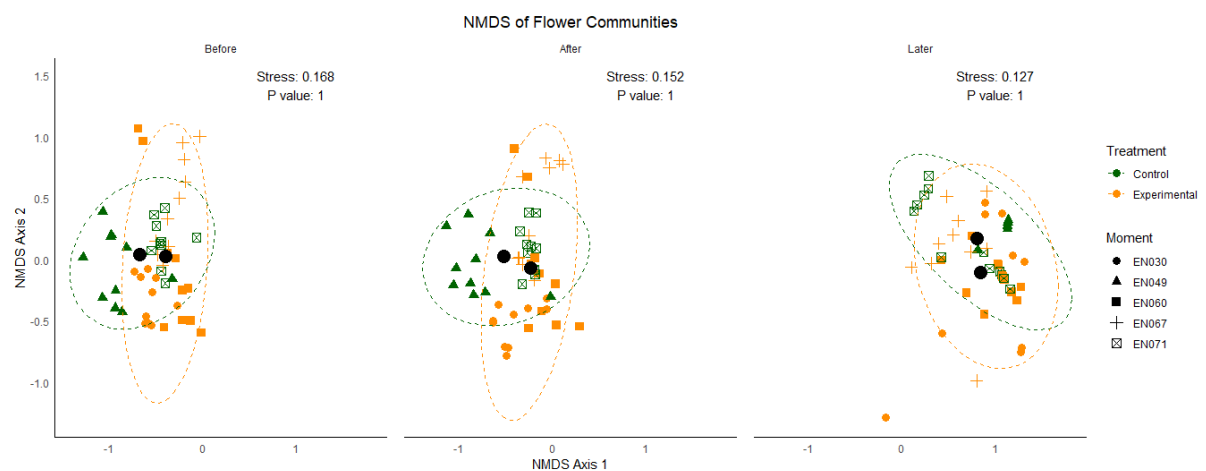


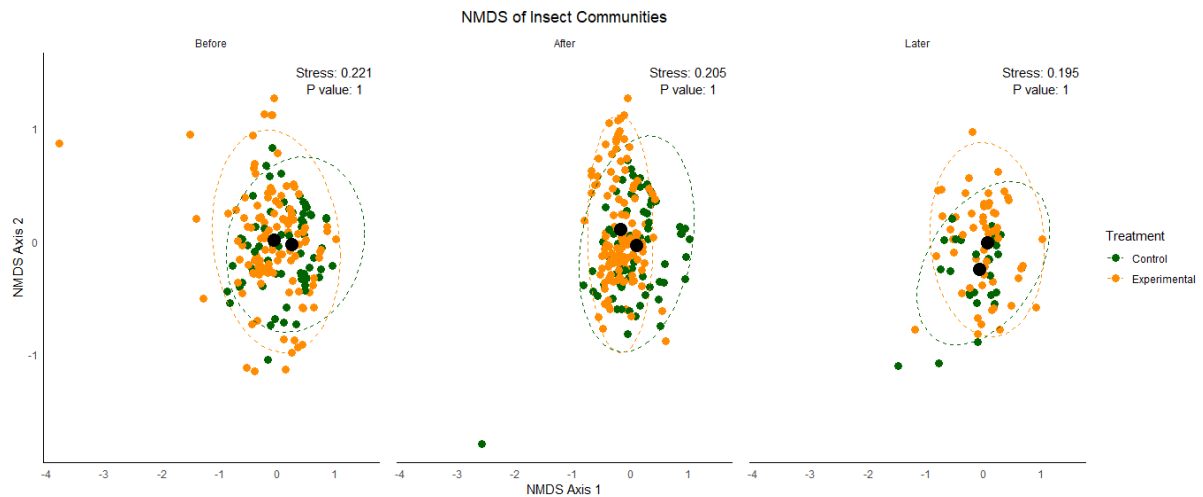
Supplementary information Chapter 5



Appendix 1: Map of the Ooijpolder near Nijmegen, the Netherlands. The green line represents the dike running through the area. Green points are the control locations, yellow points the experimental locations. An overview of the Netherlands is given in the right upper corner, with the blue point indicating the location of the Ooijpolder within the Netherlands.



Appendix 2: NMDS of floral unit availability composition, with location as 'strata' to correct for nestedness (multiple floral unit quadrants and counts for one location). Experimental locations are presented in orange, controls in green. Point shape indicates the location. We observed no significant differences in composition ($P > 0.05$).



Appendix 3: NMDS of pollinator community composition from transect counts, with location as 'strata' to correct for nestedness (multiple floral unit quadrants and counts for one location). Experimental locations are presented in orange, controls in green. Point shape indicates the location. We observed no significant differences in composition ($P > 0.05$).

Appendix 4: Table with all flower species encountered during our study, and what was considered as a floral unit.

Flower_species	Floral unit
<i>Achillea millefolium</i>	Flower head
<i>Bellis perennis</i>	Flower head
<i>Centaurea jacea / scabiosa</i>	Flower head
<i>Cichorium intybus</i>	Flower head
<i>Convolvulus arvensis</i>	Singular flower
<i>Crepis biennis</i>	Flower head

<i>Galium mollugo</i>	Singular flower
<i>Geranium dissectum</i>	Singular flower
<i>Jacobaea vulgaris</i>	Flower head
<i>Knautia arvensis</i>	Flower head
<i>Leucanthemum vulgare</i>	Flower head
<i>Lotus corniculatus</i>	Flower head
<i>Medicago lupulina</i> / <i>Trifolium dubium</i>	Flower head
<i>Myosotis arvensis</i>	Singular flower
<i>Orobanche minor</i>	Singular flower
<i>Pimpinella major</i>	Umbel
<i>Prunella vulgaris</i>	Singular flower
<i>Ranunculus acris/bulbosus</i>	Singular flower
<i>Rhinanthus alecorolophus</i>	Singular flower
<i>Sonchus asper</i>	Flower head
<i>Stellaria media</i>	Singular flower
<i>Tragopogon spec</i>	Flower head
<i>Trifolium pratense</i>	Flower head
<i>Vicia hirsuta</i>	Singular flower
<i>Vicia sativa</i>	Singular flower

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21 Appendix 5: Table of visitation data at experimental locations and control locations per period.

22 Numbers represent the number of unique visits of an individual of the given group to a flower within

23 the observation quadrant.

	Experimental (3x)	Control (2x)	Total
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Pollinator group	Before	After	Later	Before	After	Later	
Ant	30	60	14	33	51	23	211
Beefly	24	6	0	17	3	0	50
Beetle	334	887	235	172	276	67	1971
Bumblebee	2655	3527	1320	2013	1666	1010	12191
Butterfly	22	38	6	1	0	4	71
Honeybee	1574	4941	1541	621	1645	721	11043
Hoverfly	110	89	62	125	58	36	480
Other fly	133	202	1	59	49	6	450
Wasp	28	29	10	9	9	1	86
non-<i>Bombus</i> Wild bee	534	952	111	43	57	97	1794
Unidentified	38	136	2	6	19	5	206
Total	5482	10867	3302	3099	3833	1970	28553

24

25 Appendix 6: Number of individuals per species observed in transect counts at experimental locations

26 and control locations per period.

	Experimental			Control		
Species	Before	After	Later	Before	After	Later
<i>Apis mellifera</i>	304	556	259	114	418	482
<i>Bombus lapidarius</i>	201	179	113	88	75	106
<i>Halictus scabiosae</i>	107	126	16	16	10	2
<i>Bombus terrestris</i>	49	45	14	125	51	27
<i>Bombus pascuorum</i>	28	31	75	21	14	72
<i>Oedemera nobilis</i>	27	52	39	27	34	34
<i>Halictus quadricinctus</i>	16	10	2	1	2	
<i>Halictus tumulorum</i>	11	4		3	3	1
<i>Polyommatus icarus</i>	9	8			2	
<i>Bombus pratorum</i>	9	8	2	4	1	3

<i>Helophilus trivittatus</i>	8	4		29	8	
<i>Bombus hortorum</i>	6	4	10	8	5	9
<i>Oedemera lurida</i>	6	22	7	15	26	25
<i>Bombus hypnorum</i>	5	6		4	3	2
<i>Andrena labialis</i>	4					
<i>Eristalis arbustorum</i>	4					
<i>Volucella bombylans</i>	4		1			5
<i>Andrena hattorfiana</i>	3	9			5	4
<i>Lasioglossum pauxillum</i>	3	3	1	1		
<i>Myopa spec</i>	3	2	2		1	4
Brachycera	3	2		1		2
<i>Andrena ovatula</i>	2		1			2
<i>Oxythyrea funesta</i>	2	3		1		
<i>Scathophaga spec</i>	2			4		
<i>Andrena angustior</i>	1					
<i>Andrena flavipes</i>	1					
<i>Andrena haemorrhoa</i>	1	1				
<i>Andrena humilis</i>	1					
<i>Andrena nitida</i>	1					
<i>Andrena polita</i>	1					
<i>Bombus campestris</i>	1					
<i>Colletes succinctus</i>	1					
<i>Eristalis nemorum</i>	1			3		
<i>Eristalis tenax</i>	1	1		11	2	4
<i>Eupeodes corollae</i>	1	2	1	1		2
<i>Heriades truncorum</i>	1	1	1			
<i>Hoplitis anthopocoides</i>	1					
<i>Lasioglossum leucozonium</i>	1				1	
<i>Lasioglossum nitidulum</i>	1					
<i>Lasioglossum quadrinotatum</i>	1	1		1		
<i>Macrophya montana</i>	1					

<i>Macrophya spec</i>	1					
<i>Megachile willughbiella</i>	1					
<i>Pieris rapae</i>	1					
<i>Psilota anthracina</i>	1					
<i>Sphaerophoria fatarum</i>	1					
<i>Sphaerophoria scripta</i>	1	1	2			2
<i>Sphecodes ephippius</i>	1					
<i>Syrphus ribesii</i>	1	2	1	1		
<i>Trichius fasciatus</i>	1					
<i>Xanthogramma pedissequum</i>	1					
Empididae	1	2		1	1	1
<i>Episyrphus balteatus</i>		5		2	1	
<i>Zygaena filipendulae</i>		5	26			3
<i>Lasioglossum villosulum</i>		3				
Platystomatidae		3				
<i>Lasioglossum lativentre</i>		2				
<i>Stenurella melanura</i>		2				2
Parasitica		2				
<i>Andrena dorsata</i>		1				
<i>Andrena similis</i>		1				
<i>Aricia agestis</i>		1			3	
<i>Trichopsomyia flavitarsis</i>		1				
<i>Colletes similis</i>		1				
<i>Cerceris rybyensis</i>		1				
<i>Chrysotoxum festivum</i>		1	1	1		
<i>Halictus compressus</i>		1				
<i>Heteroptera spec</i>		1	6			4
<i>Oxybelus spec</i>		1				
<i>Sphecodes rubicundus</i>		1				
<i>Dasypoda hirtipes</i>			2			
<i>Corymbia rubra</i>			1			

<i>Eupeodes bacculatus</i>			1			
<i>Maniola jurtina</i>			1			25
<i>Melitta leporina</i>			1			
<i>Micrandrena spec</i>			1			
<i>Nitidulidae spec</i>			1	1		
<i>Ochlodes sylvanus</i>			1			
<i>Rhagonycha fulva</i>			1			2
<i>Thymelicus sylvestris</i>			1			
<i>Colletes fodiens</i>			1			
<i>Sphecodes crassus</i>				1		
<i>Sphecodes monilicornis</i>				1		
<i>Vespula germanica</i>				1		
<i>Andrena wilkella</i>					1	
<i>Bombus subterraneus</i>					1	
<i>Coenonympha pamphilus</i>					1	1
<i>Lasioglossum malachurum</i>					1	
<i>Merodon equestris</i>					1	
<i>Vanessa cardui</i>					1	
<i>Bombus vestalis</i>						21
<i>Epeolus cruciger</i>						1
<i>Sphaerophoria taeniata</i>						1
<i>Thymelicus lineola</i>						1
<i>Andrena carantonica</i>						1

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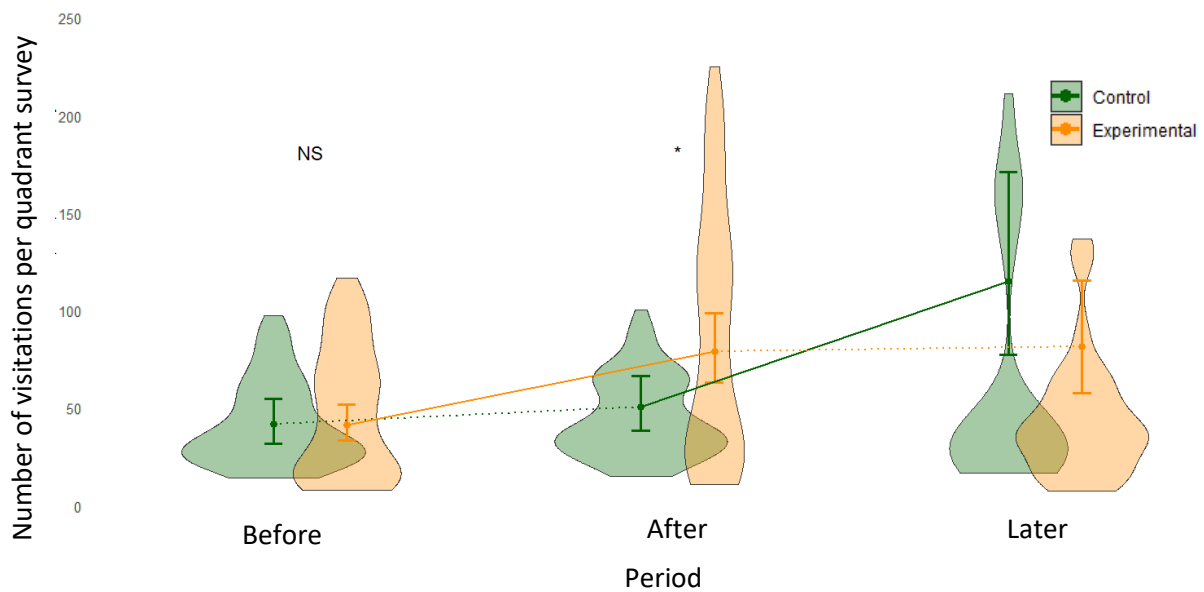
29 Appendix 7: Model outcomes for total number of floral units and visitations as response variable. for
 30 each explanatory variable the regression coefficient, Chi squared and significances (as given by a
 31 likelihood-ratio test) are indicated, as well as the emmeans estimates, Z-value and significances
 32 (Wald Test) for period comparisons. Significant outcomes are given in bold.

Response Variable	Explanatory variable	Regression coefficient (log)	χ^2 (d.f.)	Z-value	P-value
Number of floral units	Treatment * Time period		17.11		1.9e-04
	<i>Emmeans treatment</i>				
	• Control Before – Exp Before	-0.02		-0.07	0.94
	• Control After – Exp After	-0.23		-0.87	0.38
	• Control Later – Exp Later	0.89		3.38	7.0e-04
	<i>Emmeans period</i>				
	• Control Before – Control After	0.77		3.54	4.0e-04
	• Control After – Control Later	1.01		4.40	1.1e-05
	• Exp Before – Exp After	0.56		3.11	1.9e-03
	• Exp After – Exp Later	2.14		12.24	<2.2e-16
Total number of visitations	Treatment * Time period		29.58		3.8e-07
	<i>Emmeans treatment</i>	0.011		0.07	0.94

	- Control Before – Exp Before - Control After – Exp After - Control Later – Exp Later	-0.47 0.40		-3.13 2.18	0.002 0.03
	<i>Emmeans period</i>				
	- Control Before – Control After - Control After – Control Later - Exp Before – Exp After - Exp After – Exp Later	-0.02 -0.21 -0.50 0.66		-0.17 -1.61 -5.85 6.41	0.86 0.18 4.9e-09 1.4e-10
	Cloud Cover	-0.26	70.52		<2.2e-16

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Appendix 8: Model estimates of visitation frequency corrected for flower availability per period of the experiment (x-axis). Controls are shown in green, experimental locations in orange. Violins represent the distribution of model predicted values based on the available datapoints (i.e. values corrected for quadrant level baseline differences), points the model estimate and error bars the 95% confidence interval. Between treatment differences per period are indicated in text ($P > 0.05 = \text{NS}$, $0.01 < P < 0.05 = *$, $0.001 < P < 0.01 = **$, $P < 0.001 = ***$), changes between periods per treatment are indicated by lines (solid = significant, dotted = insignificant).

45 Appendix 9: Model outcomes for visitation frequency per pollinator group as response variable. For
 46 each explanatory variable the regression coefficient, Chi squared and significances (likelihood-ratio
 47 test) are indicated, as well as the emmeans estimates, Z-value and significances (Wald Test) for
 48 period comparisons. Significant outcomes are given in bold.

Response Variable	Explanatory variable	Regression coefficient (log)	χ^2 (d.f.)	Z-value	P-value
Honeybee visitations	Treatment * Time period		10.30		5.8e-03
	<i>Emmeans treatment</i>				
	• Control Before – Exp Before	-0.20		-0.14	0.89
	• Control After – Exp After	-0.96		-0.67	0.50
	• Control Later – Exp Later	0.39		0.27	0.79
	<i>Emmeans period</i>				
	• Control Before – Control After	-0.15		-0.52	0.61
Bumblebee visitations	• Control After – Control Later	-0.86		-2.43	0.02
	• Exp Before – Exp After	-0.90		-3.87	1.1e-04
	• Exp After – Exp Later	0.48		1.89	0.06
	Cloud Cover	-0.47	34.93		3.4e-09
	Treatment * Time period		17.34		1.7e-04
	<i>Emmeans treatment</i>				
		-2.7e-03		-0.01	0.99

	- Control Before – Exp Before - Control After – Exp After - Control Later – Exp Later	-0.41 0.51		-1.87 1.98	0.06 0.047
	<i>Emmeans period</i>				
	- Control Before – Control After - Control After – Control Later - Exp Before – Exp After - Exp After – Exp Later	0.27 -0.28 -0.14 0.64		1.92 -1.56 -1.23 4.68	0.054 0.12 0.22 2.8e-06
	Cloud Cover	-0.51	21.79		3.0e-06
	Non- <i>Bombus</i> Wild	Treatment * Time period	9.24		9.9e-03
	Bee visitations	<i>Emmeans treatment</i>			
	- Control Before – Exp Before - Control After – Exp After - Control Later – Exp Later	-1.55 -2.04 -0.40		-2.86 -3.68 -0.64	4.2e-03 2.3e-04 0.52
	<i>Emmeans period</i>				
	Control Before – Control After	3.4e-03 -0.73		9.0e-03 -1.57	0.99 0.12

	Control After – Control Later	-0.48		-2.35	0.02
	Exp Before – Exp After	0.91		3.23	1.2e-03
	Exp After – Exp Later				
	Cloud Cover	-0.51	33.23		8.2e-09
Beetle visitations	Treatment * Time period		3.07		0.22
	<i>Emmeans treatment</i>				
	Control Before – Exp Before	-0.31		-1.64	0.11
	Control After – Exp After	-0.74		-4.23	2.4e-05
	Control Later – Exp Later	-0.57		-2.13	0.03
	<i>Emmeans period</i>				
	Control Before – Control After	-0.45		-2.31	0.02
	Control After – Control Later	0.50		1.93	0.053
	Exp Before – Exp After	-0.88		-5.71	1.1e-08
	Exp After – Exp Later	0.67		3.69	2.3e-04
	Cloud Cover	-0.51	14.72		1.2e-04

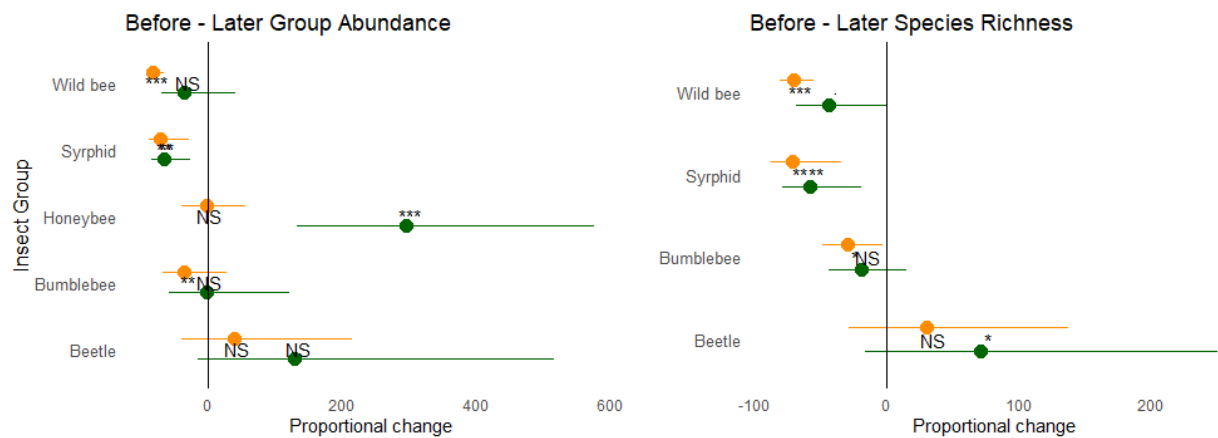
50 Appendix 10: Model outcomes for pollinator abundance and species richness from transects as
51 response variable. For each explanatory variable the regression coefficient, Chi squared and
52 significances (likelihood-ratio test) are indicated, as well as the emmeans estimates, Z-value and
53 significances (Wald Test) for period comparisons. Significant outcomes are given in bold.

Response Variable	Explanatory variable	Regression coefficient (log)	χ^2 (d.f.)	Z-value	P-value
Pollinator abundance	Treatment * Time period		34.85		2.7e-08
	<i>Emmeans treatment</i>				
	• Control Before – Exp Before	0.01		0.09	0.92
	• Control After – Exp After	0.02		0.13	0.90
	• Control Later – Exp Later	0.91		6.29	3.1e-10
	<i>Emmeans period</i>				
	• Control Before – Control After	-0.23		-1.69	0.09
Pollinator Species Richness	• Control After – Control Later	-0.31		-2.36	0.02
	• Exp Before – Exp After	-0.22		-2.01	0.04
	• Exp After – Exp Later	0.58		5.10	3.5e-07
	Cloud Cover	-0.02	0.46		0.50
	Treatment * Time period		9.87		7.2e-03
	<i>Emmeans treatment</i>				
		0.01		0.10	0.92

Control Before – Exp Before	0.08		0.55	0.58
Control After – Exp After	0.58		4.17	3.1e-05
Control Later – Exp Later				
<i>Emmeans period</i>				
Control Before – Control After	-4.1e-03		-0.03	0.98
Control After – Control Later	-0.21		-1.39	0.16
Exp Before – Exp After	0.06		0.50	0.62
Exp After – Exp Later	0.30		2.31	0.02
Cloud Cover	-0.02	0.35		0.55

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57 Appendix 11: Proportional changes in group level abundance (A) and species richness (B) in unmown
58 refuges (orange) and controls (green) in the before mowing situation and later period.

