

Electronic appendices are refereed with the text. However, no attempt is made to impose a uniform editorial style on the electronic appendices.

Electronic Appendix A. Taxonomic designation, colony abbreviation, geographic coordinates and sample size (n) for each sampling location.

taxon	geographic origin	colony	co-ordinates	n	collected by
<i>argentatus</i>	Norway, Tromsø	argNN	69°40'N, 19°00'E	10	R.R. Snell
	Germany, Hiddensee	argDE	54°20'N, 13°10'E	9	R. Barth, A.J. Helbig
	Finland, Lake Saimaa	argFI	61°16'N, 28°15'E	7	R. Juvaste
	Estonia, Matsalu	argES	58°31'N, 24°10'E	10	K. Rattiste
	Russia, Kandalaksha	argWS	67°08'N, 32°32'E	5	I. Charitonova, V. Bianki, M. Gulmakha
	Iceland, Skruður	ageIC	65°00'N, 13°20'W	15	R.R. Snell
	Denmark, Faeroe Island	ageFA	62°20'N, 07°20'W	5	J.K. Jensen, E. Fritze, R.R. Snell
	France, Finistère	ageFR	48°40'N, 03°20'W	10	R.R. Snell
	Netherlands, Rotterdam	ageNL	51°56'N, 04°28'E	8	N.v. Swelm, P. de Knijff
	Norway, Kristiansand	ageSN	58°10'N, 06°40'E	11	T.O. Hansen
<i>armenicus</i>	Turkey, Tuz Gölü	armTU	38°50'N, 33°10'E	5	A.J. Helbig, D. Liebers
	Turkey, Van Gölü	armVA	38°20'N, 43°10'E	5	A.J. Helbig, D. Liebers
<i>atlantis</i>	Portugal, Island of Madeira	atlMD	32°52'N, 17°10'W	5	M.v. Leeuwen, N.v. Swelm
	Portugal, Berlenga Island	atlPO	39°25'N, 09°28'W	4	M.v. Leeuwen, L. Moreis
<i>barabensis</i>	Morocco, Essaouira	atIMO	31°30'N, 09°45'W	5	M.v. Leeuwen, N.v. Swelm
	Kazakhstan, Lake Tengiz	barKZ	50°30'N, 69°30'E	10	A.J. Helbig, D. Liebers
<i>cachinnans</i>	Romania, Danube Delta	cacBS	44°30'N, 28°30'E	6	R. Klein, A. Buchheim
	Ukraine, Odessa	cacOD	46°20'N, 32°30'E	6	A. Rudenko, N.v. Swelm
<i>dominicanus</i>	Ukraine, Azov' Black Sea	cacAS	46°40'N, 35°20'E	4	V. Dierschke, D. Liebers
	Russia, N Caspian Sea	cacCS	45°00'N, 48°20'E	10	T. Tennhardt, D. Liebers
<i>fuscus</i>	Antarctic Peninsula	domAN	62°11'S, 58°59'W	10	J. Welcker, H.-U. Peter
	Finland, Lake Saimaa	fusFI	61°50'N, 28°50'E	17	R. Juvaste, N.v. Swelm
<i>glaucescens</i>	USA, Gulf of Alaska	glcAL	59°26'N, 146°19'W	10	D.A. Bell
	Canada, NWT, Baffin Island	goINT	69°01'N, 68°00'W	7	R.R. Snell
<i>glaucoides</i>	Iceland, Reykjavik	graIC	64°09'N, 21°57'W	9	A. Sigfusson, R.R. Snell
	Denmark, Faeroe Island	graFA	62°20'N, 07°20'W	5	J.K. Jensen, E. Fritze, R.R. Snell
<i>graellsii</i>	England, Stockport	graUK	53°25'N, 02°10'W	7	P. Stuart, N.v. Swelm
	Netherlands, Rotterdam	granL	51°55'N, 04°28'E	9	N.v. Swelm, F. Cottaar, K. Verbeek
<i>heuglini</i>	Russia, Kanin-Peninsula	heuKA	67°40'N, 44°10'E	10	P. Mierauskas

taxon	geographic origin	colony	co-ordinates	n	collected by
<i>hyperboreus</i>	Canada, NWT, Baffin Island	hypNT	69°00'N, 68°00'W	10	R.R. Snell
	Iceland, Bjarnjarhafnarfjall	hypIC	65°00'N, 23°00'W	10	R.R. Snell
	Svalbard, Longyearbyen	hypSP	78°13'N, 15°20'E	10	R.R. Snell
	Russia, Novaja Semija	hypSI	70°40'N, 54°32'E	10	A. Filchagov, V. Kalyakin
<i>intermedius</i>	Norway, Vest-Agder	intNO	58°20'N, 06°40'E	11	T.O. Hansen
<i>marinus</i>	Denmark, Faeroe Island	marFA	62°20'N, 07°20'W	9	J.K. Jensen
<i>michahellis</i>	Spain, Galicia, La Coruña	micGA	43°30'N, 08°50'W	5	A. Bermejo
	Spain, Gibraltar	micGI	36°08'N, 05°21'W	7	M.v. Leeuwen, N.v. Swelm
	France, Strasbourg, Alsace	micFR	48°10'N, 08°00'W	4	M. Boschert
	Italy, Capraia Island	micIT	43°03'N, 09°48'W	4	N. Baccetti
	Malta, Fiffia Island	micMA	35°57'N, 14°26'W	4	J. Sultana, C. Gauci, F. Cottaar
	Greece, Island of Crete	micKR	35°10'N, 25°50'W	4	A.J. Helbig
	Romania, Constanta	micRU	44°10'N, 28°37'W	4	R. Klein, A. Buchheim
<i>mongolicus</i>	Mongolia, Chowd, Char Nuur	monWE	47°50'N, 92°20'E	5	A. Bräunlich, O. Munhtogtoh
	Mongolia, Tchojbaisan	monEA	48°00'N, 114°30'E	5	A. Bräunlich, O. Munhtogtoh
<i>occidentalis</i>	USA, San Francisco Bay	occca	37°44'N, 122°22'W	6	D.A. Bell
<i>schistsagus</i>	Russia, Magadan	schMG	59°33'N, 151°26'E	10	O. Butorina, S. Andeev
<i>smithsonianus</i>	USA, Alaska, Fairbanks	smIAL	64°50'N, 147°10'W	5	R.R. Snell
	Canada, NWT, Yellowknife	smINT	62°40'N, 113°20'W	4	J. Sirois
	Canada, ONT, Lake Huron	smION	45°16'N, 80°15'W	10	C. Weseloh, D. Liebers
	Canada, NBW, Kent Island	smINB	47°51'N, 64°33'W	9	R.R. Snell
	Canada, Prince Edward Isl.	smIPE	46°10'N, 63°30'W	10	R.R. Snell
<i>taimyrensis</i>	Russia, Taimyr-Peninsula	taITA	74°10'N, 86°30'E	11	C. Unger, D. Liebers
<i>vegae</i>	Russia, Tchukotka, Anadyr	vegTC	64°32'N, 176°49'E	9	O. Butorina

Electronic Appendix B. Variable nucleotide positions and accession numbers of the 160 concatenated haplotypes identified in this study (note that there is no haplotype no. 71). Dots indicate identity with reference sequence (first line). The reference sequence is identical to haplotype no. 138.

Cytochrome-b-Gene (70 variable sites)

ref.	111111122	23333333334	4444445555	5556666777	7777888888	8899999000	0000000111	111	1111111111
#001	11111122	23333333334	4444445555	5556666777	7777888888	8899999000	0000000111	111	1111111111
#002	2935667916	9004568990	2244891245	7890112234	55792334677	99033369022	24566678133	2233567778	8899900001
#003	4903251994	1798431030	0948923532	9586254426	7910820703	1856900823	9792905034	3467541341	2588912672
#004	TCAAGCCGCA	ATCACCTAAT	CTCCAAGACC	TCTCAATATA	GTTGAGTAAC	ACTGGTTAGT	CCAGTTTTTT	ATAGTCCGTT	TTTCTAAGTT
#005	.....GTT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....C
#006	.....T	.....G	.....T	.....T	.....T	.....G	.....C	.....A	.....C
#007	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....C
#008	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....C
#009	.....T	.....T	.....G	.....G	.....G	.....G	.....G	.....G	.....G
#010	.....T	.....T	.....G	.....G	.....G	.....G	.....G	.....G	.....G
#011	.....TT	.....C	.....T	.....T	.....T	.....C	.....C	.....A	.....T
#012	.....TT	.....C	.....T	.....T	.....T	.....C	.....C	.....A	.....T
#013	.....TT	.....C	.....T	.....T	.....T	.....C	.....C	.....A	.....T
#014	.....TT	.....C	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#015	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#016	.....T	.....T	.....G	.....G	.....G	.....G	.....G	.....G	.....G
#017	.....GTT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#018	.....GTT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#019	.....GTT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#020	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#021	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#022	.....TT	.....C	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#023	.....TT	.....C	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#024	.....TT	.....C	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#025	.....TT	.....C	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#026	.....GTT	.....T	.....G	.....G	.....G	.....G	.....G	.....G	.....G
#027	.....GTT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#028	.....TT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#029	.....TT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#030	.....TT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#031	.....TT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#032	.....TT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#033	.....TT	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#034	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#035	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#036	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#037	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#038	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#039	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#040	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T
#041	.....T	.....T	.....G	.....G	.....G	.....G	.....G	.....G	.....G
#042	.....T	.....T	.....G	.....G	.....G	.....G	.....G	.....G	.....G
#043	.....T	.....T	.....T	.....T	.....T	.....A	.....C	.....A	.....T

HVR-I region (46 variable sites)

ref.	111111	11111111111	12222222222	2222333
#001	111111	11111111111	12222222222	2222333
#002	2233567778	8899900001	1112334588	9112244448
#003	3467541341	2588912672	3481023002	6781412495
#004	ATAGTCCGTT	TTTCTAAGTT	CCCGCTGGTA	TGCTCTTCCA
#005	.....A	.....C	.....T	.....ATA
#006	.....A	.....C	.....T	.....ATA
#007	.....A	.....C	.....T	.....ATA
#008	.....A	.....C	.....T	.....ATA
#009	.....A	.....C	.....T	.....ATA
#010	.....A	.....C	.....T	.....ATA
#011	.....A	.....C	.....T	.....ATA
#012	.....A	.....C	.....T	.....ATA
#013	.....A	.....C	.....T	.....ATA
#014	.....A	.....C	.....T	.....ATA
#015	.....A	.....C	.....T	.....ATA
#016	.....A	.....C	.....T	.....ATA
#017	.....A	.....C	.....T	.....ATA
#018	.....A	.....C	.....T	.....ATA
#019	.....A	.....C	.....T	.....ATA
#020	.....A	.....C	.....T	.....ATA
#021	.....A	.....C	.....T	.....ATA
#022	.....A	.....C	.....T	.....ATA
#023	.....A	.....C	.....T	.....ATA
#024	.....A	.....C	.....T	.....ATA
#025	.....A	.....C	.....T	.....ATA
#026	.....A	.....C	.....T	.....ATA
#027	.....A	.....C	.....T	.....ATA
#028	.....A	.....C	.....T	.....ATA
#029	.....A	.....C	.....T	.....ATA
#030	.....A	.....C	.....T	.....ATA
#031	.....A	.....C	.....T	.....ATA
#032	.....A	.....C	.....T	.....ATA
#033	.....A	.....C	.....T	.....ATA
#034	.....A	.....C	.....T	.....ATA
#035	.....A	.....C	.....T	.....ATA
#036	.....A	.....C	.....T	.....ATA
#037	.....A	.....C	.....T	.....ATA
#038	.....A	.....C	.....T	.....ATA
#039	.....A	.....C	.....T	.....ATA
#040	.....A	.....C	.....T	.....ATA
#041	.....A	.....C	.....T	.....ATA
#042	.....A	.....C	.....T	.....ATA
#043	.....A	.....C	.....T	.....ATA

Acc. no. Cyt-b
 Acc. no. HVR-I

Elec. App. B (cont'd)

Cytochrome-b-Gene (70 variable sites)

HVR-I region (46 variable sites)

ref.	11111122	23333333	44444555	55566677	77788888	88999900	00000011	11111111	11111111	12222222	222333	Acc-No	Acc-No
	2935667916	9004568990	2244891245	7890112234	5579234677	9903369022	2456678133	3467541341	2588912672	3481023002	6781412495	134550	HVR-I
	TCAGACCGCA	ATCACCTAAT	CTCCAAGACC	TCTCAATATA	GTTGAGTAAC	ACTGGTTAGT	CCAGTTTTTT	ATAGTCCGTT	TTTCTAAGTT	CCCGCTGGTA	TGCTCTTCCA	CGAGGA	
#090	...TT...	...T...	...T...	...G...	...G...	...C...	...C...	...T.A...	C..C.G..	..A.....	.....G...	AJ508101
#091	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508309	
#092	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ507817	
#094	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ507818	
#095	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508109	
#096	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508107	
#097	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508133	
#098	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508133	
#099	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508134	
#100	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#101	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508326	
#102	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508327	
#103	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508328	
#104	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#105	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#106	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#107	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...T.G...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#108	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#109	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#110	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#111	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#112	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#113	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#114	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#115	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#116	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#117	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#118	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#119	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#120	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#121	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#122	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#123	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#124	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#125	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#126	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#127	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#128	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#129	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#130	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#131	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#132	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#133	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508148	
#134	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...TT...	...G.....	...G.....	...A.....	...A.A...	AJ508122	

Elec. App. B (cont'd)

Cytochrome-b-Gene (70 variable sites)

HVR-I region (46 variable sites)

ref.	11111122	23333333	44444455	55566677	77778888	88999900	11111111	11111111	11111111	12222222	222233	Acc-No	Acc-No	
	9004568990	1798431030	0948923532	9586254426	7910820703	1856900823	9792905034	2588912672	3481023002	6781412495	134550	Cyt-b	HVR-I	
#135	TCAGACCCGCA	ATCACCTAAT	CTCCAAGACC	TCTCAATATA	GTTGAGTAAC	ACTGGTTAGT	CCAGTTTTTT	ATAGTCCGTT	TTTCTAAGTT	CCCGCTGGTA	TGCTCTTCCA	CGAGGA	AJ508093	AJ508325
#136AG...TA.	C...C.G.	.....	.....	.G.	AJ508091	AJ276947
#137	AJ508111	AJ507739
#138	AJ508111	AJ277127
#139	AJ508130	AJ277128
#140	AJ507743	AJ507743
#141	AJ507740	AJ507740
#142	AJ507810	AJ507810
#143	AJ507812	AJ507812
#144	AJ507811	AJ277128
#145	AJ277128	AJ277128
#146	AJ508125	AJ277128
#147	AJ508099	AJ276950
#148	AJ508093	AJ276950
#149	AJ508141	AJ277132
#150	AJ508143	AJ507762
#151	AJ507737	AJ507737
#152	AJ276941	AJ276941
#153	AJ277127	AJ277127
#154	AJ508128	AJ277127
#155	AJ508128	AJ507744
#156	AJ508128	AJ507737
#157	AJ508121	AJ508330
#158	AJ508121	AJ508331
#159	AJ508121	AJ508332
#160	AJ508121	AJ508333
#161	AJ508121	AJ508334

Electronic Appendix D. Results of nested clade analysis (two-step clades and higher) on 53 geographically defined populations of the herring gull complex.

Clade number	Chi-square analysis p-value	inference	conclusion
2.02	0.025	1y2n11y12n	contiguous range expansion
2.06	<0.001	1y2y3y5n6?7y	restricted gene flow with some long distance dispersal
2.17	0.001	1y2y3n4y9y10y	allopatric fragmentation
2.19	<0.001	1y2y3n4n	restricted gene flow with isolation by distance
3.01	0.015	1y2y3n4n	restricted gene flow with isolation by distance
3.02	<0.001	1y2n11y12y13y	long distance colonization
3.03	<0.001	1y2n11y12n	contiguous range expansion
3.05	<0.001	1y2n11y12n	contiguous range expansion
3.06	<0.001	1y2n11y12y13n14y	long distance colonization
3.08	<0.001	1y2y3n4n	restricted gene flow with isolation by distance
4.01	<0.001	1y2y3n4n	restricted gene flow with isolation by distance
4.02	<0.001	1y2n11y12n	contiguous range expansion
4.03	<0.001	1y2n11y12n	contiguous range expansion
5.01	<0.001	1y2n11y12n	contiguous range expansion
5.02	<0.001	1y2n11y12n	contiguous range expansion
6.01	<0.001	1y2y3y5y15y16y	allopatric fragmentation

The nested clade design is shown in figure 4 of the main paper. Results are presented here only for clades for which the null hypothesis of no association between geography and the haplotype tree could be rejected at the 5% level of significance. Interpretation of the results is based on the inference key of 24 October 2001 (http://biog.byu.edu/zooology/crandell_lab/geodis.htm).