

Supplementary Material

Table S1: Change in mean stem count number between 1971 and the 2020s by species, for each pinewood site and as a mean across all sites – native woody species

Group	Site no.	Site	<i>Pinus sylvestris</i>	<i>Betula spp.</i>	<i>Alnus glutinosa</i>	<i>Fraxinus excelsior</i>	<i>Populus tremula</i>	<i>Salix spp.</i>	<i>Ilex aquifolium</i>	<i>Juniperus</i>	<i>Sambucus nigra</i>	<i>Quercus sp.</i>	<i>Sorbus spp.</i>	Total change by site - natives
Deeside Group	1	Glen Tanar	87					0					0	87
	2	Ballochbuie	69	20				0		8			0	97
	3	Mar Lodge	31	2				0					0	33
Speyside Group	4	Abernethy	58	-12				0					-5	41
	5	Rothiemurchus	44	18	1		-8	-42		1	1		0	15
	6	Glenmore	121	-3				0		5			0	123
	7	Glen Feshie	-28	19				3		5			0	-1
	27	Dulnain	33					0		4			0	37
Rannoch Group	8	Black Wood of Rannoch	24	-13				-55					1	-43
	9	Meggernie	12	86	5			5					-2	106
Great Glen Group	10	Glen Moriston	114	-190			-1	-52		1			-21	-149
	11	Glengarry	-43	171				0					0	128
	12	Barisdale	-4	11				0	6	3			-30	-14
	13	Loch Arkaig & Glen Mallie	-3	-6				0					-4	-13
	14	Ardgour	15	54		1		3					0	73
Strath Glass Group	15	Glen Affric	-18	46				6				1	-6	29
	16	Glen Cannich	50	-18				-16					4	20
	17	Glen Strathfarrar	18	33	1			0					-1	51
	18	Guisachan & Cougie	11	147	3			-212					-52	-103
Wester Ross Group	19	Coulin	34	145	1			0					24	204
	20	Achnashellach	12	-125				0					-14	-127
	21	Shieldaig	19	-41				0					-16	-38
	23	Loch Maree	16	-46				0	5	2			7	-16
Northern Group	22	Amat	38	22	1			0		1			-1	61
Southern Group	24	Black Mount	-61	18	1			1					-123	-164
	25	Glen Orchy	1	147				1				2	5	156
	26	Tyndrum	5	30		1		0					-4	32
Mean			24.3	19.1	0.5	0.1	-0.3	-13.3	0.4	2.8	0	0.1	-8.8	24.9
S.D.			41.8	77.5	1.1	0.3	1.5	48	1.5	8.9	0.2	0.4	31.5	212.7

Table S2. Change in non-native woody species

<i>Group</i>	<i>Site no.</i>	<i>Site</i>	<i>Larix sp.</i>	<i>P. contorta</i>	<i>Picea albies</i>	<i>P. nigra</i>	<i>Pseudotsuga menziesii</i>	<i>P. sitchensis</i>	<i>Total change by site - non-natives:</i>
<i>Deeside Group</i>	1	Glen Tanar					-3		-3
	2	Ballochbuie			14				14
	3	Mar Lodge							0
<i>Speyside Group</i>	4	Abernethy	46		-7			-7	32
	5	Rothiemurchus							0
	6	Glenmore						-46	-46
	7	Glen Feshie	-32						-32
	27	Dulnain							0
<i>Rannoch Group</i>	8	Black Wood of Rannoch	-31		5			-1	-27
	9	Meggernie	2						2
<i>Great Glen Group</i>	10	Glen Moriston		2	11	14		-24	3
	11	Glengarry		-62	-192			-74	-328
	12	Barisdale							0
	13	Loch Arkaig and Glen Mallie	-50					29	-21
	14	Ardgour			38				38
<i>Strath Glass Group</i>	15	Glen Affric	-4		-6				-10
	16	Glen Cannich	-11	-42	-10				-63
	17	Glen Strathfarrar							0
	18	Guisachan and Cougie	7	13	-124		-59	4	-159
<i>Wester Ross Group</i>	19	Coulin							0
	20	Achnashellach	1			-3		-9	-11
	21	Shieldaig							0
	23	Loch Maree							0
<i>Northern Group</i>	22	Amat							0
<i>Southern Group</i>	24	Black Mount							0
	25	Glen Orchy			94				94
	26	Tyndrum							0
Mean			-4.4	-3.3	-6.3	0.4	-2.3	-4.7	-20.6
S.D.			17.8	14.5	48.8	2.8	11.3	18.1	113.3

Table S3. Mean number of species per site and relative and absolute change between surveys.

Group	Site no.	Site	Mean number of species		Change	
			1971	2020s	Absolute	Percentage
<i>Deeside Group</i>	1	Glen Tanar	12.8	10.3	-2.5	-19.6
	2	Ballochbuie	21.2	15.4	-5.8	-27.4
	3	Mar Lodge	15.5	14.7	-0.8	-5.2
<i>Speyside Group</i>	4	Abernethy	13.6	12.9	-0.7	-4.9
	5	Rothiemurchus	16.4	16.2	-0.3	-1.5
	6	Glenmore	19.8	12.9	-6.8	-34.5
	7	Glen Feshie	18.9	16.4	-2.5	-13.2
	27	Dulnain	11.6	11	-0.6	-5.2
<i>Rannoch Group</i>	8	Black Wood	18.1	17.1	-1.0	-5.5
	9	Old Wood of Meggernie	19.7	15.6	-4.1	-21
<i>Great Glen Group</i>	10	Glen Moriston	21.6	17.7	-3.9	-18.2
	11	Glengarry	13.6	21.7	8.1	59.9
	12	Barisdale	25.4	21.1	-4.3	-16.7
	13	Loch Arkaig & Glen Mallie	20.3	24.6	4.3	21.3
	14	Ardgour	22.3	18.3	-4	-18
<i>Strath Glass Group</i>	15	Glen Affric	20.6	17.8	-2.8	-13.4
	16	Glen Cannich	19	16.8	-2.2	-11.3
	17	Glen Strathfarrar	17.2	18.8	1.6	9.5
	18	Guisachan & Cougie	20.7	15.6	-5.1	-24.8
<i>Wester Ross Group</i>	19	Coulin	22.7	22.9	0.2	0.8
	20	Achnashellach	17.7	21.3	3.6	20.5
	21	Shieldaig	19.9	18.1	-1.8	-8.8
	23	Loch Maree	13.6	16.6	2.9	21.6
<i>Northern Group</i>	22	Amat	20.1	22.1	2	10
<i>Southern Group</i>	24	Black Mount	18.1	17.1	-1	-5.5
	25	Glen Orchy	19.7	14.2	-5.5	-27.9
	26	Tyndrum	21.4	25	3.6	17
		<i>Mean</i>	<i>18.6</i>	<i>17.5</i>	<i>-1.1</i>	<i>-4.5</i>

Table S4. List of top 25 ground flora species recorded, 2018-2022

	Species	Common name	No. of records	Change in position on list
1	<i>Calluna vulgaris</i>	Heather	392	=
2	<i>Vaccinium myrtillus</i>	Bilberry/Blaeberry	374	=
3	<i>Molinia caerulea</i>	Purple moor-grass	314	↑
4	<i>Deschampsia flexuosa</i>	Wavy hair grass	306	=
5	<i>Potentilla erecta</i>	Tormentil	289	↓
6	<i>Blechnum spicant</i>	Hard fern	278	↑
7	<i>Sorbus aucuparia</i>	Rowan	242	↑
8	<i>Erica tetralix</i>	Cross-leaved heather	190	↑
9	<i>Vaccinium vitis-idaea</i>	Cowberry	190	↓
10	<i>Pteridium aquilinum</i>	Bracken	189	=
11	<i>Carex echinata</i>	Star sedge	183	↑
12	<i>Betula seedling/sp</i>	Birch	181	↓
13	<i>Galium saxatile</i>	Heath bedstraw	170	↑
14	<i>Narthecium ossifragum</i>	Bog asphodel	150	↑
15	<i>Erica cinerea</i>	Bell heather	133	↑
16	<i>Juncus effusus</i>	Soft rush	123	↑
17	<i>Trichophorum cespitosum</i>	Deergrass Hare's Tail	123	↑
18	<i>Eriophorum vaginatum</i>	Cottongrass	106	↑
19	<i>Juncus squarrosus</i>	Heath rush Devil's bit	89	↑
20	<i>Succisa pratensis</i>	scabious	89	↑
21	<i>Oxalis acetosella</i>	Wood-sorrel Round-leaved	88	↑
22	<i>Drosera rotundifolia</i>	sundew	86	↑
23	<i>Agrostis canina sens.lat.</i>	Brown bent	82	↓
24	<i>Eriophorum angustifolium</i>	Hare's-tail cottongrass	81	↑
25	<i>Anthoxanthum odoratum</i>	Sweet vernal grass	73	↑

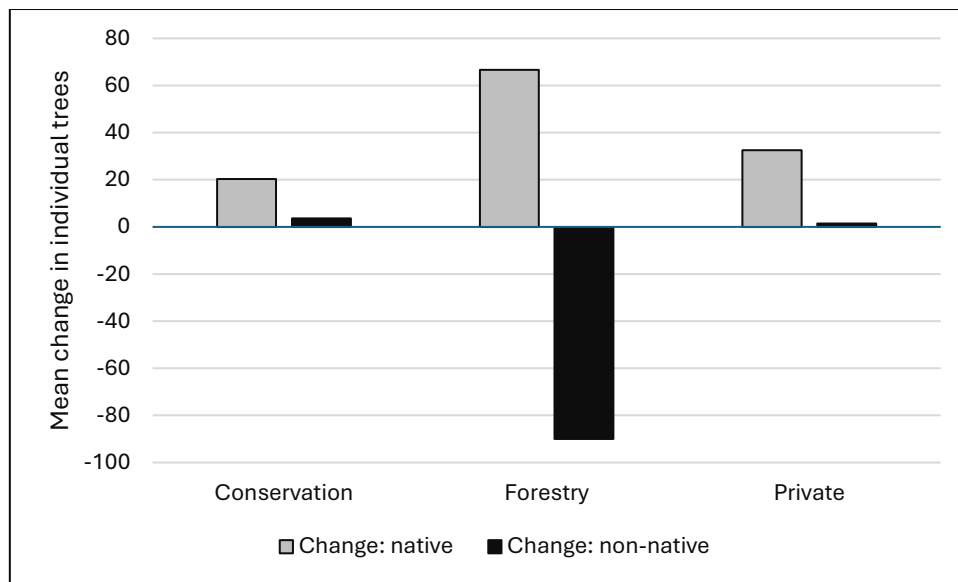


Figure S1. Change in native and non-native woody species, by site ownership