TAC meeting #2: 6/12/21

TAC meetings #3: 26/04/22

TAC meeting #1: 24/05/21

Project 1: The effects of invertebrates on ecosystem functions and services

Project 2: A global meta-analysis reveals that beneficial biodiversity is positively associated with landscape heterogeneity in conventional agroecosystems

Project 3: Crop compositional heterogeneity suppresses the abundance of *Pieris canidia*, a major pest of cruciferous vegetables

TAC meeting #1: 24/05/21

Project 4: Biodiversity in agricultural landscapes: Balancing crop production and biodiversity conservation by promoting crop heterogeneity

TAC meeting #2: 6/12/21

Project 4: Promoting higher crop heterogeneity can reduce agricultural risks (i.e. input supply risk, output market risk, yield risk, and price risk) and increase farmers' income

TAC meetings #3: 26/04/22

Project 4: The effects of fine scale heterogeneity in urban green spaces on pollinator communities

TAC meetings #3: 26/04/22

Project 1: The effects of invertebrates on ecosystem functions and services

Project 2: A global meta-analysis reveals that beneficial biodiversity is positively associated with landscape heterogeneity in conventional agroecosystems

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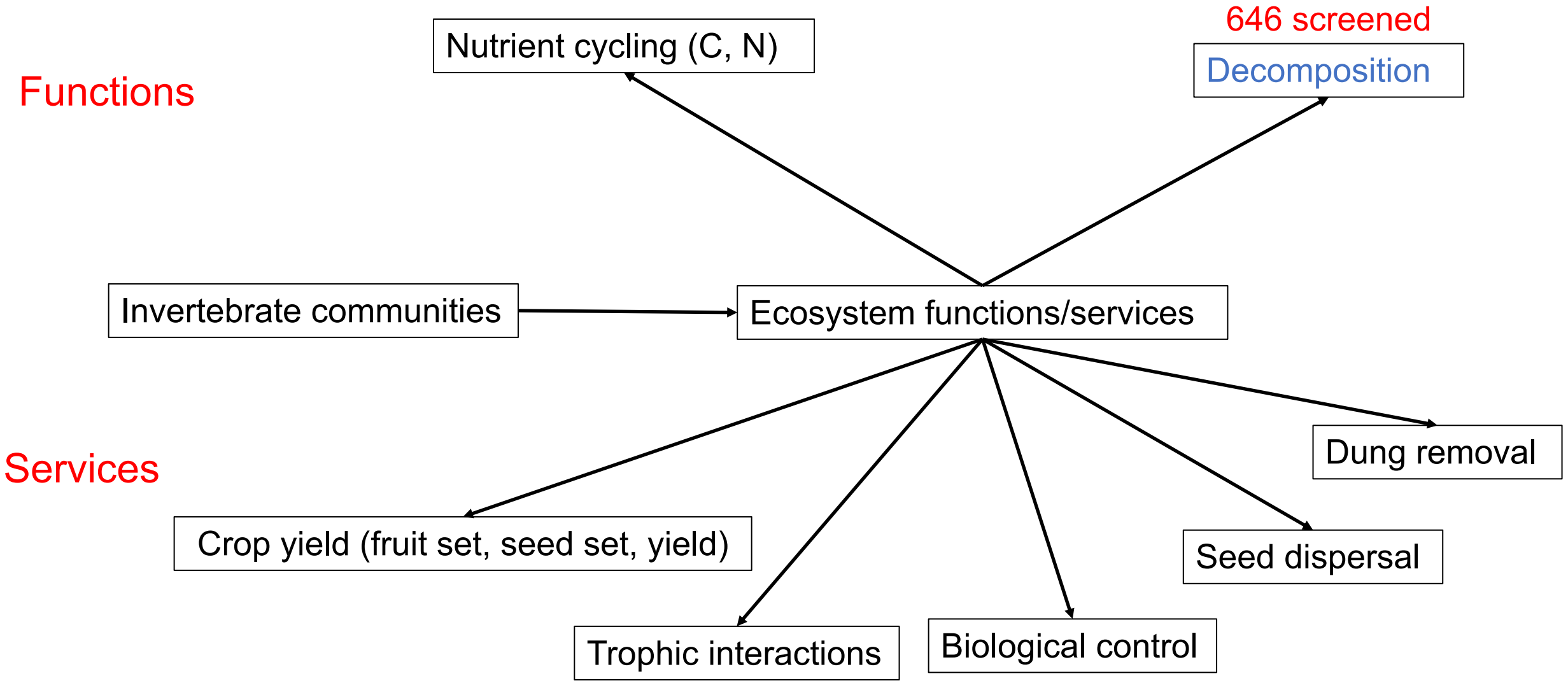
Project 4: The effects of fine scale heterogeneity in urban green spaces on pollinator communities

Project 1: The effects of invertebrates on ecosystem functions and services



Literature search

("decomposition" OR "breakdown" OR "decay*"

OR "mass loss" OR "mass remaining") AND

("species richness" OR "diversity" OR

"biodiversity") AND ("insect*" OR "arthropod*" OR

"inverte*" OR "macroinvertebrate*" OR "detritivor*")

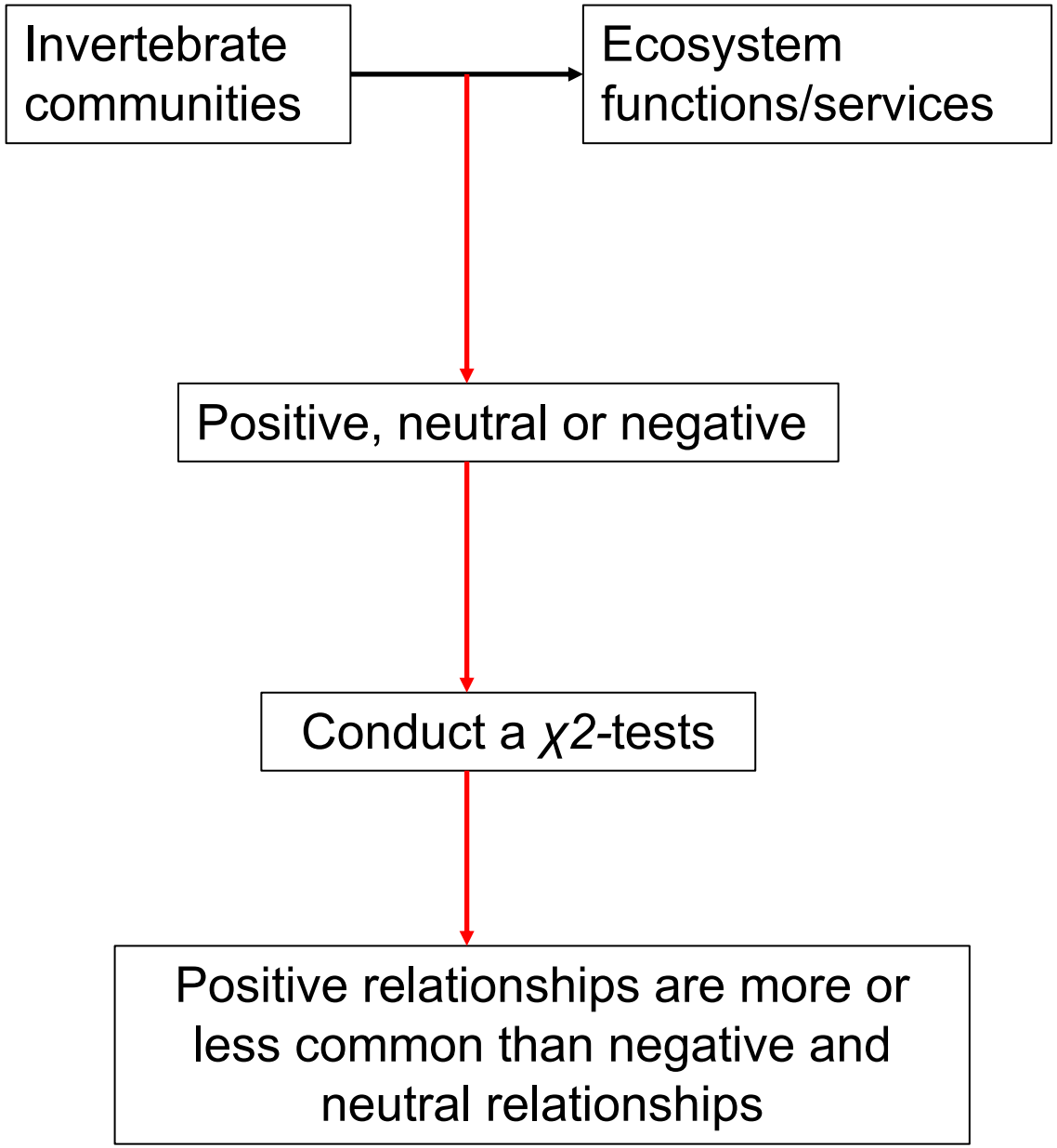
AND ("ecosystem function*" OR "stability" OR

"ecosystem proces*") **AND** ("manipulat*" OR

"exclu*" OR "treat*"

OR "experiment*")

NOT



	A	B	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
4		Article Title	Continent	Country	Study system	Category of funct	Ecosystem function (Y	Focal gro	Specific measurement	Rem	Invertebrate taxon (X)	Taxon (specific)	Biodiversity indicator (	Biodiversity indicator (specific)	ter	Relationship (Y~X)	elationsh	Relationship as	Control method	Test	Rema	Duration	Other pre
5	Eg	Insects affe	Asia	China	Forest	Decomposition	breakdown / decay / ma	leaves	Tree carbon storage (Mg C h		Insect	bees	Taxonomic diversity / fu	Species richness / abundance		Positive	es	Regression					Yes
7	5	Ant-mediate	North Amer	USA	Forest	Decomposition	mass loss	leaves	mass lost (g)		Insects	ant Formica subser	Taxonomic diversity	presence absence of ants		Positive	es	Comparative	mesh size	ANOVA, Tu		4 (2011)	Yes
9	7	The effects	South Amer	Costa Ric	Bromeliad	Decomposition	mass loss	leaves			Macroinvertebrates	NA	Taxonomic diversity	macroinvertebrate abundance		Positive	es	Comparative	site			10	Yes
10	8	Consumer tr	North Amer	USA	Saltmarshes	Decomposition	mass remaining	litter	mass remaining (g dry mass		Invertebrates	NA	Trophic diversity	presence absence of detritivores		Positive	es	Comparative	no leaf litter	ANOVA		11	Yes
11	9	Plant Divers	Europe	Germany	Grassland	Decomposition	mass remaining	litter	rate of decomposition		Invertebrates	NA	Taxonomic diversity	species richness		Positive	es	Comparative				9	Yes
13	9	Plant Divers	Europe	Germany	Grassland	Decomposition	mass remaining	litter	rate of decomposition		Invertebrates	NA	Taxonomic diversity	abundance		Positive	o	Regression				9	Yes
14	11 (may	Terrestrial vertebrate predators drive the structure and functioning of aquatic food webs																					
15	12	Biotic vs. Ab	Australia	Australia	Laboratory	Decomposition	mass remaining	leaves	rate of decomposition		Invertebrates	caddisfly larvae	Taxonomic diversity	species richness		Positive	es	Comparative				16	Yes
16	13	Diversity an	South Amer	Brazil	Rainforest	Decomposition	mass loss	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	presence absence macroinvertebrate		Positive	es	Comparative	mesh size	ANOVA			Yes
19	16	Resilience o	Asia	Indonesia	Oil palm	Decomposition	mass remaining	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	presence absence of invertebrates		Positive	es	Comparative	mesh size			8	Yes
20	17	When does	Europe	Sweden	Streams	Decomposition	ash free dry mass	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	detritivore richness		Positive (spring)	es	Comparative	season			3	Yes
21	17	When does	Europe	Sweden	Streams	Decomposition	ash free dry mass	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	detritivore richness		Negative (autumn)	es	Comparative	season			6	Yes
22	18	Shredder-ta	Australia	Australia	Streams	Decomposition	mass loss	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	shredder presence		Positive	es	Comparative	mesh size			3	Yes
25	21	Placing biod	Europe	Sweden	Streams	Decomposition	mass loss	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	detritivore richness		Negative	es	Comparative	no detritivores				Yes
26	21	Placing biod	Europe	Sweden	Streams	Decomposition	mass loss	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	detritivore density		Positive	es	Comparative	no detritivores				Yes
27	22	Landscape heterogeneity strengthens the relationship between beta-diversity and ecosystem function																				52	
28	23 (may	Dam-associated multiple-stressor impacts on fungal biomass and richness reveal the initial signs of ecosystem functioning impairment																					
40	35	Nonlinear ef	North Amer	USA	Ponds	Decomposition	mass loss	detritus	rate of decomposition		Invertebrates	caddisfly	Taxonomic diversity	abundance		Positive	es	Comparative	Caddisfly abundance			4	Yes
45	40 (may	Decomposition of terrestrial resource subsidies in headwater streams: Does consumer diversity matter?																					
47	42 (may	EMPIRICAL-EVIDENCE THAT DECLINING SPECIES-DIVERSITY MAY ALTER THE PERFORMANCE OF TERRESTRIAL ECOSYSTEMS																					
48	43 (may	Differential resource consumption in leaf litter mixtures by native and non-native amphipods																					
49	44	Leaf-litter br	Europe	Ireland, S	Streams	Decomposition	mass loss	leaves	rate of decomposition		Invertebrates	NA	Taxonomic diversity	richness		Positive	es	Comparative	mesh size			5 to 8	Yes
52	47	Collembola s	Europe	Germany	Greenhouse	Decomposition	mass remaining	litter	net decomposition		Invertebrates	collembola	Taxonomic diversity	richness		Negative	es	Comparative	no collembola			10	Yes
54	49	Species diversity and decomposition in laboratory aquatic systems: the role of species interactions														Result is co-explained	y fungal	richness hence excluded					
56	51	Disrupting th	South Amer	Ecuador	Streams	Decomposition	mass loss	litter	rate		Invertebrates		Taxonomic diversity	shredder richness		Positive (indirect)	es	Comparative	shredder presence			4	Yes
65	60	Fast attrition	Europe	European	Shrublands	Decomposition	mass loss	litter	rate or decomposition		Invertebrates	springtails	Taxonomic diversity	richness		Positive	es	Comparative	no warming or disturbance				Yes
67	62	Dominant sp	North Amer	USA	Streams	Decomposition	mass remaining	leaves	rate of breakdown		Invertebrates	Pycnopsyche	Taxonomic diversity	species density		Positive	es	Comparative	presence absence of pycnops			4	Yes
73	68	Tadpoles en	North Amer	Panama	Streams	Decomposition	mass loss	leaves	Trichospermum sp.	leaf	Invertebrates	NA	Taxonomic diversity	species density		Positive	es	Comparative	presence absence of tadpoles			4	Yes
75	70	Multiple elements of soil biodiversity drive ecosystem functions across biomes																					
79	74	Numerical and per capita response	Streams					leaf litter						insect diversity						the response is species depen			
84	79	The community and ecosystem consequences of intraspecific diversity: a meta-analysis																					
85	80	Effect of ex	Europe	Portugal	Streams	Decomposition	mass remaining	litter	Oak		Invertebrates	NA	Taxonomic diversity	presence absence of invertebrates		Positive	es	Comparative	mesh size			4	Yes
87	82	Differential r	Asia	Japan	Forest	Decomposition	removal rate	vetebrate	mouse		Invertebrates	burying beetles	Taxonomic diversity	beetle abundance		Positive	es	Comparative	trap type			1	Yes
90	85	Simulating s	Europe	France	Streams	Decomposition	mass loss	leaves	Alder and beech leaves		Invertebrates	Nemurella picteti K	Taxonomic diversity	species richness		Positive	o	Comparative					Yes
110	105	Agriculture i	North Amer	Panama	Streams	Decomposition	mass loss	leaves			Invertebrates	NA	Taxonomic diversity	invertebrate richness		Positive	es	Comparative	litter type				Yes
111	106	Does invasiv	Africa	Botswana	Temporary rivers	Decomposition	mass remaining	leaf litter			Invertebrates	NA	Taxonomic diversity	abundance		Positive	o	Comparative	mesh size			8	Yes
115	110	Salmon carcasses alter leaf litter species diversity effects on in-stream decomposition																					
116	111	Habitat fragmentation and the func	Forest		Dung removal		dung removed	dung			Invertebrates	dung-dwelling Apho	Taxonomic diversity	abundance		*effect varied for each	axon						
117	112	Ecosystem functioning in stream assemblages from different regions: contrasting responses to variation in detritivore richness, evenness and density																					
119	114	Dietary nich	Africa	Kenya	Streams	Decomposition	mass loss	litter			Invertebrates	crabs	Taxonomic diversity	richness		Positive	o	Comparative	exclusion			4	Yes
120	115	Management actions shape dung beetle community structure and functional traits in restored tallgrass prairie									no paper												
124	119	Mechanisms behind positive diversity effects on ecosystem functioning: testing the facilitation and interference hypotheses																					
125	120	Dynamic fee	Asia	China	Forest	Decomposition	mass loss	leaf litter	wood mass loss rate		Invertebrates	termites	Taxonomic diversity	abundance		Positive	es	Regression	mesh size			24, 48, 5	Yes
126	121	Potential im	Europe	France	Streams	Decomposition	mass remaining	leaves	Alder		Invertebrates	amphipods	Taxonomic diversity	density		Positive	es	Comparative				1	Yes
133	128	Area size m	South Amer	Brazil	Forest	Decomposition	mass loss	leaf litter	NA		Invertebrates	Arachnida, Chilopo	Taxonomic diversity	abundance, richness				Regression	Napthalene treatm	There are t		34	Yes
139	134	How biologic	Australia	Australia	Streams	Decomposition	leaf mass loss per mg	leaf litter	NA		Invertebrates	caddisflies, mayfly	Taxonomic diversity	presence absence		Positive	o	Comparative	exclusion			2	Yes
140	135	Diversity has stronger top-down than bottom-up effects on decomposition																					
142	137	Nonlinear Ef	Europe	Switzerlan	Streams	Decomposition	per capita leaf process	leaf litter	NA		Invertebrates	Gammarus fossaru	Taxonomic diversity	abundance		Negative	es	Comparative	collection of different species			2	Yes
143	138	Relative effe	North Amer	USA	Ponds	Decomposition	decomposition rate	NA			Invertebrates		Taxonomic diversity	richness		Positive	o	Comparative					Yes
144	139	Biodiversity	Oceania	Micronesi	Streams	Decomposition	leaf breakdown rate	leaf litter	NA		Invertebrates	snails, fish, shrimp	Taxonomic diversity	density		Positive	o	Comparative	electrified			3	Yes
147	142	The impact	Euroke	UK	Agriecosystems	Decomposition	mass remaining	leaf litter	NA		Invertebrates	>1.8 mm	Taxonomic diversity	abundance		Positive	es	Comparative	mesh size			35	Yes
148	143	Influence of	Hawaii	North Am	Forests	Decomposition	litter decomposition rat	leaf litter			Invertebrates	Succinea cepulla,	Taxonomic diversity	mollusc biomass		Positive	es	Comparative	exclusion (manipulate mollusc			NA	Yes
150	145	Landscape-d	Europe	Sweden	Streams	Decomposition	mass loss	leaves	Alder sp.		Invertebrates		Taxonomic diversity	abundance		Positive	es	Regression				12	Yes
156	151	Dung decom	South Amer	Chile	Forest	Decomposition	weight loss	dung	cow feces		Invertebrates	beetles	Taxonomic diversity	abundance		Positive	es	Comparative	type of forest patch?			8	Yes
158	153	Functional c	Asia	Japan	Forest	Decomposition	percentage removal	carcass	mouse		Invertebrates and Verteb	scavengers	Taxonomic diversity	presence absence		Positive	es	Comparative				1	Yes
159	154 (ma	Habitat Complexity in Aquatic Microcosms Affects Processes Driven by Detritivores																					
164	159	Geographic shifts in the	Costa Ric		Forests	Decomposition	mass loss	leaf litter			Invertebrates		Trophic diversity	trophic structure		Positive	es	Comparative				4, 8	Yes
168	163	Species turn	Europe	Switzerlan	Streams	Decomposition	consumption rate	leaf litter			Invertebrates	amphipods	Taxonomic diversity	richness		Negative	o	Comparative	mesocosm			4	Yes
174	169	Recovery of	Australasia	Australia	Forests	Decomposition	decomposition rate	leaf litter			Invertebrates		Taxonomic diversity	abundance		Positive	es	Comparative	mesh size			32	Yes
175	170	Drought impact on stream detritivo			Streams	Decomposition	mass loss	leaves			Invertebrates	Asellus aquaticus,	Taxonomic diversity	abundance		Positive	es	Comparative	mesocosms			6	Yes
200	195	Changes in	South Amer	Bogota	Forests	Decomposition	percent decomposition	litter			Invertebrates		Taxonomic diversity	richness and density		No difference		Comparative				8	Yes
202	197	Decomposition processes in coast			Lagoons	Decomposition	decomposition rate	leaves	Ruppia maritima		Invertebrates		Taxonomic diversity			Negative	es	Comparative	mesh size			4	Yes
205	200	Global-scale coordinated networks as a tool for exploring the functioning of stream ecosystems																					
206	201 (ma	Small-scale patch complexity, benthic invertebrate colonisation and leaf breakdown in three headwater streams in Bay of Plenty, New Zealand																					
217	212 (ma	Tree functional diversity affects litter decomposition and arthropod community composition in a tropical forest																					
220	215 (ma	Genetic variation within a dominant shrub structures green and brown community assemblages																					
226	221	Processing	Europe	Sweden	Lakes	Decomposition	weight loss	leaves	Alder sp., Oak		Invertebrates	caddisfly larvae, fr	Functional diversity	multispecies combinations		Not positive / negative		Comparative	type of species		There	8	Yes
227	222	Spatio-temp	Europe	Ireland	Shores	Decomposition	mass loss per day	kelp			Invertebrates		Taxonomic diversity	richness		No effect		Comparative	exclusion		more of testing		Yes
230	225 (ma	Effects of experimental warming, litter species, and presence of macroinvertebrates on litter decomposition and associated decomposers in a temperate mountain stream																					
232	227	Delayed ins	North Amer	USA	Forests	Decomposition	mass loss	carrion	swine		Invertebrates	NA	Taxonomic diversity	taxon richness		Positive	es	Comparative	exclusion of insects				Yes

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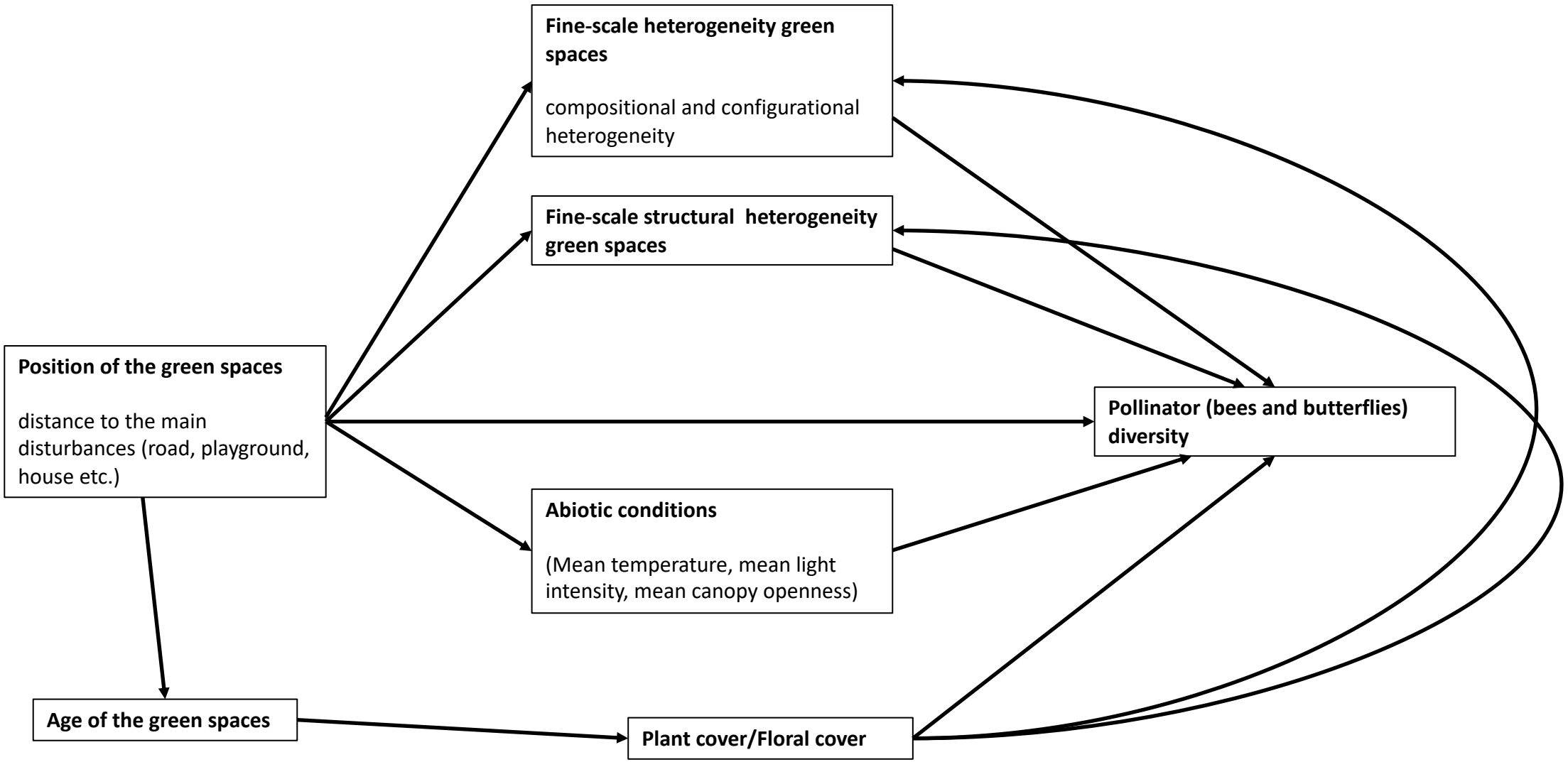
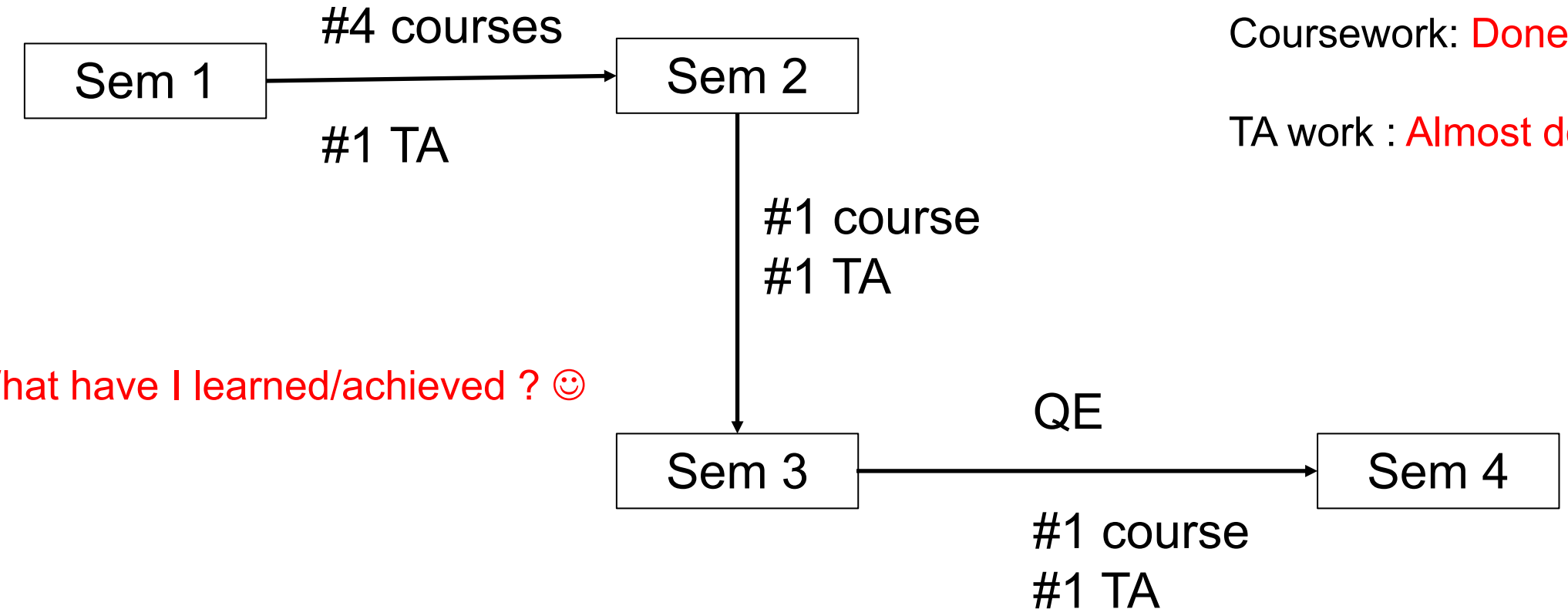
Project 4: The effects of fine scale heterogeneity in urban green spaces on pollinator communities



Phillips *et al.*, 2022; *Biological Conservation*
Anderson *et al., 2010; Ecology*

PHD journey as an international student so far



Coursework: Done!

TA work : Almost done!

What have I learned/achieved ? ☺