

Supplementary material:

Table S1. Predictor importance in (A) ENFA and (B) MAXENT models based on the three sampling strategies (1, 2, 3), each tested with full (F) and reduced (R) dataset. (A) In ENFA models the contribution of each predictor to explained information is provided, which is defined as the contribution to marginality (M, provided by the first factor) plus the contribution to specialisation (S, provided by the subsequent significant factors) divided by 2 (Hirzel et al. 2002). The number of significant factors are indicated and the amount of information they account for are given in parentheses. (B) In MAXENT, an estimate of predictor importance is given as percent (%) contribution to the models' total increase in regularised log likelihood compared to a uniform distribution. At each iteration of the training algorithm, this increase (= gain) is added to the value of the corresponding predictor, or subtracted from it if the gain was negative. Linearly intercorrelated variables must be interpreted with caution as the overall contribution to gain may be split between variables (see FOALL and AGALL). The total amount of regularised log likelihood is given in parentheses.

(A) ENFA	1F 3F (92.2%)	2F 4F (94.2%)	3F 3F (93.1%)	1R 3F (98.2%)	2R 4F (94.3%)	3R 3F (93.3%)
SNOWD	0.255	0.208	0.409	0.430	0.174	0.383
SCVAL	0.156	0.128	0.368	0.297	0.130	0.324
SLOPE	0.019	0.055	0.044	0.022	0.066	0.038
TOPEX	0.060	0.017	0.059	0.119	0.022	0.067
FOALL	0.336	0.376	0.111	0.281	0.453	0.101
FCOMI	0.141	0.133	0.142	0.248	0.124	0.190
AGFOR	0.128	0.191	0.144	0.207	0.157	0.150
AGALL	0.336	0.402	0.401	0.294	0.399	0.384
AGDIST	0.155	0.175	0.125	0.251	0.153	0.135
URB	0.069	0.126	0.041	0.116	0.099	0.047
URBDIST	0.137	0.123	0.047	0.247	0.123	0.064
STTRA	0.097	0.104	0.060	0.153	0.095	0.068
STALL	0.091	0.089	0.051	0.132	0.071	0.082
STDIST	0.152	0.130	0.081	0.258	0.123	0.113
(B) MAXENT	1F (1.756)	2F (1.689)	3F (2.133)	1R (2.578)	2R (2.386)	3R (3.838)
SNOWD	60.7	47.2	59.7	73.8	63.9	64.8
SCVAL	4.3	6.4	32.7	7.3	4.0	24.5
SLOPE	0.1	0.2	2.1	0.0	0.6	1.9
TOPEX	3.3	0.9	1.0	1.2	0.3	0.1
FOALL	0.1	13.0	2.0	6.5	10.3	2.3
FCOMI	0.5	4.6	0.5	1.1	3.3	0.4
AGFOR	4.2	0.2	0.3	2.3	0.0	0.3
AGALL	20.4	18.8	0.6	4.6	13.8	2.0
AGDIST	0.2	1.2	0.0	0.6	0.3	0.9
URB	0.3	0.8	0.0	0.1	1.8	0.2
URBDIST	0.1	0.0	0.0	0.0	0.7	0.1
STTRA	0.1	6.2	0.0	0.2	0.2	0.2
STALL	0.1	0.1	0.3	0.9	0.0	0.3
STDIST	5.6	0.4	0.8	1.4	0.8	2.0

Table S2. Statistical significance of the differences between Kappa values for the models given in Fig. 4a, b, comparing ENFA and MAXENT models of three different sampling strategies (1, 2, 3) and two different sample sizes (full and reduced data set). Differences in the models' performances in localising unknown areas of species presence ("location", Fig. 4a, with absence data collected outside a 1 km buffer around the presence data are presented in the upper right part of the matrix, differences in the precise delineation of their spatial extent ("precision" Fig. 4b, with absence data collected within a 1 km buffer around the presence data) in the lower left part. Asterisks indicate the level of significance (** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$).

model	dataset	strategy	ENFA						MAXENT						
			full			red.			full			red.			
			1	2	3	1	2	3	1	2	3	1	2	3	
ENFA	full	1		n.s.	***	*	n.s.	***	n.s.	***	***	***	***	***	***
		2	*		***	n.s.	n.s.	***	n.s.	***	***	***	***	***	***
		3	***	***		***	***	n.s.	***	***	***	***	***	***	***
	red.	1	n.s.	n.s.	***		n.s.	***	***	***	***	***	***	***	***
		2	*	n.s.	***	n.s.		***	n.s.	***	***	***	***	***	***
		3	***	***	n.s.	***	***		***	***	**	***	***	***	***
MAXENT	full	1	n.s.	*	***	n.s.	*	***		***	***	***	***	***	
		2	n.s.	n.s.	***	n.s.	n.s.	***	n.s.		***	***	***	***	
		3	***	***	**	***	***	*	***	***		***	***	n.s.	
	red.	1	***	n.s.	*	**	n.s.	**	***	**	***		n.s.	***	
		2	***	*	n.s.	***	*	*	***	***	***	n.s.		***	
		3	***	***	**	***	***	**	***	***	n.s.	***	***		

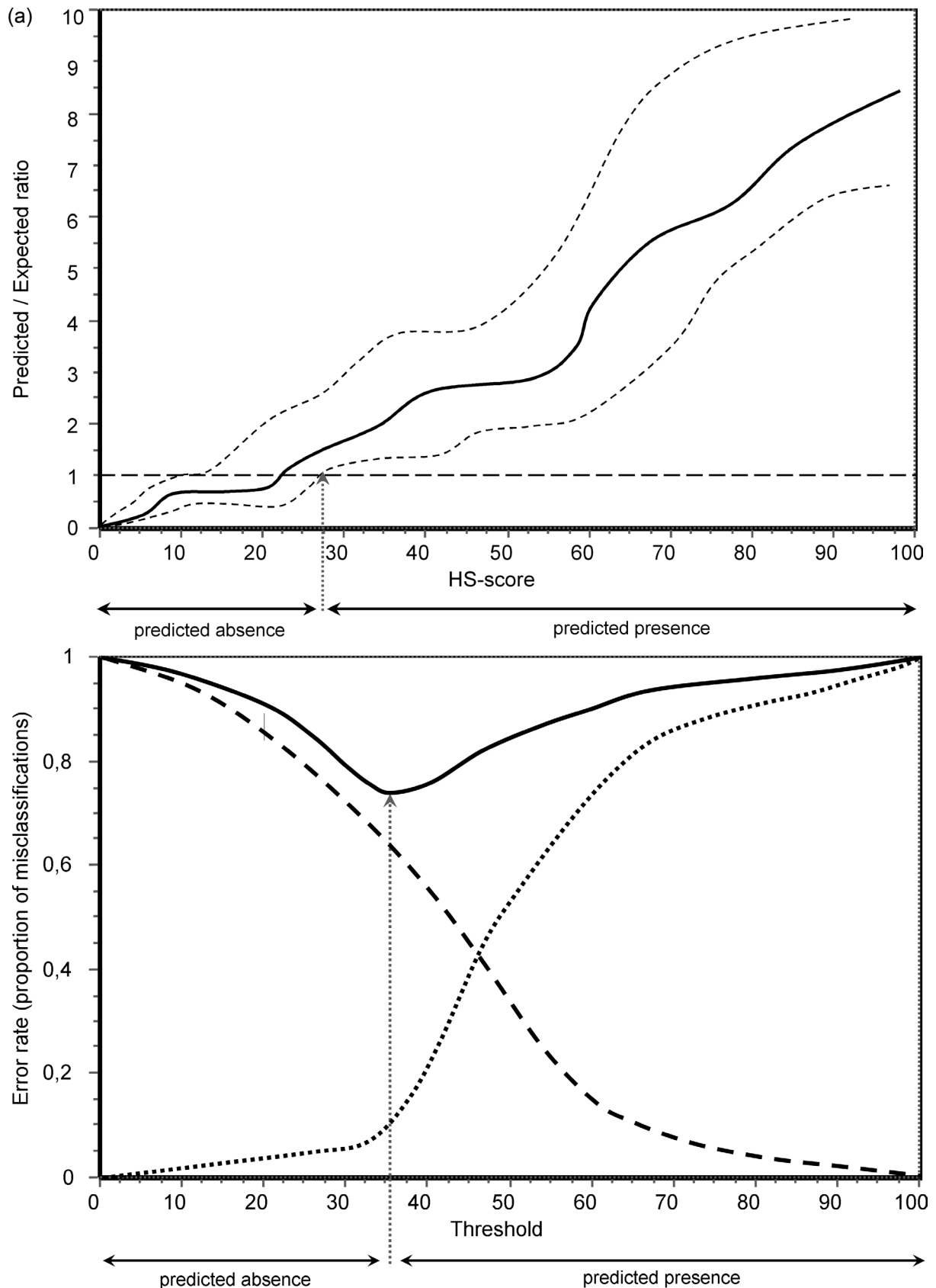


Figure S1. Methods for discriminating between predicted presence and absence used with the different modelling methods. In the ENFA models (a) predicted presence was assigned to all HS-scores larger than the value at which the ratio of predicted to expected species presence (P/E, continuous line) including its 90% confidence interval (dashed line) was > 1 (cf. Hirzel et al. 2006, modified). In MAXENT models (b) the threshold was selected according to the different types of misclassification error. With increasing threshold-values the proportion of misclassified presences (omission error, dotted line) increases, while the proportion of misclassified absences (commission error, dashed line) decreases. The threshold was assigned to the HS score value at which the total amount of misclassification (solid line) was minimised (cf. Fielding and Bell 1997, modified).