MOLECULAR ECOLOGY

Supplemental information for:

Demography and evolutionary history of grey wolf populations around the Bering Strait

Carolina Pacheco[1,2,3]*, Astrid Vik Stronen[4,5,6], Bogumiła Jędrzejewska[7], Kamila Plis[7], Innokentiy M. Okhlopkov[8], Nikolay V. Mamaev [8], Sergei V. Drovetski[9], Raquel Godinho [1,2,3]*

[1] CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Campus de Vairão, Universidade do Porto, Vairão, Portugal

[2]Department of Biology, Faculty of Sciences, University of Porto, Porto, Portugal

[3]BIOPOLIS, Program in Genomics, Biodiversity and Land Planning, CIBIO, Campus de Vairão, Vairão, Portugal

[4]Department of Biology, Biotechnical Faculty, University of Ljubljana, Ljubljana, Slovenia

[5]Department of Biotechnology and Life Sciences, Insubria University, Varese, Italy

[6]Department of Chemistry and Bioscience, Aalborg University, Aalborg, Denmark

[7]Mammal Research Institute, Polish Academy of Sciences, Białowieża, Poland

[8]Institute of Biological Problems of Cryolithozone, Siberian Branch of Russian Academy of Sciences, Yakutsk, Russia

[9]Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

*Correspondence: carolina.pacheco@cibio.up.pt (C.P.); rgodinho@cibio.up.pt (R.G.)

This PDF file includes:

Supplemental Figures (Figure S1 to S8)

Supplemental Tables (Table S1)

SUPPLEMENTAL FIGURES

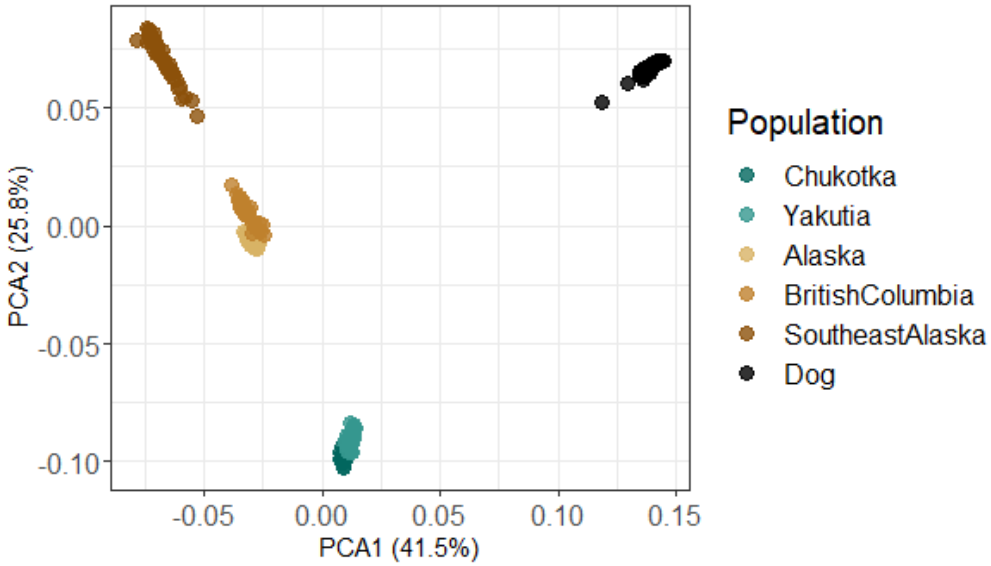

Figure S1. PCA plot of all wolves used in this study plus 36 mixed breed dogs genotyped for the same SNP panel by Cronin et al., (2015) and Medrano et al., (2014). This analysis was done with the 56K SNP dataset described in the "Population structure and differentiation" section of the Methods in the main text.

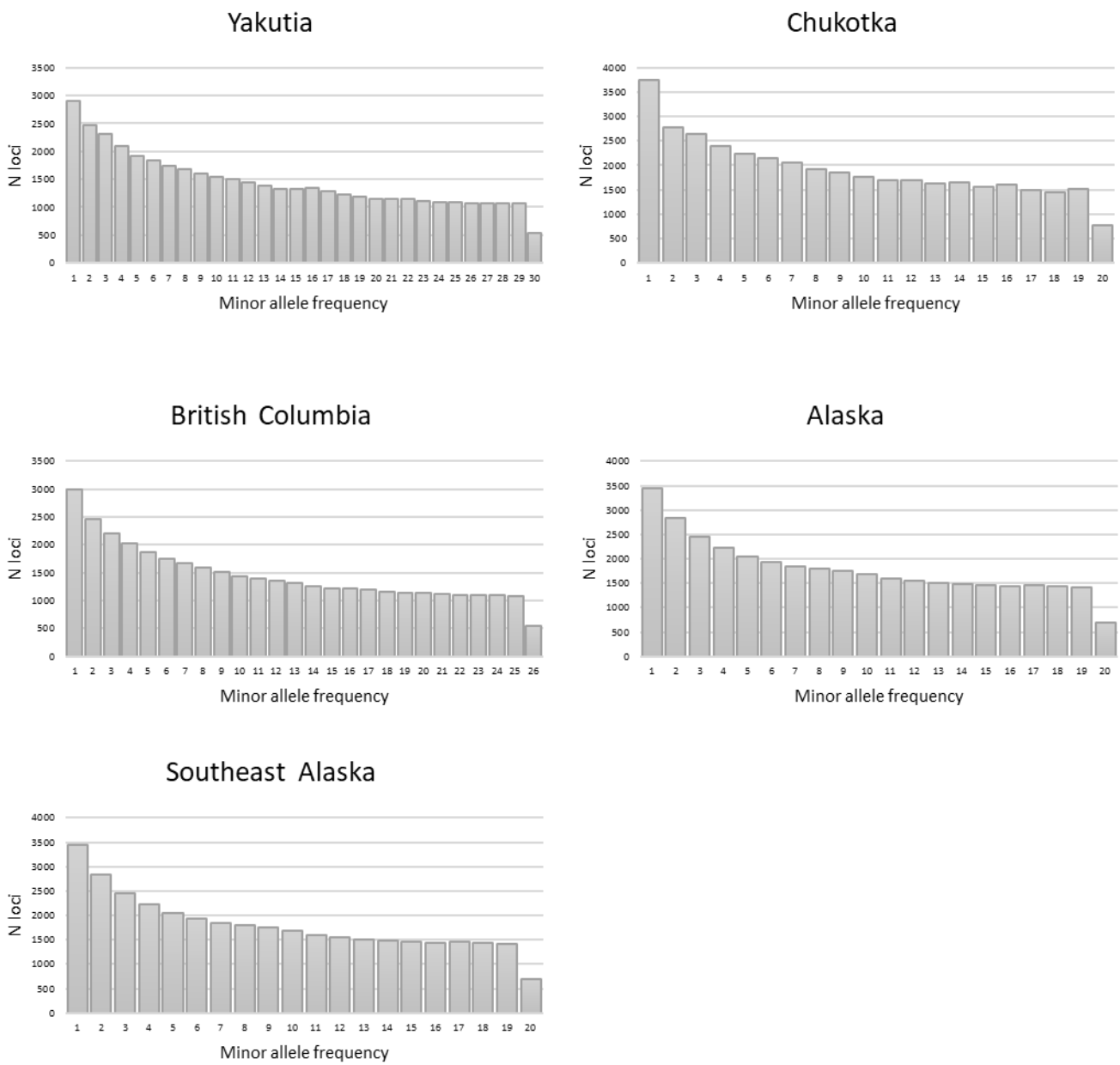

Figure S2. Site frequency spectrum (SFS) of the different populations used as input for the STAIRWAY PLOT analysis.

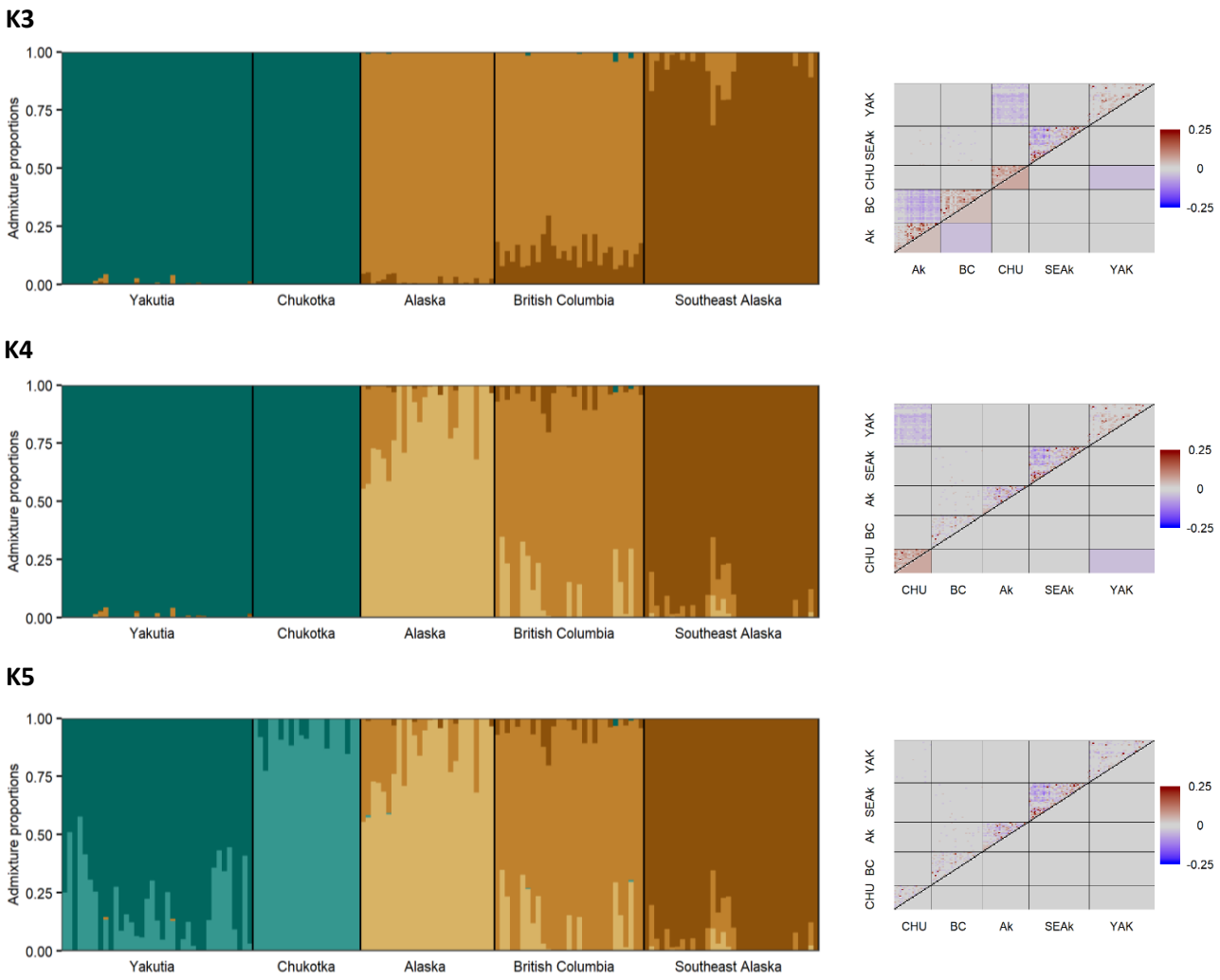

Figure S3. Population structure of grey wolves around the Bering Strait based on 56K SNPs inferred with ADMIXTURE analysis with assumed number of ancestral populations (*K*) ranging from 3 to 5 (left). Each vertical bar represents an individual and the colouring corresponds to its genetic ancestry. Matrix of pairwise correlations for residuals between true genotypes and genotypes predicted by the admixture model inferred with EVALADMIX analysis (right) using all grey wolves individuals for *K* ranging from 3 to 5. Values above the diagonal line indicate individual pairwise correlation and values under the diagonal indicate population mean correlations. Values deviating from zero indicate a poor fit of the admixture model to the data.

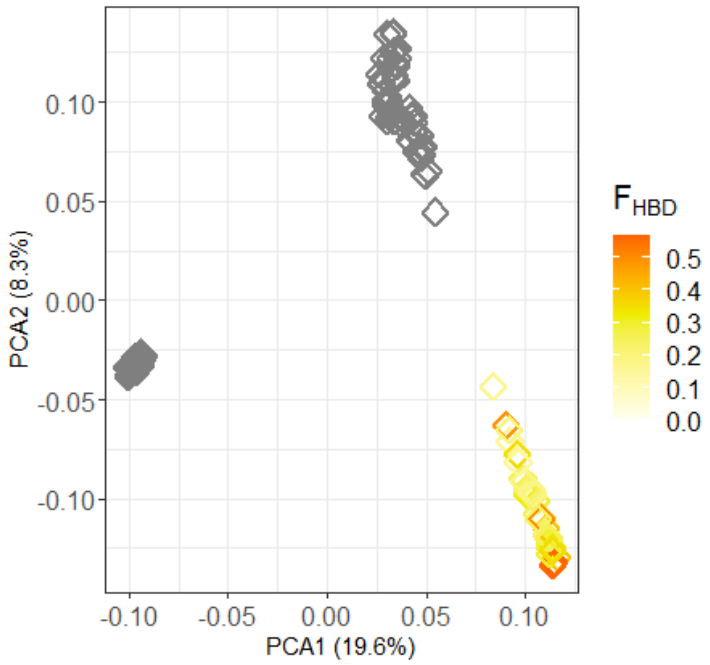

Figure S4. PCA plot of all wolves based on the 56K SNP dataset. The Southeast Alaska population is coloured based on inbreeding estimated by F_{HBD}.

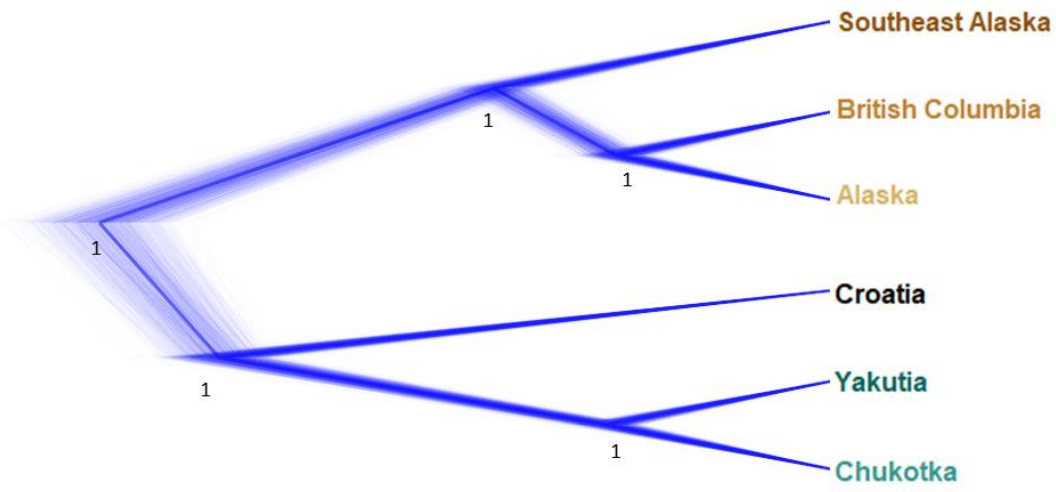

Figure S5. Phylogenetic trees from Bayesian coalescent analysis of SNP data using SNAPP with the same set of individuals as presented in Figure 4 of the main text. The thick line shows the consensus tree, and the numbers at each node denote the posterior probability.

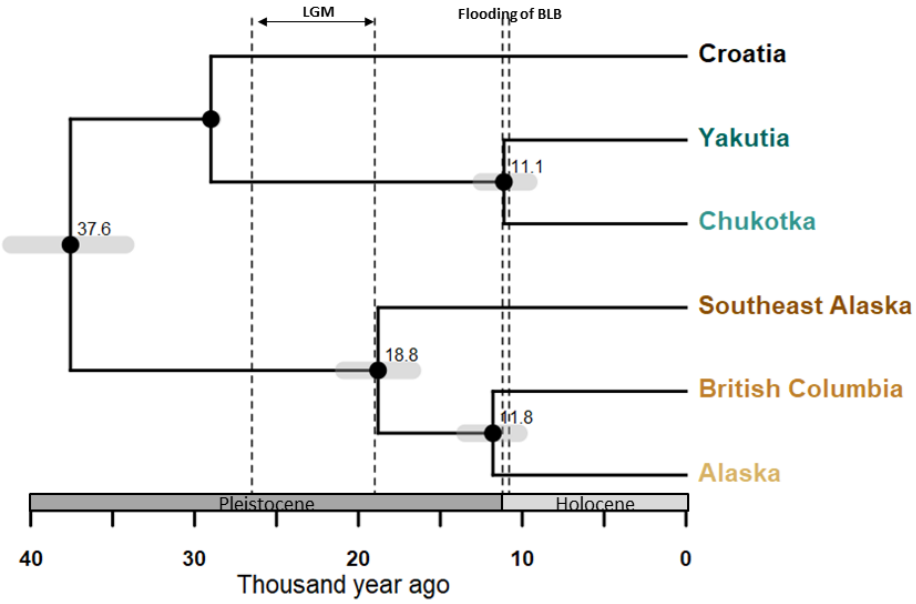

Figure S6. Chronogram of wolf populations resulting from Bayesian coalescent analysis of SNP data using SNAPP. This analysis was performed with a different set of individuals than used in Figure 4 of the main text but selected based on the same criteria. Median ages are provided above nodes, with 95% highest posterior densities (HPD) represented by the grey bars below. The x-axis corresponds to time before present in thousands of years. The vertical dashed lines indicate the intervals of the Last Glacial Maximum (LGM) and the estimated flooding of the Bering Land Bridge (BLB).

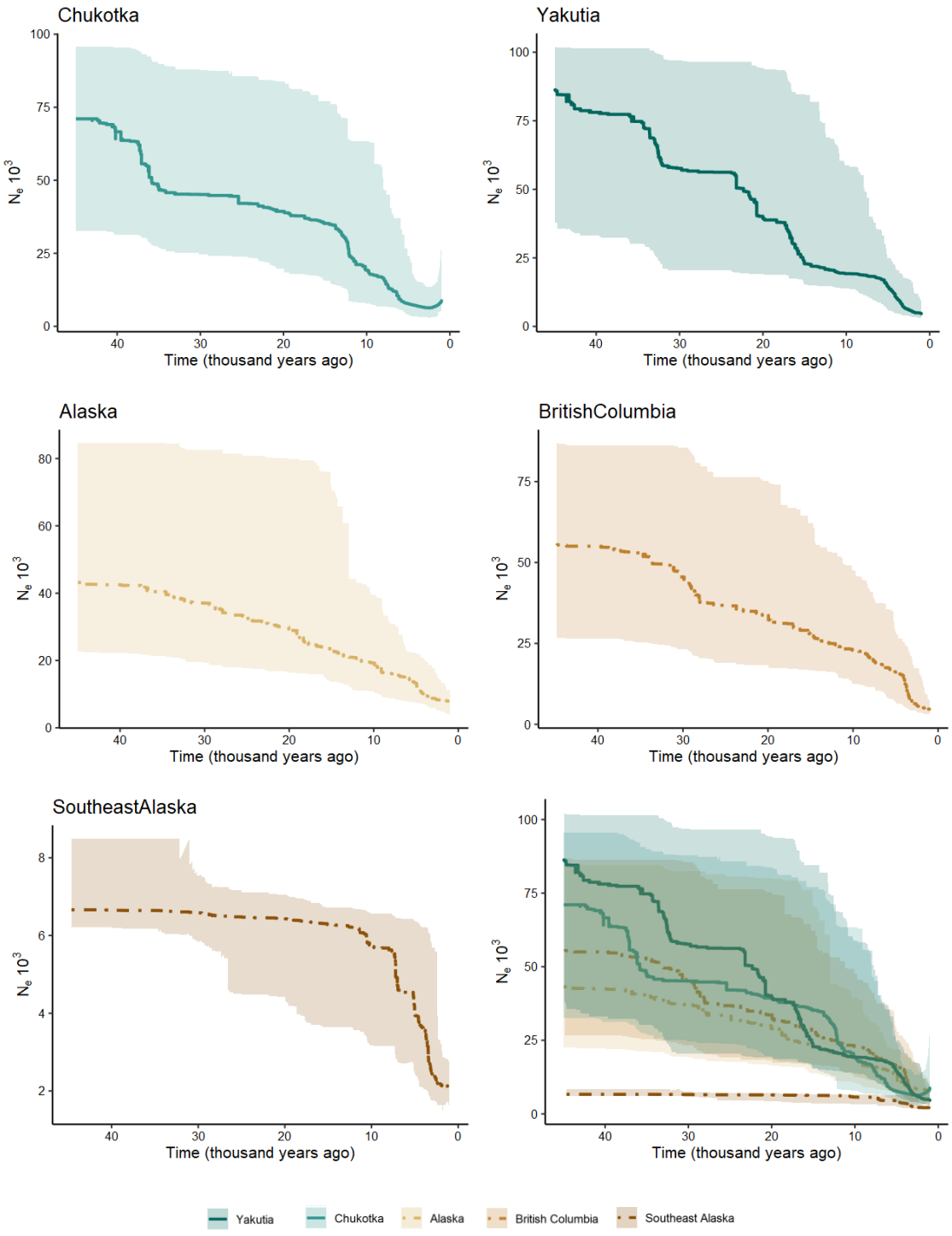

Figure S7. Reconstruction of demographic history with STAIRWAY PLOT, showing historic estimates of temporal N_E for each population. Lines indicate the median and the shaded ribbon indicates the 95% intervals of the estimated N_E, plotted from the past to the present.

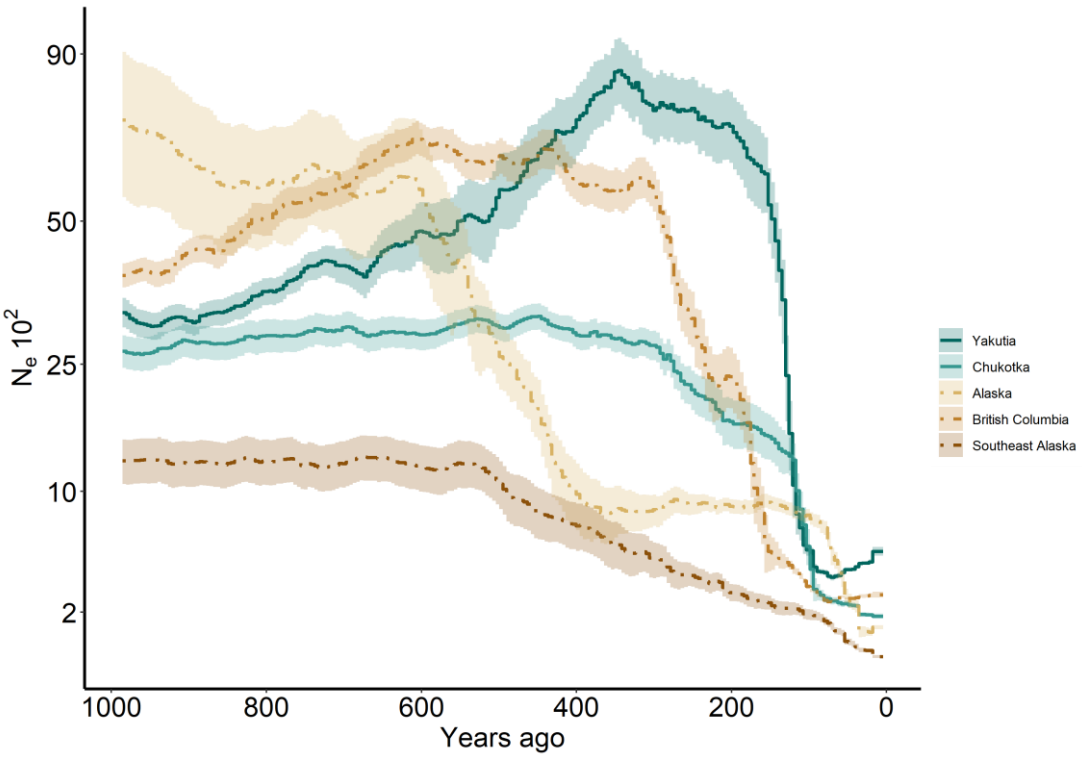

Figure S8. Reconstruction of temporal N_E across the past 1000 years inferred using GONE. The shadow area gives the 95% confidence interval of the estimates obtained by running 50 replicates, each corresponding to a random sample of 19 chromosomes per individual (half of the total number of chromosomes).

SUPPLEMENTAL TABLE

Table S1. Sample information for the dataset used in this study. We genotyped 58 Russian wolves, sampled between 2008 and 2011, and used available data from 89 North American wolves. The table presents the country, region, and locality of origin for each sample, the individual sex, and the reference for genotypes. All samples from Russian wolves were muscle tissue. nd: not determined.

Sample ID	Country	Region	Locality	Sex	Reference
CHU467	Russia	Chukotka	UstndBelaya	M	This study
CHU468	Russia	Chukotka	UstndBelaya	F	This study
CHU469	Russia	Chukotka	UstndBelaya	F	This study
CHU470	Russia	Chukotka	UstndBelaya	M	This study
CHU472	Russia	Chukotka	UstndBelaya	M	This study
CHU473	Russia	Chukotka	UstndBelaya	M	This study
CHU477	Russia	Chukotka	UstndBelaya	M	This study
CHU478	Russia	Chukotka	UstndBelaya	M	This study
CHU479	Russia	Chukotka	UstndBelaya	F	This study
CHU480	Russia	Chukotka	UstndBelaya	M	This study
CHU482	Russia	Chukotka	UstndBelaya	M	This study
CHU483	Russia	Chukotka	UstndBelaya	M	This study
CHU484	Russia	Chukotka	UstndBelaya	F	This study
CHU485	Russia	Chukotka	UstndBelaya	F	This study
CHU486	Russia	Chukotka	UstndBelaya	F	This study
CHU487	Russia	Chukotka	UstndBelaya	F	This study
CHU489	Russia	Chukotka	Mouth of the river Kanchelan	F	This study
CHU490	Russia	Chukotka	Mouth of the river Kanchelan	M	This study
CHU491	Russia	Chukotka	Lake Chistoe (Magadan Oblast)	M	This study
CHU492	Russia	Chukotka	Kanchalan village (UstndBelaya)	F	This study
CHU493	Russia	Chukotka	Kanchalan village (UstndBelaya)	F	This study
YAK1444	Russia	Yakutia	Batagay	nd	This study
YAK1446	Russia	Yakutia	Saidy	M	This study
YAK1447	Russia	Yakutia	Kharyyalakh	M	This study
YAK1448	Russia	Yakutia	Bulun	M	This study
YAK1449	Russia	Yakutia	EngyandSayylyga	F	This study
YAK1451	Russia	Yakutia	Bala	F	This study
YAK1452	Russia	Yakutia	Markha	nd	This study
YAK1454	Russia	Yakutia	Tomtor	M	This study
YAK1455	Russia	Yakutia	Uritskoye	F	This study
YAK1456	Russia	Yakutia	Markha	nd	This study
YAK1458	Russia	Yakutia	EngyandSayylyga	nd	This study
YAK1460	Russia	Yakutia	Salban	M	This study
YAK1464	Russia	Yakutia	Kystatyam	nd	This study
YAK1469	Russia	Yakutia	Stolby	nd	This study
YAK1470	Russia	Yakutia	Ugoyan	M	This study
YAK1472	Russia	Yakutia	Ert	nd	This study
YAK1473	Russia	Yakutia	Kystatyam	M	This study
YAK1474	Russia	Yakutia	Kystatyam	nd	This study

Sample ID	Country	Region	Locality	Sex	Reference
YAK1476	Russia	Yakutia	Berdinka	M	This study
YAK1477	Russia	Yakutia	Sebyanndkyuyol	M	This study
YAK1483	Russia	Yakutia	Abaga	F	This study
YAK1484	Russia	Yakutia	Aldan	F	This study
YAK1485	Russia	Yakutia	Tympy	nd	This study
YAK1486	Russia	Yakutia	Tympy	nd	This study
YAK1489	Russia	Yakutia	UstndMaya	nd	This study
YAK1492	Russia	Yakutia	Sebyanndkyuyol	F	This study
YAK1493	Russia	Yakutia	Diupsya	M	This study
YAK1494	Russia	Yakutia	Byadi	M	This study
YAK1495	Russia	Yakutia	Bolugur	F	This study
YAK1498	Russia	Yakutia	Kresndkhaldzhai	nd	This study
YAK1499	Russia	Yakutia	Teply klyuch	M	This study
YAK1501	Russia	Yakutia	Saydy	F	This study
YAK1503	Russia	Yakutia	Mekimdya	nd	This study
YAK1504	Russia	Yakutia	Uolba	F	This study
YAK1509	Russia	Yakutia	DaiandAmgata	F	This study
YAK1510	Russia	Yakutia	Saydy	F	This study
YAK1512	Russia	Yakutia	Saidy	nd	This study
BC38	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC41	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC42	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC43	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC44	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC45	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC46	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC47	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC48	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC49	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC51	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC52	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC53	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC54	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC56	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC57	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC59	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC60	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)

Sample ID	Country	Region	Locality	Sex	Reference
BC61	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC62	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC63	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC64	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC65	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC66	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC67	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC68	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC155	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC316	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
BC317	Canada	British Columbia	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak70	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak71	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak72	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak73	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak74	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak75	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak76	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak77	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak80	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak83	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak84	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak89	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak91	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak140	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak141	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak142	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak143	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak144	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak145	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)

Sample ID	Country	Region	Locality	Sex	Reference
Ak147	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak148	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak149	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak150	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak152	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak153	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
Ak154	United States of America	Interior Alaska	nd	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk97	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk98	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk99	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk103	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk107	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk206	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk213	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk216	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk220	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk223	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk217	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk218	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk246	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk249	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk250	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)

Sample ID	Country	Region	Locality	Sex	Reference
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SEAk268	United States of America	Game Management Units 1A	Southernmost mainland and Revillagigedo Island	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk200	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk219	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk224	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk226	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk235	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk236	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk241	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk242	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk243	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk244	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
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SEAk247	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk251	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
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SEAk258	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)
SEAk260	United States of America	Game Management Units 3	Kupranof, Etolin, Mitkof islands	nd	Cronin et al. (2015) & Medrano et al. (2014)