APPENDIX S3: Logistic regression results

This appendix includes the following sections:

- *Logistic regression results based on restricted LGM range estimates*

- *Logistic regression results based on unrestricted LGM range estimates*

Logistic regression results based on restricted LGM range estimates

This section provides further details (than those presented in the main text) on the logistic regression results computed with the restricted LGM range estimates.

Table S3.1. Summary of results for regression models including climate (M_C) or accessibility (M_A) alone, or together (M_{CA}). Accessibility was calculated based on the restricted estimates of species' LGM range.

	K	ΔAIC	n_{best}	n_{subst}	w (%)	w_{best} (%)	R_L^2 (%)	$R_{L\,best}^2$ (%)
All species								
M_C	7	94.9 ± 104.1	97	36	8.6 ± 20.5	66.2 ± 6.9	35.1 ± 13.9	39.7 ± 13.1
M_A	2	479.9 ± 376.2	0	0	0.0 ± 0.3	—	15.8 ± 15.5	—
M_{CA}	8	0.1 ± 0.4	919	97	91.4 ± 20.5	97.5 ± 8.4	42.7 ± 14.3	43.0 ± 14.4
Species with a positive $\beta_{MA(A)}$								
M_C	7	113.7 ± 110.3	48	20	6.8 ± 18.5	66.4 ± 6.6	32.7 ± 11.7	39.4 ± 10.8
M_A	2	379.9 ± 338.7	0	0	0.0 ± 0.4	—	19.2 ± 15.4	—
M_{CA}	8	0.1 ± 0.4	607	48	93.2 ± 18.5	97.9 ± 7.9	42.8 ± 13.2	43.1 ± 13.3

K, total number of estimated parameters including the intercept; ΔAIC, mean (± sd) Akaike difference across all species ($n = 1,016$) and species with positive model-averaged accessibility coefficients ($\beta_{MA(A)}$, $n = 665$); n_{best} and n_{subst}, number of times a model was selected as the best ($\Delta AIC = 0$) or as having substantial support ($0 < \Delta AIC \leq 2$); w and w_{best}, mean (± sd) Akaike weight for all species or for the species for which the models were chosen as the best; and R_L^2 and $R_{L\,best}^2$, mean proportion (± sd) of the variation in species occurrences explained by a given model for all species or for the species for which the models were chosen as the best.
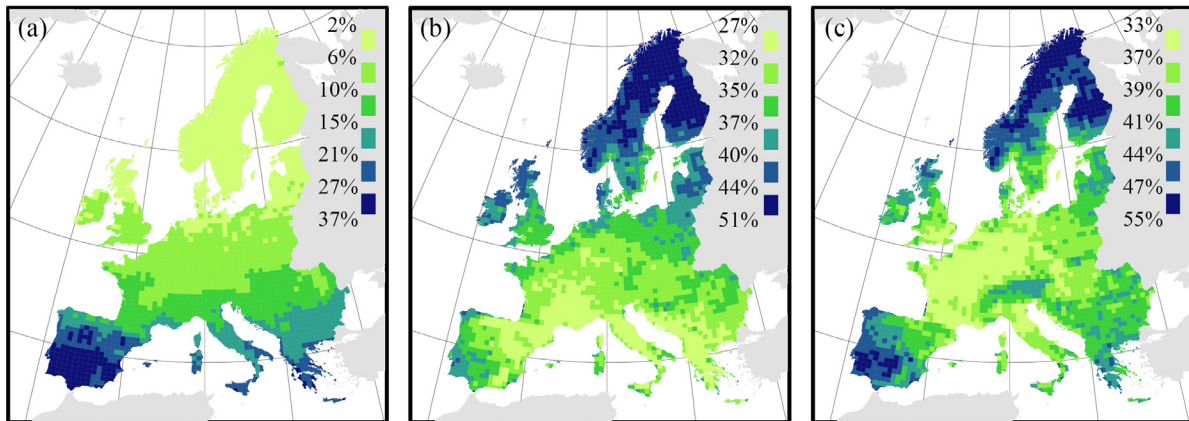
Figure S3.1 Geographic patterns in the importance of accessibility and climate for species occurrences across Europe. Average likelihood R^2 for models with (a) only accessibility, (b) only climate, or (c) both accessibility and climate. All values were calculated across species with a positive model-averaged accessibility coefficient ($n = 655$) in each c. 50×50 km AFE cell. Maps are in the ETRS 1989 Lambert Azimuthal Equal Area projection.
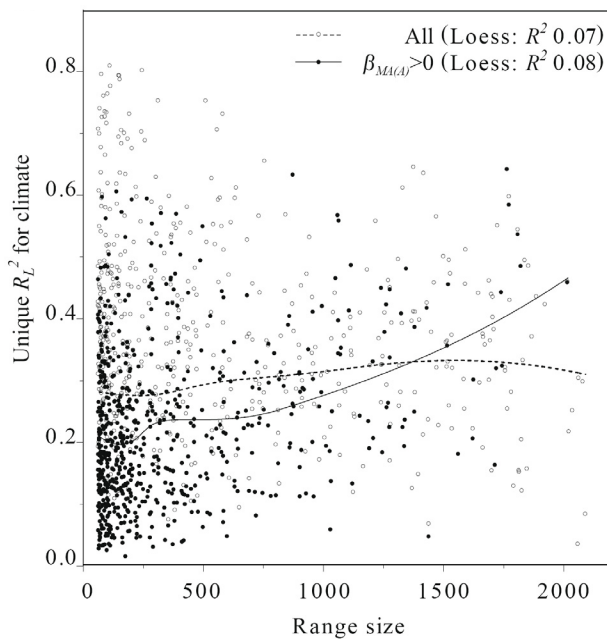

Figure S3.2 Relationship between the importance of climate for species occurrences and species current range size. Unique R_L^2 for climate represent the variation in species occurrences uniquely explained by climate after controlling for the effect of accessibility (shown for all species, $n = 1,016$). Linear and Gaussian local (loess, fitted with span = 0.75 and a quadratic term) regressions were fitted either for all species or only for species with a positive model-averaged accessibility coefficient ($n = 655$).

Logistic regression results based on unrestricted LGM range estimates

The logistic regression results computed with accessibility to recolonisation from the unrestricted estimates of species' LGM ranges were very similar to those obtained using the more realistic restricted estimates (compare Table S3.1 and Table 1 (in the main text) with Table S3.2 and S3.3).

Table S3.2 Summary of results for the regression models including climate (M_C) and accessibility (M_A) alone, or together (M_{CA}). Accessibility was calculated based on the unrestricted estimates of species' LGM range.

	K	ΔAIC	n_{best}	n_{subst}	w (%)	w_{best} (%)	R_L^2 (%)	$R_{L\ best}^2$ (%)
All species								
M_C	7	93.4±103.2	98	35	8.6±20.6	66.2±6.9	35.1±13.9	39.7±13.1
M_A	2	481.3±374.9	0	0	0.0±0.2	-	15.4±14.9	-
M_{CA}	8	0.1±0.4	918	98	91.3±20.6	97.5±8.4	42.5±14.1	42.8±14.2
Species with a positive $\beta_{MA(A)}$								
M_C	7	112.2±109.4	48	19	6.8±18.5	66.4±6.6	32.6±11.7	39.4±10.8
M_A	2	383.6±338.2	0	0	0.0±0.2	-	18.7±14.7	-
M_{CA}	8	0.1±0.4	601	48	93.2±18.5	98.0±7.8	42.5±12.9	42.7±13.0

K, total number of estimated parameters including the intercept; ΔAIC, mean (± SD) Akaike difference across all species ($n = 1,016$) and species with positive model-averaged accessibility coefficients ($\beta_{MA(A)}$, $n = 665$); n_{best} and n_{subst}, number of times a model was selected as the best ($\Delta AIC = 0$) or as having substantial support ($0 < \Delta AIC \leq 2$); w and w_{best}, mean (± SD) Akaike weight for all species or for the species for which the models were chosen as the best; and R_L^2 and $R_{L\ best}^2$, mean proportion (± SD) of the variation in species occurrences explained by a given model for all species or for the species for which the models were chosen as the best.

Table S3.3 Relative importance of climate and accessibility for species occurrences. Accessibility was calculated based on the unrestricted estimates of species' LGM range.

	All		Positive $\beta_{MA(A)}$	
	W (%)	$R_{L\ unique}^2$ (%)	W (%)	$R_{L\ unique}^2$ (%)
Climate	100.0±0.2	28.7±16.2	100.0±0.2	22.6±12.7
	100.0 (96.3; 100.0)	25.9 (2.2; 80.9)	100.0 (96.3; 100.0)	20.6 (2.2; 64.1)
Accessibility	91.4±20.6	5.5±8.5	93.2±18.5	8.6±9.3
	100.0 (26.9; 100.0)	0.7 (0.0; 49.8)	100.0 (26.9; 100.0)	5.1 (0.0; 49.8)

W, average (± SD) and median (minimum; maximum) summed Akaike weights for climate and accessibility. $R_{L\ unique}^2$, average (± SD) and median (minimum; maximum) proportion of variation in species occurrences uniquely explained by climate or accessibility after controlling for the other factor. The values were either calculated across all species ($n = 1,016$) or only for species with a positive model-averaged parameter accessibility coefficient (positive $\beta_{MA(A)}$, $n = 655$).