

Ecography

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Supplementary material

Appendix 1.

Table A1. The list of investigated watercourses of the Vistula Delta Fens with the number of distinguished recently occupied beaver territories, and beaver sites densities. Table is sorted by the number of beaver sites.

Watercourse	No. of beaver sites	Mean length of coastline/ beaver site (km)	Density of beaver sites (No. of beaver sites/ km coastline)
Vistula	49	2.43	0.41
Drużo reserve (lake + canals)	30	2.51	0.39
Nogat	24	5.72	0.17
Szkarpawa	11	5.42	0.18
Tuja	8	8.71	0.11
Vistula floodplains	5	1.15	0.87
Dead Vistula	5	9.57	0.10
Motława	5	12.38	0.08
Królewiecka Vistula	4	6.31	0.16
Linawa Canal	3	14.39	0.07
Śledziowy Canal	2	10.00	0.10
Panieński Canal	2	17.64	0.06
Czarna Łacha	1	17.45	0.06
Wielki Canal	1	18.95	0.05

Table A2. SIMPER analysis results of comparison between beaver sites and random sites in three ring buffers (0–100, 101–200, and 201–500 m from the centre point) for all land cover types.

Ring (m)	Land use type	Average cover (%)		Dissimilarity (%)		
		Beaver	Random	Average	Contribution	Total ¹
0–100	Arable land	6.3	17.5	14.2	23.6	60.02
	Fallow land	26.2	28.1	12.8	21.2	
	Trees & shrubs	16.2	3.0	12.4	20.7	
	Grassland	0.9	0.8	5.4	9.0	
	Urban area	0.4	1.1	4.7	7.9	
	Shrubs	0.9	0.3	4.2	7.0	
	Forest	0.4	0.1	3.3	5.5	
	Small water bodies	0.7	0.0	3.1	5.1	
101–200	Arable land	7.7	19.6	13.2	23.6	55.74
	Fallow land	33.3	27.1	11.3	20.2	
	Trees & shrubs	12.7	4.5	10.0	18.0	
	Grassland	1.3	1.0	5.5	9.8	
	Urban area	0.5	1.7	5.1	9.1	
	Shrubs	1.1	0.6	4.4	7.9	
	Forest	0.8	0.1	3.6	6.4	
	Small water bodies	0.5	0.1	2.8	4.9	
201–500	Arable land	11.0	22.1	11.6	22.5	51.63
	Fallow land	32.9	27.1	9.7	18.8	
	Trees & shrubs	11.1	4.8	8.0	15.5	
	Grassland	1.7	2.2	6.0	11.6	
	Urban area	1.6	1.8	5.3	10.3	
	Shrubs	1.6	0.8	4.4	8.5	
	Forest	0.9	0.2	3.7	7.1	
	Small water bodies	0.7	0.1	3.0	5.9	

¹ – the Total dissimilarity is calculated as a sum of „Average” column.

Table A3. Summary of Detrended Correspondence Analysis (DCA) based on the variability of beaver and random sites.

Statistic	Axis 1	Axis 2	Axis 3	Axis 4
Eigenvalues	0.2058	0.1105	0.0997	0.0839
Explained variation (cumulative)	29.99	46.09	60.62	72.85
Gradient length	3.68	3.02	3.17	1.95
Total variation 0.68616				

Table A4. Summary of Detrended Correspondence Analysis (DCA) based on the variability of land use composition in beaver sites, which were used to calculate the efficiency of constrained models in Variation Partitioning (VP, Table A5) and Canonical Correspondence Analysis (CCA, Table A7).

Statistic	Axis 1	Axis 2	Axis 3	Axis 4
Eigenvalues	0.2963	0.1471	0.1238	0.0909
Explained variation (cumulative)	30.17	45.15	57.76	67.02
Gradient length	3.2	2.01	2.85	1.91
Total variation 0.98202				

Table A5. Summary of Variation partitioning (VP) with the Principal Coordinate Analysis of Neighbour Matrices (PCNM).

Fraction	Explained variation				
	Efficiency ¹	% of Explained	% of All	<i>df</i>	MS
a – density of beaver sites	2.69	5.4	1.8	1	0.01674
b – space predictors PCNM	39.09	79.3	26.2	16	0.01705
c – shared	7.61	15.3	5.1	--	--
Total Explained	49.39	100	33	17	0.01966
All Variation		--	100	149	--
Tested Fraction	<i>pseudo-F</i>	<i>p</i>			
a + b + c	5.3	0.001			
a + c	9.9	0.001			
b + c	5.2	0.001			

¹ – the result of comparison with unconstrained model from Table A4.

Table A6. Forward selection results of Principal Coordinate Analysis of Neighbour Matrices (PCNM).

Eigenfunction	Explains %	Contribution %	Efficiency ¹	<i>pseudo-F</i>	<i>p</i> (adj) ²
PCO.1	9.5	19.6	14.17	15.6	0.033
PCO.2	3.7	7.5	5.52	6.5	0.033
PCO.3	1.7	3.5	2.54	3.4	0.007
PCO.4	4.8	9.9	7.16	8.3	0.033
PCO.5	2.7	5.6	4.03	5.0	0.033
PCO.7	1.2	2.4	1.79	2.5	0.026
PCO.8	1.4	2.8	2.09	2.7	0.032
PCO.9	2.0	4.1	2.98	3.9	0.005
PCO.14	1.4	2.8	2.09	2.8	0.029
PCO.17	1.0	2.1	1.49	2.2	0.042
PCO.19	1.0	2.1	1.49	2.2	0.042
PCO.20	1.2	2.4	1.79	2.5	0.032
PCO.22	2.5	5.0	3.73	4.6	0.003
PCO.24	1.2	2.5	1.79	2.5	0.033
PCO.27	1.3	2.7	1.94	2.7	0.025
PCO.30	2	4.1	2.98	3.8	0.008

¹ – the result of comparison with unconstrained model from Table A4, ² – adjusted by Holm correction.

Table A7. Summary of the Canonical Correspondence Analysis (CCA).

Statistic	Axis 1	Axis 2	Axis 3	Axis 4
Eigenvalues	0.1016	0.0307	0.0075	0.2649
Explained variation (cumulative)	10.34	13.47	14.24	41.21
Pseudo-canonical correlation	0.6491	0.4662	0.2227	0
Explained fitted variation (cumulative)	72.66	94.63	100	
Permutation Test Results: On All Axes	<i>pseudo-F</i> = 8.1, <i>p</i> = 0.001			
Total variation is 0.98202, explanatory variables account for 14.2% (adjusted 12.5%)				