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Investigating the relationship between non-vascular epiphytes and age structures within phorophytes on *Quercus robur* and *Pinus sylvestris*, at Dundreggan, Scotland

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Appendix 1

NPIEC - Native Pinewood Index of Ecological continuity

The species listed in Table 9 are arranged in their geographical groupings, as indicated in the left column.

The Native Pinewoods for which lichen records exist, are also arranged in geographical groups, and the full name and location of each wood is given at the end of this Table.

		WESTERN GROUP									CENTRAL GROUP									EASTERN GROUP					
		Ba	Co	Lm	Be	Cg	Cc	Cr	Dd	Ac	Am	Af	Ap	Ca	Gu	Sf	Mo	Mg	Bw	Ab	Ro	Bb	Ct	Ma	Gt
	Alectoria sarmen.				D					I		K	L		N	O		R					W		
	Arthonia leucopell.	A	B	C	D			G	H	I	J	K	L		N	O	P		R	S		U			
	A. vinosa		B								J	K	L		N	O				S	T	U		W X	
	Chaen. brun/trich.	A	B	C	D	E	F	G	H		J	K	L	M	N	O	P	Q	R	S	T	U	V	W X	
W	C. chrysocephala		B		D						J	K	L		N	O	P	Q	R	S	T	U	V	W X	
I	Chrysoth. chrysoph.		B		D	E					J	K			N				R	S		U			
D	Elixia flexella		B		D					I		K	L		N	O				S				W	
E	Hypoceno. friesii	A	B	C	D	E	F	G	H	I	J	K	L		N	O		R	S	T	U	V	W X		
S	Imshaug. aleurites	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U		W X	
P	Lecidea hypopta	A	B	C	D				H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W X	
R	L. turgidula	A		C	D							K	L	M	N	O	P	Q		S	T	U	V	W	
E	Lopadium discif.				D			G		I		K	L		N	O			R			U	V	X	
A	Loxospora elatina	A	B	C	D	E	F	G		I	J	K	L	M	N	O			R	S	T	U		W X	
D	Megalaria pulverea		B	C	D					I		K	L		N	O			R				V		
	Microcalic. ahlneri		B	C			F					K	L		N				S					W	
	Mycoblastus affinis	A	B	C	D			G		I	J	K	L		N	O		Q	R	S	T	U		W	
	Pertusaria borealis				D				H	I	J					O		Q	R	S	T	U		W X	
	Protop. ochrococca	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W X	
	Thelot. lepadinum	A	B	C	D	E		G		I	J	K	L	M	N	O			R	S		U		W	
	Xylographa spp.(2+)		B		D			G		I		K	L	M	N	O		Q	R	S	T	U	V	W X	
W	Calicium parvum										J	K			N				R					X	
E	Cavern. hultenii	A	B	C	D			G		I	J	K	L	M	N	O			R						
S	Degelia atl./plumb.	A	B	C	D				H		J	K	L	M		O			R						

		WESTERN GROUP									CENTRAL GROUP									EASTERN GROUP					
		Ba	Co	Lm	Be	Cg	Cc	Cr	Dd	Ac	Am	Af	Ap	Ca	Gu	Sf	Mo	Mg	Bw	Ab	Ro	Bb	Ct	Ma	Gt
T	Hypotr. laevigata	A		C	D	E	F	G	H																
	Lobaria spp.	A	B	C	D	E		G			J	K	L	M	N	O			R	S	T		r		
&	Melasp. lentiginosul.	A	B							I															
	Micarea adnata	A	B	C	D							K	L			O			R						
C	M. alabastrites	A	B	C	D	E	F	G	H	I						O									
E	M. hedlundii		B	C	D											O									
N	M. stipitata	A	B	C	D					I															
T	M. synotheoides	A	B	C	D		F		H	I									R						
R	Pannaria s. lat. spp.	A	B	C	D	E		G		I	J	K	L	M		O			R	S					
A	Pert. ophthalmiza	A	B	C	D	E	F	G		I					N	O									
L	Platis. norvegica		B		D			G		I	J	K	L		N	O	P								
	Sticta spp.		B	C	D	E		G	H	I						O							r		
E	Bryoria capillaris							G			J	K	L		N	O	P		R	S	T	U			
A	B. furcellata											K	L		N	O				S					
S	Chaen. xyloxena		B													O				S	T			W	
T	Chaen'opsis pusiola											K	L		N	O			R		T	U		W	
	Cladonia botrytes																			S	T	U		W	
&	C. cenotea																			S	T	U		W	
	Cyphelium inquin.										J	L			N	O	P		R	S	T		W	X	
C	C. tigillare																			S	T			W	
E	Lecanora cadubriae													M	N	O	P	Q	R	S	T	U	V	W	X
N	Lecidea botryosa														N					S	T	U	V	W	X
T	Micarea contexta																			S	T			W	X
R	Microcal. dissemin.											K	L		N		P			S	T	U		W	X
A	Mycoblastus alpinus																				T	U		W	
L	Pycnora xanthoc.																			S	T			W	
	Sclero. pall./peron.							G				K	L			O			R	S	T	U		W	
	Total (full)	21	29	24	31	13	10	19	12	23	20	32	30	13	31	35	12	12	28	32	27	25	11	29	16
	Total (widespread)	10	16	12	18	7	6	10	7	14	13	19	18	8	19	18	7	9	16	17	12	16	9	16	11

Western Group

Ba = Barrisdale (vc 97; 18(NG)/80)
Co = Coulin (vc 105; 18(NG)/95)
Lm = Loch Maree NNR (vc 105; 28(NH)/06)
Be = Beinn Eighe NNR (Coille na Glas-leitire,
Allt a'Chuirn, Allt Sguabaidh & Allt na
Doire Daraich) (vc 105; 18(NG)/96 &
28(NH)/06)
Cg = Cona Glen (vc 97; 17(NM)/97)
Cc = Coille Coire Chuilc (vc 88; 27(NN)/32)
Cr = Crannach (vc 98; 27(NN)/34)
Dd = Doire Darach (vc 105; 27(NN)/24)
Ac = Achnashellach (vc 105; 28(NH)/04)

Central Group

Am = Amat (vc 106; 28(NH)/48)
Af = Affric (vc 96; 28(NH)/12 & 28(NH)/22)
Ap = Affric (Pollan Bhuidhe only; 28(NH)/12)
Ca = Cannich (vc 96; 28(NH)/23 & 28(NH)/33)
Gu = Guisachan (vc 96; 28(NH)/22)
Sf = Strathfarrar (vc 96; 28(NH)/32-33-34)
Mo = Moriston (vc 96; 28(NH)/21 & 28(NH)/31)
Mg = Old Wood of Meggernie (vc 88; 27(NN)/54)
Bw = Black Wood of Rannoch (vc 88; 27(NN)/55)

Eastern Group

Ab = Abernethy (vc 96; 28(NH)/91 & 38(NJ)/01)
Ro = Rothiemurchus (vc 96; 28(NH)/90,
28(NH)/80 & 28(NH)/91)
Bb = Ballochbuie (vc 93; 37(NO)/18-19, &
37(NH)/28)
Ct = Crathes (vc 92; 37(NO)/29)
Ma = Mar (vc 92; 37(NO)/09)
Gt = Glentinar (vc 92; 37(NO)/49)

Appendix 2. List of epiphytic species found

<i>Arthonia didyma</i>	<i>Gyalecta truncigena</i>	<i>Pertusaria albescens</i>
<i>Arthonia punctiformis</i>	<i>Hypogymnia physodes</i>	<i>Physica tenella</i>
<i>Arthopyrenia punctiformis</i>	<i>Hypogymnia tubulosa</i>	<i>Platismatia glauca</i>
<i>Arthopyrenia fraxini</i>	<i>Isothecium myosuroides</i>	<i>Ramalia fraxinea</i>
<i>Baeomyces rufus</i>	<i>Lecanor expallens</i>	<i>Schismatomma umbrinum</i>
<i>Bryoria fuscescens</i>	<i>Lecanora albella</i>	<i>Species 1</i>
<i>Candelariella vitellina</i>	<i>Lecanora expallens</i>	<i>Species 2</i>
<i>Cetratia islandica</i>	<i>Lecanora inticata</i>	<i>Species 4</i>
<i>Chaenotheca branchypoda</i>	<i>Lecidella elaeochroma</i>	<i>Sphaerophorus globulus</i>
<i>Cladonia coniocrea</i>	<i>Leptogium lichenoides</i>	<i>Stenocybe pullatula</i>
<i>Cladonia digitata</i>	<i>Lobaria pulmonaria</i>	<i>Thelotrema lepadinum</i>
<i>Cladonia incrassata</i>	<i>Lobarium Scrobiculata</i>	<i>Umbilicaria cylindrica</i>
<i>Cladonia pyxidata</i>	<i>Melanelia laciniatula</i>	<i>Umbilicaria polyphylla</i>
<i>Cladonia strepsilis</i>	<i>Orchrolechia androgyna</i>	<i>Umbilicaria polyrrhiza</i>
<i>Collema gebulentum</i>	<i>Orchrolechia tartarea</i>	<i>Usnea filipendula</i>
<i>Degelia plumbea</i>	<i>Pannaria conoplea</i>	
<i>Degelia atlantica</i>	<i>Parmeila saxatilis</i>	
<i>Dicranium scoparium</i>	<i>Parmelia laevigata</i>	
<i>Dicranum bonjeanii</i>	<i>Parmelia omphalodes</i>	
<i>Dicranum fuscescens</i>		
<i>Dicranum majus</i>		
<i>Dicranum scoparium</i>		
<i>Evernia prunastri</i>		
<i>Frullania dilatata</i>		
<i>Fuscidea lightfootii</i>		

Appendix 3. Environmental Measurements for Oak

Oak Tree	Zone	Branch	Aspect	Circumference	Length	Number of species
1	1	P1	E	0.63	2.3	7
1	1	S1	NW	0.25	3.3	6
1	1	T1	E	0.22	0.81	4
1	1	P2	SW	0.75	1.21	7
1	1	S2	N	0.31	1.57	9
1	1	T2	NE	0.11	0.64	4
1	1	P3	E	0.39	2.24	9
1	1	S3	NW	0.23	1.78	6
1	1	T3	NE	0.22	1.36	2
1	2	P1	NW	0.72	1.22	7
1	2	S1	NE	0.3	1.33	5
1	2	T1	W	0.12	0.77	5
1	2	P2	E	0.87	4.24	10
1	2	S2	S	0.19	1.64	3
1	2	T2	NE	0.25	0.84	4
1	2	P3	SE	0.76	2.23	12
1	2	S3	NW	0.34	1.21	5
1	2	T3	W	0.21	1.84	3
1	3	P1	N	0.64	2.22	12
1	3	S1	SW	0.23	1.9	3
1	3	T1	NW	0.19	0.48	4
1	3	P2	NE	0.56	2.9	10
1	3	S2	S	0.47	2.2	9
1	3	T2	N	0.12	0.77	4
1	3	P3	S	0.91	1.26	6
1	3	S3	N	0.24	0.91	8
1	3	T3	NW	0.2	1.48	8
2	1	P1	S	1.2	2.6	14
2	1	S1	SE	0.31	3.2	5
2	1	T1	S	0.05	1.1	2
2	1	P2	SW	0.76	2.8	15
2	1	S2	SW	0.38	2.2	4
2	1	T2	SW	0.18	1.1	6
2	1	P3	NE	0.3	0.63	7
2	1	S3	N	0.19	0.46	4
2	1	T3	NW	0.16	0.4	2
2	2	P1	SW	0.82	4.5	12
2	2	S1	NW	0.12	0.6	4
2	2	T1	NW	0.06	0.56	2
2	2	P2	W	0.68	1.5	10
2	2	S2	NW	0.29	1.47	10
2	2	T2	NW	0.08	1	2

2	2	P3	N	0.56	2.4	9
2	2	S3	NE	0.32	1	9
2	2	T3	NE	0.17	0.3	8
2	3	P1	N	0.66	2.1	13
2	3	S1	N	0.16	0.53	7
2	3	T1	NW	0.7	0.6	2
2	3	P2	NW	0.9	0.6	9
2	3	S2	SW	0.6	2.83	10
2	3	T2	S	0.4	0.17	4
2	3	P3	NW	0.4	1.75	9
2	3	S3	W	0.7	0.58	3
2	3	T3	SW	0.5	0.37	3
3	1	P1	SW	0.49	5.2	8
3	1	S1	S	0.39	2.33	3
3	1	T1	SW	0.26	0.8	5
3	1	P2	W	0.6	3.36	12
3	1	S2	W	0.28	1.91	4
3	1	T2	SE	0.15	1.09	3
3	1	P3	N	0.68	3.56	9
3	1	S3	W	0.33	2.63	5
3	1	T3	W	0.22	1.26	2
3	2	P1	S	0.62	1.98	15
3	2	S1	SE	0.31	1.62	7
3	2	T1	NW	0.2	1.75	3
3	2	P2	S	0.78	3.83	8
3	2	S2	E	0.54	2.4	7
3	2	T2	N	0.35	1.7	4
3	2	P3	NW	0.1	2.61	18
3	2	S3	NW	0.71	1.67	7
3	2	T3	S	0.16	0.98	4
3	3	P1	N	0.82	3.43	7
3	3	S1	SE	0.6	1.63	12
3	3	T1	NE	0.16	1.14	1
3	3	P2	N	0.8	1.56	10
3	3	S2	W	0.61	1.62	9
3	3	T2	S	0.17	1.82	3
3	3	P3	SW	0.89	3.04	11
3	3	S3	N	0.49	2.59	6
3	3	T3	N	0.12	2.87	4

Appendix 4 Environmental Measurements for Scots pine

Scots Pine Tree	Zone	Branch	Aspect	Circumference	Length	Number of species
1	1	P1	N	0.67	3.45	2
1	1	S1	N	0.36	1.93	4
1	1	T1	NW	0.19	1.33	2
1	1	P2	N	0.47	1.16	4
1	1	S2	N	0.36	1.93	1
1	1	T2	E	0.11	0.99	5
1	1	P3	NW	0.73	3.95	3
1	1	S3	NE	0.35	1.47	3
1	1	T3	NW	0.24	2.26	1
1	2	P1	W	0.68	7.57	0
1	2	S1	E	0.42	1.9	2
1	2	T1	S	0.2	0.65	1
1	2	P2	E	0.64	5.29	1
1	2	S2	S	0.58	2.52	2
1	2	T2	SE	0.25	3.59	1
1	2	P3	E	0.69	10.26	2
1	2	S3	E	0.29	3.17	1
1	2	T3	SE	0.24	2.25	1
1	3	P1	N	0.33	1.61	0
1	3	S1	E	0.32	1.26	3
1	3	T1	E	0.24	1.04	1
1	3	P2	SE	0.59	2.38	0
1	3	S2	N	0.23	2.85	2
1	3	T2	NW	0.19	0.94	3
1	3	P3	NW	0.58	3.72	3
1	3	S3	NW	0.39	1.57	1
1	3	T3	E	0.23	2.35	3
2	1	P1	N	0.57	2.66	4
2	1	S1	N	0.33	1.47	1
2	1	T1	SE	0.21	1.26	0
2	1	P2	SE	0.49	1.37	4
2	1	S2	SE	0.3	2.68	3
2	1	T2	SE	0.15	1.5	2
2	1	P3	N	0.46	3.21	2
2	1	S3	SE	0.41	2.67	2
2	1	T3	E	0.21	2.63	2
2	2	P1	NE	0.46	3.25	0
2	2	S1	SE	0.37	2.2	0
2	2	T1	SW	0.23	0.64	1
2	2	P2	SE	0.33	2.22	1
2	2	S2	W	0.39	1.46	2

2	2	T2	E	0.2	3.25	3
2	2	P3	NW	0.64	6.18	6
2	2	S3	E	0.71	2.73	0
2	2	T3	NE	0.31	1.49	3
2	3	P1	SE	0.65	2.8	0
2	3	S1	SE	0.28	2.94	2
2	3	T1	SE	0.16	1.11	1
2	3	P2	NE	0.32	2.3	2
2	3	S2	SE	0.59	2.21	1
2	3	T2	SE	0.12	0.98	0
2	3	P3	W	0.7	3.16	3
2	3	S3	E	0.33	3.76	2
2	3	T3	S	0.2	1.44	0
3	1	P1	E	0.71	2.79	0
3	1	S1	SE	0.31	1.46	0
3	1	T1	E	0.21	1.28	0
3	1	P2	W	0.39	1.55	2
3	1	S2	SE	0.31	1.52	2
3	1	T2	SW	0.17	0.57	1
3	1	P3	SE	0.89	7.5	1
3	1	S3	S	0.44	2.19	1
3	1	T3	W	0.23	0.88	2
3	2	P1	SW	0.8	1.51	1
3	2	S1	NW	0.4	3.59	0
3	2	T1	S	0.18	1.66	0
3	2	P2	N	0.49	9.45	2
3	2	S2	E	0.26	2.56	1
3	2	T2	S	0.12	0.7	0
3	2	P3	NW	0.75	2.46	1
3	2	S3	SW	0.22	3.26	2
3	2	T3	S	0.12	0.7	1
3	3	P1	SE	0.39	4.43	0
3	3	S1	SW	0.2	1.34	0
3	3	T1	SE	0.11	0.95	0
3	3	P2	SE	0.52	1.2	1
3	3	S2	S	0.19	1.4	0
3	3	T2	N	0.58	0.21	2
3	3	P3	NE	0.41	1.67	0
3	3	S3	E	0.22	1.75	0
3	3	T3	S	0.13	0.56	1