Supplementary Material

Home range size and resource use of breeding and non-breeding white storks along a land use gradient

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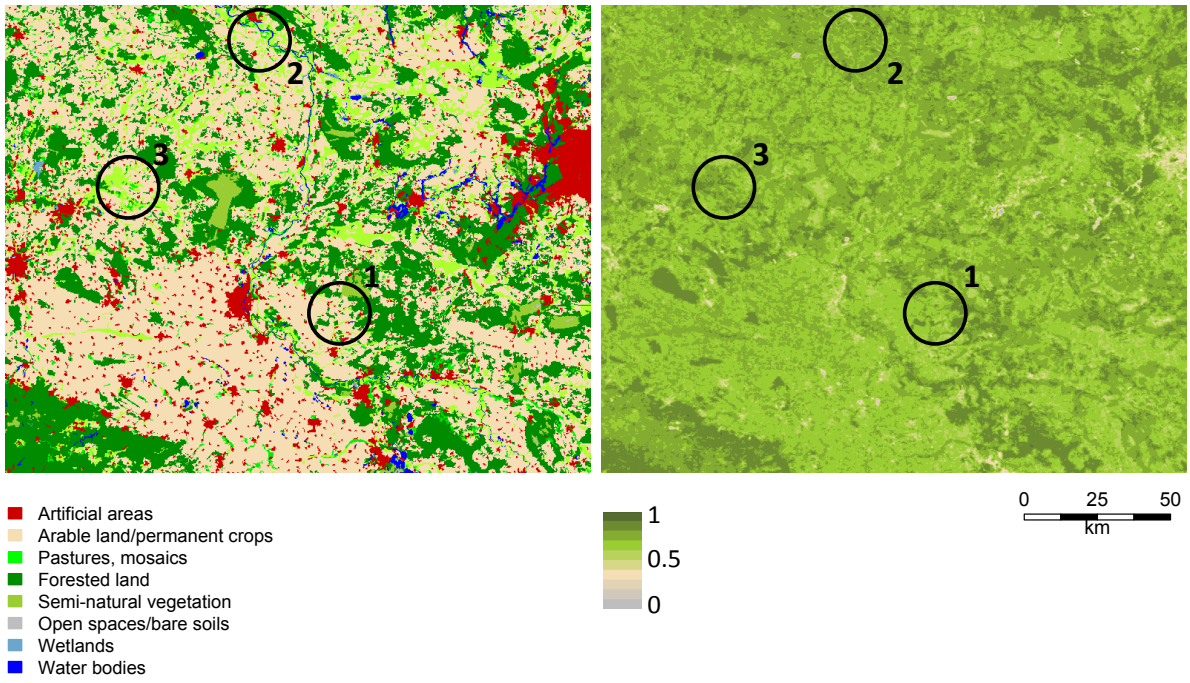
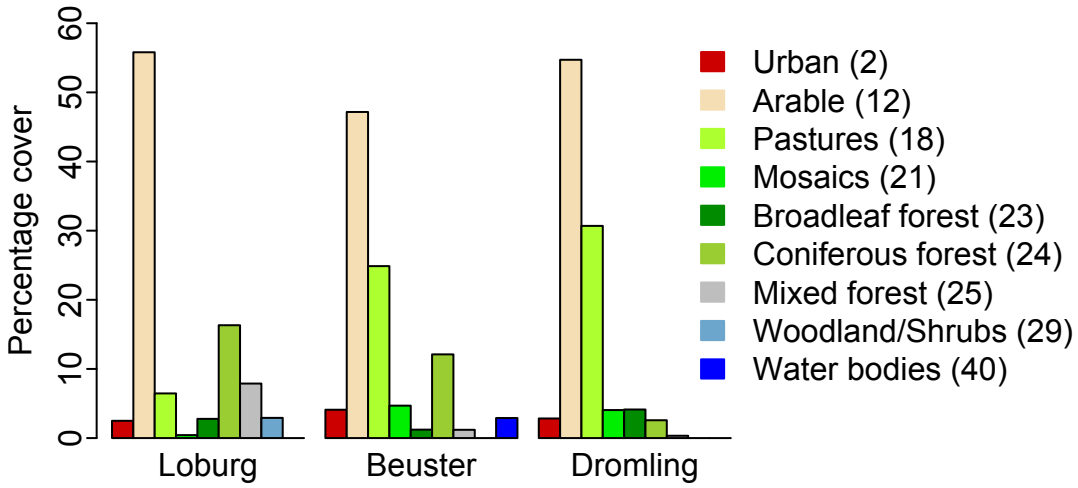
1 Supplementary Figures and Tables

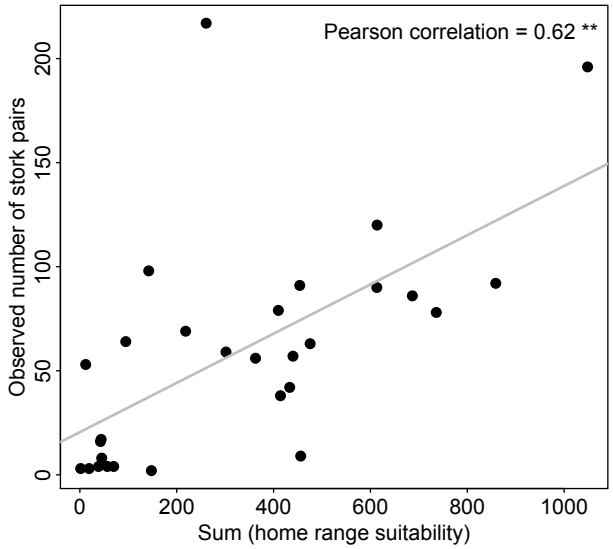
1.1 Supplementary Figures



Supplementary Figure S1. Corine land cover types 2006 (left) and Normalized differenced vegetation index NDVI (right) in study region. The study area is delimited by Berlin in the East and by Harz mountains in Southwest. Numbers indicate the mean central nest coordinates (with 15km buffer) of all individuals tracked in the three study locations (1) Loburg, (2) Beuster and (3) Dromling. NDVI was averaged over all considered tiles in 2014.



Supplementary Figure S2. Percentage cover of relevant Corine land cover types in the different study locations. These were evaluated within 15 km buffer distances around the mean central nest coordinates of all individuals tracked in the three study locations and correspond to the numbered circles shown in the maps of Fig. S1.



Supplementary Figure S3. Correlation between observed white stork density in study region and predicted home range suitability. Stork pairs per community were extracted from NABU (Mitteilungsblatt 107/2015 BAG Weißstorchschutz). Also see Table S2.

1.2 Supplementary Tables

Supplementary Table S1. Home range estimates ± standard error and the range in parentheses

Estimator	All	Breeding	Non-breeding	Brood-loss	Female (breeding)	Male (breeding)	Beuster (breeding)	Drömling (breeding)	Loburg (breeding)
MCP 50%	16.7 ± 12.2 (0.0 – 826.6)	0.8 ± 0.2 (0.0 – 6.8)	29.9 ± 14.5 (0.3 – 92.5)	62.7 ± 58.8 (0.1 – 826.6)	1.0 ± 0.4 (0.0 – 6.8)	0.7 ± 0.2 (0.0 – 3.6)	0.8 ± 0.4 (0.0 – 5.3)	1.1 ± 0.2 (0.0 – 3.3)	0.7 ± 0.5 (0.0 – 6.8)
MCP 95%	78.3 ± 26.7 (1.3 – 1425.6)	21.4 ± 3.5 (1.3 – 133.2)	334.1 ± 131.2 (20.6 – 986.1)	141.7 ± 100.1 (2.7 – 1425.6)	23.5 ± 6.3 (1.3 – 133.2)	20.0 ± 3.8 (1.7 – 61.4)	19.0 ± 5.1 (1.3 – 61.4)	19.5 ± 3.9 (1.7 – 52.7)	26.8 ± 9.2 (3.2 – 133.2)
MCP 99.9%	164.0 ± 34.8 (2.9 – 1582.0)	64.7 ± 10.1 (5.9 – 322.7)	576.0 ± 166.0 (37.0 – 1422.5)	291.6 ± 111.8 (2.9 – 1582.0)	50.2 ± 7.0 (12.9 – 134.4)	69.3 ± 16.0 (5.9 – 322.7)	46.8 ± 11.0 (5.9 – 191.6)	73.1 ± 21.4 (17.1 – 322.7)	78.4 ± 21.2 (12.9 – 310.0)

Supplementary Table S2. Correlation between observed white stork density in study region and predicted home range suitability. Stork pairs per community were extracted from NABU (Mitteilungsblatt 107/2015 BAG Weißstorchschutz). Also see Figure S3.

Community	Stork pairs	Sum (Home range suitability)
Altmarkkreis Salzwedel	92	858.82
Anhalt Bitterfeld	42	433.30
Barnim	53	12.06
Berlin	3	19.04
Boerde	78	736.01
Brandenburg a.d.Havel	4	56.73
Braunschweig, Wolfenbuettel, Helmstedt, Wolfsburg, Goslar	57	440.07
Dessau Rosslau	17	43.99
ElbeElster	98	142.21
Gifhorn	59	301.73
Harz	9	456.02
Havelland	86	686.58
Jerichower Land	63	475.45
Luechow Dannenberg	69	218.43
Magdeburg	4	38.44
Mansfeld Suedharz	4	69.81
Nordhausen	3	1.71
Nordsachsen	64	94.80
Oberhavel	79	409.87
Osterode Harz	NA	2.13
Ostprignitz Ruppin	120	613.76
Potsdam	8	45.09
Potsdam Mittelmark	90	613.19
Prignitz	217	260.84
Saalekreis	16	42.63
Salzgitter	NA	2.32

Salzlandkreis	38	414.29
Stendal	196	1048.39
Teltow Flaeming	56	362.74
Uelzen	2	147.70
Wittenberg	91	454.04
Pearson correlation r = 0.61 **		

Supplementary Table S3. Estimates of generalized linear mixed models (GLMMs) quantifying fine-scale resource selection of breeding and non-breeding white storks within different availability radii. GLMMs were fit using binomial error structure and year, animal and region as random factors. GPS data were filtered to include only foraging activities (ACC categories pecking and walking). All variables were centered and standardized prior to modeling. Blue indicates significant positive effects; red indicates significant negative effects. P-values: *** p<0.001, ** p<0.01, * p<0.05, ‘ p<0.1.

	Breeding			***Non-breeding***		
Predictors	**1km**	**2.5km**	**5km**	**1km**	**2.5km**	**5km**
(Intercept)	-1.15 ***	-1.21 ***	-1.30 ***	-1.27 ***	-1.37 ***	-1.47 ***
Urban (Corine 2)	0.46 ***	0.38 ***	0.52 ***	0.24 ***	0.28 ***	0.33 ***
Arable (Corine 12)	0.49 ***	0.31 ***	0.73 ***	0.08 ‘	-0.06	-0.03
Pasture (Corine 18)	0.78 ***	0.67 ***	1.08 ***	0.52 ***	0.55 ***	0.67 ***
Mosaics (Corine 21)	0.31 ***	0.25 ***	0.46 ***	-0.25 ***	-0.27 ***	-0.21 ***
Broadleaf forest (Corine 23)	0.10 ***	0.003	0.10 ***	-0.12 ***	-0.18 ***	-0.24 ***
Coniferous forest (Corine 24)	-0.07 ***	-0.29 ***	-0.40 ***	-0.25 ***	-0.50 ***	-0.78 ***
Mixed forest (Corine 25)	-	-0.14 ***	-0.09 ***	-	-0.20 ***	-0.19 ***

Water (Corine 40)	-	-0.11 ***	0.02	-	-0.06 ‘	-0.02
NDVI	1.13 ***	1.75 ***	1.88 ***	0.35 ***	0.84 ***	1.02 ***
$(NDVI)^2$	-1.04 ***	-1.59 ***	-1.75 ***	-0.26 **	-0.72 ***	-0.94 ***
Explained deviance	**3.28 %**	**6.21 %**	**9.02 %**	**5.08 %**	**9.72 %**	**13.44 %**