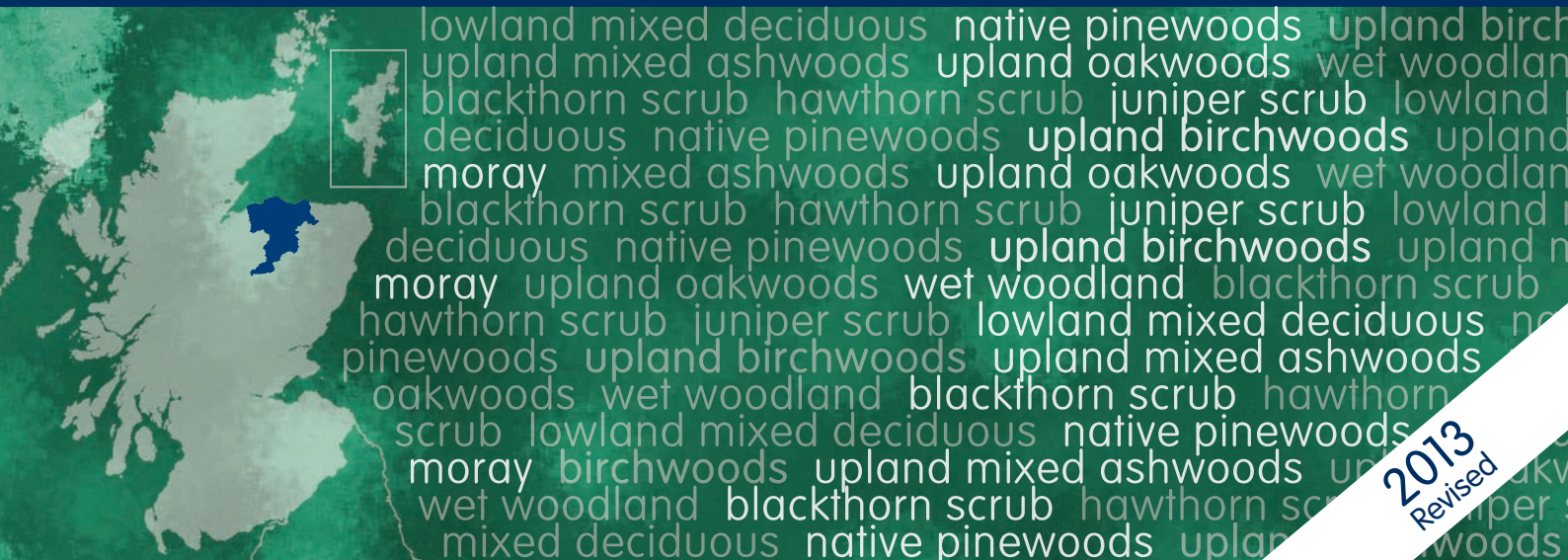




Native Woodland Survey of Scotland Moray



Native Woodland Survey of Scotland

Introduction

Native woodlands are a vital part of Scotland's natural and cultural heritage, providing us with a wide range of social, environmental and economic benefits.

What is left today is only a small proportion of the native woodland that once covered much of Scotland, though much has been done since the 1980s to protect and restore the areas that remain. The Scottish Forestry Strategy (2006) promotes continuing action to expand our native woods, to improve their condition and to restore native woodland habitats on ancient woodland sites.

To support this work Forestry Commission Scotland (FCS) has developed the Native Woodland Survey of Scotland (NWSS), which is the most extensive habitat survey of its kind ever undertaken in Scotland. The survey will provide a nationwide map and a comprehensive picture of our native woodland resource for the first time.

Results will be reported separately for each local authority area and in a national summary. This report presents summary information from the Native Woodland Survey of Scotland for the Moray local authority area.

Survey Aims

The Native Woodland Survey of Scotland will create a woodland map linked to a spatial dataset which describes the type, extent, composition and condition of all native woods in Scotland over 0.5ha in area.

Planted woods on ancient woodland sites (PAWS) will also be surveyed, even where they are not mainly native in species composition, in order to provide information to help maintain or restore their remaining biodiversity value.

Method

The fieldwork for Moray was carried out between January 2007 and December 2012. Using woodland maps that had been prepared from aerial photographs, the surveyors identified, mapped and assessed all of the native woodland, nearly-native woodland and PAWS over 0.5ha in area.

An outline of the survey method and the features assessed can be found in Annex 2, and more information is available on the [NWSS web pages](#) on the Forestry Commission Scotland website.

Native Woodland Survey of Scotland

What is a native woodland?

Woodlands are defined in the survey as areas with at least 20% cover of trees and shrubs, and native woodlands are woods where the canopy cover is composed mainly of native species (ie over 50%).

Nearly-native woodlands are woods where native species make up between 40% and 50% of the canopy. They could have potential to be converted into native woodlands by altering their species mix.

Planted woods on Ancient Woodland Sites (PAWS) are derived from the Scottish Ancient Woodlands Inventory (see SNH, 1997). These woodlands appear to have originated through natural regeneration sometime before the mid-19th century, but were later converted to planted woods.

Native species are defined broadly as those native to Scotland and to the region.

How will survey results be made available?

Between late winter 2009 and spring 2013, summaries of the key results will be published for each local authority area in Scotland, in a series of **reports** on the NWSS web-pages on the Forestry Commission Scotland website. These will be followed by a national summary report.

After each report is published, complete **spatial datasets** for each local authority area and **associated training** will be made available. This will help those who wish to carry out more complex analyses using web browsers and/or GIS software.

The spatial datasets are available from the Forestry Commission (see www.forestry.gov.uk/datadownload), as well as being published by Forestry Commission Scotland on a Forestry Commission **Map Viewer**. The Map Viewer facility for users outside the Forestry Commission can be accessed through the NWSS web pages.

User guidance notes are also available on the NWSS web-pages to help users to interpret the data and consider further uses and analyses. These will be updated in response to experience and users' feedback.

Forestry Commission Scotland wishes to thank Scottish Natural Heritage (SNH) for their help and financial contribution to the survey, and also to a wide range of other organisations and individuals whose advice and experience has been invaluable in developing and carrying out the project; including Forest Research, Haycock & Jay Associates and the RPS Group Plc for carrying out the field survey work.

Results for Moray

Executive Summary

1. Native woodland

- The area of native woodland in Moray is 12,211ha, which is 18.9% of the total woodland area or 5.5% of the total land area of Moray.
- The main priority habitat types are Native pinewoods, Upland birchwoods and Wet woodland.
- Under half of the native woods in Moray are highly semi-natural in their present structure and composition, with 47% of the total area in the 80-100% semi-natural category (41% of the native woodlands in Moray are native pinewoods, many of which will be Scots pine of plantation origin).
- The most common native tree species in the upper canopy is Scots pine.
- Woodland canopy cover averages 72% across all native woods.
- Native species make up 91% of canopy cover averaged across all types of native woods; individual types range from 86% native species in the canopy of Lowland mixed deciduous woodland to 95% in Upland birchwoods.
- Non-native tree species comprise 7% of the established regeneration stage and 9% of the canopy in mature woodland.
- Estimated deadwood volume averages 21m³ per ha.
- Invasive non-native species in the shrub and field layers occupy 1.3% of native woodland areas, with the category known as Other herbaceous invasive exotics as the main threat.
- Native woods in Moray have 75% of the total area in the lowest two categories of the herbivore impact assessment.
- 48% of native woodland is in good health for biodiversity, based on analysis of four key condition measures.

2. Ancient woodland

- There are 1,604ha of woodland now present on ancient woodland sites, of which 45% is native woodland. Another 4% is nearly-native in composition (ie 40-50% native species in canopy).
- Native ancient woodland areas are highly semi-natural in current composition and structure (87% of the area is in the 80-100% semi-natural category).
- Some 19% of planted woods on ancient woodland sites (PAWS) are native woodlands. Scots pine (outside the pine zone) and Sitka spruce are the main components (28% and 19% respectively) of the canopy of the non-native PAWS woods.

More information is presented in the next 2 sections for specific aspects of area and condition for native woodlands (part 1) and ancient woodlands (part 2).

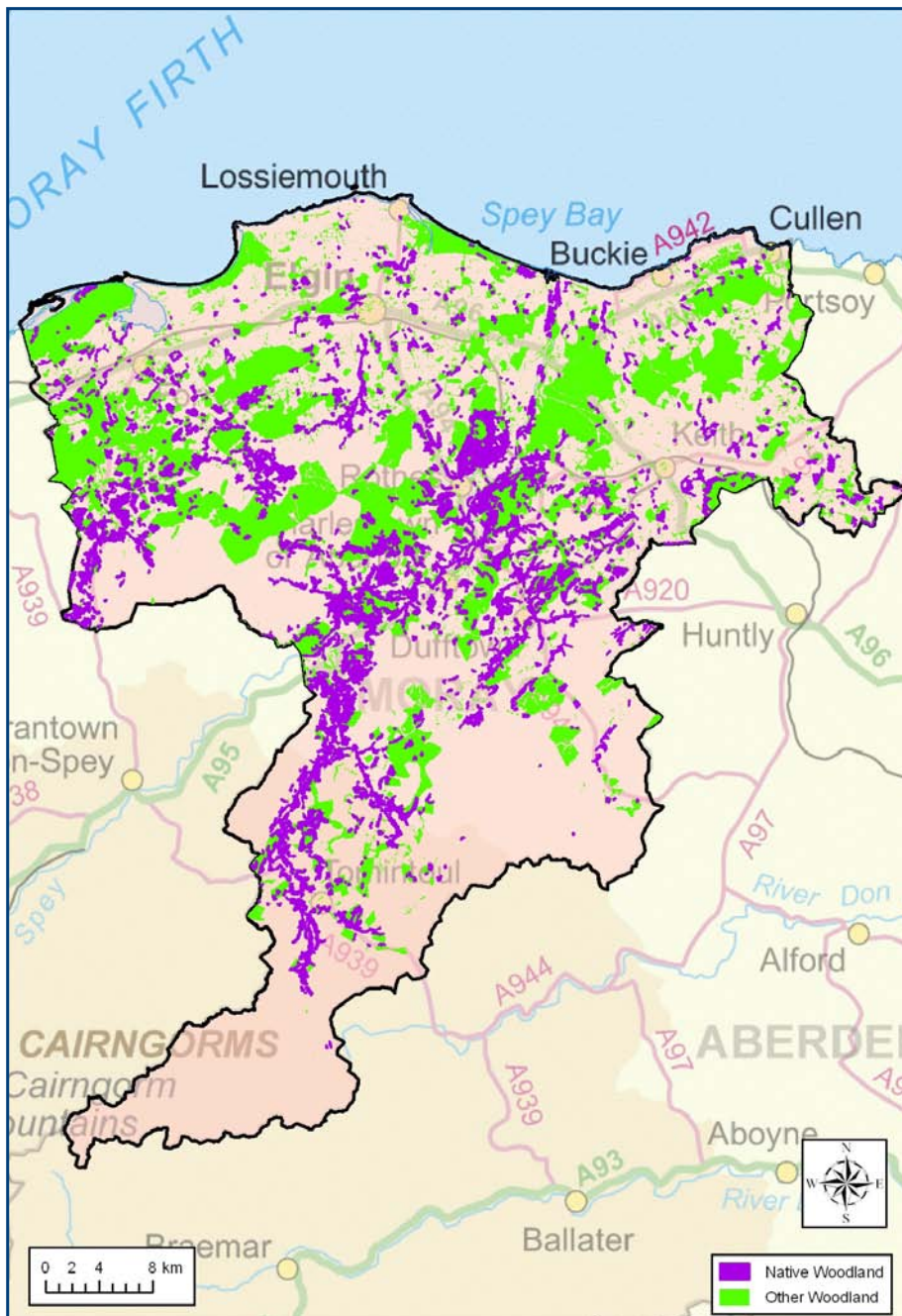
Native Woodland Survey of Scotland

Part 1: Native woodland

1. Area of Native Woodland

A total of 12,211ha or 18.9% of the woodland area in Moray is comprised of native woods, with another 558ha (0.9%) of nearly-native woodland. Native woodlands comprise 5.5% of the land area of Moray.

Figure 1a: Distribution of native and other woodland in Moray.



The native pinewood zone in Scotland (see Fig 1b) is the historical maximum extent of Scots pine (*Pinus sylvestris*) distribution within Scotland since the last glaciation and within which Scots pine is believed to be a native species. The zone is based on the work by McVean and Ratcliffe (1962) and was digitised by Forest Research. For the purposes of the NWSS a 1km buffer was added (see Fig 1c). For the survey, if Scots pine is present in any polygon (a mapped survey unit area) which intersects the pine zone it is recorded as native, whilst outside of this zone Scots pine is regarded as not native.

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Native Woodland Survey of Scotland

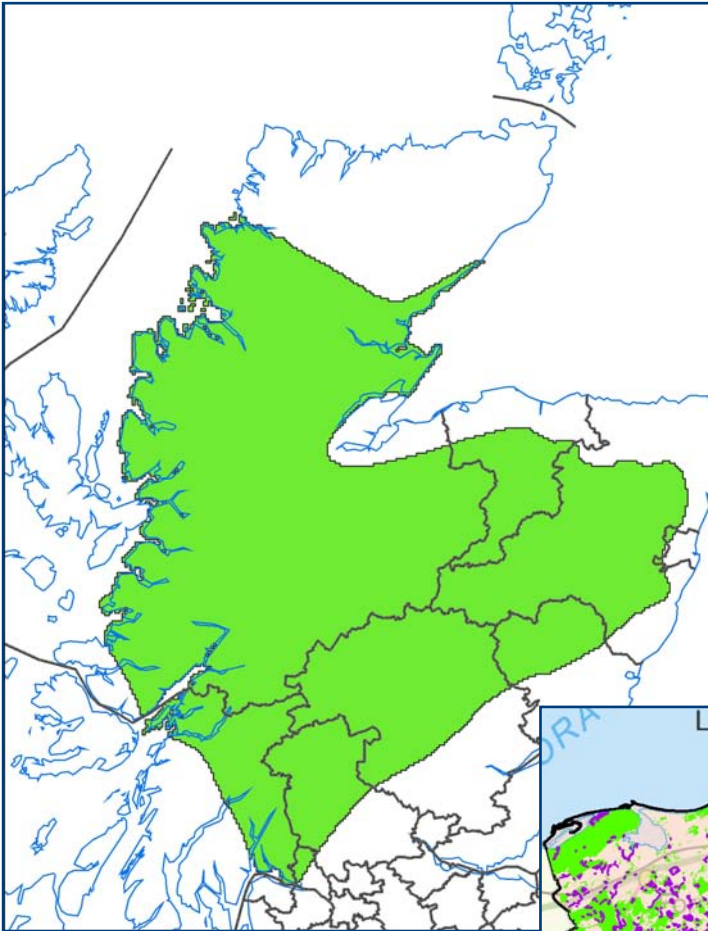
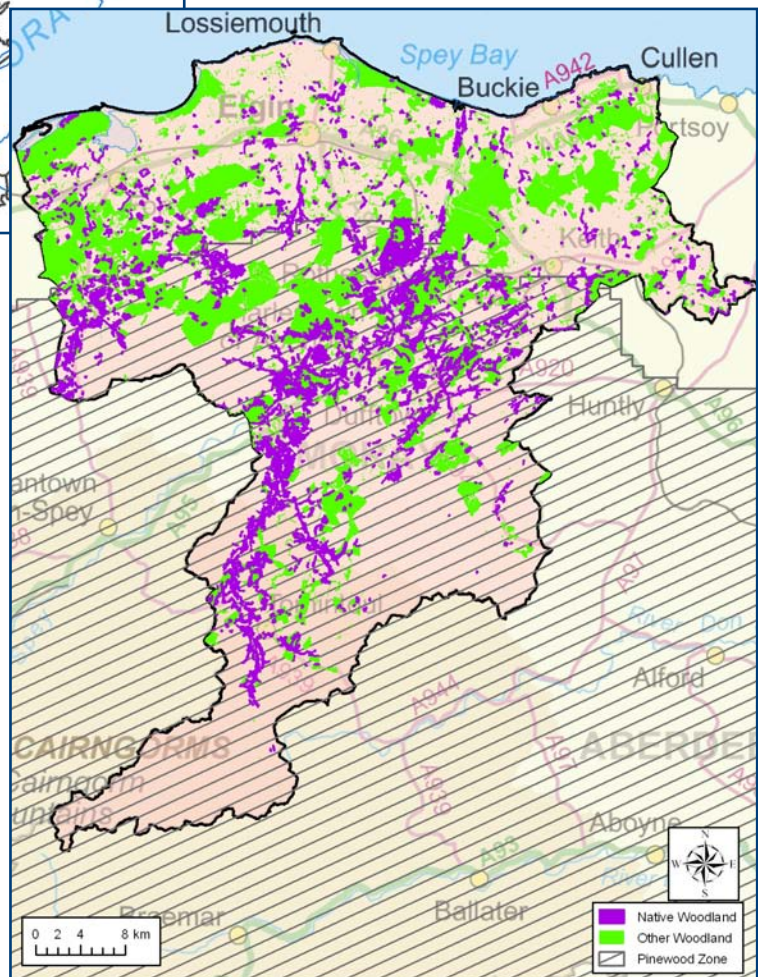


Figure 1b: The boundary of the native pinewood zone in Scotland (plus 1km buffer)

Figure 1c: The boundary of the native pinewood zone in Moray (plus 1km buffer)



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Native Woodland Survey of Scotland

Table 1: Summary of native woodland area by type

Native Woodland Type ^{1,2}	Area (ha)	%
Lowland mixed deciduous woodland ³	459	4
Native Pinewoods	4,993	41
Upland birchwoods	3,389	28
Upland mixed ashwoods	258	2
Upland oakwoods	166	1
Wet woodland	1,416	12
Blackthorn scrub	4	<0.1
Hawthorn scrub	2	<0.1
Juniper scrub	57	<1
Other type ⁴	1,467	12
Total	12,211	100

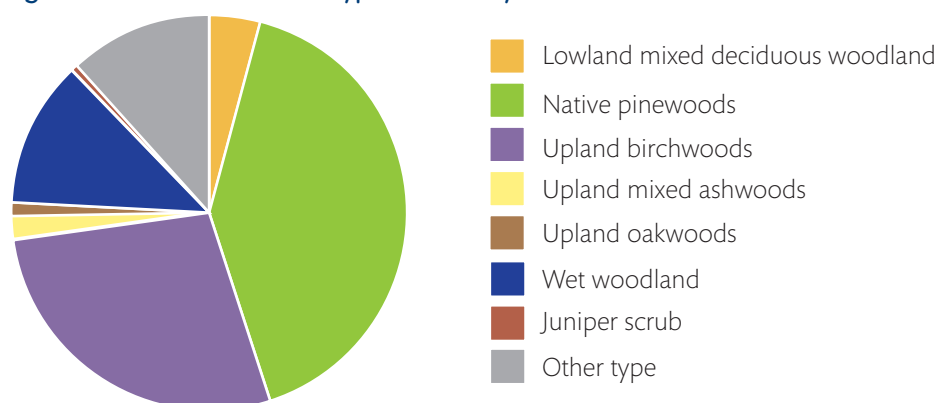
Note 1: The top 6 rows are native woodland types which are priority habitats under the UK Biodiversity Action Plan.

Note 2: 35% of mapped units (polygons) of native woodland surveyed contained a single native woodland habitat type. The remaining 65% consist of mosaics of 2 or more woodland types where no one patch has an area over 0.5ha.

Note 3: This type is sometimes referred to as Lowland mixed broadleaved woodland.

Note 4: "Other" native woodland includes areas that were not attributable to a particular native woodland type.

Figure 2: Native woodland types in Moray

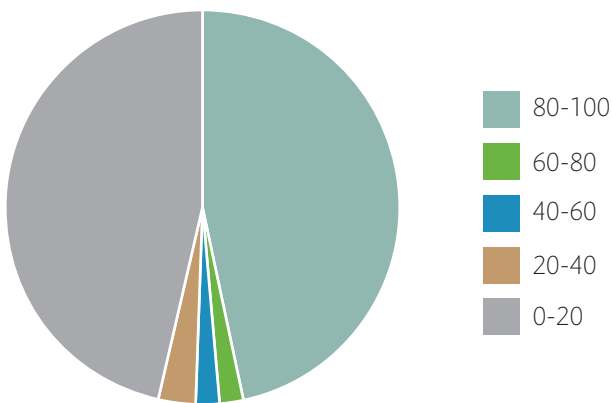


Native Woodland Survey of Scotland

2. Degree of Semi-naturalness of Native Woodland

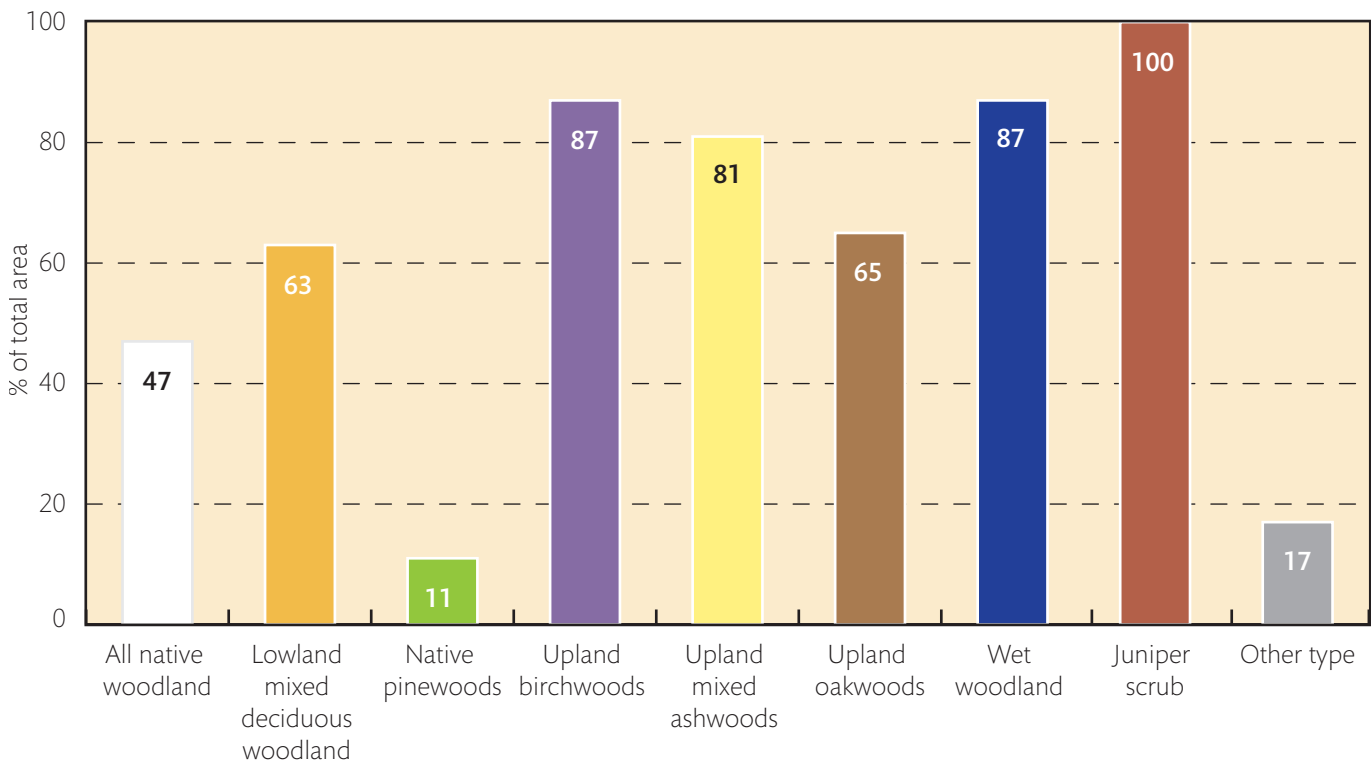
An assessment of the composition and structure of each native woodland area indicated whether they appeared to be semi-natural or planted, taking account of signs of planting like straight rows or plough furrows. Results are summarised in 20% classes (ie 0-20% semi-natural, 20-40% semi-natural etc) in Figure 3.

Figure 3: Semi-naturalness of native woodland



A high value for semi-naturalness suggests a high nature conservation value, including a likely past history of natural regeneration. In Moray 47% of the total area is in the 80-100% semi-natural category.

Figure 4: Percentage of each native woodland type with 80-100% semi-naturalness



Note 5: Areas are assigned to type according to the dominant type in each native woodland unit. Only woodland types with >30ha in the whole report area are shown.

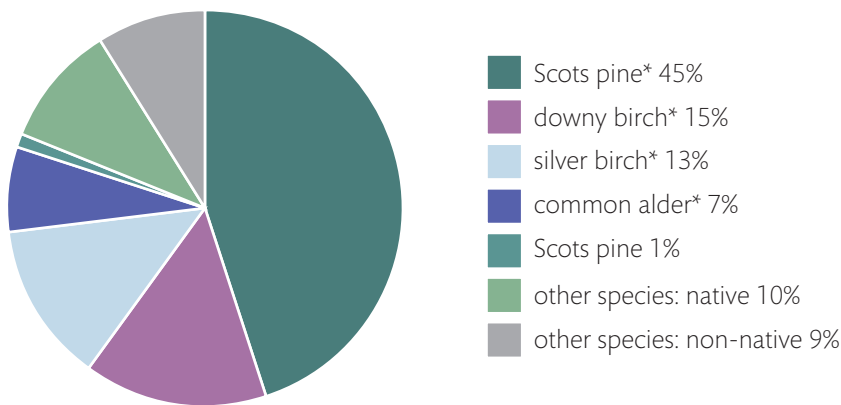
Native Woodland Survey of Scotland

3. Tree Species Composition

Tree species composition was assessed for the upper canopy layer, which consists of the veteran, mature and pole immature layers. These are combined to identify the species proportions in the woodland. In the survey Scots pine is recognised as a native species only within the natural range of native pinewoods (the "Native pinewood zone"). For further details see "NWSS Survey Plan, Process and Procedures, P7.

Scots pine is the most common native species in the upper canopy layers of the native woods in Moray (45%).

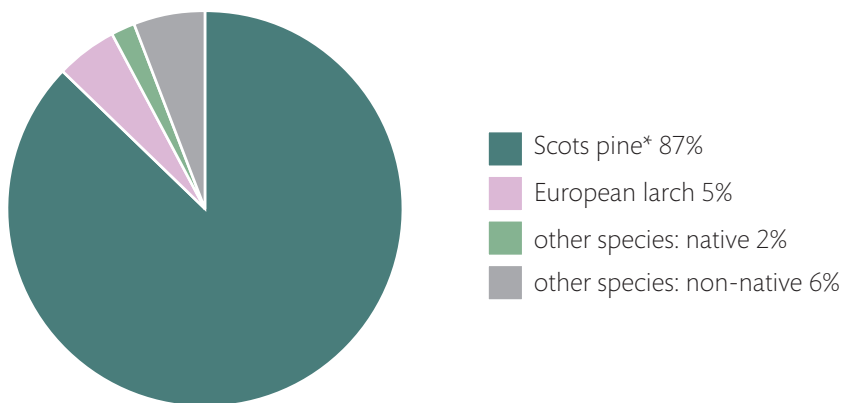
Figure 5: Species composition of the upper canopy layers of All native woodland



*native species

Figures 6-8 show the species composition of upper canopy layers for the three most extensive native woodland priority habitats in Moray (from Table 1). These analyses are based on classifying each native woodland unit according to the main priority woodland type present.

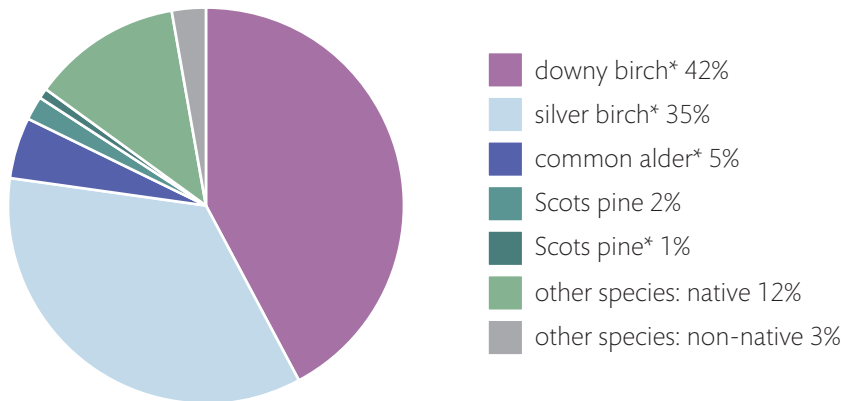
Figure 6: Species composition of the upper canopy layers of Native pinewoods



*native species

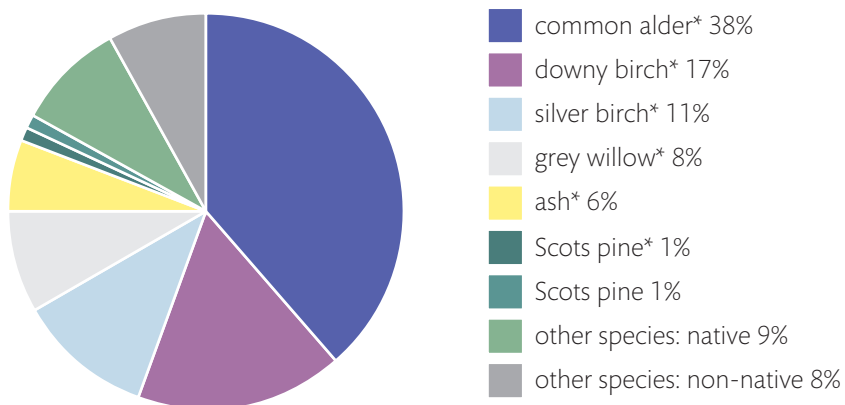
Native Woodland Survey of Scotland

Figure 7: Species composition of the upper canopy layers of Upland birchwoods



*native species

Figure 8: Species composition of the upper canopy layers of Wet woodland



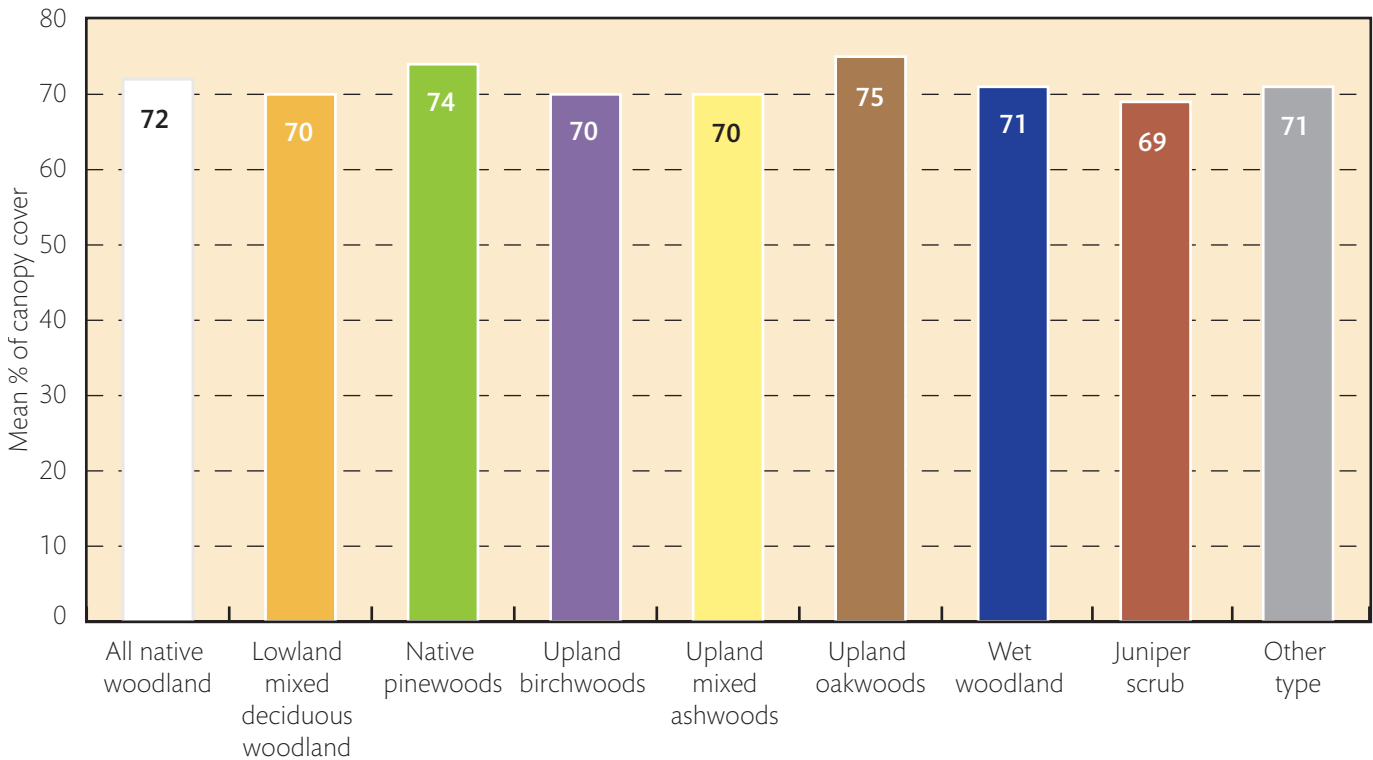
*native species

Native Woodland Survey of Scotland

4. Total Canopy Cover

This measure is a weighted mean estimate of total canopy cover of all species combined. In each native woodland unit the surveyor assessed the uppermost layer present at any part of the wood. This included areas of established regeneration or shrub layer if there were no larger trees above them.

Figure 9: Mean total canopy cover for native woodland types (total percentage cover for all species combined)



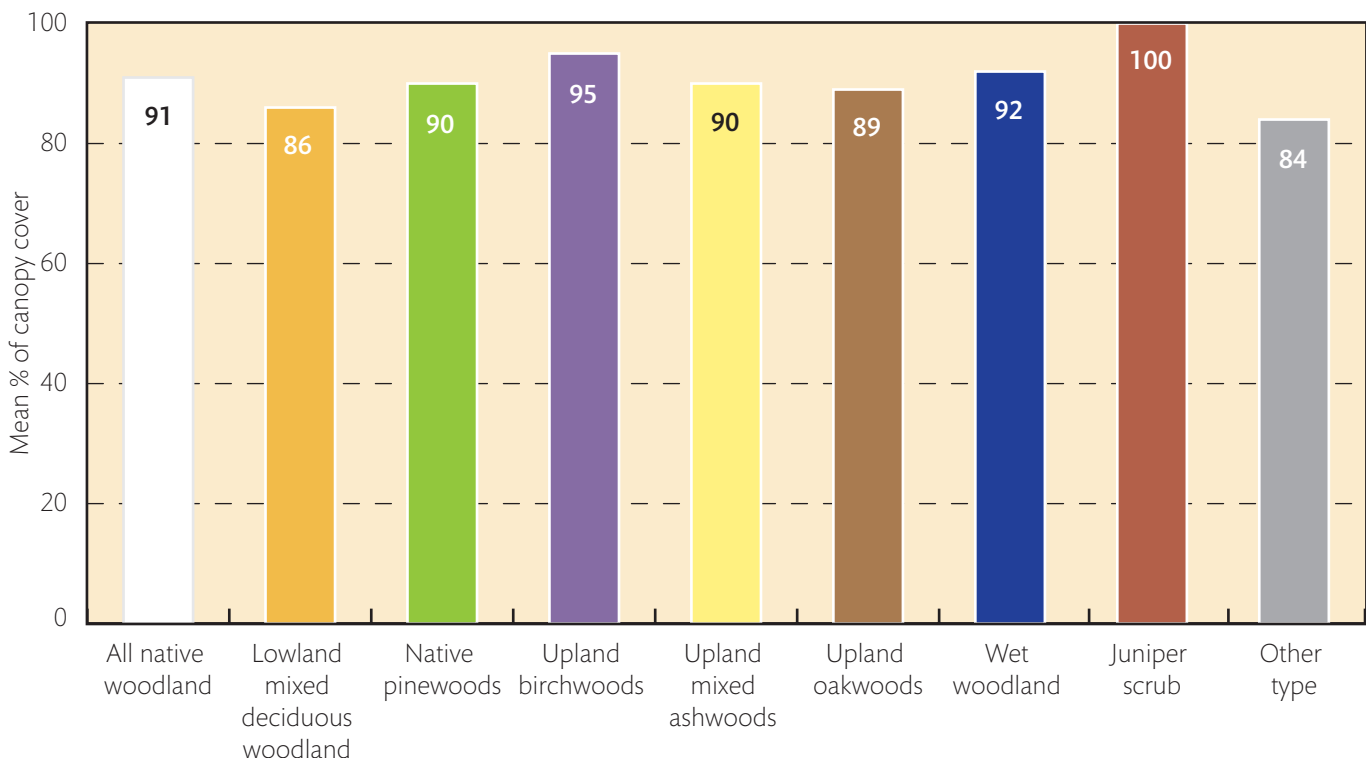
Note 6: Areas are assigned to types according to the proportions of all types present in each native woodland unit. Only woodland types with >30ha in the whole report area are shown.

Native Woodland Survey of Scotland

5. Percentage of Native Species in the Canopy

This measure is a weighted mean estimate of the share of the total canopy cover which is made up of native trees or shrubs. As for section 4, in each native woodland unit the surveyor assessed the uppermost layer present at any part of the wood. This included areas of established regeneration or shrub layer if there were no larger trees above them.

Figure 10: Mean % of native species in the canopy for native woodland types



Note 7: Areas are assigned to types according to the proportions of all types present in each native woodland unit. Only woodland types with >30ha in the whole report area are shown.

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6. Structural Diversity

For native woodlands as a whole, and for each woodland type with at least 30ha present across the whole report area, the weighted mean cover of each structural stage is shown

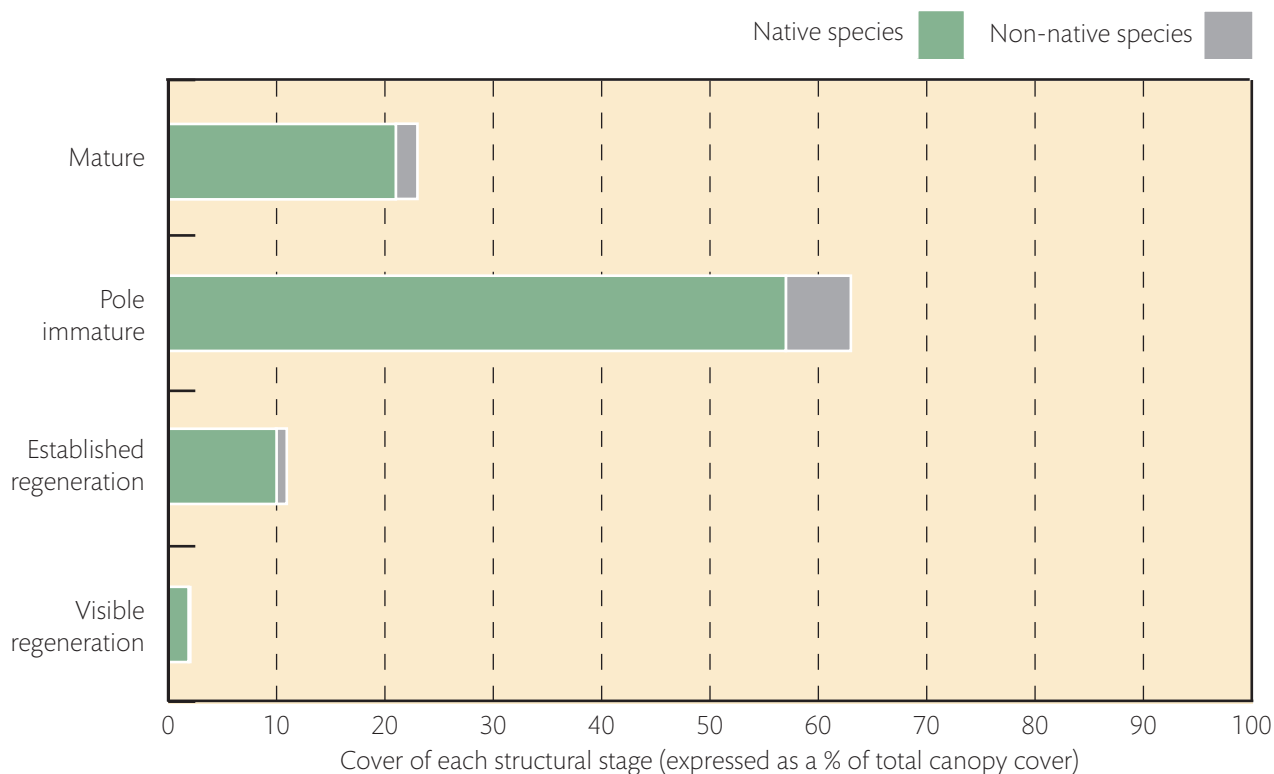
(Figs 11-18), expressed as a percentage of the total canopy cover. Because structural stages or layers can overlap, e.g. regeneration and shrub layers may occur beneath mature trees (See diagram), the combined cover of structural stages may exceed 100% of the total canopy cover, which is assessed as in section 4 above.

The proportions of native and non native species in the main structural stages are also shown, i.e. where the structural stage (veteran, mature etc) occupies at least 1% of the total area of that woodland type. Further data is given in Annex 1.

Each mapping unit (polygon) was allocated to a priority woodland type based on the dominant type present.



Figure 11: Proportions and composition of the main structural stages present in All native woodland



Native Woodland Survey of Scotland

Figure 12: Proportions and composition of the main structural stages present in Lowland mixed deciduous woodland

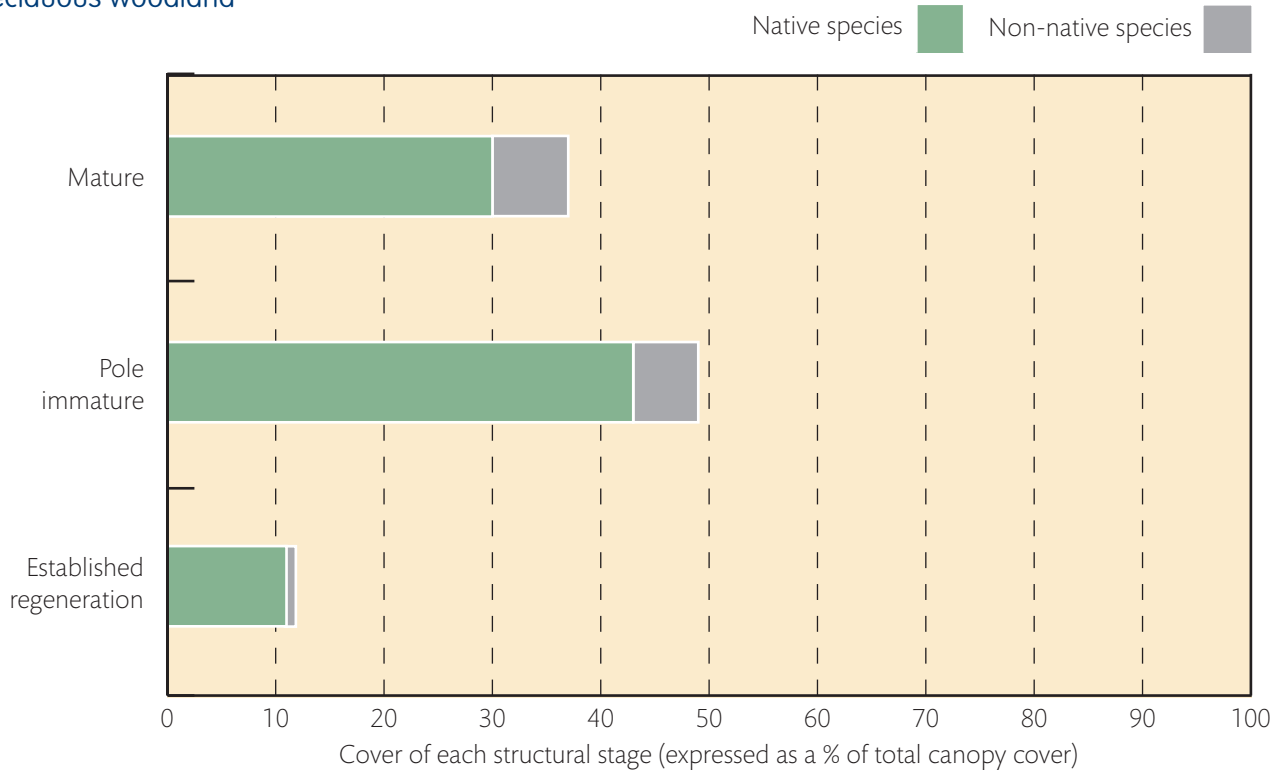
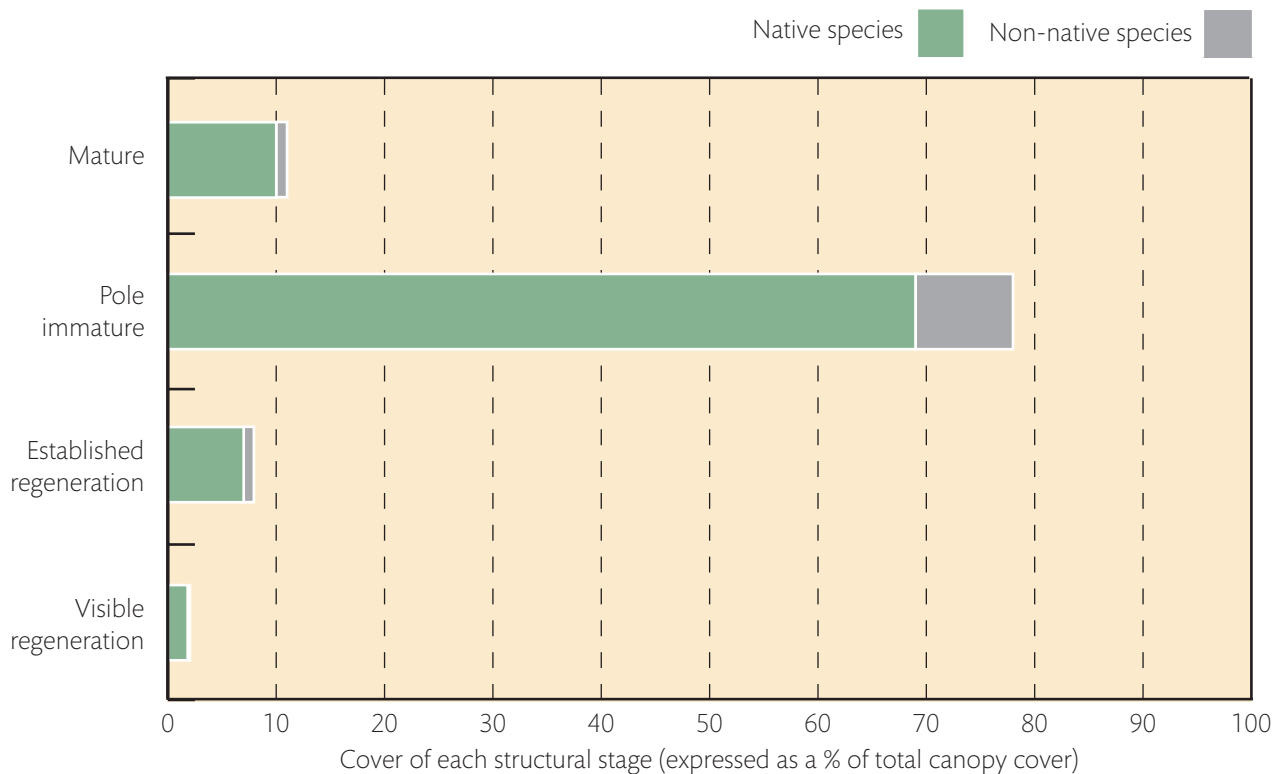


Figure 13: Proportions and composition of the main structural stages present in Native pinewoods



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Figure 14: Proportions and composition of the main structural stages present in Upland birchwoods

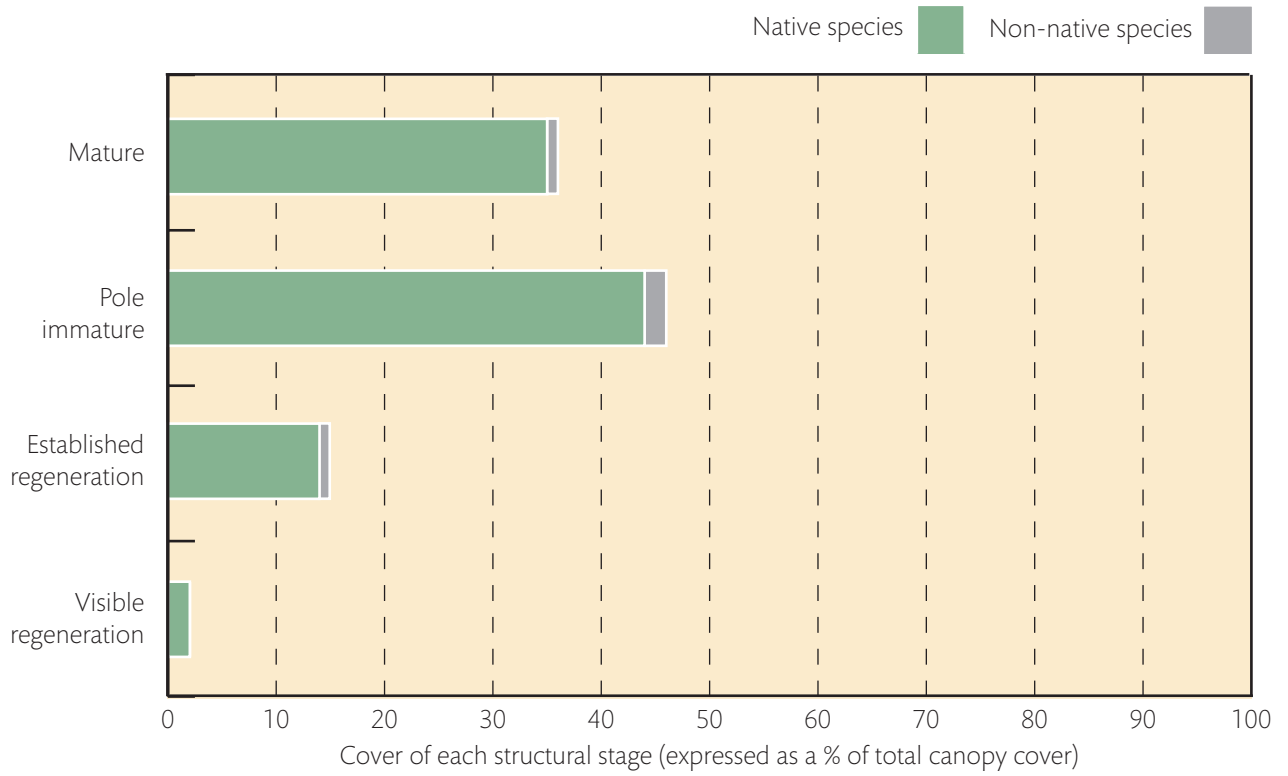
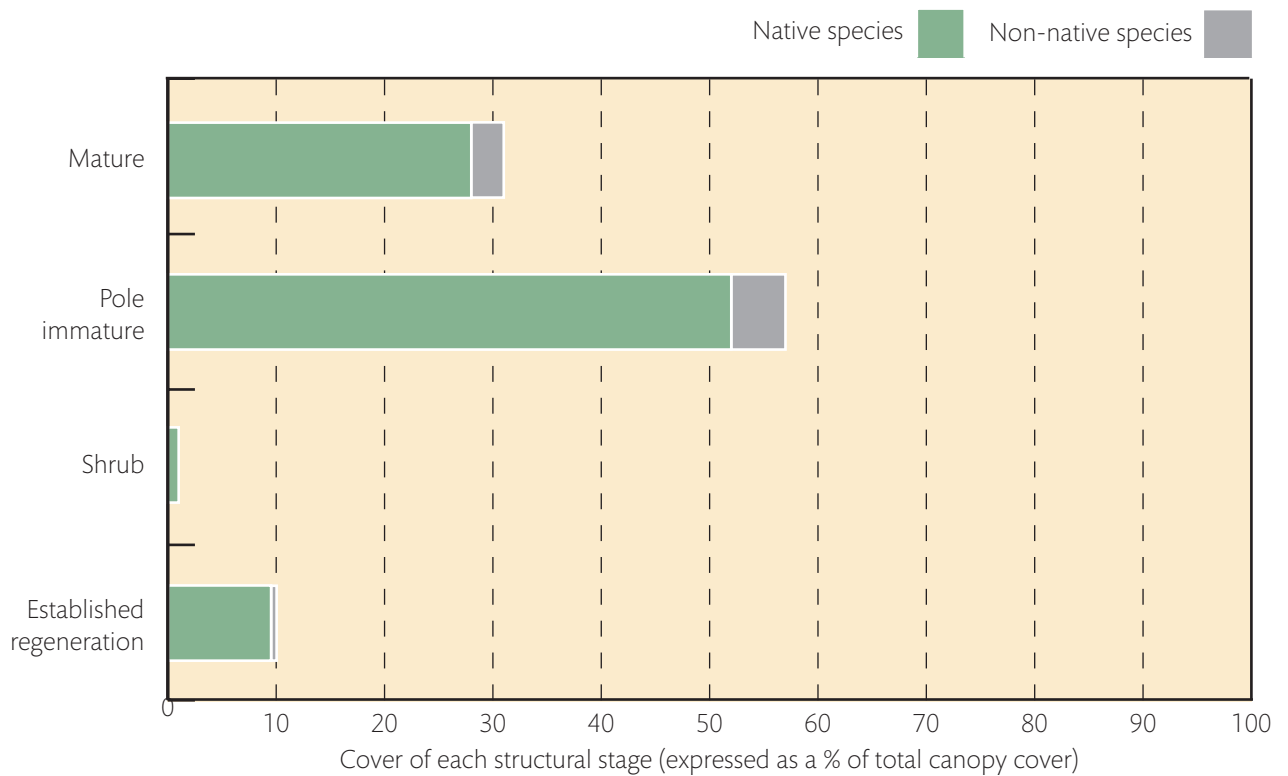


Figure 15: Proportions and composition of the main structural stages present in Upland mixed ashwoods



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Figure 16: Proportions and composition of the main structural stages present in Upland oakwoods

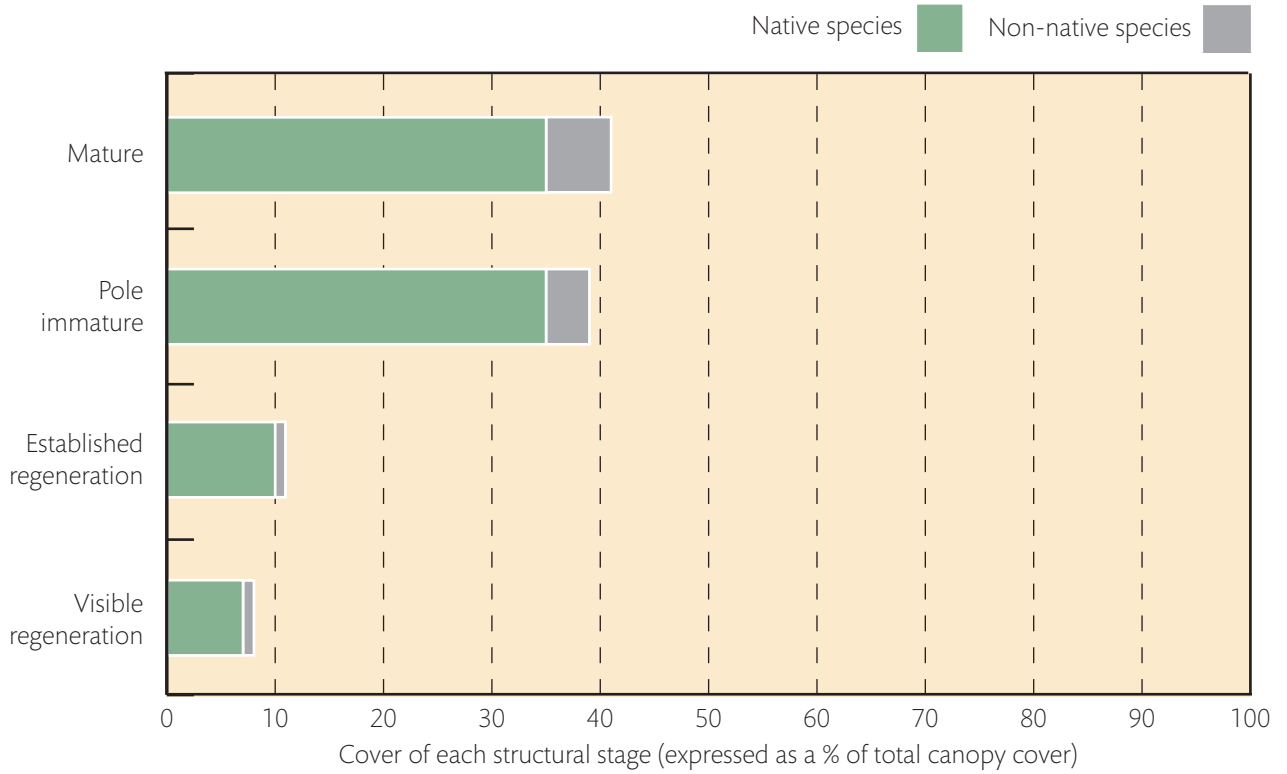
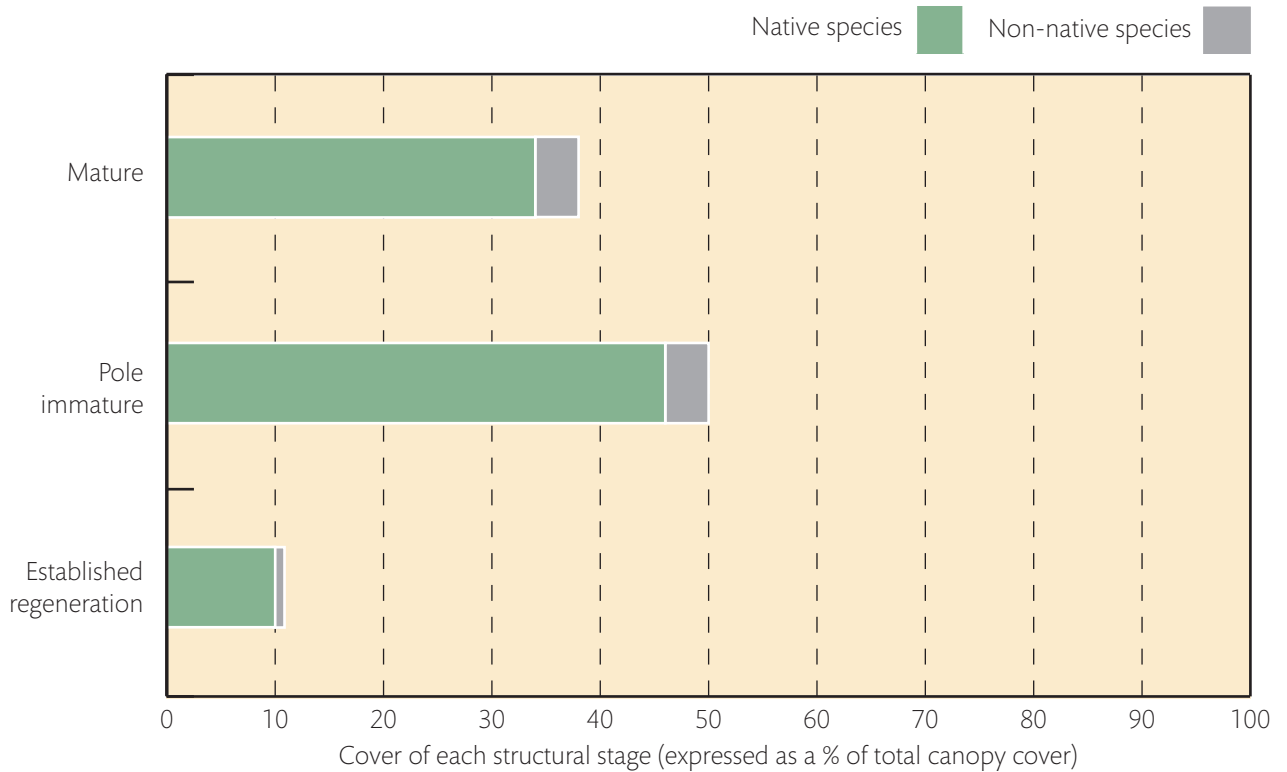
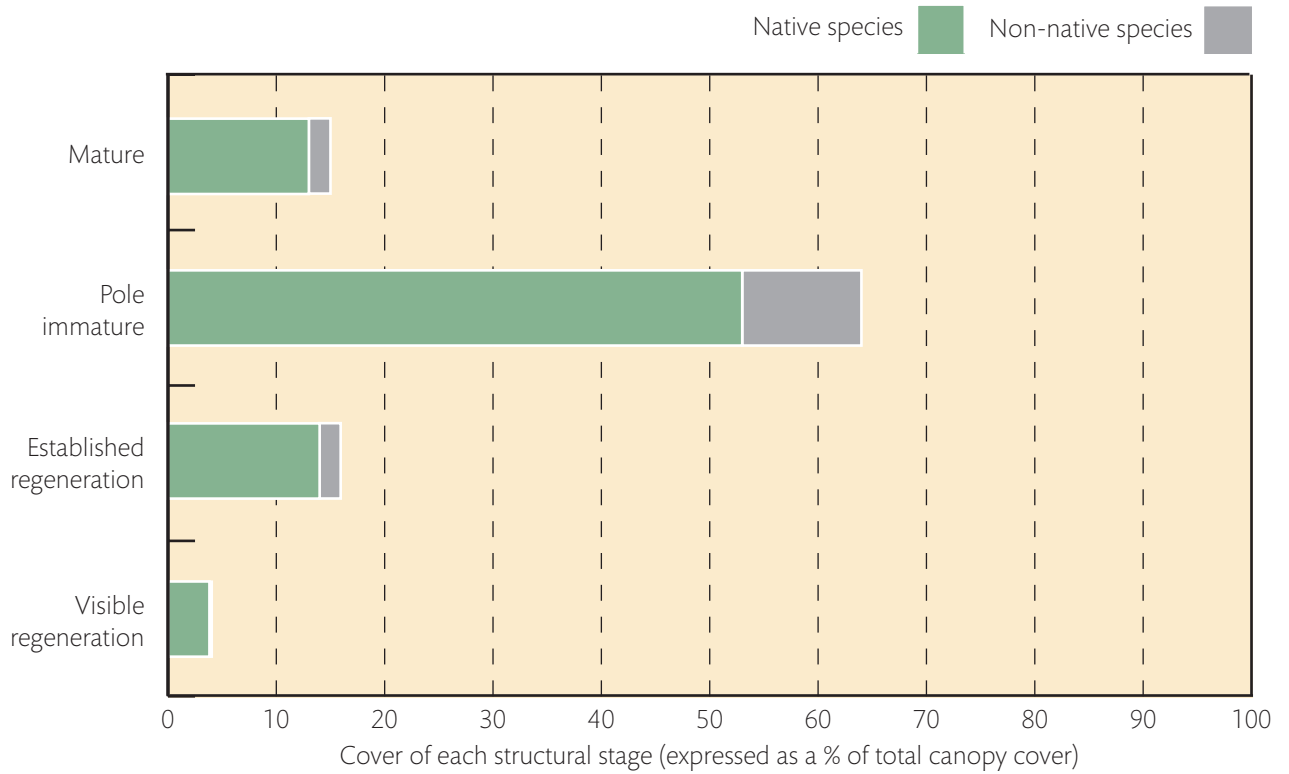


Figure 17: Proportions and composition of the main structural stages present in Wet woodland



Native Woodland Survey of Scotland

Figure 18: Proportions and composition of the main structural stages present in Other type

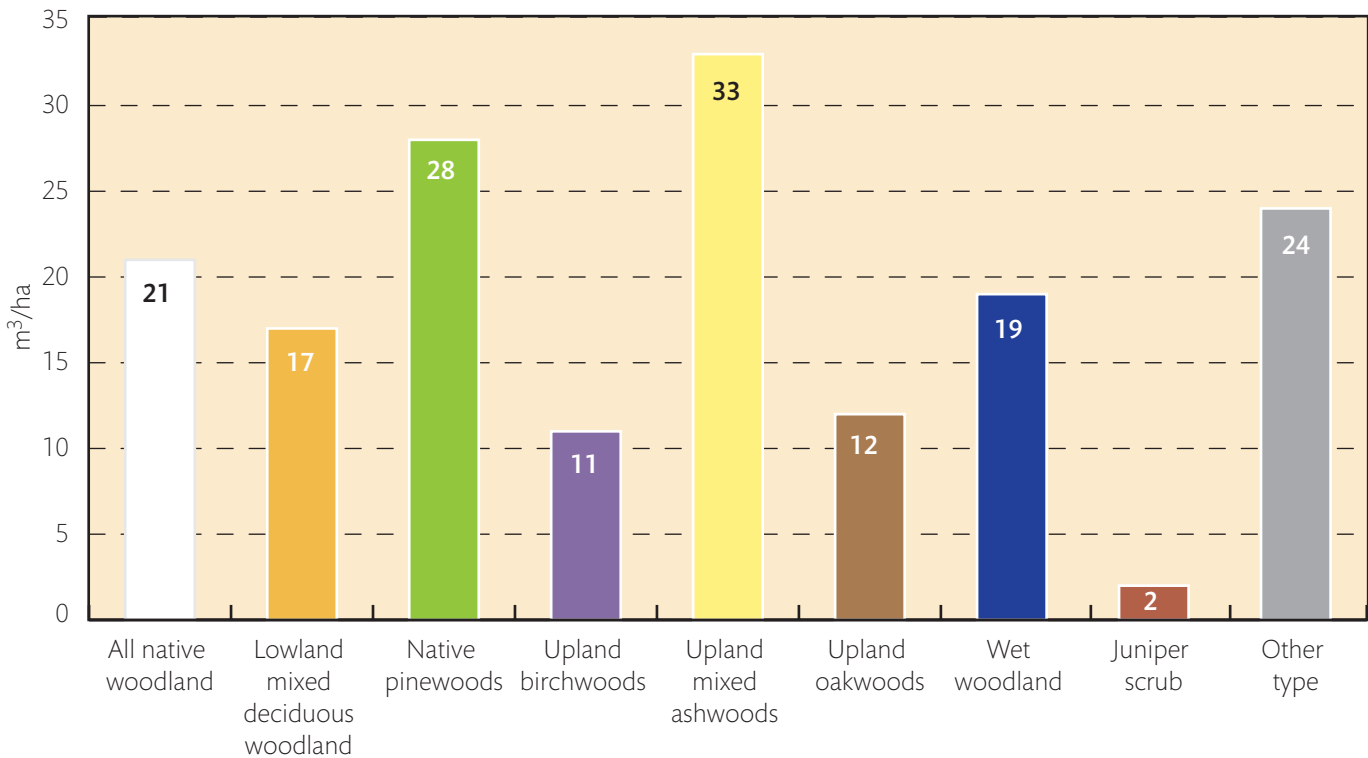


Native Woodland Survey of Scotland

7. Deadwood

Deadwood volumes were estimated from one or more plots in each native woodland unit surveyed. In units with two or more woodland types, volume estimates were assigned to priority woodland types in proportion to the area of each. The mean deadwood volume is 21 m³/ha.

Figure 19: Estimates of volumes of deadwood in native woodland



Note 8: Only woodland types with >30ha in the report area are shown.

Native Woodland Survey of Scotland

8. Invasive Non-native Species

The presence and cover of invasive non-native plant species in the shrub and field layers was assessed in each native woodland area surveyed. Five well-known invasive species were assessed individually.

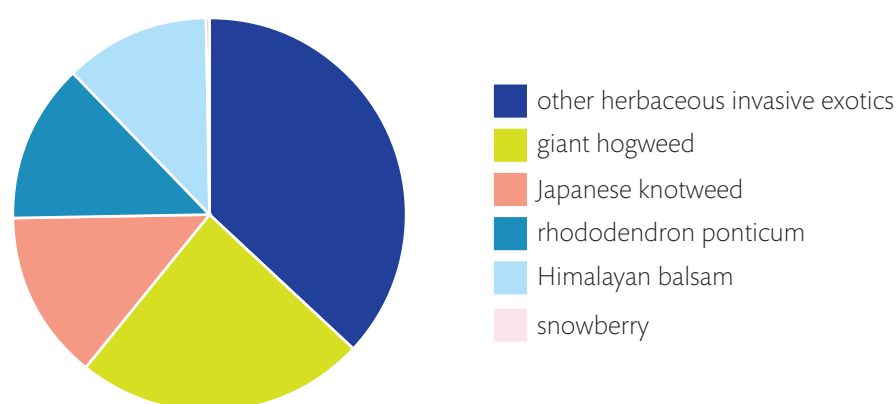
The area of woodland currently affected by invasive non-native species is 150ha. Other herbaceous invasive exotics and giant hogweed are by far the biggest threats and are predominantly found in Upland birchwoods. For more information see Annex 1.

Table 2: Extent of recorded invasive non-native shrub and field layer species in All native woods

Species	Area of invasives (ha)	Percentage of Native Woodland Area†
Other herbaceous invasive exotics	55.0	0.5
Giant hogweed	35.7	0.3
Japanese knotweed	21.3	0.2
Rhododendron ponticum	19.8	0.2
Himalayan balsam	17.6	0.1
Snowberry	0.4	<0.1
Total	150.0	1.3

† Figures rounded to one decimal place.

Figure 20: Proportions of recorded invasive non-native shrub and field layer species in All native woods



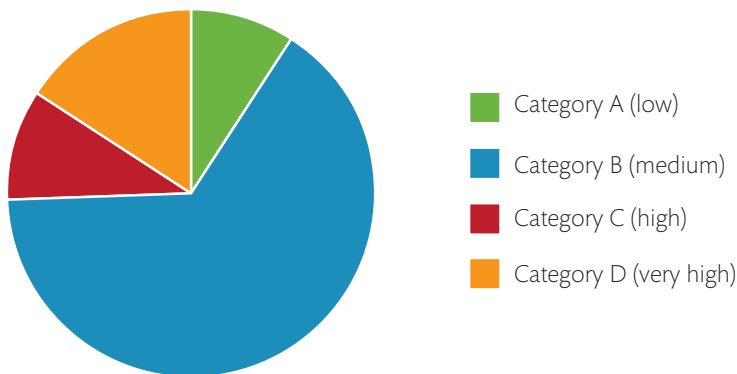
Native Woodland Survey of Scotland

9. Herbivore Impact Assessment for Native Woods

A herbivore impact assessment was made in each native woodland unit. This used a revised decision tree and a 4-point scale (A to d), which took into account the presence and extent of grazing, browsing and other impacts.

Native woods in Moray have 75% of the area within the lowest two categories (See Fig 21).

Figure 21: Herbivore impact in All native woods

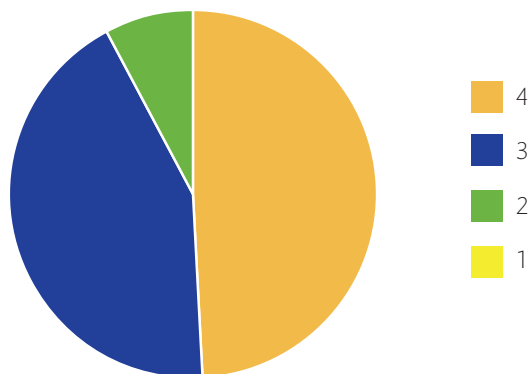


10. Native Woodland Condition Indicator

The indicator - developed for use across the whole report area - describes the average health or condition of native woods for biodiversity. It is based on assessment of four key condition attributes. The attributes and their associated desired range are: canopy cover (50-90%), native species as % of canopy cover (90% or over), herbivore impact value (A or B), and invasive non-native species cover (not more than 10% and less than three invasive species present).

The indicator values suggest that 48% of all native woodland in Moray is in good overall health for biodiversity with an indicator value of 4 (i.e. all condition attributes are in the desired range), with a further 43% having an indicator value of 3 (see Fig 22). Further details of the Indicator and its use are in NWSS User Guidance Notes on the NWSS web pages.

Figure 22: Proportions of Native Woodland Condition Indicator values (all native woods combined)



Note 9: The chart shows proportion of native woodland areas that scored 0, 1, 2, 3 or 4 for condition attributes i.e. the number of condition attributes which are in the desired range.

Part 2: Ancient woodlands

Table 3: Current status of woodlands that were recorded as ancient woodlands in the Scottish Ancient Woodlands Inventory - SAWI (SNH 1997).

Current status	Area (ha)	% of Total Current Area
Native woodland	728	45
Nearly-native woodland	56	4
Other woodland (under 40% native species)	819	51
- Areas surveyed as plantations on ancient woodland sites (PAWS) ¹⁰	668	
- Broadleaved or mixed woods ¹¹	85	
- Conifer woods ¹²	66	
Total area of ancient woodland in NWSS	1,603	100
Other land ¹³	289	-
Area of ancient woods in SAWI ¹³	1,892	-

Note 10: Areas recorded as planted ancient woods on the SAWI- fully surveyed under NWSS.

Note 11: Areas assessed as under 40% native species in NWSS. Broadleaved species make up at least 20% of cover from the digital woodland map. Not surveyed in detail.

Note 12: Areas assessed as under 40% native species in NWSS. Conifer species make up greater than 80% of cover from the digital woodland map. Not surveyed in detail.

Note 13: The SAWI area and current (NWSS) area of ancient woodland may be different for a number of reasons, including mapping errors or inaccuracies in the SAWI estimates and real changes in woodland area which have occurred since the 1980's. Some of this "Other land" may also be recorded as felled, under ground preparation, very young trees etc.

Further analysis, together with possible verification on the ground, will be needed to understand the exact nature of the changes described in Note 13 for Table 3 and to assess how much, if any, actual loss of ancient woodland there has been.

Native Woodland Survey of Scotland

Table 4: Current composition of ancient woodlands that were recorded on the Scottish Ancient Woodlands Inventory (SAWI)

Table 4.1: Areas classed as Ancient and semi-natural woods in SAWI

SAWI Category	Current State		%
	NWSS Type	NWSS (ha)	
Ancient Semi-natural 1,003 ha	Native	563	56
	Nearly-native	29	3
	Non-native†	38	4
	Broadleaved/mixed, not native	82	8
	Conifer, not native	55	5
	Other land	236	24
	Total	1,003	100

† Surveyed as PAWS: area under 40% native species.

Table 4.2: Areas classed as Planted woods on ancient woodland sites (PAWS) in SAWI.

SAWI Category	Current State		%
	NWSS Type	NWSS (ha)	
PAWS 889 ha	Native	165	19
	Nearly-native	27	3
	Non-native†	630	71
	Broadleaved/mixed, not native	3	<1
	Conifer, not native	11	1
	Other land	53	6
	Total	889	100

† Surveyed as PAWS: area under 40% native species.

Native Woodland Survey of Scotland

Figure 23: Percentage semi-naturalness of ancient woodland surveyed as native woods in NWSS

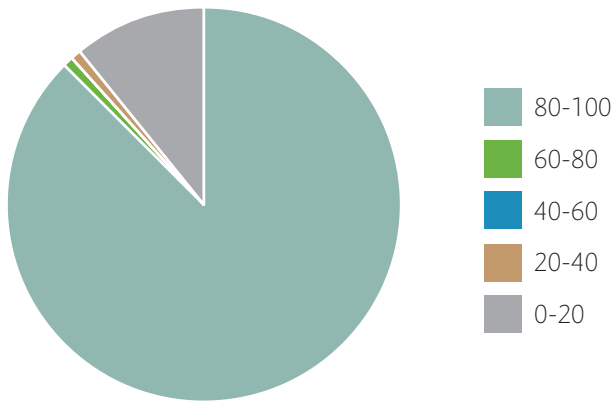
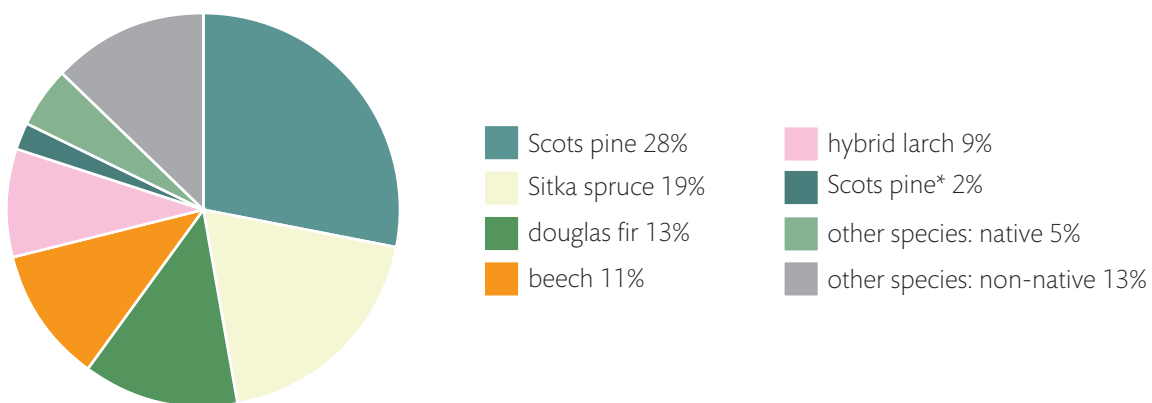


Figure 24: Species composition of PAWS that are mainly non-native



*native species

Note 14: Composition shares are based on all structural layers combined.

Native Woodland Survey of Scotland

Annex 1

Additional detailed information

Table 5: Proportion and area of semi-naturalness classes in native woodland (See Fig 3)

% Semi-natural	Area (ha)	%
0-20	5,745	47
20-40	318	3
40-60	203	2
60-80	252	2
80-100	5,692	47
Total	12,211	100

Table 6.1: Proportions and composition of the main structural stages present in All native woodland (see Fig 11)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	23	91	9
Pole immature	63	90	10
Established regeneration	11	93	7
Visible regeneration	2	93	7

Note 15: In tables 6.1 - 6.8 it is important to be aware that the canopies may overlap or be fragmented.

Note 16: Only structural stages (veteran, mature etc) occupying at least 1% of the total area of that woodland type are shown.

Table 6.2: Proportions and composition of the main structural stages present in Lowland mixed deciduous woodland (see Fig 12)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	37	81	19
Pole immature	49	88	12
Established regeneration	12	92	8

Native Woodland Survey of Scotland

Table 6.3: Proportions and composition of the main structural stages present in Native pinewoods (see Fig 13)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	11	88	12
Pole immature	78	89	11
Established regeneration	8	92	8
Visible regeneration	2	91	9

Table 6.4: Proportions and composition of the main structural stages present in Upland birchwoods (see Fig 14)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	36	96	4
Pole immature	46	95	5
Established regeneration	15	94	6
Visible regeneration	2	98	2

Table 6.5: Proportions and composition of the main structural stages present in Upland mixed ashwoods (see Fig 15)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	31	90	10
Pole immature	57	92	8
Shrub	1	100	0
Established regeneration	10	96	4

Native Woodland Survey of Scotland

Table 6.6: Proportions and composition of the main structural stages present in Upland oakwoods (see Fig 16)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	41	86	14
Pole immature	39	91	9
Established regeneration	11	92	8
Visible regeneration	8	84	6

Table 6.7: Proportions and composition of the main structural stages present in Wet woodland (see Fig 17)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	38	90	10
Pole immature	50	91	9
Established regeneration	11	95	5

Table 6.8: Proportions and composition of the main structural stages present in Other type (see Fig 18)

Structural stage	% of total canopy cover	% of native species in each stage	% of non-native species in each stage
Mature	15	86	14
Pole immature	64	83	17
Established regeneration	16	89	11
Visible regeneration	4	95	5

Native Woodland Survey of Scotland

Table 7.1: Extent of invasive species presence in native woodland polygons

Priority Woodland Type	Number of native polygons with invasives recorded	% of native woodland polygons
All native woodland	330	12
Native pinewoods	34	1
Lowland mixed deciduous woodland	53	2
Upland birchwoods	86	3
Upland mixed ashwoods	14	1
Upland oakwoods	7	0
Wet woodland	89	3
Other type	47	2

Note 17: There are a total of 2,692 native woodland polygons in Moray.

In Tables 7.2 to 7.8 the area and percentage of the main recorded invasive species in the priority woodland types is given where there is a combined area of over 1.0ha of all invasives present in that woodland type. Individual invasive species are only noted here where they comprise at least 1% of the area of invasives in that woodland type.

Table 7.2: Area and percentage of the main recorded invasive species in Lowland mixed deciduous woodland

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Other herbaceous invasive exotics	5.6	33
Giant hogweed	5.2	30
Himalayan balsam	2.8	16
Japanese knotweed	1.8	11
Rhododendron ponticum	1.5	9
Snowberry	0.1	1
Total	17.0	100

Native Woodland Survey of Scotland

Table 7.3: Area and percentage of the main recorded invasive species in Native pinewoods

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Other herbaceous invasive exotics	7.9	85
Rhododendron ponticum	1.4	15
Total	9.3	100

Table 7.4: Area and percentage of the main recorded invasive species in Upland birchwoods

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Other herbaceous invasive exotics	19.8	30
Giant hogweed	14.0	21
Japanese knotweed	13.9	21
Rhododendron ponticum	10.5	16
Himalayan balsam	7.9	12
Total	66.1	100

Table 7.5: Area and percentage of the main recorded invasive species in Upland mixed ashwoods

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Other herbaceous invasive exotics	1.4	89
Giant hogweed	0.1	8
Himalayan balsam	<0.1	3
Total	1.6	100

Native Woodland Survey of Scotland

Table 7.6: Area and percentage of the main recorded invasive species in Upland oakwoods

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Rhododendron ponticum	3.9	55
Other herbaceous invasive exotics	3.1	45
Total	7.0	100

Table 7.7: Area and percentage of the main recorded invasive species in Wet woodland

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Other herbaceous invasive exotics	10.2	37
Giant hogweed	6.9	25
Himalayan balsam	6.5	23
Japanese knotweed	2.9	10
Rhododendron ponticum	1.2	4
Snowberry	0.1	1
Total	27.8	100

Table 7.8: Area and percentage of the main recorded invasive species in Other type

Species	Area of invasives (ha)	% of total area of invasives in this woodland type
Giant hogweed	9.6	45
Other herbaceous invasive exotics	7.0	33
Japanese knotweed	2.7	13
Rhododendron ponticum	1.4	6
Himalayan balsam	0.4	2
Snowberry	0.2	1
Total	21.3	100

Native Woodland Survey of Scotland

Table 8.1: Herbivore impact in All native woodland (see Fig 21)

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	267	1,064	10	9
B	1,630	8,071	61	66
C	299	1,168	11	9
D	496	1,907	18	16

Table 8.2: Herbivore impact in Lowland mixed deciduous woodland

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	15	65	8	15
B	130	301	73	69
C	13	39	7	9
D	19	30	11	7

Table 8.3: Herbivore impact in Native pinewoods

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	87	561	13	10
B	440	4,131	68	77
C	84	492	13	9
D	37	175	6	3

Table 8.4: Herbivore impact in Upland birchwoods

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	73	191	8	5
B	495	1,895	52	51
C	84	273	9	7
D	299	1,327	31	36

Native Woodland Survey of Scotland

Table 8.5: Herbivore impact in Upland mixed ashwoods

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	6	18	7	9
B	50	136	58	65
C	14	23	16	11
D	16	33	19	16

Table 8.6: Herbivore impact in Upland oakwoods

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	8	54	18	34
B	25	76	56	49
C	5	6	11	4
D	7	20	16	13

Table 8.7: Herbivore impact in Wet woodland

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	39	113	9	9
B	277	839	64	66
C	56	173	13	14
D	64	147	15	12

Table 8.8: Herbivore impact in Blackthorn scrub

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	1	1	50	61
B	1	1	50	39

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Table 8.9: Herbivore impact in Juniper scrub

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	1	2	3	5
B	19	31	56	63
C	4	4	12	8
D	10	12	29	25

Table 8.10: Herbivore impact in Other type

Herbivore impact category	Number of polygons	Area (ha)	% of polygons	% of area
A	36	57	12	6
B	193	662	62	64
C	39	158	13	15
D	43	162	14	16

Table 9: Area and percentage of native woodland with each condition score (see Fig 22)

Condition	Area (ha)	% of area
0	0	0
1	45	<1
2	1,047	9
3	5,232	43
4	5,863	48
Total	12,187	100

Annex 2

Outline of the Survey method

This annex outlines the survey approach. More information on the methods and guidance on the interpretation of the results can be found on the NWSS webpages on the Forestry Commission Scotland website.

1. Areas were selected for survey using digital woodland maps, which were prepared from aerial photographs taken within the previous five years. The digital maps identified woodland types that could contain native woodland areas, as well as all planted woods on ancient woodland sites (PAWS).
2. When the surveyors visited these areas they identified and surveyed all native woodland, nearly-native woods and PAWS sites over 0.5ha. For each area of native woodland surveyors recorded the priority habitat type(s) and National Vegetation Classification type(s) (NVC) (Rodwell, 1991) present.
3. They also collected a wide range of other information about the surveyed areas, including:
 - woodland composition and structure (eg whether planted or semi-natural, the cover and stocking density of all tree and shrub species in each structural stage, information on veteran trees);
 - presence and extent of herbivore impacts;
 - presence and cover of five invasive non-native shrub and field layer species;
 - presence and size of deadwood;
 - a range of other features where relevant e.g. erosion, built development, dumping, pests and diseases, damage by identified species of animal eg deer/sheep/rabbit; recreational and other management impacts.
4. Customised quality assurance systems were developed and implemented for mapping, field survey and data recording components of the work. The whole project has been managed by a project manager working to a project board.

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Glossary

A **glossary** of terms can be found on the NWSS web pages.



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