Dataset Documentation
Scottish Pinewoods Survey 1971 (Native Pinewood Survey)

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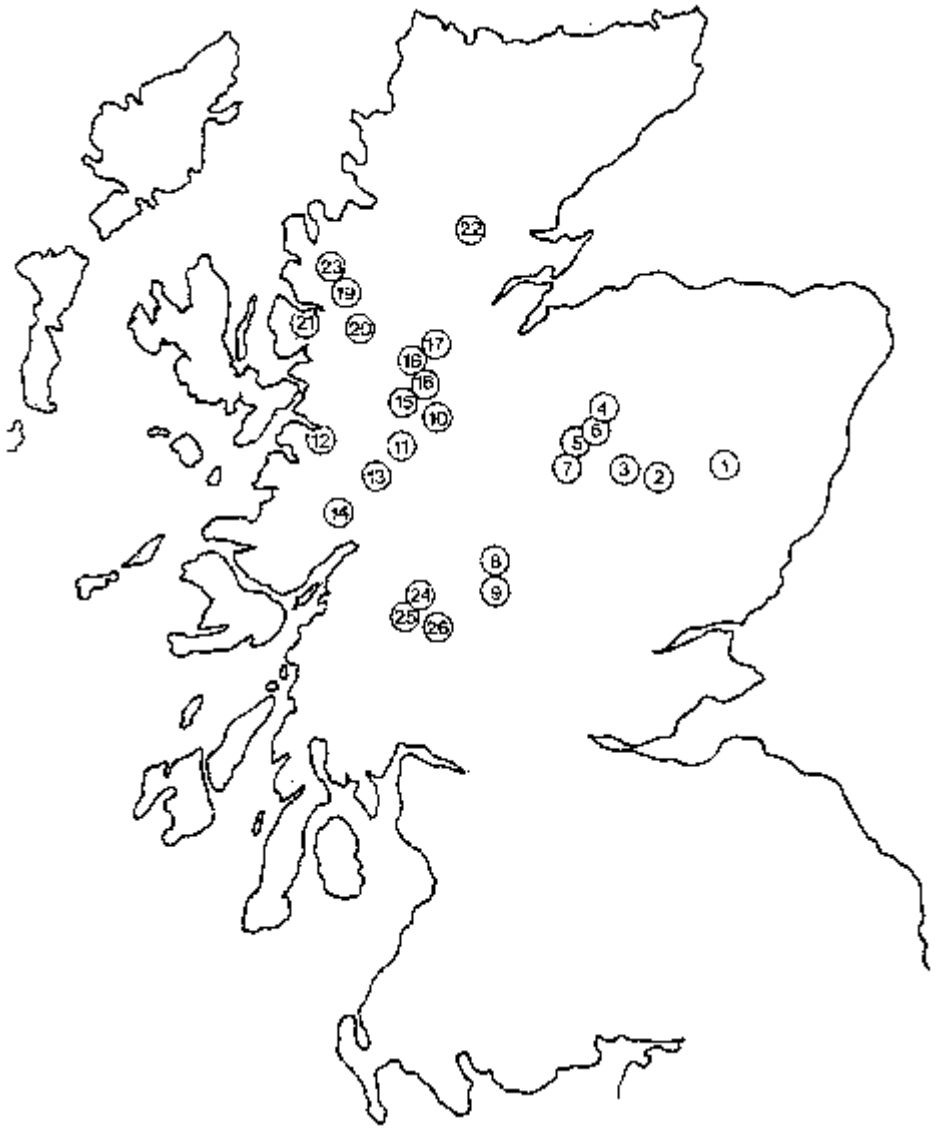
Contents

Dataset Series Name:	**Scottish Pinewood Survey 1971**	
Dataset Description:	A detailed ecological survey of the Scots Pine woodland habitats within Scotland. In all, 27 woods from throughout northern Scotland were identified as the major remaining native pinewoods, and within each wood 16 randomly selected 200m^2 plots were surveyed (26 of the woods were surveyed in 1971, with 1 extra wood surveyed in 1972). Details about the trees, ground flora, soil, habitat types as well as general plot information were collected for each plot using standardized procedures and coding systems.	
Geographic Coverage:	Scotland	
Time Period:	1971-72	
Data Categories:	Vegetation Data:	Vascular plants. Bryophytes. Trees, saplings & shrubs.
	Soil Data:	Horizon depths and descriptions. pH.
	Habitat Data:	Habitat categories. Slope. Aspect.
Survey Design & Methods:	Samples of all known major pinewoods in Scotland. Bunce & Shaw's 1973 standardized survey methods.	
Related Datasets:	• **National Woodland Survey 1971** - carried out in the same year, using the same methodology (and repeated in 2000-2003). **Scottish Pinewood Survey 1973** - a follow-up survey to a subset of the woods.	
Key documents & publications:	• Steven H.M. & Carlisle A. (1959). *The Native Pinewoods of Scotland.* Edinburgh: Oliver & Boyd. • Bunce R.G.H & Shaw M.W. (1971). *National Woodland Classification 1971: Handbook of Field Methods.* Unpublished document, ITE Merlewood. • Bunce R.G.H. & Shaw M.W. (1973). A Standardized Procedure for Ecological Survey. *Journal of Environmental Management*, Vol. 1, 239-258. • Hill M.O., Bunce R.G.H, & Shaw M.W. (1975). Indicator species analysis: a divisive polythetic method of classification and its application to a survey of native pinewoods in Scotland. *Journal of Ecology*, Vol. 63, 597-613. • Bunce R.G.H. (1977). The range of variation in the pinewoods. In: *Native pinewoods of Scotland*, edited by R.G.H. Bunce and J.N.R. Jeffers, 10-25. Cambridge: Institute of Terrestrial Ecology. • Goodier R. & Bunce R.G.H. (1977). The Native Pinewoods of Scotland: The current state of the resource. In: *Native pinewoods of Scotland*, edited by R.G.H. Bunce and J.N.R. Jeffers, 78-87. Cambridge: Institute of Terrestrial Ecology.	
Originator Details:	R.G.H. Bunce, Woodlands Research Section, Nature Conservancy - Merlewood.	

1. Geographical Coverage



1 Glentanar
2 Ballochbuie
3 Mar
4 Abernethy
5 Rothiemurchus
6 Glenmore
7 Glen Feshie
8 Black Wood of Rannoch
9 Old Wood of Meggernie, Glen Lyon
10 Glen Moriston
11 Glengarry
12 Barrisdale
13 Loch Arkaig and Glen Mallie
14 Ardgour
15 Glen Affric
16 Glen Cannich
17 Glen Strathfarrar
18 Guisachan and Cougie
19 Coulin
20 Achnashellach
21 Shieldaig
22 Amat
23 Loch Maree
24 Black Mount
25 Glen Orchy
26 Tyndrum

N.B. The Dulnan, surveyed in 1972 is located to the west of Abernethy (4) and north of Glen Feshie (7).

2.1 Vegetation Data

In each of the woodland plots, 3 categories of vegetation data were recorded:-

i) Trees, saplings & shrubs
ii) Vascular plants
iii) Bryophytes growing on the ground

Method

A nested quadrat system was used to record the vegetation present within each of the 200m^2 plots surveyed. Individual trees were recorded throughout the plot, whilst individual saplings and shrubs were recorded in opposing quarters of the plot only. For vascular plants, species lists were recorded by 4m^2, 25m^2, 50m^2, 100m^2 & 200m^2 nested quadrats, with only previously unfound species listed as the quadrat size increases. An estimate of the % cover for each of the species throughout the plot overall was also recorded, by class size (5% bands, 1%, few/ Presence '+' has been replaced by 0.5). Samples of bryophytes were collected for later identification and species lists drawn up for the plot overall.

Parameters (refer to field handbook (Shaw and Bunce, 1971) for full descriptions)

Trees, saplings & shrubs - by individual

Species name
Diameter at breast height
Tree dead indicator
Height of widest tree in plot
Grouping of stems in a coppice stool

Vascular plants - by species and quadrat

Species name
Species name code
% cover estimate

Bryophytes - by species and plot

Species name
Species name code

Other Cover/ Abundance Data - by plot

% Litter
% Wood
% Rock
% Bare ground
% Water
% Bryophytes

2.2 Soil Data

The soil of each woodland plot was classified by horizon using the set of standard categories outlined below. pH was also measured for soil samples from each plot (top 0-15cm).

Methods

In the centre of each plot a shallow pit was dug to enable examination of the surface layers of soil, and auger samples were taken to classify lower horizons. Precise definitions for each of the descriptive categories were used and are detailed in the field handbook (Shaw and Bunce, 1971). A sample from the top 10cm was taken away for the pH analysis.

Parameters

pH
Horizon depths
Horizon descriptions (see table below)
Rocks & stone type and percentages (see table below)

Soil Horizon Descriptive Categories & Classes (refer to field handbook for full descriptions)

Litter Layer

Composition	
Tree leaves	Fern
Needles	Ericoid
Grass	Bryophyte
Herb	Wood

Organic Layer

Texture	*Moisture*
Fibrous	Very Wet
Granular	Wet
Amorphous	Damp
	Dry

Mixed Mineral / Organic Layer

Transition with mineral soil	*Colour*	*Texture*	*Moisture*	*Structure*
Sharp	Black	Clay	Very Wet	Powder
Gradual	Brown	Silt	Wet	Crumb
	Red	Sandy	Damp	Clod
	Mottled	Stony	Dry	

Leached or Eluviated Layer

Colour	*Texture*
Whitish	Clay
Greyish	Silt
	Sandy
	Stony

Weathered Mineral Layer

Deposition layer		*Colour excl dep. layer*	*Texture*	*Moisture*	*Structure*
		Yellow	Clay	Very Wet	Powder
Black	Comp.	Yellow/Brown	Silt	Wet	Crumb
Red/Brown	Uncomp.	Brown	Sandy	Damp	Clod
		Red	Stony	Dry	
		Mottled			

Underlying Material

Texture	
Clay	Stony
Silt	Rock (frag)
Sandy	Rock (solid)

Rocks & Stones in Soil

Composition (%)		*Shape (%)*	*Size range (%)*
Slate/shale	Limestone	Round	<5 cm
Sandstone	Flint	Sub-angular	5-10cm
Grit	Granite	Angular	10-20cm
Chalk	Others		>20cm

2.3 Habitat Data

Habitat types of each of the woodland plots were classified using the specific pre-defined categories given below. The slope and aspect of each plot were also measured. Additional descriptions were recorded for the whole site.

Methods

All the classes within each of the habitat categories listed which applied to the 200m^2 plot were crossed on the data sheet. Precise definitions for each category and its classes were used, and are detailed in the field handbook (Shaw and Bunce, 1971).

Slope was measured using a clinometer from the highest to lowest point in the plot, passing through the centre of the pot. The aspect was taken bearing down the slope, measured with a *Silva* compass.

Parameters

slope (°), aspect (° mag), habitat types (see table below)

Habitat Categories & Classes (refer to field handbook for full descriptions)

Trees - Management

Coppice stool	Singled coppice	Recently cut coppice	Stump hard. new
Stump hard. old	Stump con. new	Stump con. old	

Trees - Regeneration

Alder	Rhododendron	Ash	Sweet chestnut	Hazel	Yew	Rowan
Birch	Other hardwood	Hawthorn	Scots pine	Oak	Beech	Wych elm
Hornbeam		Lime	Aspen	Sycamore	Holly	Other conifers

Trees - Dead (=habitats)

Fallen broken	Fallen uprooted	Log very rotten	Fallen bnh >10cm
Hollow tree	Rot hole	Stump <10cm	Stump >10cm

Trees - Epiphytes & Lianes

Bryo. base	Bryo. trunk	Bryo. branch	Lichen trunk
Lichen branch	Fern	Ivy	Macrofungi

Habitats - Rock

Stone <5cm	Rocks 5-50cm	Boulders >50cm	Scree
Rock outcrop <5m	Cliff >5m	Rock ledges	Bryo covered rock
Gully	Rock piles	Exp. gravel/sand	Exp. min. soil

Habitats - Aquatic

small pool 1m^2	Ditch/drain dry	Aquatic veg.	Pond/lake >20m^2	Stream/river slow Marsh/bog
stream/river fast	Pond 1-20m^2	Ditch/drain wet	Spring	

Habitats - Open

Gld. 5-12m	Gld. >12m	Rocky knoll <12m	Rocky knoll >12m
Path <5m	Ride >5m	Track non-prep	Track metalled

Habitats - Human

Wall dry	Wall mortared	Wall ruined	Embankment
Soil excavated	Quarry/mine	Rubbish dom.	Rubbish other

Habitats - Vegetation

Blackthorn	Bracken dense	Rose clump	Rhododendron thicket	Macfungi soil	Umbel. clump
thicket	Leaf drift Hawthorn	Moss bank	W.herb clump	Bramble clump	Grass bank
Nettle clump	thicket	Herb veg >1m	Fern bank		Macfungi. wood

Animals (mainly signs of)

Sheep	Cattle	Horse/pony	Pig
Red deer	Other deer	Rabbit	Badger
Fox	Mole	Squirrel	Anthill
Corpse/bones	Spent cartridges		

3. Scottish Pinewood Survey 1971 – Survey Design & Methods

Original Purpose of Survey
To provide a more precise definition of the range of ecological variation in pinewoods than previously existed before 1971; to enable the development of an integrated conservation strategy for the remaining native pinewoods in Scotland.

Sample Design
All the major native pinewoods identified in the book by Steven and Carlisle (1959) were included in the 1971 survey. In addition the Dulnan, the other remaining major pinewood, was surveyed in 1972.

In each of the selected woods, 16 randomly assigned 200m^2 quadrats were selected for the survey.

Survey Methods
The methods outlined in *Bunce & Shaw (1973)* were used for this survey. Further details of exactly what and how the information was recorded, including definitions of any classifications used are given in the field handbook. Bunce R.G.H & Shaw M.W. (1971). *National Woodland Classification 1971: Handbook of Field Methods.* Unpublished document, ITE Merlewood.

Summaries of the methods used are as follows:

Vegetation Data
A nested quadrat system was used to record the vegetation present within each of the 200m^2 plots surveyed. Individual trees were recorded throughout the plot, whilst individual saplings and shrubs were recorded in opposing quarters of the plot only. For vascular plants, species lists were recorded by 4m^2, 25m^2, 50m^2, 100m^2 & 200m^2 nested quadrats, with only previously unfound species listed as the quadrat size increases. An estimate of the % cover for each of the species throughout the plot overall was also recorded, by class size (5% bands, 1%, few). Samples of bryophytes were collected for later identification and species lists drawn up for the plot overall.

Soil Data
The soil of each plot surveyed was classified by horizon using a set of standard categories. In the centre of each plot a shallow pit was dug to enable examination of the surface layers of soil, and auger samples were taken to classify lower horizons. Precise definitions for each of the descriptive categories used are detailed in the field handbook. A sample from the top 10cm was taken away for pH analysis.

Habitat Data
Habitat types of each of the woodland plots were classified using pre-defined categories and descriptive classes. All classes within each of the habitat categories listed on the data sheets which applied to the 200m^2 plot were crossed on the data sheet. Precise definitions for each habitat category and its classes were provided, and are detailed in the field handbook. Slope was measured using a clinometer from the highest to lowest point in the plot, passing through the centre of the pot. The aspect was taken bearing down the slope, measured with a *Silva* magnetic compass.

Descriptions were also recorded for each woodland site.

4. Summary of available data per site

Site no.	Approx. start date	Site name	OSGR	Site description	Plot description	Soil	Ground flora	Tree data	Plot data
1	16 July 1971	Glentanar	NO470920	Y	Y	Y	Y	Y	Y
2	29 July 1971	Ballochbuie	NO200895	Y	Y	Y	Y	Y	Y
3	18 July 1971	Mar	NO035932	Y	Y	Y	Y	Y	Y
4	12 July 1971	Abernethy	NH990180	Y	Y	Y	Y	Y	Y
5	22 July 1971	Rothiemurchus	NH920080	Y	Y	Y	Y	Y	Y
6	22 July 1971	Glenmore	NH980090	Y	Y	Y	Y	Y	Y
7	23 July 1971	Glen Feshie	NN845990	Y	Y	Y	Y	Y	Y
8	25 July 1971	Black Wood of Rannoch	NN580560	N	N	N	N	Y	Y
9	27 July 1971	Old Wood of Meggernie, Glen Lyon	NN555455	Y	Y	Y	Y	Y	Y
10	22 August 1971	Glen Moriston	NH310120	Y	Y	Y	Y	Y	Y
11	15 August 1971	Glengarry	NH230010	Y	Y	Y	Y	Y	Y
12	14 August 1971	Barisdale	NG890030	Y	Y	Y	Y	Y	Y
13	21 August 1971	Loch Arkaig and Glen Mallie	NN170875	Y	Y	Y	Y	Y	Y
14	18 August 1971	Ardgour	NM960713	Y	Y	Y	Y	Y	Y
15	13 July 1971	Glen Affric	NH145225	Y	Y	Y	Y	Y	Y
16	24 August 1971	Glen Cannich	NH160300	Y	Y	Y	Y	Y	Y
17	30 October 1971	Glen Strathfarrar	NH370390	Y	Y	Y	Y	Y	Y
18	26 August 1971	Guisachan and Cougie	NH298235	Y	Y	Y	Y	Y	Y
19	07 August 1971	Coulin	NG995557	Y	Y	Y	Y	Y	Y
20	11 August 1971	Achnashellach	NH035470	Y	Y	Y	Y	Y	Y
21	10 August 1971	Shieldaig	NG820524	Y	Y	Y	Y	Y	Y
22	03 August 1971	Amat	NH460855	Y	Y	Y	Y	Y	Y
23	06 August 1971	Loch Maree	NH010609	Y	Y	Y	Y	Y	Y
24	29 July 1971	Black Mount	NN350455	Y	Y	Y	Y	Y	Y
25	30 July 1971	Glen Orchy	NN250360	Y	Y	Y	Y	Y	Y
26	28 July 1971	Tyndrum	NN330280	Y	Y	Y	Y	Y	Y
27	05 August 1972	Dulnan	NH830180	Y	Y	Y	Y	Y	Y

Y = Yes
N= No

Note: ***Additional plots (up to 50) were undertaken at site 4, Abernethy.***

5. Data Tables and Descriptions

Scots_Pine_1971_Sites.csv

Description: Approximate locations of surveyed Scots Pine woodlands (point features).

Column Name	Type	Description
ID	Long Integer	Site ID number (1-27)
NAME	Text	Site name
OSGR	Text	OS grid reference of site point
POINT_X	Double	Easting of site in metres (OSGB1936, BNG)
POINT_Y	Double	Northing of site in metres (OSGB1936, BNG)

SCOTS_PINE_1971_SITE_INFO.csv

Description: Descriptions of surveyed sites (whole woodland), surveyed plots (individual plots), including habitat descriptions, animal descriptions and tree descriptions. Includes soil horizon descriptive categories for plots. Includes site names, plot slope and aspect, and survey dates.

Column name	Type	Description
SITE_NO	Number	Site number (1-27)
PLOT_NO	Number	Plot number (1-16, site 4; 1 - 50)
CODE	Number	Code (from recording sheet)
DESCRIPTION	Text	Description
CODE_PC	Number	Percentage applying to code (where relevant)
CODE_GROUP	Text	Code grouping (see field sheets)
CODE_GROUP_DESCRIPTION	Text	Description of code grouping
PLOT_DATE	Date	Date on which plot was surveyed
PLOT_SLOPE	Number	Slope in degrees
PLOT_ASPECT	Number	Aspect in degrees magnetic
DATA_SHEET	Text	Field sheet on which codes were recorded

SCOTS_PINE_1971_TREE_DATA.csv

Description: Tree species data from each plot, including diameter at breast height measurements (DBH).

Column	Type	Description
SITE_NO	Number	Site number (1-27)
PLOT_NO	Number	Plot number (1-16, site 4; 1 - 50)

TREE_NO	Number	Tree number (identical tree numbers denote different stems on the same individual tree)
NEST	Number	Nest number, 1-4 (see field handbook (Shaw and Bunce, 1971)). Denotes quarters of the plot (not the same as the ground flora nests).
TREE_TYPE	Text	Type of tree (Tree, Sapling or Shrub)
SPECIES	Text	Species of tree (Stace, 1997)
DBH	Number	Diameter at breast height, measurement in cm.
DEAD	Text	'D' if stem is dead
TREE_HT	Number	Height of widest tree in plot m (sp. of tree in 'Species' column)
DATA_SHEET	Text	Field sheet on which codes were recorded

SCOTS_PINE_1971_GROUND_FLORA.csv

Description: Ground flora records (vascular plants and bryophytes) for Scots Pine 1971 plots, including bare ground, total bryophytes, litter, rock and wood cover. Nomenclature follows (Stace, 1997).

Column name	Type	Description
SITE_NO	Number	Site number (1-27)
PLOT_NO	Number	Plot number (1-16, site 4; 1 - 50)
NEST	Number	Nest number 1-5 (see field handbook (Shaw and Bunce, 1971))
COVER	Number	% cover in nest (0.5 denotes 'present')
BRC_NUMBER	Number	Biological Record Centre species number, where available
BRC_NAME	Text	Scientific name or description
COMMON_NAME	Text	Common name where available
GROWTH_FORM	Text	Growth form of species. *aq - Aquatic, b - Bryophyte, f - Forbs, fe - Ferns, g - Grass, l - Lichen, ma - Marine alga, m - Other monocots, s - Sedge, ss - Dwarf shrub, w - Woody*

SCOTS_PINE_1971_SOIL_DATA.csv

Description: Soil data, per plot. Soil pH and horizon depths.

Column name	Type	Description
SITE_NO	Number	Site number (1-27)
PLOT_NO	Number	Plot number (1-16, site 4; 1 - 50)
FLORA_RECORDER	Text	Initials of flora surveyor
SOIL_PH	Number	Soil pH value
LITTER_FROM	Number	Depth of litter layer in cm from
LITTER_TO	Number	Depth of litter layer in cm to
ORGANIC_FROM	Number	Depth of organic layer in cm from
ORGANIC_TO	Number	Depth of organic layer in cm to

MIXED_FROM	Number	Depth of mixed layer in cm from
MIXED_TO	Number	Depth of mixed layer in cm to
LEACHED_FROM	Number	Depth of leached layer in cm from
LEACHED_TO	Number	Depth of leached layer in cm to
WEATHER_FROM	Number	Depth of weathered layer in cm from
WEATHER_TO	Number	Depth of weathered layer in cm to
UNDER_DEPTH	Number	Depth of underlying material from
DATA_SHEET	Text	Field sheet on which codes were recorded

6. References

Shaw, M. W. & Bunce, R. G. H. (1971) National Woodlands Classification 1971 Handbook of Field Methods. Merlewood Research Station.
Stace, C. (1997) *New flora of the British Isles.* Cambridge University Press, Cambridge.
Steven, H. M. & Carlisle, A. (1959) *The native pinewoods of Scotland.* Oliver & Boyd, Edinburgh.

7. Acknowledgements

- *Survey management: Bob Bunce, Wally Shaw*
- *Field surveyors: C. Eccles, D.J. Taylor, P. Bassett, K. H. Chorlton, K. Wilson, M. Ball, M. J. Bottomly, M. W. Shaw, R. Bunce, D.J. Taylor, P. Bassett*
- *Data management and documentation: Claire Wood, Caroline Hallam, Deirdre Caffrey*