

Supplementary Information (SI): Insect community reassembly in a spatiotemporally heterogenous restoration landscape

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Appendix 1: Build it and they will come: Insect pollinator community reassembly in spatiotemporally heterogenous forest restoration.

Table A.1: Results of an indicator species analysis for the vegetation community across sampled restoration sites age range (in years) and unmined forest (MRF) in the Northern Jarrah Forest. The age class columns (1-5, 5-15... MRF) indicate (with ones) which restoration site ages were preferred by the species. The final two columns represent the associate statistic (Stat) and p-value (*P*) of permutational test conducted via multilevel pattern analysis using the *multipatt* function in the *indispecies* statistical package for R (Cáceres & Legendre 2009).

<i>Genus Species</i>	Abundance	1-5	5-15	15-20	20-30	30-45	MRF	Stat	<i>P</i>
<i>Acacia acuminata</i>	1	0	0	0	0	1	0	0.354	0.116
<i>Acacia alata</i>	4	1	0	0	0	0	0	0.500	0.022
<i>Acacia browniana</i>	7	0	1	0	0	0	0	0.189	1.000
<i>Acacia drummondii</i>	181	0	1	0	0	0	0	0.796	0.001
<i>Acacia extensa</i>	55	0	1	0	0	0	0	0.502	0.044
<i>Acacia horridula</i>	1	1	0	0	0	0	0	0.289	1.000
<i>Acacia lateriticola</i>	74	1	0	0	0	0	0	0.833	0.001
<i>Acacia longifolia</i>	1	0	0	0	1	0	0	0.289	1.000
<i>Acacia nervosa</i>	2	1	0	0	0	0	0	0.289	1.000
<i>Acacia pulchella</i>	34	0	0	1	0	0	0	0.551	0.012
<i>Acacia urophylla</i>	24	0	1	0	0	0	0	0.354	0.336
<i>Adenanthos barbiger</i>	13	0	0	0	0	0	1	0.577	0.005
<i>Aira caryophyllea</i>	135	0	1	0	0	0	0	0.289	1.000
<i>Allocasuarina fraseriana</i>	5	0	0	0	1	0	0	0.246	0.882
<i>Allocasuarina humilis</i>	1	0	1	0	0	0	0	0.289	1.000
<i>Amphypogon amphipogonoides</i>	32	0	0	0	0	1	0	0.469	0.051
<i>Banksia grandis</i>	15	0	0	0	0	0	1	0.408	0.212
<i>Billardiera sp. 1</i>	1	0	0	0	0	1	0	0.354	0.116
<i>Billardiera variifolia</i>	17	0	0	0	0	0	1	0.420	0.067
<i>Boronia fastigiata</i>	20	0	0	0	0	0	1	0.559	0.010
<i>Bossiaea aquifolium</i>	1060	0	0	1	0	0	0	0.736	0.001
<i>Bossiaea eriocarpa</i>	1	0	1	0	0	0	0	0.289	1.000
<i>Bossiaea ornata</i>	8	1	0	0	0	0	0	0.383	0.124
<i>Bossiaea pulchella</i>	1	0	1	0	0	0	0	0.289	1.000
<i>Burchardia congesta</i>	54	0	0	0	0	0	1	0.764	0.001
<i>Caladenia ferruginea</i>	1	0	0	0	0	1	0	0.354	0.127
<i>Caladenia sp. 1</i>	37	0	0	0	1	0	0	0.367	0.356
<i>Calothamnus lateralis</i>	1	0	1	0	0	0	0	0.289	1.000

<i>Calothamnus quadrifidus</i>	1	0	0	0	0	1	0	0.354	0.127
<i>Chamaescilla corymbosa</i>	8	0	0	0	0	0	1	0.198	1.000
<i>Chenopodium carinatum</i>	3	0	1	0	0	0	0	0.236	0.900
<i>Chenopodium sp. 1</i>	2	0	0	0	0	0	1	0.204	1.000
<i>Chorizema dicksonii</i>	3	0	0	1	0	0	0	0.236	0.899
<i>Chorizema ilicifolium</i>	7	0	0	0	0	0	1	0.463	0.041
<i>Clematis pubescens</i>	2	0	0	0	0	0	1	0.289	1.000
<i>Conostylis pusilla</i>	1	0	0	0	0	0	1	0.289	1.000
<i>Conostylis setigera</i>	67	0	0	0	1	0	0	0.417	0.489
<i>Corchorus macropetalus</i>	1	1	0	0	0	0	0	0.289	1.000
<i>Corymbia calophylla</i>	5	0	0	0	0	1	0	0.500	0.012
<i>Dampiera linearis</i>	2	1	0	0	0	0	0	0.408	0.135
<i>Daviesia cordata</i>	1	1	0	0	0	0	0	0.289	1.000
<i>Daviesia preissii</i>	13	0	0	1	0	0	0	0.289	1.000
<i>Daviesia rhombifolia</i>	41	0	1	0	0	0	0	0.588	0.007
<i>Dioscorea hastifolia</i>	29	0	0	0	0	1	0	0.524	0.009
<i>Disa bracteata</i>	1	0	0	0	0	0	1	0.289	1.000
<i>Diuris longifolia</i>	10	0	0	0	0	0	1	0.289	1.000
<i>Drakaea sp. 1</i>	11	0	0	0	0	0	1	0.408	0.153
<i>Drosera erythrohiza</i>	1	0	0	0	0	0	1	0.289	1.000
<i>Drosera pallida</i>	199	0	0	1	0	0	0	0.580	0.008
<i>Eucalyptus marginata</i>	7	0	0	0	1	0	0	0.500	0.016
<i>Eucalyptus megacarpa</i>	4	0	0	0	1	0	0	0.500	0.028
<i>Eucalyptus patens</i>	1	1	0	0	0	0	0	0.289	1.000
<i>Eucalyptus resinifera</i>	12	0	0	0	0	1	0	0.707	0.001
<i>Gamochaeta coarctata</i>	12	0	0	0	1	0	0	0.433	0.091
<i>Gompholobium marginatum</i>	2	0	0	0	1	0	0	0.289	1.000
<i>Gompholobium preissii</i>	2	1	0	0	0	0	0	0.289	1.000
<i>Haemodorum sp. 1</i>	2	0	0	0	0	0	1	0.289	1.000
<i>Hakea amplexicaulis</i>	13	0	1	0	0	0	0	0.320	0.487
<i>Hakea ilicifolia</i>	1	1	0	0	0	0	0	0.289	1.000
<i>Hakea lissocarpa</i>	2	0	0	0	0	0	1	0.204	1.000
<i>Hakea undulata</i>	5	0	1	0	0	0	0	0.408	0.126
<i>Hardenbergia comptoniana</i>	1	0	0	0	0	1	0	0.354	0.133
<i>Hemiandra sp. 1</i>	3	0	0	1	0	0	0	0.289	1.000
<i>Hibbertia acerosa</i>	1	0	0	0	0	1	0	0.354	0.127
<i>Hibbertia amplexicaulis</i>	33	0	0	0	0	0	1	0.343	0.561
<i>Hibbertia commutata</i>	198	0	1	0	0	0	0	0.534	0.132
<i>Hibbertia huegelii</i>	1	1	0	0	0	0	0	0.289	1.000
<i>Hibbertia perfoliata</i>	14	0	0	0	0	1	0	0.364	0.170

<i>Hibbertia racemosa</i>	18	0	1	0	0	0	0	0.500	0.017
<i>Hovea chorizemifolia</i>	16	0	0	0	0	0	1	0.714	0.001
<i>Hypocalymma angustifolia</i>	157	0	1	0	0	0	0	0.661	0.004
<i>Hypocalymma cordifolium</i>	1	0	0	0	1	0	0	0.289	1.000
<i>Hypochaeris glabra</i>	426	0	1	0	0	0	0	0.500	0.169
<i>Kennedia coccinea</i>	6	1	0	0	0	0	0	0.471	0.043
<i>Labuchea punctata</i>	1	0	0	0	0	1	0	0.354	0.116
<i>Lagenophora huegelii</i>	132	0	0	0	1	0	0	0.572	0.025
<i>Lasiopetalum floribundum</i>	112	0	0	0	0	0	1	0.624	0.007
<i>Lechenaultia biloba</i>	2	0	0	0	0	0	1	0.204	1.000
<i>Lepidosperma squamatum</i>	2	1	0	0	0	0	0	0.204	1.000
<i>Leucopogon capitellatus</i>	3	0	0	0	0	0	1	0.309	0.421
<i>Leucopogon nutans</i>	8	0	0	0	0	1	0	0.149	1.000
<i>Leucopogon propinquus</i>	1	0	0	0	0	0	1	0.289	1.000
<i>Leucopogon verticillatus</i>	4	0	0	0	0	1	0	0.612	0.002
<i>Levenhookia stipitata</i>	16	0	0	0	0	1	0	0.310	0.405
<i>Lomandra caespitosa</i>	27	0	0	0	0	0	1	0.405	0.109
<i>Lomandra hermaphrodita</i>	31	0	0	0	0	0	1	0.552	0.006
<i>Lomandra integra</i>	13	0	0	0	0	0	1	0.378	0.148
<i>Lomandra micrantha</i>	94	0	0	0	0	0	1	0.725	0.001
<i>Lomandra preissii</i>	29	0	0	0	0	0	1	0.565	0.006
<i>Lomandra sonderi</i>	54	0	0	0	0	0	1	0.682	0.003
<i>Lomandra sp. 1</i>	4	0	1	0	0	0	0	0.204	1.000
<i>Lomandra spartea</i>	11	0	0	0	0	1	0	0.491	0.023
<i>Lotus subbiflorus</i>	9	0	1	0	0	0	0	0.289	1.000
<i>Loxocarya cinerea</i>	21	0	0	0	0	0	1	0.500	0.021
<i>Macrozamia riedlei</i>	42	0	0	0	0	0	1	0.813	0.001
<i>Microtis media</i>	16	0	1	0	0	0	0	0.451	0.050
<i>Mirbelia dilatata</i>	23	0	0	0	1	0	0	0.505	0.014
<i>Neurachne alopecuroidea</i>	13	1	0	0	0	0	0	0.351	0.324
<i>Opercularia apiciflora</i>	75	0	0	0	1	0	0	0.412	0.288
<i>Opercularia echinocephala</i>	32	0	0	1	0	0	0	0.441	0.094
<i>Orchidaceae sp. 1</i>	1	0	1	0	0	0	0	0.289	1.000
<i>Patersonia babianooides</i>	4	0	0	0	0	0	1	0.289	1.000
<i>Pentapeltis peltigera</i>	51	0	0	0	0	0	1	0.707	0.001
<i>Persoonia longifolia</i>	6	0	0	0	0	0	1	0.577	0.001
<i>Phyllanthus calycinus</i>	3	1	0	0	0	0	0	0.236	0.891
<i>Pimelea suaveolens</i>	3	0	0	1	0	0	0	0.236	0.899
<i>Platysace filiformis</i>	4	0	0	0	0	0	1	0.408	0.147
<i>Platysace tenuissima</i>	252	0	0	1	0	0	0	0.667	0.001

<i>Pseudognaphalium luteo-album</i>	30	1	0	0	0	0	0	0.387	0.171
<i>Pteridium esculentum</i>	41	0	0	0	0	0	1	0.707	0.001
<i>Pterostylis nana</i>	198	0	0	0	1	0	0	0.528	0.018
<i>Pterostylis recurva</i>	1	0	0	0	0	1	0	0.354	0.133
<i>Pterostylis sp. 1</i>	5	0	0	0	1	0	0	0.258	0.906
<i>Pterostylis vittata</i>	6	0	0	0	0	0	1	0.373	0.258
<i>Pyrorchis nigricans</i>	1	0	0	0	0	0	1	0.289	1.000
<i>Ranunculus colonorum</i>	9	0	0	0	0	0	1	0.333	0.276
<i>Rytidosperma caespitosum</i>	13	0	0	0	0	1	0	0.265	0.398
<i>Scaevola calliptera</i>	9	0	0	0	0	1	0	0.231	0.746
<i>Senecio diaschidea</i>	17	0	1	0	0	0	0	0.243	0.720
<i>Senecio quadridentatus</i>	65	0	0	1	0	0	0	0.496	0.037
<i>Sphaerolobium medium</i>	4	1	0	0	0	0	0	0.408	0.155
<i>Stylidium amoenum</i>	1	0	0	1	0	0	0	0.289	1.000
<i>Stylidium piliferum</i>	57	0	0	0	0	1	0	0.405	0.132
<i>Tetraria capillaris</i>	115	0	0	0	0	0	1	0.714	0.001
<i>Tetrarrhena laevis</i>	64	0	0	0	0	0	1	0.813	0.001
<i>Tetratheca hirsuta</i>	22	0	0	0	0	1	0	0.612	0.003
<i>Thelymitra crinita</i>	14	0	0	0	0	0	1	0.426	0.048
<i>Thelymitra sp. 1</i>	3	0	0	0	0	1	0	0.500	0.018
<i>Thomasia sp. 1</i>	3	0	0	0	1	0	0	0.408	0.162
<i>Thysanotus dichotomus</i>	10	0	0	0	0	1	0	0.567	0.007
<i>Thysanotus manglesianus</i>	7	0	0	0	1	0	0	0.500	0.024
<i>Thysanotus multiflorus</i>	43	0	0	1	0	0	0	0.669	0.001
<i>Thysanotus sp1.</i>	1	0	0	0	0	1	0	0.354	0.123
<i>Thysanotus sp2.</i>	9	0	0	0	0	0	1	0.229	1.000
<i>Thysanotus thyrsoides</i>	47	0	1	0	0	0	0	0.417	0.150
<i>Trachymene pilosa</i>	56	0	1	0	0	0	0	0.500	0.023
<i>Trichocline spathulata</i>	9	0	0	0	0	0	1	0.408	0.160
<i>Tricoryne elatior</i>	2	0	0	0	0	0	1	0.289	1.000
<i>Trymalium ledifolium</i>	264	0	0	1	0	0	0	0.794	0.001
<i>Velleia trinervis</i>	5	0	1	0	0	0	0	0.408	0.165
<i>Vulpia myuros</i>	8	0	1	0	0	0	0	0.408	0.165
<i>Xanthorrhoea gracilis</i>	88	0	0	0	0	0	1	0.802	0.001
<i>Xanthorrhoea preissii</i>	105	0	0	0	0	0	1	0.900	0.001
<i>Xanthosia atkinsoniana</i>	5	0	0	0	0	1	0	0.185	0.870
<i>Xanthosia candida</i>	1	0	1	0	0	0	0	0.289	1.000

Table A.2: Results of an indicator species (morphospecies reported at family level resolution) analysis reported at family level for in the insect community across sampled restoration sites (age range in years) and unmined forest (MRF) sampled in the Northern Jarrah Forest. The age

class columns (1-5, 5-15... MRF) indicate (with ones) which restoration site ages were preferred by the species. The final two columns represent the associate statistic (Stat) and p-value (P) of permutational test conducted via multilevel pattern analysis using the *multipatt* function in the *indispecies* statistical package for R (Cáceres & Legendre 2009). NAs in the *P* value column correspond to those species which occur in all restoration age classes.

Morphospecies	Abundance	1-5	5-15	15-20	20-30	30-45	MRF	Stat	<i>P</i>
<i>Acroceridae sp. 1</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Aphelinidae sp. 1</i>	8	0	0	1	0	1	0	0.35	0.171
<i>Aphelinidae sp. 2</i>	2	1	1	0	0	0	0	0.236	1.000
<i>Aphelinidae sp. 3</i>	2	0	1	0	0	0	1	0.236	1.000
<i>Apidae sp. 1</i>	714	1	1	0	1	0	0	0.634	0.018
<i>Apidae sp. 2</i>	467	1	1	0	1	1	1	0.828	0.001
<i>Apidae sp. 3</i>	66	1	1	0	0	0	1	0.541	0.124
<i>Apidae sp. 4</i>	7	1	0	0	0	0	0	0.368	0.075
<i>Asilidae sp. 1</i>	2	0	1	0	1	0	0	0.236	1.000
<i>Asilidae sp. 2</i>	6	0	1	1	0	0	0	0.236	1.000
<i>Aulacidae sp. 1</i>	2	0	1	0	1	0	0	0.236	1.000
<i>Bethylidae sp. 1</i>	3	0	1	1	0	1	0	0.25	0.654
<i>Bethylidae sp. 2</i>	4	0	0	1	1	0	0	0.333	0.135
<i>Bibionidae sp. 1</i>	2	0	0	0	1	1	0	0.258	0.355
<i>Braconidae sp. 1</i>	16	0	0	0	0	1	0	0.369	0.122
<i>Braconidae sp. 2</i>	23	0	0	1	1	1	0	0.472	0.013
<i>Braconidae sp. 3</i>	25	1	1	0	1	1	0	0.473	0.229
<i>Braconidae sp. 4</i>	3	0	1	0	0	1	0	0.316	0.103
<i>Braconidae sp. 5</i>	1	0	0	0	0	1	0	0.289	0.105
<i>Braconidae sp. 6</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Buprestidae sp. 1</i>	41	1	0	0	0	0	0	0.521	0.002
<i>Buprestidae sp. 2</i>	4	0	1	0	0	0	0	0.236	1.000
<i>Buprestidae sp. 3</i>	7	1	1	0	0	0	0	0.289	0.430
<i>Buprestidae sp. 4</i>	4	1	1	0	0	0	1	0.272	0.717
<i>Buprestidae sp. 5</i>	2	0	0	0	1	1	0	0.258	0.393
<i>Calliphoridae sp. 1</i>	3	1	1	0	0	1	0	0.25	0.658
<i>Calliphoridae sp. 2</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Calliphoridae sp. 3</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Carabidae sp. 1</i>	92	1	1	1	1	1	1	0.61	NA
<i>Carabidae sp. 2</i>	13	1	1	0	1	0	0	0.408	0.045
<i>Carabidae sp. 3</i>	8	1	0	0	0	0	0	0.321	0.227
<i>Carabidae sp. 4</i>	4	0	1	1	1	0	1	0.236	1.000
<i>Cecidomyiidae sp. 1</i>	2	1	0	0	1	0	0	0.236	1.000

<i>Cerambycidae sp. 1</i>	6	0	1	0	1	0	1	0.304	0.451
<i>Cerambycidae sp. 2</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Chalcididae sp. 1</i>	3	0	1	1	1	0	0	0.236	1.000
<i>Chalcididae sp. 2</i>	1	0	0	0	0	1	0	0.289	0.107
<i>Chalcididae sp. 3</i>	2	1	0	0	0	0	0	0.333	0.168
<i>Chironomidae sp. 1</i>	7216	1	1	1	1	1	1	0.995	NA
<i>Chloropidae sp. 1</i>	491	0	1	1	1	1	1	0.86	0.009
<i>Chrysomelidae sp. 1</i>	82	1	1	1	1	1	1	0.514	NA
<i>Chrysomelidae sp. 2</i>	8	0	0	0	1	1	0	0.417	0.021
<i>Chrysomelidae sp. 3</i>	35	1	1	1	0	1	1	0.476	0.149
<i>Chrysomelidae sp. 4</i>	6	0	0	0	1	0	0	0.34	0.122
<i>Chrysomelidae sp. 5</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Chrysomelidae sp. 6</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Ciidae sp. 1</i>	275	1	1	1	1	1	1	0.642	NA
<i>Ciidae sp. 2</i>	28	1	1	0	1	1	1	0.362	0.901
<i>Cleridae sp. 1</i>	4	0	1	0	0	1	1	0.289	0.332
<i>Cleridae sp. 2</i>	30	0	1	1	1	1	1	0.423	0.342
<i>Cleridae sp. 3</i>	10	1	1	0	0	1	0	0.36	0.216
<i>Cleridae sp. 4</i>	3	0	0	0	0	1	0	0.408	0.013
<i>Cleridae sp. 5</i>	2	0	0	1	1	0	0	0.236	1.000
<i>Coccinellidae sp. 1</i>	100	1	0	0	0	0	0	0.597	0.001
<i>Coccinellidae sp. 2</i>	2	1	0	0	0	0	0	0.236	1.000
<i>Coccinellidae sp. 3</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Colletidae sp. 1</i>	39	1	0	1	0	0	1	0.363	0.657
<i>Colletidae sp. 2</i>	14	1	1	0	1	0	1	0.318	0.819
<i>Colletidae sp. 3</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Colletidae sp. 4</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Colletidae sp. 5</i>	13	1	1	0	1	0	1	0.236	1.000
<i>Colletidae sp. 6</i>	11	0	0	1	0	0	0	0.384	0.081
<i>Colletidae sp. 7</i>	3	1	0	0	0	0	1	0.289	0.423
<i>Colletidae sp. 8</i>	5	1	1	0	1	0	0	0.236	1.000
<i>Conopidae sp. 1</i>	3	1	0	0	0	0	0	0.236	1.000
<i>Corylophidae sp. 1</i>	4	1	1	1	0	0	0	0.236	1.000
<i>Corylophidae sp. 2</i>	4	1	0	1	0	0	1	0.236	1.000
<i>Crabronidae sp. 1</i>	2	0	1	0	0	0	0	0.236	1.000
<i>Cryptophagidae sp. 1</i>	4	1	0	0	0	1	0	0.316	0.113
<i>Culicidae sp. 1</i>	10	0	0	0	0	1	1	0.258	0.376
<i>Curculionidae sp. 1</i>	255	0	1	1	1	1	1	0.754	0.002
<i>Curculionidae sp. 2</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Curculionidae sp. 3</i>	14	1	1	1	1	1	1	0.328	NA
<i>Curculionidae sp. 4</i>	4	1	1	1	0	0	0	0.236	1.000

<i>Curculionidae sp. 5</i>	4	0	1	0	1	0	0	0.236	1.000
<i>Dermestidae sp. 1</i>	2	0	0	0	0	1	0	0.289	0.119
<i>Dolichopodidae sp. 1</i>	8	1	1	1	0	0	0	0.272	0.720
<i>Drosophilidae sp. 1</i>	49	1	0	1	1	1	1	0.319	0.916
<i>Elateridae sp. 1</i>	15	1	1	1	1	0	1	0.333	0.726
<i>Elateridae sp. 2</i>	3	0	0	0	0	0	1	0.236	1.000
<i>Elateridae sp. 3</i>	11	0	0	1	0	0	0	0.353	0.110
<i>Elateridae sp. 4</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Empididae sp. 1</i>	5	0	1	1	1	1	0	0.246	0.886
<i>Empididae sp. 2</i>	2	0	0	0	1	0	0	0.236	1.000
<i>Empididae sp. 3</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Empididae sp. 4</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Eucharitidae sp. 1</i>	2	0	0	0	0	0	1	0.333	0.156
<i>Eucnemidae sp. 1</i>	159	1	1	0	1	0	1	0.541	0.151
<i>Eucnemidae sp. 2</i>	2	1	0	1	0	0	0	0.236	1.000
<i>Eucnemidae sp. 3</i>	2	1	0	0	1	0	0	0.236	1.000
<i>Eulophidae sp. 1</i>	74	1	1	1	1	1	0	0.605	0.085
<i>Eulophidae sp. 2</i>	9	0	1	0	0	1	1	0.359	0.158
<i>Eulophidae sp. 3</i>	22	0	0	1	1	1	0	0.34	0.751
<i>Eulophidae sp. 4</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Eupelmidae sp. 1</i>	7	1	0	1	1	1	0	0.275	0.664
<i>Eurytomidae sp. 1</i>	6	0	1	1	0	0	1	0.236	1.000
<i>Fergusoninidae sp. 1</i>	3	1	0	0	0	0	0	0.236	1.000
<i>Figitidae sp. 1</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Formicidae sp. 1</i>	242	1	1	1	0	1	1	0.79	0.011
<i>Formicidae sp. 2</i>	1	0	0	0	0	1	0	0.289	0.111
<i>Formicidae sp. 3</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Formicidae sp. 4</i>	5	0	1	1	0	0	0	0.333	0.152
<i>Formicidae sp. 5</i>	25	1	1	1	0	0	0	0.372	0.162
<i>Formicidae sp. 6</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Formicidae sp. 7</i>	20	1	1	0	0	1	1	0.389	0.170
<i>Halictidae sp. 1</i>	334	1	1	0	0	0	0	0.753	0.001
<i>Halictidae sp. 2</i>	3	1	0	0	0	0	0	0.408	0.022
<i>Halictidae sp. 3</i>	2	1	1	0	0	0	0	0.236	1.000
<i>Halictidae sp. 4</i>	97	1	0	0	0	0	0	0.614	0.001
<i>Halictidae sp. 5</i>	170	1	0	0	0	0	0	0.707	0.001
<i>Halictidae sp. 6</i>	534	1	0	0	0	0	0	0.708	0.001
<i>Halictidae sp. 7</i>	370	1	0	0	0	0	0	0.522	0.004
<i>Halictidae sp. 8</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Hepialidae sp. 1</i>	5	0	1	0	0	0	0	0.361	0.091
<i>Hesperiidae sp. 1</i>	7	1	1	0	0	0	0	0.343	0.193

<i>Hesperiidae sp. 2</i>	3	0	0	0	1	0	0	0.333	0.133
<i>Ichneumonidae sp. 1</i>	6	0	1	0	0	1	0	0.316	0.117
<i>Ichneumonidae sp. 2</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Latridiidae sp. 1</i>	193	0	1	1	1	1	1	0.834	0.001
<i>Leiodidae sp. 1</i>	3	1	1	0	0	0	0	0.289	0.432
<i>Leiodidae sp. 2</i>	6	1	0	1	0	1	0	0.25	0.639
<i>Lucanidae sp. 1</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Lycaenidae sp. 1</i>	8	1	1	0	1	0	1	0.289	0.752
<i>Megachilidae sp. 1</i>	38	1	1	1	1	1	1	0.383	NA
<i>Megachilidae sp. 2</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Megachilidae sp. 3</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Megachilidae sp. 4</i>	13	1	1	0	1	0	1	0.354	0.322
<i>Megaspilidae sp. 5</i>	2	0	0	1	0	1	0	0.258	0.369
<i>Megaspilidae sp. 6</i>	1	0	0	0	0	1	0	0.289	0.107
<i>Meloidae sp. 1</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Mordellidae sp. 1</i>	231	0	1	1	1	1	1	0.584	0.101
<i>Muscidae sp. 1</i>	45	1	1	1	1	1	1	0.542	NA
<i>Muscidae sp. 2</i>	7	1	0	1	1	0	1	0.264	0.890
<i>Mycetophilidae sp. 1</i>	269	0	1	0	1	1	1	0.697	0.003
<i>Mycetophilidae sp. 2</i>	1	0	0	0	0	1	0	0.289	0.121
<i>Nepticulidae sp. 1</i>	35	1	1	1	0	1	1	0.375	0.871
<i>Nitidulidae sp. 1</i>	234	1	0	0	0	0	0	0.49	0.174
<i>Nitidulidae sp. 2</i>	2	0	1	0	0	0	1	0.236	1.000
<i>Nitidulidae sp. 3</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Noctuidae sp. 1</i>	18	1	1	1	0	0	1	0.378	0.534
<i>Nymphalidae sp. 1</i>	2	1	0	0	0	0	0	0.333	0.186
<i>Oecophoridae sp. 1</i>	205	1	1	1	1	1	1	0.664	NA
<i>Oecophoridae sp. 2</i>	60	1	1	1	1	1	1	0.475	NA
<i>Oecophoridae sp. 3</i>	40	1	1	0	0	1	0	0.547	0.004
<i>Phoridae sp. 1</i>	549	1	1	1	1	1	1	0.721	NA
<i>Pieridae sp. 1</i>	2	0	0	1	0	0	0	0.236	1.000
<i>Platygastridae sp. 1</i>	16	1	0	1	1	1	1	0.315	0.939
<i>Platygastridae sp. 2</i>	4	1	0	0	0	0	0	0.236	1.000
<i>Platygastridae sp. 3</i>	33	1	1	1	0	1	0	0.487	0.069
<i>Platygastridae sp. 4</i>	2	0	1	0	0	1	0	0.258	0.378
<i>Platygastridae sp. 5</i>	1	0	0	0	0	1	0	0.289	0.125
<i>Platygastridae sp. 6</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Pompilidae sp. 1</i>	1	0	0	1	0	0	0	0.236	1.000
<i>Pompilidae sp. 1</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Pompilidae sp. 1</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Pompilidae sp. 1</i>	1	1	0	0	0	0	0	0.236	1.000

<i>Pteromalidae sp. 1</i>	6	1	1	1	0	1	0	0.275	0.706
<i>Pteromalidae sp. 2</i>	14	1	0	0	0	1	0	0.355	0.348
<i>Pteromalidae sp. 3</i>	1	0	1	0	0	0	0	0.236	1.000
<i>Ptinidae sp. 1</i>	143	0	1	0	0	0	1	0.57	0.013
<i>Ptinidae sp. 2</i>	3	0	0	1	0	1	0	0.258	0.349
<i>Ptinidae sp. 3</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Ptinidae sp. 4</i>	3	0	0	1	0	0	1	0.289	0.442
<i>Scarabaeidae sp. 1</i>	66	1	0	1	0	1	0	0.513	0.228
<i>Scarabaeidae sp. 2</i>	2	0	1	0	1	0	0	0.236	1.000
<i>Scarabaeidae sp. 3</i>	14	0	1	0	0	0	0	0.236	1.000
<i>Scarabaeidae sp. 4</i>	5	1	0	0	0	0	1	0.289	0.423
<i>Scarabaeidae sp. 5</i>	2	1	0	1	0	0	0	0.236	1.000
<i>Scarabaeidae sp. 6</i>	2	1	0	0	0	0	0	0.236	1.000
<i>Scirtidae sp. 1</i>	4	1	0	0	0	0	1	0.236	1.000
<i>Scoliidae sp. 1</i>	2	0	0	1	1	0	0	0.236	1.000
<i>Sepsidae sp. 1</i>	14	0	1	0	0	0	0	0.236	1.000
<i>Sphecidae sp. 1</i>	25	1	0	0	0	0	0	0.471	0.007
<i>Sphecidae sp. 2</i>	5	0	0	1	1	1	0	0.289	0.392
<i>Staphylinidae sp. 1</i>	60	1	1	1	1	1	1	0.602	NA
<i>Staphylinidae sp. 2</i>	3	0	0	1	0	0	0	0.333	0.160
<i>Staphylinidae sp. 3</i>	9	0	0	1	0	1	1	0.331	0.321
<i>Staphylinidae sp. 4</i>	23	0	1	1	1	0	1	0.407	0.394
<i>Staphylinidae sp. 5</i>	2	0	1	0	1	0	0	0.236	1.000
<i>Syrphidae sp. 1</i>	49	1	1	1	1	0	0	0.469	0.211
<i>Syrphidae sp. 2</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Tabanidae sp. 1</i>	15	0	1	0	1	0	1	0.343	0.662
<i>Tachinidae sp. 1</i>	2	0	0	0	1	1	0	0.258	0.346
<i>Tachinidae sp. 1</i>	2	1	0	0	0	1	0	0.258	0.367
<i>Tenebrionidae sp. 1</i>	11	1	1	0	0	0	0	0.364	0.142
<i>Tephritidae sp. 1</i>	13	0	0	0	1	0	1	0.31	0.425
<i>Tephritidae sp. 2</i>	1	0	0	0	1	0	0	0.236	1.000
<i>Tephritidae sp. 3</i>	1	1	0	0	0	0	0	0.236	1.000
<i>Throscidae sp. 1</i>	2	0	0	0	0	0	1	0.333	0.183
<i>Tiphiidae sp. 1</i>	2	0	0	0	1	1	0	0.258	0.368
<i>Tipulidae sp. 1</i>	423	1	1	1	1	1	1	0.56	NA
<i>Tipulidae sp. 2</i>	3	0	0	1	1	1	0	0.25	0.637
<i>Torymidae sp. 1</i>	1	0	0	0	0	1	0	0.289	0.105
<i>Vespidae sp. 1</i>	4	1	0	0	0	0	0	0.236	1.000
<i>Vespidae sp. 2</i>	2	1	0	1	0	0	0	0.236	1.000
<i>Zopheridae sp. 1</i>	5	0	0	1	1	0	0	0.236	1.000

Table A.3: Functional guild classification for sampled insect families.

Fungivore	Pollinator	Detritivore	Parasitoid	Predator	Herbivore
Ciidae	Apidae	Calliphoridae	Acroceridae	Asilidae	Buprestidae
Corylophidae	Bibionidae	Cecidomyiidae	Aphelinidae	Carabidae	Cerambycidae
Cryptophagidae	Colletidae	Chloropidae	Aulacidae	Cleridae	Chrysomelidae
Latridiidae	Culicidae	Dermestidae	Bethylidae	Coccinellidae	Curculionidae
Leiodidae	Halictidae	Drosophilidae	Braconidae	Crabronidae	Fergusoninidae
Lucanidae	Hepialidae	Elateridae	Chalcididae	Dolichopodidae	Meloidae
Mycetophilidae	Hesperiidae	Eucnemidae	Conopidae	Empididae	Mordellidae
Throscidae	Lycaenidae	Muscidae	Eucharitidae	Formicidae	Tephritidae
Zopheridae	Megachilidae	Nitidulidae	Eulophidae	Pompilidae	
	Nepticulidae	Phoridae	Eupelmidae	Scoliidae	
	Noctuidae	Ptinidae	Eurytomidae	Sphécidae	
	Nymphalidae	Scarabaeidae	Figitidae	Staphylinidae	
	Oecophoridae	Scirtidae	Ichneumonidae	Tachinidae	
	Pieridae	Sepsidae	Megaspilidae	Tiphiidae	
	Syrphidae	Tabanidae	Platygastridae	Vespidae	
		Tenebrionidae	Pteromalidae		
		Tipulidae	Torymidae		

Table A.4: Post-hoc pairwise tests for one-way permutational multivariate analysis of variance on ranked Bray-Curtis dissimilarity matrix for (log10 + 1) transformed insect community data across sampled sites defined by their year of restoration. Bolded values indicate that compositions from each site are statistically different. *<0.05, **<0.01

Year	2018	2017	2015	2011	2010	2007	2003	2002	2001	1996	1994	1991	1985	1979	MRF1	MRF2
2017	0.690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	0.268	0.275	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	0.126	0.139	0.715	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	0.145	0.066	0.368	0.919	-	-	-	-	-	-	-	-	-	-	-	-
2007	0.057	0.024*	0.083	0.258	0.529	-	-	-	-	-	-	-	-	-	-	-
2003	0.045*	0.009**	0.041*	0.073	0.322	0.392	-	-	-	-	-	-	-	-	-	-
2002	0.032*	0.003**	0.022*	0.035*	0.173	0.485	0.880	-	-	-	-	-	-	-	-	-
2001	0.019*	0.013*	0.014*	0.040*	0.206	0.363	0.593	0.805	-	-	-	-	-	-	-	-
1996	0.038*	0.008**	0.019*	0.045*	0.219	0.507	0.401	0.817	0.452	-	-	-	-	-	-	-
1994	0.017*	0.004**	0.009**	0.025*	0.141	0.479	0.724	0.814	0.883	0.775	-	-	-	-	-	-
1991	0.066	0.029*	0.052	0.310	0.600	0.427	0.186	0.184	0.187	0.555	0.316	-	-	-	-	-
1985	0.052	0.008**	0.030*	0.069	0.455	0.452	0.399	0.545	0.475	0.818	0.502	0.524	-	-	-	-
1979	0.030*	0.006**	0.052	0.143	0.31	0.425	0.181	0.319	0.335	0.528	0.473	0.957	0.809	-	-	-
MRF1	0.033*	0.016*	0.028*	0.278	0.535	0.651	0.479	0.611	0.276	0.572	0.75	0.543	0.407	0.263	-	-
MRF2	0.040*	0.011*	0.022*	0.154	0.279	0.584	0.325	0.264	0.08	0.300	0.164	0.204	0.443	0.185	0.685	-
MRF3	0.044*	0.011*	0.021*	0.214	0.405	0.589	0.13	0.168	0.087	0.349	0.304	0.609	0.326	0.536	0.802	0.684

Table A.5: Summary of one-way analysis of variance (ANOVA) examining the effect of restoration age classes on the abundance of insect functional guilds.

	Pollinators		Detritivores		Fungivores		Herbivores		Parasitoids		Predators	
<i>Df</i>	<i>F Value</i>	<i>p</i>	<i>F Value</i>	<i>p</i>	<i>F Value</i>	<i>p</i>	<i>F Value</i>	<i>p</i>	<i>F Value</i>	<i>p</i>	<i>F Value</i>	<i>p</i>
(5, 96)	11.95	<0.001	3.13	0.011	1.77	0.125	5.78	<0.001	5.04	<0.001	4.41	<0.001

Table A.6: Results of the best-fit generalised linear mixed model in terms of the z-statistic, (*Statistic*) and significance (*p*) for the fixed effects of vegetation abundance, vegetation species richness and vegetation diversity (Simpson's) on the abundance of insect functional guilds. The number of observations (obs.), AIC value and the marginal (mR^2) and conditional (cR^2) coefficients of determination are listed below each response column. An example of the visual representation of these results can be seen for Pollinators and Parasitoids in Figure 5.

	Pollinators		Detritivores		Fungivores		Herbivores		Parasitoids		Predators	
<i>Vegetation Predictors</i>	<i>Statistic</i>	<i>p</i>	<i>Statistic</i>	<i>p</i>	<i>Statistic</i>	<i>p</i>	<i>Statistic</i>	<i>p</i>	<i>Statistic</i>	<i>p</i>	<i>Statistic</i>	<i>p</i>
Abundance	-2.11	0.035	0.09	0.93	0	0.997	-0.31	0.754	-2.28	0.023	-0.25	0.804
Richness	-0.62	0.538	1.2	0.229	1.07	0.286	-0.87	0.383	-0.87	0.384	0.63	0.53
Diversity	0.52	0.605	-0.99	0.322	-0.78	0.436	1.34	0.181	-0.19	0.85	-0.41	0.685
mR^2 / cR^2	0.128 / 0.328		0.018 / 0.018		0.020 / 0.112		0.042 / 0.187		0.122 / 0.172		0.007 / 0.119	
AIC	832.3		853.5		637.5		619.8		455.4		630.6	

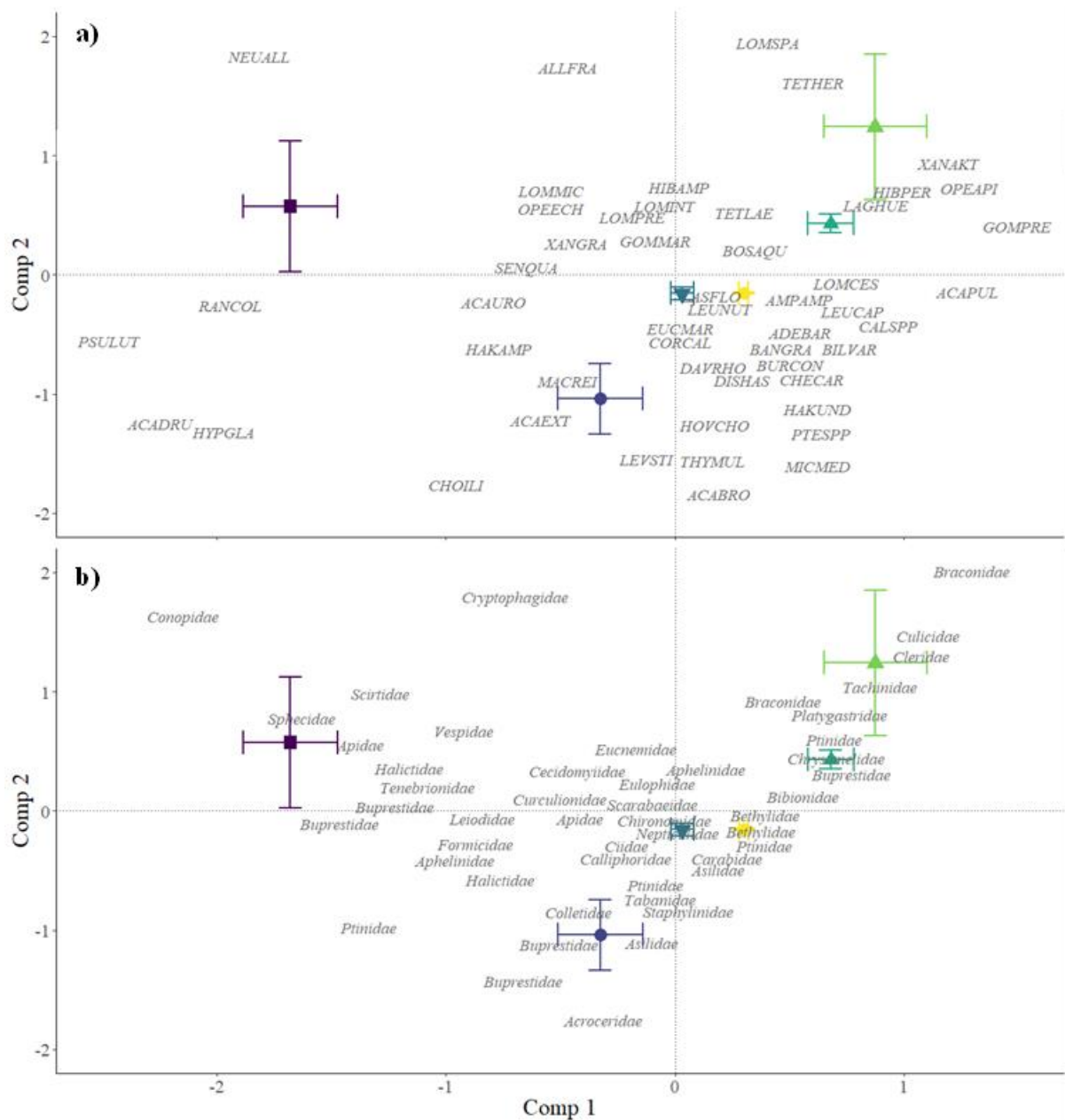


Figure A.1: Predictive co-correspondence (CoCA) biplot of a) vegetation community composition and b) insect community composition. Text overlay represents vegetation species codes (see full species names in Appendix Table A.1) and insect families corresponding to ordination scores with some species and families removed for readability. Points represent restoration age class centroids and standard errors; 1-5 year (■), 5-15 (●), 15-20 (▼), 20-30 (▲), 30-45 (▲) and unmined remnant forest (MRF; ●).

