Supplementary information

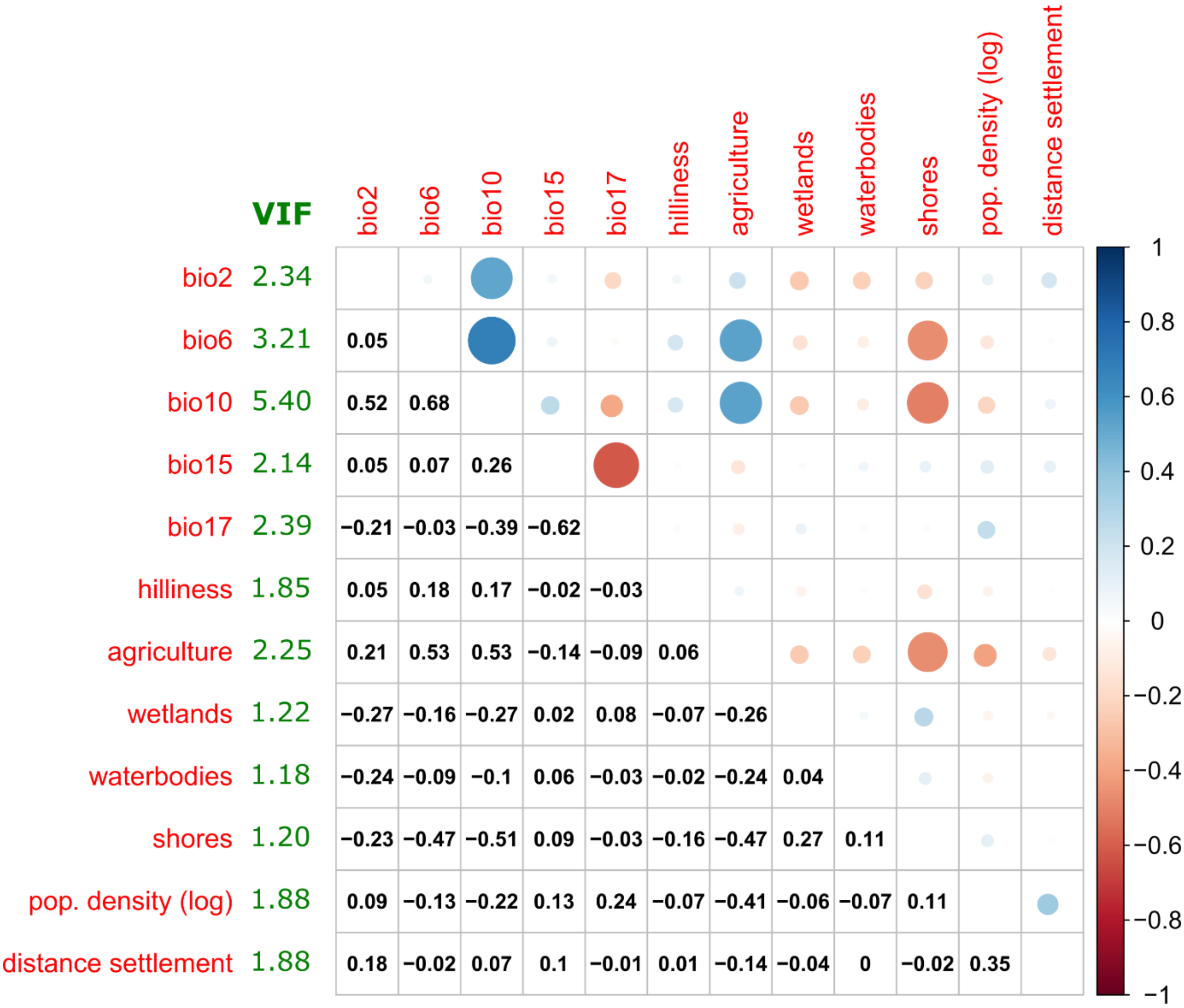

Figure S1. Pairwise Pearson's correlation coefficients for predictor variables. *VIF values for the variables are given in green. The following candidate variables were excluded from the analysis due to high correlation: mean altitude, artificial surfaces, forest and semi-natural areas, bio1 (mean annual temperature), bio3 (isothermality), bio4 (temperature seasonality), bio5 (max temperature of warmest month), bio7 (temperature annual range), bio8 (mean temperature of wettest quarter), bio9 (mean temperature of driest quarter), bio11 (mean temperature of coldest quarter), bio12 (mean annual precipitation), bio13 (precipitation of wettest month), bio14 (precipitation of driest month), bio16 (precipitation of wettest quarter), bio18 (precipitation of warmest quarter), bio19 (precipitation of coldest quarter).*

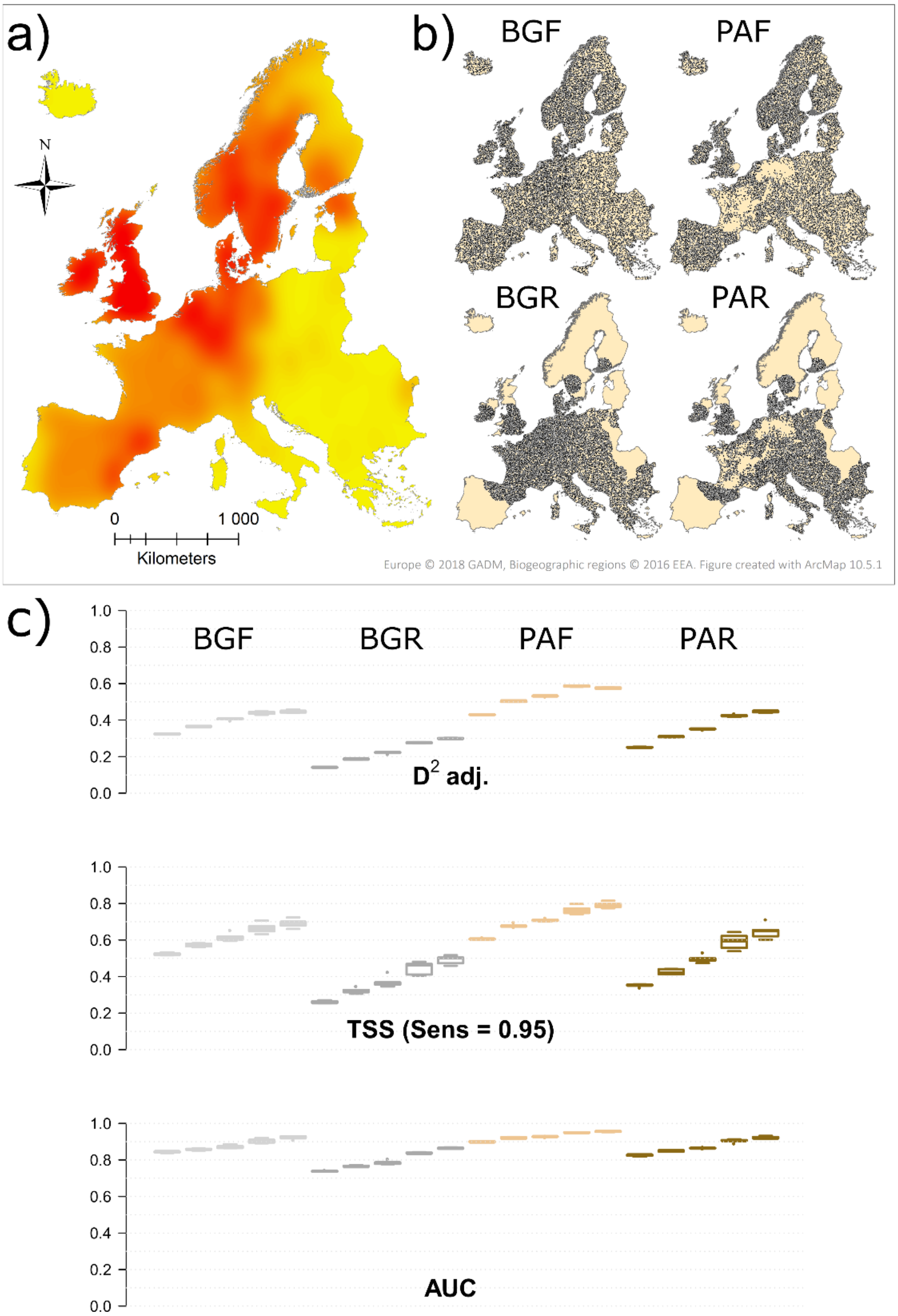

Figure S2. Absence sampling strategies. *a) Bias file, i.e. a probability density surface derived from presences of comparable species deposited on GBIF. Red colours indicate high and yellow colours low sampling intensity. b) Sampling schemes of the four examined versions of generated absences: BGF = background (i.e. sampling within all grid cells) full extent and BGR = background restricted extent, PAF = pseudo-absences (i.e. sampling only within non-presence grid cells) full extent and PAR = pseudo-absences restricted extent (i.e. 150 km buffer around coypu occurrences) c) Model evaluation (D^2, TSS, AUC) by means of the results of a fivefold cross-validation per persistence level and absence design. Pseudo-absences across the full extent of our study area (PAF) performed best and consequently were chosen for further analysis.*

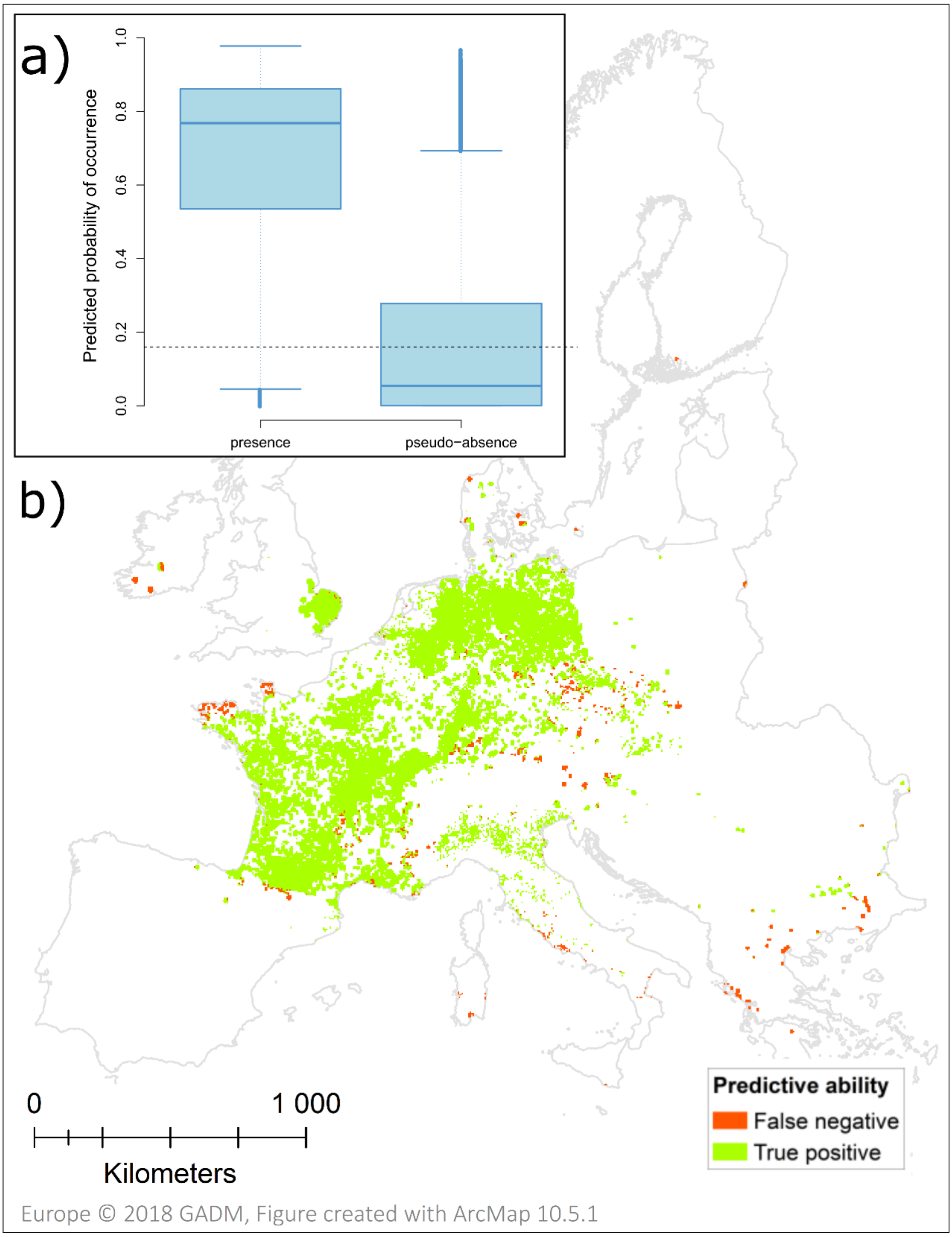

Figure S3. Predictive ability of the consensus prediction under current climatic conditions (1979 - 2013). *a) Boxplot showing the distribution of the predicted probabilities of occurrence for presence and pseudo-absence grid cells. Medians of predicted probability of occurrence are 0.05 and 0.77, for pseudo-absence and presence, respectively. b) Spatial patterns of omission errors (1309 grid cells; in red) and true positives (24225 grid cells; in green).*

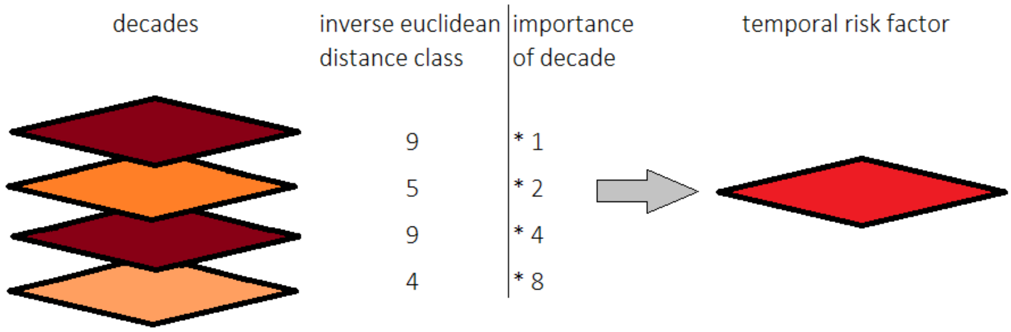

Figure S4. Calculation of the weighting factor for the coypu invasion risk map. *The inverse Euclidean distance to the nearest grid cell with coypu presence (max. distance 150 km) was calculated for each grid cell for each decade (1980–1989; 1990–1999; 2000–2009; 2010–2018) and consequently divided in classes from 10 (close) to 1 (very distant). The resulting values have been weighted, according to the increasing importance of the decade (x decade = 2 x former decade, starting with 1 for 1980–1989) and summed up for each cell (see example above). Further, the matrix was scaled from 0 to 100 by dividing each grid cell value by the maximum value of the matrix and multiplying with 100. The risk map was derived as follows: probability of occurrence [%] * spatiotemporal risk factor.*

Table S1. Presence data sources included in this study, listed by country and the total number of records per country after data cleaning. *The downloaded GBIF data comprises 26 datasets (shown in parentheses) and was partly overlapping with other primary or secondary sources, from where data has been requested.*

Country	*Sources*	*#*
Albania	Bego et al. (2018)	7
Austria	NHM Vienna; *Biologiezentrum Linz* (J. Plass); *Haus der Natur* (Salzburg); inatura Dornbirn; iNaturalist; Hunting authorities Burgenland, Styria and Vorarlberg; Burgenland Provincial Government Dep. for Nature Conservation; Spitzenberger (2001); Spitzenberger et al. (1996); GBIF (naturgucker, anymals.org); beaver officers	134
Belgium	Natuurpunt Studie/Waarnemingen.be (website for nature information of Natuurpunt and Stichting Natuurinformatie); Natagora; iNaturalist; GBIF (RBINS DaRWIN, Natuurpunt)	326
Bulgaria	ESENIAS project (unpublished, Dragoev 1978; Gabrashanski et al. 1980, Gruychev 2012), Gruychev (2017), Peshev et al. (2004)	101
Croatia	ESENIAS project (CAEN 2017); Purger & Kristufek (1991)	7
Czech Republic	Anděra (2011); Anděra M. (personal communication); GBIF (iNaturalist, naturgucker); iNaturalist	819
Denmark	Danish Environmental Protection Agency; Fugle og Natur; Danish Hunting Statistics; GBIF (Atlas of Danish Mammals)	32
Finland	Finnish Invasive Alien Species Portal (http://www.vieraslajit.fi/)	1
France	MNHN, GBIF (IASTracker, iNaturalist, MHNG, naturgucker), iNaturalist	10,255
Germany	Arnold, Greiser, Krüger, & Martin, (2016) & DJV (Deutscher Jagdverband); DVWK (1997); GBIF (iNaturalist, anymals.org, naturgucker, Artenfinder, „GEO-Tag der Artenvielfalt“, MNHNL); Heidecke et al. 2001 and Heidecke (2009) in Scheide (2013); iNaturalist	6,702
Greek	ESENIAS project (Adamopoulou & Legakis 2016); iNaturalist	49

Hungary	Department of Nature Conservation of Ministry of Agriculture; Fertö Hanság Nationalpark; iNaturalist	36
Ireland	GBIF (National IAS Database)	4
Italy	Ornitho.it; Italian Mammal Society (ATIt); GBIF (iNaturalist, naturgucker); iNaturalist	3,058
Luxembourg	MNHNL	9
Macedonia	Purger & Kristufek (1991)	3
Montenegro	Purger & Kristufek (1991)	1
Netherlands	NDFF, Zoogdierverenigung; GBIF (naturgucker); iNaturalist	1,945
Poland	Institute of Nature Conservation PAS, GBIF (Mammal Research Institute PAS, Institute of Nature Conservation PAS)	7
Romania	ESENIAS project (Murariu and Chişamera 2004)	5
Serbia	Purger & Kristufek (1991), iNaturalist	3
Slovakia	State Nature Protection SR; Administration of Protected Landscape Area Ponitrie	19
Slovenia	Bioportal (www.bioportal.si); Purger & Kristufek (1991); iNaturalist	29
Spain	Herrero & Couto (2002); Salsamendi, Latierro, & O'Brien (2010); GBIF (Ministry of Agriculture, Food and Environment; naturgucker, ornithon.cat); http://www.diariovasco.com	80
Sweden	GBIF (Artportalen)	1
Switzerland	Info fauna Centre Suisse de Cartographie de la Faune (CSCF); iNaturalist; GBIF (MHNG, naturgucker)	54
Turkey	ESENIAS project (Özkan 1999)	14
United Kingdom	GBIF (Atlas of Mammals (1993), NBIS, SBIS)	531
In total		**24,232**

Table S2. Top models (ΔAIC < 4) that have been used for averaging within the persistence levels and their according weight. *Only water bodies and shores were repeatedly removed from top models.*

	poly(bio02, 2)	poly(bio06, 2)	poly(bio10, 2)	poly(bio15, 2)	poly(bio17, 2)	poly(hilliness, 2)	poly(popgrid, 2)	poly(dist, 2)	poly(agriculture, 2)	poly(wetlands, 2)	poly(waterbodies, 2)	poly(shores, 2)	ΔAICc	weight
all	+	+	+	+	+	+	+	+	+	+	+	+		0.67
	+	+	+	+	+	+	+	+	+	+	X	+	1.43	0.33
multiple	+	+	+	+	+	+	+	+	+	+	+	X		0.78
	+	+	+	+	+	+	+	+	+	+	+	+	2.59	0.22
one GL	+	+	+	+	+	+	+	+	+	+	+	X		0.54
	+	+	+	+	+	+	+	+	+	+	X	X	0.71	0.38
	+	+	+	+	+	+	+	+	+	+	+	+	4	0.07
two GL	+	+	+	+	+	+	+	+	+	+	+	X		0.7
	+	+	+	+	+	+	+	+	+	+	+	+	1.67	0.3
establ	+	+	+	+	+	+	+	+	+	+	X	X		0.4
	+	+	+	+	+	+	+	+	+	+	X	+	0.11	0.38
	+	+	+	+	+	+	+	+	+	+	+	X	2.23	0.13
	+	+	+	+	+	+	+	+	+	+	+	+	2.8	0.1