Native Woodland Survey of Scotland

Orkney and Shetland
**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 Orkney and Shetland Islands local authorities areas.

**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 the Orkney and Shetland Islands was carried out between May 2010 and December 2010. 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 1, and more information is available on the [NWSS web pages](#) on the Forestry Commission Scotland website.
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.

*Information was collected on cases where native species had been planted on soil types where they would not be expected to grow naturally. This information has not been used to define and map native woods but it can be analysed to assess where changes in future composition may be desired or predicted.

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 will be available from Forestry Commission Scotland, as well as being published by Forestry Commission Scotland on a Forestry Commission Map Viewer. This 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.
Results for the Orkney Islands

Executive Summary

1. Native woodland

- The area of native woodland in the Orkney Islands is 35ha, which is 27.1% of the total woodland area.
- The main priority habitat types are Wet woodland, Lowland mixed deciduous woodland and Upland birchwoods.
- Some native woods in the Orkney Islands are highly semi-natural in their present structure and composition, with 31% of the total area in the 80-100% semi-natural category.
- The most common native tree species in the upper canopy are eared willow, downy birch and common alder.
- Woodland canopy cover averages 58% across all native woods.
- Native species make up 89% of canopy cover averaged across all types of native woods.
- Non-native tree species comprise 11% of the established regeneration stage and 22% of the pole immature canopy.
- Estimated deadwood volume averages <1m3 per ha; note there are few mature trees present in the native woodlands.
- Invasive non-native species in the shrub and field layers occupy 5% of native woodland areas, recorded under the category of “Other herbaceous invasive exotics”.
- All native woods in the Orkney Islands have low levels of browsing and grazing.
- Just over half of the native woodland is in good health for biodiversity, based on analysis of four key condition measures.

2. Ancient woodland

There are no ancient woodlands recorded for the Orkney Islands in the inventory of ancient and long established woodland sites and the inventory of semi natural woodlands.
Part 1: Native woodland

1. Area of Native Woodland

A total of 35ha or 27.1% of the woodland area in the Orkney Islands is comprised of native woods, with another 7ha (5.4%) of nearly-native woodland.

Figure 1: Distribution of native and other woodland in the Orkney Islands
Native Woodland Survey of Scotland

Table 1: Summary of native woodland area by type

<table>
<thead>
<tr>
<th>Native Woodland Type¹,²</th>
<th>Area (ha)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowland mixed deciduous woodland³</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Upland birchwoods</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Wet woodland</td>
<td>20</td>
<td>57</td>
</tr>
<tr>
<td>Other type⁴</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35</td>
<td>100</td>
</tr>
</tbody>
</table>

Note 1: The top 3 rows are native woodland types which are priority habitats under the UK Biodiversity Action Plan.
Note 2: 41% of mapped units (polygons) of native woodland surveyed contained a single native woodland habitat type. The remaining 59% 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 Orkney
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. A high value for semi-naturalness suggests a high nature conservation value, including a likely past history of natural regeneration.

Native woodland in the Orkney Islands has 69% in the 0-20% semi-natural category while the remaining 31% is highly semi-natural in the 80-100% category.

3. Tree Species Composition

Tree species composition was assessed for all canopy layers which are then 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.

Eared willow, downy birch and common alder are the main native species in the native woods on the Orkney Islands. Only 10% of the total canopy area is recorded as non-native.

Figure 3: Species composition of the canopy layers of native woodland

*native species
4. Structural Diversity

The weighted mean cover of each structural stage is 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.

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.

There is a developing native woodland structure in the Orkney Islands with a strong presence of pole immature trees and established regeneration. Whilst mature trees are present they are too scarce to register in Figure 4.

**Figure 4: Proportions and composition of the main structural stages present in All native woodland**

Cover of each structural stage (expressed as a % of total canopy cover)
5. 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 or nearly-native woodland area surveyed. Five well-known invasive species were assessed individually. Invasive non-native species in the shrub and field layers occupy 5% of native woodland area, recorded under the category of "Other herbaceous invasive exotics"; this was all found in one wood, indicating that it could be easily targeted.

6. Herbivore Impact Assessment for Native Woods

A herbivore impact assessment was made in each native woodland unit. This used a decision tree and a 6-point scale (A to F), which took into account the presence and extent of grazing and browsing and other impacts. All native woods in the Orkney Islands were assessed as having low herbivore impacts with all of the area in the two lowest categories.

7. 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%).

The indicator values suggest that 52% of all native woodland in the Orkney Islands 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 39% having an indicator value of 3 (see Fig 5). Further details of the Indicator and its use are in NWSS User Guidance Notes on the NWSS web pages.

Figure 5: Proportions of Native Woodland Condition Indicator values (all native woods combined)

Note 5: The chart shows proportion of native woodland areas that scored 1, 2, 3 or 4 for condition attributes i.e. the number of condition attributes which are in the desired range.
Native Woodland Survey of Scotland

Results for the Shetland Islands
Executive Summary

1. Native woodland

• The area of native woodland in the Shetland Islands is 3ha in 2 woodlands, at Lunga Water and Loch of Clickimin, which is 7.9% of the total woodland area.
• The priority habitat types are Upland birchwoods, Wet woodland and Lowland mixed deciduous woodland.
• The Lunga Water woodland falls into the 20-40% semi natural category, whilst that at Loch of Clickimin is not semi natural.
• The most common native tree species are downy birch, grey willow and rowan.
• The structure of the native woodlands is mostly visible regeneration with some established regeneration and shrubs.
• The Lunga Water woodland has a canopy cover of 20%, whilst that at Loch of Clickimin has a canopy cover of 40%.
• The Lunga Water woodland is comprised of 100% native species, whilst that at Loch of Clickimin is comprised of 95% native species.
• There is no deadwood recorded in the native woodlands; note there are no mature trees.
• Japanese knotweed is the only invasive species recorded.
• Native woods in the Shetland Islands have low levels of browsing and grazing.
• None of the native woodland is in good health for biodiversity, based on analysis of four key condition measures, due to the current low level of canopy cover.

2. Ancient woodland

There are no ancient woodlands recorded for the Shetland Islands in the inventory of ancient and long established woodland sites and the inventory of semi natural woodlands.
Part 1: Native woodland

1. Area of Native Woodland

A total of 3ha equivalent to 7.9% of the woodland area, in two woodlands in the Shetland Islands, is comprised of native woods, with another 2ha (5.8%) in one nearly-native woodland.

Figure 1: Distribution of native and other woodland in the Shetland Islands
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. A high value for semi-naturalness suggests a high nature conservation value, including a likely past history of natural regeneration.

There are two native woodlands in the Shetland Islands. The Lunga Water woodland falls into the 20-40% semi natural category, whilst that at Loch of Clickimin is not semi natural.
3. Tree Species Composition

Tree species composition was assessed for all canopy layers which are then 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.

The Lunga Water woodland is comprised of 100% native species, whilst that at Loch of Clickimin is comprised of 95% native species.

**Figure 3: Species composition of the canopy layers of native woodland**

*downy birch* 70%
*grey willow* 16%
*rowan* 6%
other species: native 8%

4. Structural Diversity

The weighted mean cover of each structural stage is 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.

There are no mature or pole immature stages present but there is significant visible regeneration in the native woods in the Shetland Islands; established regeneration and shrub species are present at low levels.
5. 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 or nearly-native woodland area surveyed. Five well-known invasive species were assessed individually. Japanese knotweed was recorded as present at <100 stems per hectare in one woodland. No other invasive species was recorded in the native or nearly-native woodlands.

6. Herbivore Impact Assessment for Native Woods

A herbivore impact assessment was made in each native woodland unit. This used a decision tree and a 6-point scale (A to F), which took into account the presence and extent of grazing and browsing and other impacts.

Native woods in the Shetland Islands were assessed as having low herbivore impacts with all of the area in the second lowest category of B.

7. 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%).

All native woodland in the Shetland Islands has an indicator value of 3. Further details of the Indicator and its use are in NWSS User Guidance Notes on the NWSS web pages.
Annex 1
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 FCS 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 (e.g. 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 e.g. 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.

References


Scottish Natural Heritage (1997). The inventory of ancient and long established woodland sites and the inventory of semi natural woodlands (provisional). SNH Information and Advisory Note series. [NB: The inventory was first published in 1987, and is widely referred to as the Scottish Ancient Woodlands Inventory].

Glossary

A glossary of terms can be found on the NWSS web pages.
Forestry Commission Scotland serves as the forestry directorate of the Scottish Government and is responsible to Scottish Ministers.

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