Ecography

E6554
Keil, P., Biesmeijer, J. C., Barendregt, A., Reemer, M. and Kunin, W. E. 2010. Biodiversity change is scale-dependent: an example from Dutch and UK hoverflies (Diptera, Syrphidae). – Ecography 33: xxx–xxx.

Supplementary material

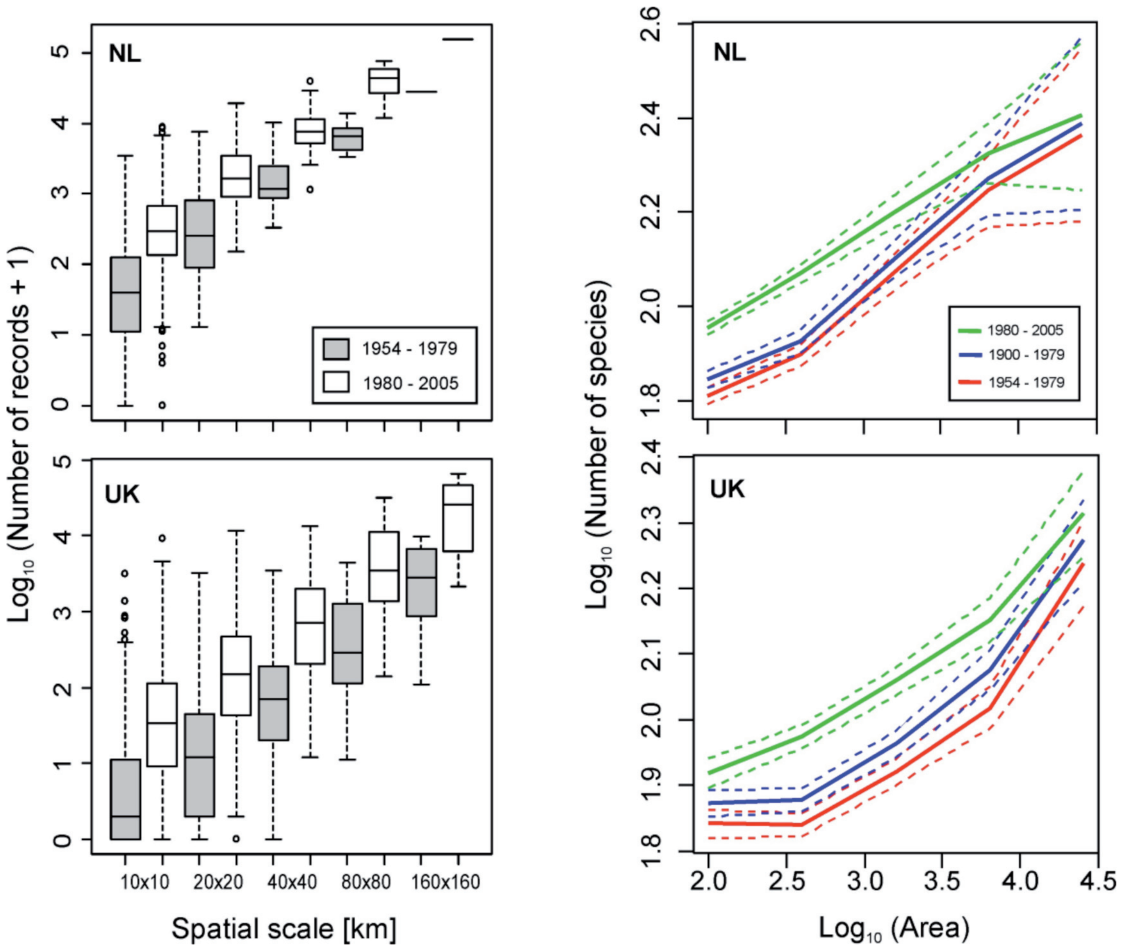

Figure S1. Left: numbers of records in all UK and all Dutch grid cells at various spatial scales, including all the grid cells that were later excluded from the analyses. Note that Dutch data are approximately an order of magnitude better and much more regularly distributed than the UK data. The thick lines are medians, boxes and dashed lines are quartiles and dots represent outliers. Right: species-area relationships (SAR) plotted using grid cells with more than 100 records in both 1954–1979 and 1980–2005 periods. We generated the SARs by simply plotting the number of species (not standardized by rarefaction) in all grid cells at all spatial scales against area of the grid cells. The solid lines are fits of generalized additive models (GAM, smoothing splines). Dashed lines are standard error curves. Note that these SARs are only rough estimations because they were plotted using the data with variable sampling efforts.

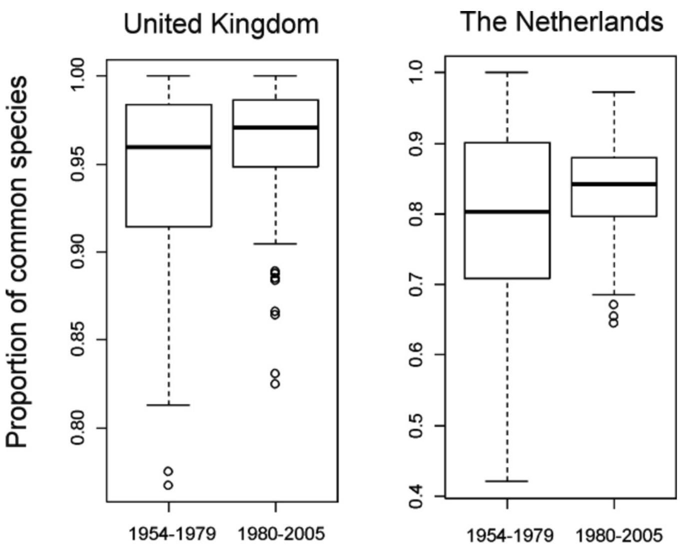

Figure S2. Proportion of the common species in the grid cells of NL and UK, 10 × 10 km scale. Only cells with >50 records were included (the results with minimum of 100 records were nearly identical). Both differences were significant (Wilcoxon rank sum test, NL: p=0.0032, W=22731; UK: p=0.006512, W= 8078). A species was considered to be "common" if it was classified as "unthreatened" in the Syrph the Net database (Speight and Castella 2006) in the country of interest (UK or NL). The figure shows that there is a different proportion of common species in the two periods which can be caused either by different collecting habits in the two time periods or it can be a real trend (e.g. a result of homogenisation, extinction of rare species and so on). The thick lines are medians, boxes and dashed lines are quartiles and dots represent outliers.

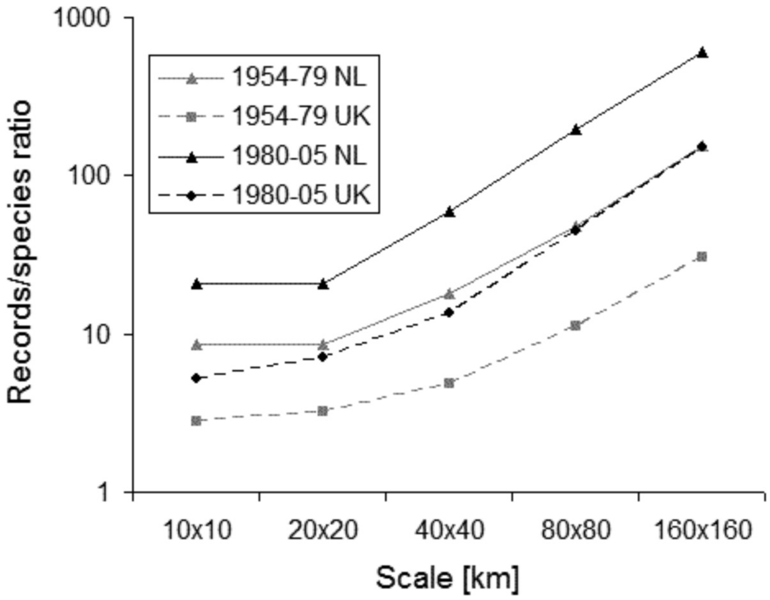

Figure S3. Mean values of number of records/number of species ratios found in each grid cell at all spatial scales and in the two time periods (pre- and post-1980). In the Netherlands the ratios are good even at fine scales (~ ten records per species). In the UK the ratios are poor at fine scales, but improve at coarse scales. Hence, estimates of ΔS from fine scales in the UK should be interpreted with caution.

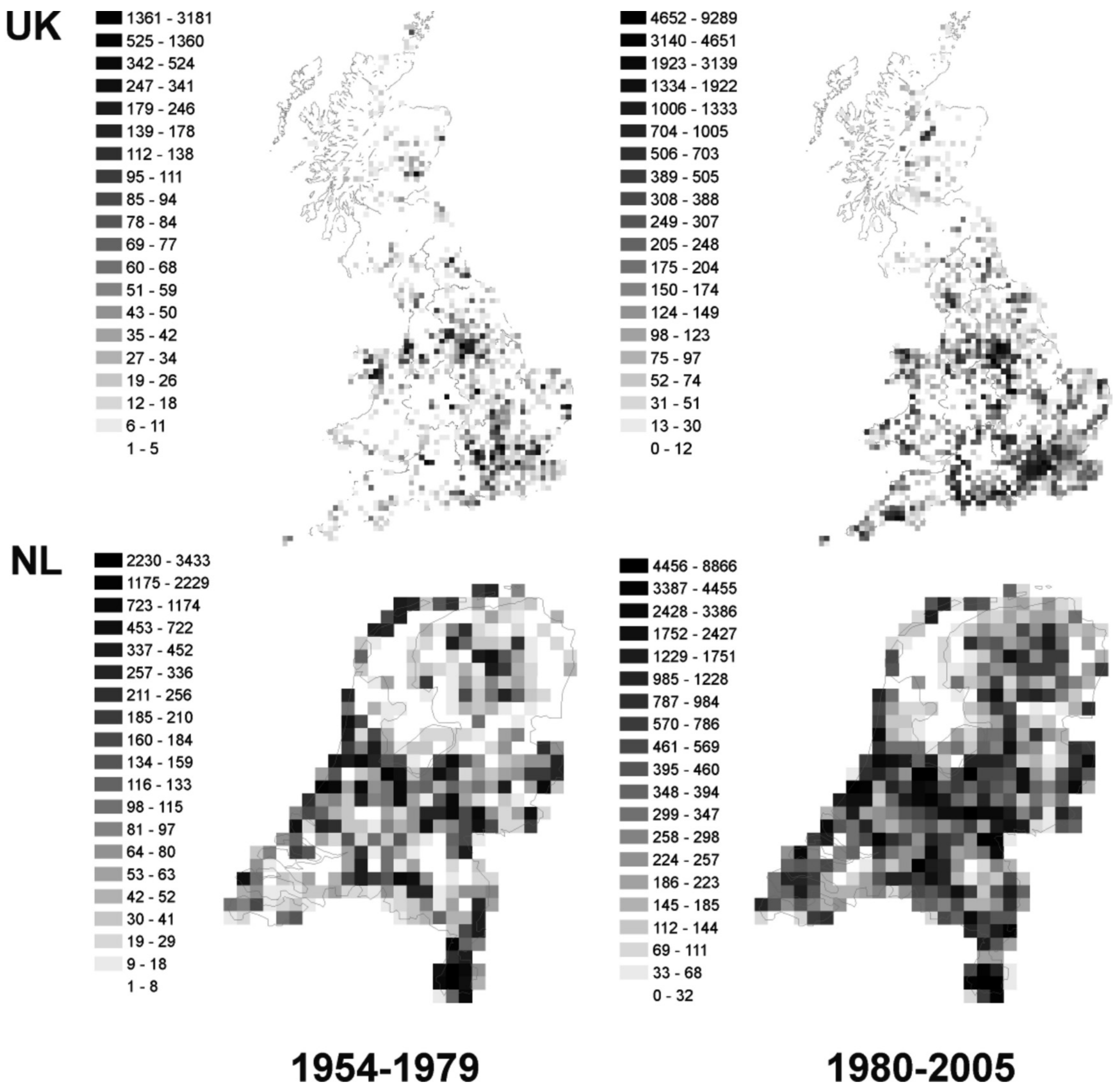

Figure S4. Numbers of individual records of hoverflies in the two studied countries in the two equal time intervals.

Table S1. Numbers of grid cells that were used in the bootstrap analyses. We estimated rates of species richness changes (ΔS) for each of the grid cells within each combination of minimum number of records, scale and time period. The median trend of ΔS (±95% bootstrapped confidence interval of the median) was then calculated using these grid cells (Fig. 3).

		Number of grid cells used in the study			
Minimum number of records	Scale [km]	NL unequal time periods	NL equal time periods	UK unequal time periods	UK equal time periods
10	10 × 10	251	230	232	166
25	10 × 10	230	210	196	134
50	10 × 10	183	160	153	100
75	10 × 10	156	135	106	71
100	10 × 10	126	113	70	46
125	10 × 10	112	95	55	36
150	10 × 10	97	84	43	26
200	10 × 10	78	66	30	19
250	10 × 10	66	55	22	12
300	10 × 10	63	45	16	9
10	20 × 20	77	69	195	144
25	20 × 20	77	68	185	133
50	20 × 20	75	68	160	110
75	20 × 20	74	65	131	89
100	20 × 20	68	61	106	66
125	20 × 20	64	57	81	49
150	20 × 20	61	55	69	42
200	20 × 20	58	50	48	30
250	20 × 20	53	46	40	26
300	20 × 20	46	41	31	22
10	40 × 40	26	23	84	64
25	40 × 40	26	23	84	64
50	40 × 40	26	23	82	60
75	40 × 40	26	23	75	54
100	40 × 40	26	23	65	49
125	40 × 40	26	23	62	45
150	40 × 40	26	23	57	39
200	40 × 40	26	23	48	30
250	40 × 40	26	23	39	25
300	40 × 40	26	23	36	24
10	80 × 80	6	6	26	22
25	80 × 80	6	6	26	22
50	80 × 80	6	6	26	22
75	80 × 80	6	6	26	22
100	80 × 80	6	6	26	21
125	80 × 80	6	6	25	21
150	80 × 80	6	6	24	20
200	80 × 80	6	6	22	16
250	80 × 80	6	6	22	15
300	80 × 80	6	6	21	15
10	160 × 160	1	1	7	5
25	160 × 160	1	1	7	5
50	160 × 160	1	1	7	5
75	160 × 160	1	1	7	5

100	160 × 160	1	1	7	5
125	160 × 160	1	1	7	5
150	160 × 160	1	1	7	5
200	160 × 160	1	1	7	5
250	160 × 160	1	1	7	5
300	160 × 160	1	1	7	5