonus lavaretus* were used. Genbank accession number (GB), alignment temperature (Ta), concentration (C), fluorophor (Fph), PCR multiplex assignment (mplx).

Locus ID (GB)	Ta	C [µM]	Fph	mplx
Bwf1 [a]	57	0.25	PET	I
Bwf2 [a]	57	0.1	PET	I
BFRO018 (AF175252) [b]	60	0.08	PET	II
CalTet1 (EU311794) [c]	60	0.15	PET	IV
ClaTet3 (EU311796) [c]	57	0.125	PET	I
ClaTet6 (EU311799) [c]	61	0.15	6-FAM	III
ClaTet13 (EU311806) [c]	57	0.15	6-FAM	I
ClaTet17 (EU311810) [c]	60	0.17	6-FAM	IV
ClaTet18 (EU311811) [c]	57	0.2	VIC	I
Cocl-lav4 (AY453197) [d]	57	0.075	6-FAM	I
Cocl-lav6 (AY453199) [d]	57	0.15	NED	I
Cocl-lav10 (AY453201) [d]	57	0.05	NED	I
Cocl-lav18 (AY453203) [d]	60	0.08	PET	II
Cocl-lav27 (AY453207) [d]	57	0.04	VIC	I
Cocl-lav49 (AY453212) [d]	60	0.08	NED	II
C2-157/Cisco-157 [e]	60	0.1	VIC	IV

[a] Patton JC, Gallaway BJ, Fechhelm RG, Cronin MA (1997) Genetic variation of microsatellite and mitochondrial DNA markers in broad whitefish (*Coregonus nasus*) in the Colville and Sagavanirktok rivers in northern Alaska. Can J Fish Aquat Sci 54:1548-1556

[b] Susnik S, Snoj A, Dovc P (1999) A new set of microsatellite markers for grayling: BFRO014, BFRO015, BFRO016, BFRO017 and BPRO018. Anim Genet 30:478-478

[c] Winkler KA, Weiss S (2008) Eighteen new tetranucleotide microsatellite DNA markers for *Coregonus lavaretus* cloned from an alpine lake population. Mol Ecol Resour 8:1055-1058

[d] Rogers SM, Marchand MH, Bernatchez L (2004) Isolation, characterization and cross-salmonid amplification of 31 microsatellite loci in the lake whitefish (*Coregonus clupeaformis*, Mitchill). Mol Ecol Notes 4:89-92

[e] Turgeon J, Estoup A, Bernatchez L (1999) Species flock in the North American Great Lakes: molecular ecology of Lake Nipigon ciscoes (Teleostei: Coregonidae: *Coregonus*). Evolution 53:1857-1871

Table S3. Summary statistics of genetic variation at 16 microsatellite loci in three groups of whitefish (D: DR whitefish morph, L: littoral LSR whitefish, P: profundal LSR whitefish) in the three lakes Lahpojavri (Lp), Suopatjavri (Su), and Vuolgamasjavri (Vg). N = sample size (individuals), N_a = observed number of alleles, H_o= observed heterozygosity, H_e= expected heterozygosity, F_{IS} = coefficient of inbreeding, HWE = p-values from the exact tests and bold values indicate significant departures from Hardy-Weinberg equilibrium per locus per population and per population across loci (mean). None of the p-values were significant after sequential Bonferroni corrections.

Pop		BWF1	BWF2	Cla-Tet01	Cla-Tet03	Cla-Tet06	Cla-Tet13	Cla-Tet17	Cla-Tet18	Cocl-lav04	Cocl-Lav06	Cocl-Lav10	Cocl-lav18	Cocl-lav27	Cocl-lav49	BFRO-018	C2-157	Mean	SD
LpL	**N**	24	24	24	23	24	24	23	24	24	24	24	23	24	23	23	25	24	0.6
	Na	4	3	3	4	4	5	8	2	1	2	3	2	1	2	1	2	3	1.8
	Ho	0.458	0.667	0.542	0.478	0.583	0.750	0.739	0.292	0.000	0.125	0.208	0.304	0.000	0.435	0.000	0.040	0.351	0.268
	He	0.470	0.582	0.461	0.427	0.532	0.756	0.733	0.430	0.000	0.187	0.192	0.258	0.000	0.386	0.000	0.039	0.341	0.253
	F_{IS}	0.024	-0.145	-0.175	-0.119	-0.096	0.008	-0.008	0.321	-	0.330	-0.086	-0.179	-	-0.127	-	-0.020	-0.021	0.168
	HWE	0.595	0.482	0.562	1	0.464	0.873	0.489	0.152	-	0.209	1	1	-	1	-	-	0.951	
LpP	**N**	21	21	19	21	21	21	18	21	21	21	21	21	21	21	21	20	21	0.9
	Na	5	3	4	3	4	7	8	2	1	2	2	2	1	3	1	1	3	2.1
	Ho	0.476	0.667	0.316	0.381	0.524	0.762	0.611	0.333	0.000	0.333	0.048	0.333	0.000	0.429	0.000	0.000	0.326	0.254
	He	0.553	0.591	0.321	0.543	0.484	0.787	0.745	0.387	0.000	0.278	0.046	0.278	0.000	0.421	0.000	0.000	0.340	0.271
	F_{IS}	0.139	-0.129	0.017	0.299	-0.082	0.032	0.180	0.138	-	-0.200	-0.024	-0.200	-	-0.019	-	-	0.013	0.155
	HWE	0.080	0.614	0.314	0.275	1	0.279	**0.009**	0.579	-	1	-	1	-	0.452	-	-	0.245	
LpD	**N**	23	23	16	23	23	23	16	23	23	23	23	23	23	23	23	16	22	2.8
	Na	3	3	4	5	6	6	8	3	1	4	1	2	1	2	2	2	3	2.1
	Ho	0.478	0.783	0.625	0.696	0.565	0.565	0.750	0.348	0.000	0.391	0.000	0.261	0.000	0.391	0.043	0.063	0.372	0.283
	He	0.453	0.600	0.619	0.661	0.546	0.565	0.773	0.464	0.000	0.329	0.000	0.340	0.000	0.440	0.043	0.061	0.368	0.267
	F_{IS}	-0.056	-0.304	-0.009	-0.053	-0.035	0.000	0.030	0.251	-	-0.190	-	0.233	-	0.110	-0.022	-0.032	-0.006	0.149
	HWE	1	0.159	1	0.273	0.597	0.446	0.541	0.269	-	1	-	0.245	-	0.645	-	-	0.791	
SuL	**N**	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0.0
	Na	4	3	8	4	7	6	6	2	1	2	4	2	2	3	2	2	4	2.1
	Ho	0.692	0.500	0.692	0.731	0.692	0.577	0.692	0.654	0.000	0.077	0.462	0.038	0.038	0.769	0.192	0.038	0.428	0.304
	He	0.585	0.452	0.678	0.567	0.646	0.618	0.671	0.499	0.000	0.142	0.550	0.038	0.038	0.556	0.174	0.038	0.391	0.265
	F_{IS}	-0.183	-0.106	-0.021	-0.288	-0.071	0.066	-0.032	-0.310	-	0.458	0.160	-0.020	-0.020	-0.383	-0.106	-0.020	-0.058	0.203
	HWE	0.777	1	0.700	0.196	0.546	0.074	0.623	0.235	-	0.117	0.306	-	-	0.113	1	-	0.366	

Table S3. cont.

Pop		BWF1	BWF2	Cla-Tet01	Cla-Tet03	Cla-Tet06	Cla-Tet13	Cla-Tet17	Cla-Tet18	Cocl-lav04	Cocl-Lav06	Cocl-Lav10	Cocl-lav18	Cocl-lav27	Cocl-lav49	BFRO-018	C2-157	Mean	SD
SuP	**N**	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	0.0
	Na	3	4	5	3	4	6	8	2	1	2	3	2	2	3	1	1	3	1.9
	Ho	0.409	0.455	0.636	0.273	0.636	0.545	0.864	0.409	0.000	0.273	0.273	0.045	0.136	0.682	0.000	0.000	0.352	0.273
	He	0.492	0.513	0.617	0.313	0.673	0.589	0.719	0.491	0.000	0.298	0.344	0.044	0.127	0.536	0.000	0.000	0.360	0.256
	F_{IS}	0.168	0.115	-0.032	0.129	0.054	0.074	-0.201	0.166	-	0.083	0.207	-0.023	-0.073	-0.272	-	-	0.030	0.145
	HWE	0.423	**0.003**	0.928	0.310	0.158	0.168	**0.016**	0.419	-	0.538	0.216	-	1	0.453	-	-	**0.027**	
SuD	**N**	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0
	Na	3	2	3	5	4	6	7	2	1	2	3	2	1	4	1	1	3	1.8
	Ho	0.400	0.120	0.440	0.480	0.120	0.440	0.840	0.320	0.000	0.520	0.520	0.240	0.000	0.520	0.000	0.000	0.310	0.251
	He	0.514	0.113	0.414	0.510	0.115	0.436	0.753	0.480	0.000	0.385	0.486	0.320	0.000	0.484	0.000	0.000	0.313	0.240
	F_{IS}	0.222	-0.064	-0.064	0.058	-0.042	-0.009	-0.116	0.333	-	-0.351	-0.071	0.250	-	-0.074	-	-	0.006	0.187
	HWE	0.226	1	0.371	0.876	1	0.401	0.828	0.105	-	0.144	0.559	0.217	-	1	-	-	0.695	
VgL	**N**	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0.0
	Na	3	3	7	4	6	6	8	2	2	1	3	2	3	3	1	5	4	2.1
	Ho	0.500	0.385	0.731	0.308	0.538	0.808	0.731	0.500	0.077	0.000	0.115	0.038	0.115	0.846	0.000	0.115	0.363	0.306
	He	0.452	0.403	0.692	0.353	0.499	0.738	0.756	0.411	0.074	0.000	0.178	0.038	0.110	0.660	0.000	0.146	0.344	0.273
	F_{IS}	-0.106	0.046	-0.056	0.128	-0.080	-0.094	0.033	-0.218	-0.040	-	0.353	-0.020	-0.047	-0.283	-	0.212	-0.012	0.164
	HWE	1	1	0.490	0.448	0.531	0.971	0.686	1	1	-	**0.020**	-	1	0.179	-	0.104	0.747	
VgP	**N**	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	0.0
	Na	5	3	5	4	7	6	7	3	1	2	3	1	2	3	1	3	4	2.0
	Ho	0.409	0.636	0.682	0.545	0.500	0.545	0.682	0.364	0.000	0.227	0.364	0.000	0.045	0.591	0.000	0.091	0.355	0.259
	He	0.533	0.551	0.616	0.590	0.535	0.582	0.665	0.447	0.000	0.201	0.313	0.000	0.044	0.633	0.000	0.088	0.362	0.262
	F_{IS}	0.233	-0.156	-0.107	0.075	0.066	0.062	-0.025	0.187	-	-0.128	-0.162	-	-0.023	0.067	-	-0.035	0.004	0.125
	HWE	0.238	0.177	0.648	0.490	0.199	0.485	0.683	0.806	-	1	1	-	1	0.161	-	1	0.870	
VgD	**N**	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	0.0
	Na	3	3	3	5	5	7	8	3	1	2	3	2	2	3	1	2	3	2.0
	Ho	0.520	0.200	0.440	0.640	0.480	0.680	0.720	0.640	0.000	0.440	0.480	0.200	0.040	0.480	0.000	0.040	0.375	0.256
	He	0.525	0.185	0.409	0.586	0.430	0.638	0.737	0.530	0.000	0.471	0.442	0.180	0.039	0.495	0.000	0.039	0.357	0.245
	F_{IS}	0.009	-0.082	-0.076	-0.093	-0.117	-0.065	0.023	-0.207	-	0.066	-0.087	-0.111	-0.020	0.031	-	-0.020	-0.054	0.073
	HWE	1	1	0.821	0.390	1	0.836	0.957	0.422	-	0.697	0.722	1	-	0.602	-	-	1	

Table S4. Similarity in habitat use (Schoeners index) between densely rakered (DR) and large sparsely rakered (LSR) whitefish morphs from three lakes (LP: Lahpojavri, SU: Suopatjavri, VG: Vuolgamasjavri). Biologically significant similarities (>0.6) in bold.

	LP DR	LP LSR	SU DR	SU LSR	VG DR
LP LSR	0.03				
SU DR	**0.77**	0.26			
SU LSR	0.21	**0.82**	0.44		
VG DR	0.58	0.44	**0.81**	**0.63**	
VG LSR	0.05	**0.98**	0.28	**0.84**	0.46

Table S5. Diet similarity (Schoeners index) between densely rakered (DR) and large sparsely rakered (LSR) whitefish morphs from three lakes (LP: Lahpojavri, SU: Suopatjavri, VG: Vuolgamasjavri) based on stomach content. Biologically significant similarities (>0.6) in bold.

	LP DR	LP LSR	SU DR	SU LSR	VG DR
LP LSR	0.04				
SU DR	**0.60**	0.06			
SU LSR	0.47	0.44	0.50		
VG DR	0.43	0.09	0.41	0.52	
VG LSR	0.24	**0.61**	0.27	**0.73**	0.37

Table S6. Diet and isotopic niche characteristics for densely rakered (DR) and large sparsely rakered (LSR) whitefish morphs from the three lakes (LP: Lahpojavri, SU: Suopatjavri, VG: Vuolgamasjavri). Diet niche width (Levins index, B), isotope niche width (SEA), isotope niche variability (CD), diet individual specialization (E), clustering based on stomach contents (C).

Morph	Lake	Diet niche width (B)	Isotope niche width (SEA)	Isotope niche var (CD)	Diet ind spec (E)	Clustering (C)
DR	LP	2.00	0.60	0.37	0.37	-0.02
DR	SU	1.14	0.54	0.36	0.19	0.02
DR	VG	2.43	0.75	0.46	0.59	0.00
LSR	LP	4.80	6.64	2.75	0.70	-0.06
LSR	SU	3.68	7.25	2.60	0.68	0.00
LSR	VG	5.92	5.35	2.87	0.78	0.11

Table S7. Stable isotope ratios (mean ± sd) of prey from littoral, profundal, and pelagic habitats within the three lakes.

Lake	Habitat	N	$\delta^{13}C$	$\delta^{15}N$
Lahpojavri	Littoral	14	-24.7 ± 2.0	3.2 ± 1.2
	Profundal	2	-31.2 ± 3.6	6.8 ± 1.6
	Pelagic	1	-34.7	3.2
Suopatjavri	Littoral	13	-22.8 ± 2.6	3.4 ± 1.1
	Profundal	2	-34.4 ± 1.7	6.9 ± 0.0
	Pelagic	1	-37.0	7.4
Vuolgamasjavri	Littoral	10	-27.4 ± 1.8	3.8 ± 0.6
	Profundal	2	-31.5 ± 1.9	5.3 ± 0.8
	Pelagic	1	-34.7	4.8

Table S8. Diet similarity (Schoeners index) between littoral (lit) and profundal (prof) LSR whitefish from three lakes (LP: Lahpojavri, SU: Suopatjavri, VG: Vuolgamasjavri) based on stomach content. Biologically significant similarities (>0.6) in bold.

	LP lit	LP prof	SU lit	SU prof	VG lit
LP prof	0.13				
SU lit	0.48	0.07			
SU prof	0.19	0.35	0.29		
VG lit	0.56	0.10	**0.87**	0.25	
VG prof	0.29	**0.72**	0.22	0.51	0.26

Table S9. Diet and isotopic niche characteristics for littoral and profundal LSR whitefish from three lakes (LP: Lahpojavri, SU: Suopatjavri, VG: Vuolgamasjavri). Diet niche width (Levins index B), isotope niche width (SEA), isotope niche variability (CD), diet individual specialization (E), clustering based on stomach contents (C).

Habitat	Lake	Diet niche width (B)	Isotope niche width (SEA)	Isotope niche var (CD)	Diet ind spec (E)	Clustering (C)
Littoral	LP	3.71	2.76	1.54	0.70	-0.06
Littoral	SU	3.22	4.00	1.88	0.65	0.00
Littoral	VG	3.81	4.84	2.75	0.75	0.14
Profundal	LP	1.83	2.49	1.12	0.36	-0.02
Profundal	SU	1.91	3.35	1.39	0.49	-0.05
Profundal	VG	3.30	2.20	1.00	0.54	0.00

Table S10. Summary of results from STRUCTURE for inferring K populations among LSR whitefish in the three lakes. The most likely grouping was estimated by 15 independent runs for each K. The bold values represent situations of K where ln Pr(X|K) was greatest (least negative value).

Lake	K	Reps	Mean *ln Pr(*X/K*)*	Std. dev. *ln Pr(*X/K*)*
Lahpojavri	**1**	**15**	**-932.2267**	**0.2520**
	2	15	-943.2333	3.3314
	3	15	-950.8133	11.2740
Suopatjavri	**1**	**15**	**-1134.9067**	**0.3011**
	2	15	-1136.9067	2.2736
	3	15	-1137.4800	1.4234
Vuolgamasjavri	1	15	-1112.8800	0.7485
	2	**15**	**-1111.000**	**1.6031**
	3	15	-1112.4200	1.7745