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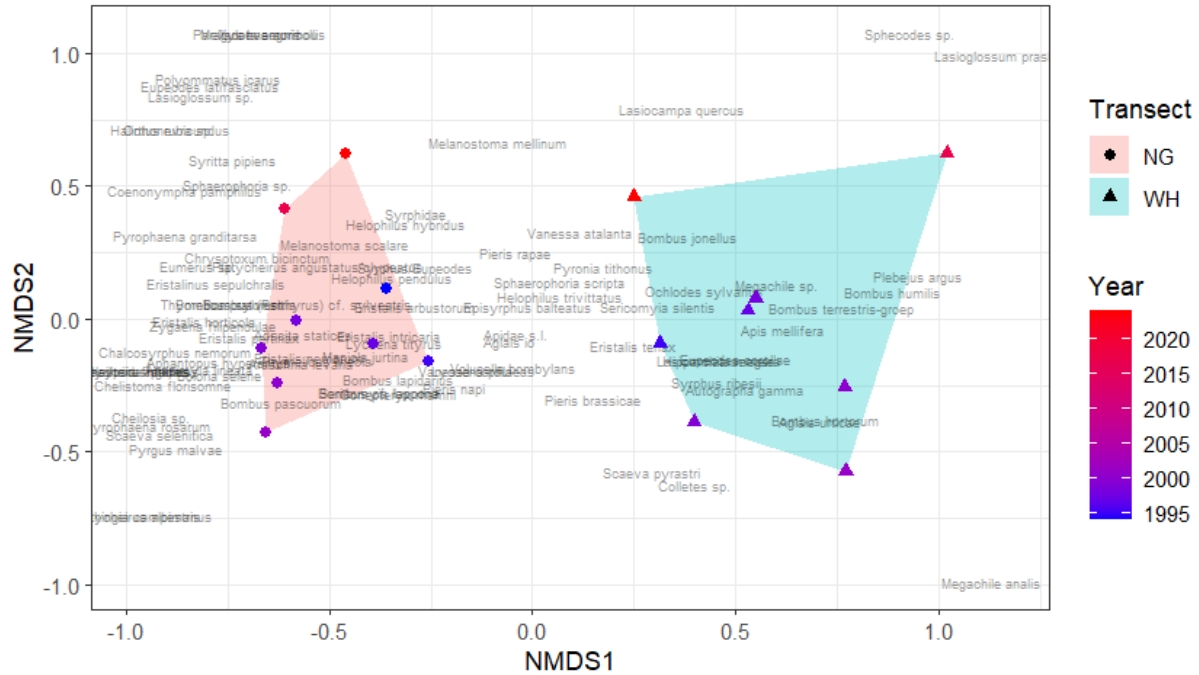


Fig. S1 Ordination plot of per year per pollinator transect using non-metric dimensional scaling (NMDS). Species composition of the pollinator transects varies per location and year. The *Nardus* grassland pollinator transect (NG) is depicted in red and indicated by circles, and the wet heathland pollinator transect (WH) is depicted in blue and indicated by triangles

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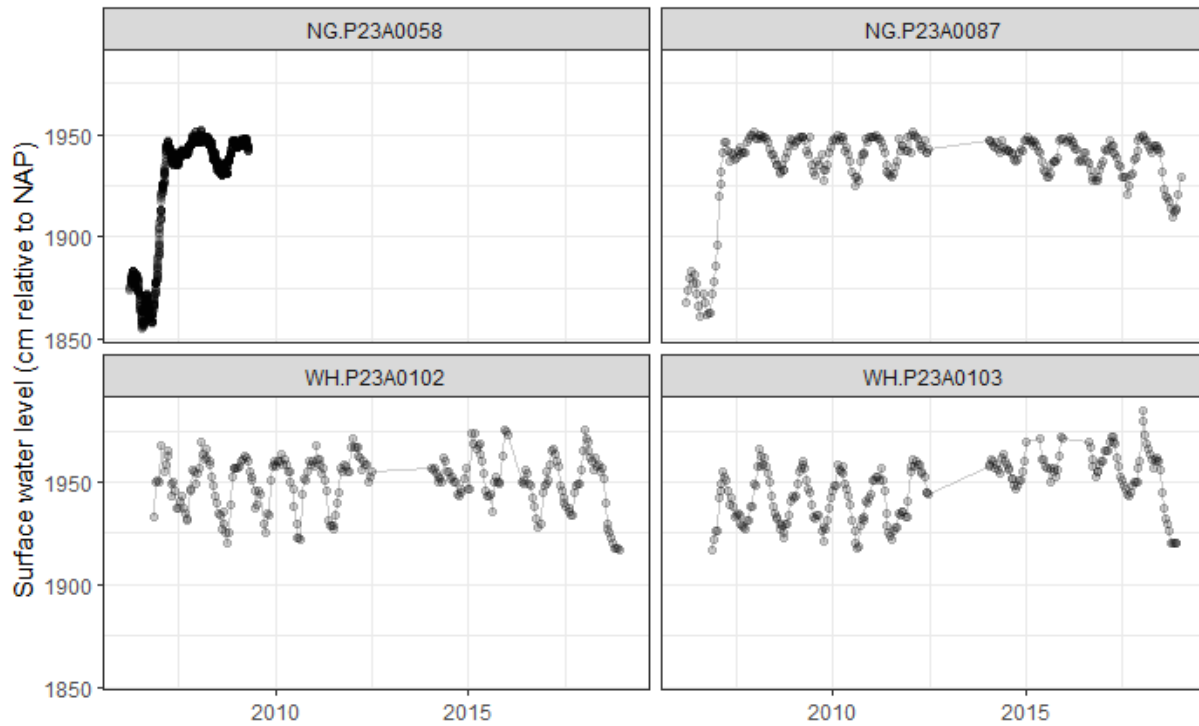


Fig. S2 Surface water level in cm relative to NAP (Normaal Amsterdams Peil) within the *Nardus* grassland pollinator and butterfly transects (NG and NG_B; ID = P23A0058 and P23A0087), and the wet heath pollinator and butterfly transects (WH and WH_B; ID= P23A0102 and P23A0103)

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Models including daily weather variables retrieved from KNMI were explored. To account for the effect of weather during sampling on multi year abundance trends in the wet heathland pollinator transect (WH) and wet heathland butterfly transect (WH_B) and the *Nardus* grassland butterfly transect (NG_B), hourly weather variables were retrieved from KNMI weather-station Hoogetveen (station number 332). Data on hourly average wind speed (FH in 0.1 m/s), temperature during sampling (T in 0.1 °C), global irradiance (Q in J/cm²) and relative humidity (U in %) were collected. As no sampling time was recorded for the *Nardus* grassland pollinator transect (NG), averaged daily weather values were explored instead. Data on daily average wind speed (FG in 0.1 m/s), daily average temperature (TG in 0.1 °C), global irradiance (Q in J/cm²), daily total precipitation (RH in 0.1 mm), and daily average humidity (UG in %) were retrieved.

Several weather variables were found to be significantly correlated with daily pollinator abundances, but only marginally improved AIC and model fit. In addition, the estimated effect of year estimated by the basic model fell within the estimated effect of year in the models which did include weather variables (Table S1-S2). Accordingly, the decision was made to present the basic models in the main text.

Table S2 GLMM model summaries of the *Nardus* grasslands pollinator transect (NG). The basic structure of the models included the season score and a continuous year variable as fixed effects, as well as year as a random categorical variable in order to correct for nestedness within years. GLMM models including daily weather variables retrieved from KNMI were explored. Incidence rate ratios (IRR), p-values, marginal R2 (M R2), conditional R2 (C R2), and AIC for each separate model are presented. Significant p-values are indicated in bold. The basic model, found in the upper row of this table, was presented in the main text. The depicted model summaries are excluding the managed species *Apis mellifera*

		Total pollinator Abundance		Syrphidae Abundance		Apidae Abundance		Butterfly Abundance	
		Year (Scaled)	Weather	Year (Scaled)	Weather	Year (Scaled)	Weather	Year (Scaled)	Weather
Basic model	IRR [CI]	1.08 [1.05 – 1.12]	-	1.28 [1.13 – 1.46]	-	1.57 [1.16 – 2.12]	-	0.83 [0.75 - 0.92]	-
	p	<0.001		<0.001		0.004		<0.001	
	M R2 / C R2	0.949 / 0.956		0.679 / 0.879		0.476 / 0.732		0.949 / 0.977	
	AIC	1637.440		1557.775		322.870		1404.164	
Basic + wind	IRR [CI]	1.08 [1.05 – 1.12]	1.00 [0.97 - 1.03]	1.27 [1.13 – 1.43]	0.94 [0.90 – 0.99]	1.57 [1.15 – 2.13]	1.02 [0.85 – 1.22]	0.83 [0.75 - 0.92]	0.99 [0.95 - 1.03]
	p	<0.001	0.825	<0.001	0.011	0.004	0.847	<0.001	0.553
	M R2 / C R2	0.949 / 0.956		0.705 / 0.876		0.474 / 0.733		0.948 / 0.977	
	AIC	1639.391		1553.304		324.833		1405.812	
Basic + temperature	IRR [CI]	1.09 [1.05 – 1.12]	1.05 [1.02 - 1.08]	1.28 [1.13 – 1.46]	0.99 [0.95 – 1.03]	1.60 [1.18 – 2.17]	1.20 [1.01 – 1.41]	0.83 [0.72 - 0.95]	1.25 [1.20 - 1.30]
	p	<0.001	0.002	<0.001	0.607	0.002	0.033	0.007	<0.001
	M R2 / C R2	0.950 / 0.957		0.677 / 0.879		0.508 / 0.748		0.932 / 0.981	
	AIC	1629.610		1559.51		320.430		1307.692	
Basic + irradiation	IRR [CI]	1.08 [1.04 - 1.12]	1.03 [1.00 - 1.06]	1.28 [1.12 – 1.45]	1.04 [0.99 – 1.09]	1.55 [1.14 – 2.09]	1.11 [0.93 – 1.31]	0.81 [0.73 - 0.91]	1.11 [1.06 - 1.15]
	p	<0.001	0.077	<0.001	0.084	0.004	0.253	<0.001	<0.001
	M R2 / C R2	0.948 / 0.956		0.680 / 0.882		0.480 / 0.730		0.947 / 0.978	
	AIC	1636.285		1556.782		323.555		1381.715	
Basic + precipitation	IRR [CI]	1.08 [1.03 - 1.12]	0.93 [0.90 - 0.96]	1.27 [1.12 – 1.44]	0.93 [0.88 – 0.98]	1.55 [1.14 – 2.11]	0.91 [0.75 – 1.11]	0.82 [0.74 - 0.92]	0.95 [0.91 - 0.99]
	p	<0.001	<0.001	<0.001	0.006	0.005	0.358	<0.001	

	M R2 / C R2	0.944 / 0.957		0.695 / 0.881		0.474 / 0.735		0.945 / 0.977	
	AIC	1615.433		1551.757		323.967		1398.960	
Basic humidity	IRR	1.08	1.00	1.29	1.08	1.57	1.00	0.82	0.92
	[CI]	[1.05 - 1.12]	[0.97 - 1.02]	[1.13 - 1.48]	[1.03 - 1.13]	[1.16 - 2.12]	[0.86 - 1.17]	[0.73 - 0.92]	[0.88 - 0.96]
	p	<0.001	0.847	<0.001	0.002	0.004	0.985	0.001	<0.001
	M R2 / C R2	0.949 / 0.956		0.671 / 0.882		0.476 / 0.732		0.940 / 0.978	
	AIC	1673.340		1550.022		324.869		1387.737	

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Table S3 GLMM model summaries of the wet heathland pollinator transect (WH). The basic structure of the models included the season score and a continuous year variable as fixed effects, as well as year as a random categorical variable in order to correct for nestedness within years. GLMM models including hourly weather variables retrieved from KNMI were explored. Incidence rate ratios (IRR), p-values, marginal R2 (M R2), conditional R2 (C R2), and AIC for each separate model are presented. Significant p-values are indicated in bold. The basic model, found in the upper row of this table, was presented in the main text. The depicted model summaries are excluding the managed species *Apis mellifera*.

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		Total pollinator Abundance		Syrphidae Abundance		Apidae Abundance		Butterfly Abundance	
		Year (Scaled)	Weather	Year (Scaled)	Weather	Year (Scaled)	Weather	Year (Scaled)	Weather
Basic model	IRR	1.10		1.08		1.13		1.08	
	[CI]	[0.80 - 1.51]	-	[0.59 - 1.99]	-	[0.91 - 1.40]	-	[0.76 - 1.53]	-
	p	0.547		0.797		0.255		0.666	
	M R2 / C R2	0.655 / 0.991		0.365 / 0.889		0.608 / 0.891		0.715 / 0.993	
	AIC	3697.580		491.361		1108.471		4004.654	
Basic wind	IRR	1.04	0.82	1.06	0.90	1.11	0.90	1.02	0.81
	[CI]	[0.77 - 1.42]	[0.80 - 0.83]	[0.57 - 1.96]	[0.79 - 1.02]	[0.89 - 1.38]	[0.85 - 0.95]	[0.73 - 1.43]	[0.79 - 0.83]
	p	0.780	<0.001	0.860	0.098	0.360	<0.001	0.919	<0.001
	M R2 / C R2	0.684 / 0.991		0.369 / 0.892		0.616 / 0.899		0.736 / 0.993	
	AIC	3383.885		490.623		1096.979		3751.220	
Basic temperature	IRR	1.10	1.08	1.08	0.97	1.10	1.08	1.07	1.12
	[CI]	[0.80 - 1.50]	[1.06 - 1.11]	[0.59 - 1.98]	[0.85 - 1.10]	[0.91 - 1.39]	[1.02 - 1.14]	[0.76 - 1.51]	[1.09 - 1.16]
	p	0.550	<0.001	0.808	0.633	0.188	0.009	0.698	<0.001
	M R2 / C R2	0.668 / 0.991		0.366 / 0.888		0.637 / 0.887		0.729 / 0.993	
	AIC	3659.882		493.135		1103.765		3947.232	
Basic irradiation	IRR	1.06	1.16	1.08	1.00	1.10	1.15	1.01	1.22
	[CI]	[0.79 - 1.43]	[1.13 - 1.19]	[0.59 - 1.99]	[0.88 - 1.14]	[0.91 - 1.34]	[1.07 - 1.23]	[0.73 - 1.41]	[1.18 - 1.27]

	p	0.710	<0.001	0.799	0.947	0.315	<0.001	0.931	<0.001
	M R2 / C R2	0.697 / 0.991		0.364 / 0.889		0.651 / 0.888		0.761 / 0.993	
	AIC	3602.329		493.356		1094.635		3880.029	
Basic + humidity	IRR [CI]	1.07 [0.80 - 1.44]	0.78 [0.76 - 0.80]	1.09 [0.61 - 1.95]	1.12 [1.00 - 1.24]	1.13 [0.92 - 1.39]	0.97 [0.92 - 1.03]	1.03 [0.75 - 1.43]	0.73 [0.70 - 0.75]
	p	0.651	<0.001	0.771	0.052	0.249	0.374	0.839	<0.001
	M R2 / C R2	0.724 / 0.992		0.378 / 0.882		0.616 / 0.889		0.776 / 0.993	
	AIC	3336.420		489.619		1109.683		3542.843	

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Table S3 Complete species list of the species encountered in the pollinator grassland transect (NG), the butterfly grassland transect (NG_B), and the pollinator wet heathland transect (WH) per species-group. Y signifies the species was encountered at least once in the corresponding transect over the course of the study, and N signifies that the species was never encountered. Conservative choices were made in terms of species richness, meaning that in analyses on species richness all individuals counted at the genus level were not considered as a separate species unless no other species within the observed genus were encountered during the study. The closely related species belonging to the *Bombus terrestris*-complex were not identified to the species-level, as this cannot be reliably done based on field characteristics

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Group			
Apidae	Species	NG	WH
	<i>Apidae</i> s.l.	Y	Y
	<i>Apis mellifera</i>	Y	Y
	<i>Bombus</i> cf. <i>sylvestris</i>	Y	N
	<i>Bombus hortorum</i>	Y	Y
	<i>Bombus humilis</i>	Y	Y
	<i>Bombus jonellus</i>	Y	Y
	<i>Bombus lapidarius</i>	Y	Y
	<i>Bombus pascuorum</i>	Y	Y
	<i>Bombus pratorum</i>	Y	N
	<i>Bombus terrestris</i> -complex	Y	Y
	<i>Chelostoma florisomne</i>	Y	N
	<i>Colletes</i> sp.	Y	Y
	<i>Dasypoda hirtipes</i>	Y	N
	<i>Halictus rubicundus</i>	Y	N
	<i>Lasioglossum prasinum</i>	N	Y
	<i>Lasioglossum</i> sp.	Y	N
	<i>Megachile analis</i>	N	Y
	<i>Megachile</i> sp.	Y	Y
	<i>Sphecodes</i> sp.	Y	Y

Butterflies	Species	NG	WH	NG_B
	<i>Adscita statices</i>	Y	Y	Y
	<i>Aglais io</i>	Y	Y	Y
	<i>Aglais urticae</i>	Y	Y	Y
	<i>Anthocharis cardamines</i>	N	N	Y
	<i>Aphantopus hyperantus</i>	Y	N	Y
	<i>Araschnia levana</i>	Y	N	Y
	<i>Autographa gamma</i>	Y	Y	Y
	<i>Boloria selene</i>	Y	N	N
	<i>Callophrys rubi</i>	N	N	Y
	<i>Celastrina argiolus</i>	Y	N	Y
	<i>Coenonympha pamphilus</i>	Y	N	Y
	<i>Euclidia mi</i>	N	N	Y
	<i>Favonius quercus</i>	N	N	Y
	<i>Gonepteryx rhamni</i>	Y	Y	Y
	<i>Hipparchia semele</i>	N	Y	N
	<i>Lasiocampa quercus</i>	N	Y	N
	<i>Lasiommata megera</i>	N	Y	N
	<i>Leucodonta bicoloria</i>	Y	N	N
	<i>Lycaena phlaeas</i>	Y	Y	Y
	<i>Lycaena tityrus</i>	Y	Y	Y
	<i>Maniola jurtina</i>	Y	Y	Y
	<i>Ochlodes sylvanus</i>	Y	Y	Y
	<i>Paragus aegeria</i>	N	N	Y
	<i>Pieris brassicae</i>	Y	Y	Y
	<i>Pieris napi</i>	Y	Y	Y
	<i>Pieris rapae</i>	Y	Y	Y
	<i>Plebejus argus</i>	Y	Y	Y
	<i>Polygonia c-album</i>	N	N	Y

	<i>Polyommatus icarus</i>	Y	N	Y
	<i>Pyrgus malvae</i>	Y	N	Y
	<i>Pyronia tithonus</i>	Y	Y	Y
	<i>Thymelicus lineola</i>	Y	Y	Y
	<i>Thymelicus sylvestris</i>	Y	N	Y
	<i>Vanessa atalanta</i>	Y	Y	Y
	<i>Vanessa cardui</i>	Y	Y	Y
	<i>Zygaena filipendulae</i>	Y	N	Y
Syrphidae	Species	NG	WH	
	<i>Anasimyia lineata</i>	Y	N	
	<i>Chalcosyrphus nemorum</i>	Y	N	
	<i>Cheilosia fraterna</i>	Y	N	
	<i>Cheilosia</i> sp.	Y	N	
	<i>Chrysotoxum bicinctum</i>	Y	N	
	<i>Episyrphus balteatus</i>	Y	Y	
	<i>Eristalinus sepulchralis</i>	Y	N	
	<i>Eristalis arbustorum</i>	Y	Y	
	<i>Eristalis horticola</i>	Y	N	
	<i>Eristalis intricaria</i>	Y	Y	
	<i>Eristalis nemorum</i>	Y	Y	
	<i>Eristalis pertinax</i>	Y	N	
	<i>Eristalis tenax</i>	Y	Y	
	<i>Eumerus</i> sp.	Y	N	
	<i>Eupeodes corollae</i>	Y	Y	
	<i>Eupeodes latifasciatus</i>	Y	N	
	<i>Helophilus hybridus</i>	Y	Y	
	<i>Helophilus pendulus</i>	Y	Y	
	<i>Helophilus trivittatus</i>	Y	Y	
	<i>Melanostoma mellinum</i>	Y	Y	

<i>Melanostoma scalare</i>	Y	Y
<i>Meliscaeva auricollis</i>	Y	N
<i>Orthonevra</i> sp.	Y	N
<i>Paragus haemorrhous</i>	Y	N
<i>Platycheirus albimanus</i>	Y	N
<i>Platycheirus angustatus/clypeatus</i>	Y	N
<i>Platycheirus peltatus</i>	Y	N
<i>Pyrophaena granditarsa</i>	Y	N
<i>Pyrophaena rosarum</i>	Y	N
<i>Rhingia campestris</i>	Y	N
<i>Scaeva pyrastris</i>	Y	Y
<i>Scaeva selenitica</i>	Y	N
<i>Sericomyia lappona</i>	Y	N
<i>Sericomyia silentis</i>	Y	Y
<i>Sphaerophoria scripta</i>	Y	Y
<i>Sphaerophoria</i> sp.	Y	N
<i>Syritta pipiens</i>	Y	N
<i>Syrphidae</i> s.l.	Y	Y
<i>Syrphus ribesii</i>	Y	Y
<i>Syrphus/Eupeodes</i>	Y	N
<i>Volucella bombylans</i>	Y	Y
<i>Xylota segnis</i>	Y	N

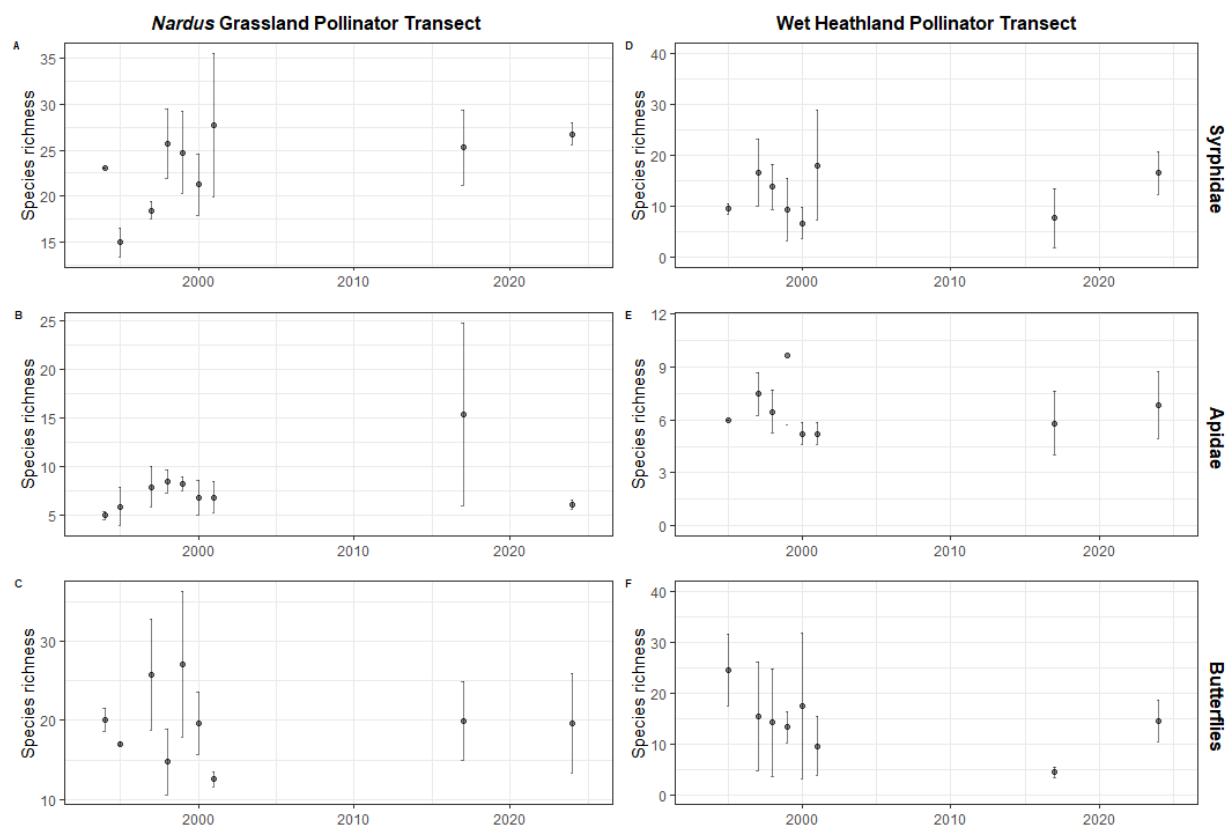


Fig. S3 Species richness in the *Nardus* grassland butterfly transect (NG_B). Chao-estimates including standard deviation of NG_B butterfly species richness