

NATIVE WOODLAND CONDITION SURVEYS

Introduction

Recent work on the collation of native woodland survey information in Scotland has suffered from attempting to amalgamate data collected by widely differing survey methods, using different definitions and criteria. In an agreement between FC National Office for Scotland and SNH, it was agreed that the two bodies would work together to develop a site by site woodland inventory for Scotland, employing a standard survey methodology, and recording a range of agreed key parameters. This will not only allow a national collation of meaningful data on Scottish native woods, but will also give managers and owners good quality and relevant data on which to base woodland management decisions.

Work on drawing up the survey technique has been carried out under the Scottish Woodland Inventory Project by the Caledonian Partnership, with European Life '94 funding. After full liaison with FC and SNH technical staff, the Inventory Project has worked up an agreed survey format and detailed notes for surveyors (Appendix 1).

The aim of this Guidance note is to introduce the new survey to both FC National Office for Scotland staff and WGS agents, and to explain how it should be applied in the field.

When should the Scottish Woodland Inventory Cards be used?

The attached survey methodology is suitable for any existing woodland composed predominantly of locally native species. It may also be used in a mixed woodland where the intention is to manage it in future as seminatural woodland, eg oakwoods underplanted with conifers where the owner is likely to agree to restoration to native woodland in the longer term (using the FC National Office for Scotland, Forestry Practice Guides for Seminatural Woodlands as standards).

FC National Office for Scotland policy is to promote the use of this standard survey technique whenever a woodland survey is needed to give advice on which to base management prescriptions under WGS. The survey work may be eligible for annual management grant or Woodland Improvement Grant under WGS.

How to use the Survey Cards

The guidance notes in the Appendix give detailed instructions on how to complete the three survey cards. These notes are aimed at foresters and agents, and do not require specialist training beyond a working knowledge of forestry, maps, and land use matters. Surveyors used to the techniques and forms will obviously be able to

complete surveys more quickly and with consistent accuracy, but skilled surveyors are not essential for one-off surveys.

However, training days may be available for those willing to develop their woodland survey skills (enquiries to your FC Conservancy office). Conservators will also be able to put owners or agents in touch with experienced woodland surveyors in your area, and be able to give an indication of typical survey costs.

What to do with Completed Survey Cards.

Local Management

Under WGS the survey card is aimed mainly at providing the woodland manager with accurate and relevant data to help him decide future action in the wood. Survey Card I records threats and damage, presence of regeneration or young trees, and overall condition. Card II records the timber potential of the stands, as well as access and terrain data. This data should assist managers come to decisions on woodland management for inclusion in the WGS Plan for future years.

Scottish Woodland Inventory

A condition of receiving grant aid for the survey work is that you send copies of the completed cards and map to your Conservator for inclusion in the national inventory. Confidentiality of ownership information will of course be maintained by the Forestry Commission.

Since this survey format is new and relatively untried in the field, it will be expected that minor amendments to the forms will occur from time to time. To assist us improve the cards FC National Office for Scotland will be pleased to have feedback from surveyors and managers on the survey cards and method.

Guidance Notes are produced to help FC National Office for Scotland staff deal with a range of subjects. They are freely available, on request, to owners, managers and agents in order to help them in the preparation of WGS applications etc.

Some Guidance Notes deal with well-developed topics. Other Guidance Notes cover subjects which are fast moving, with fairly rapid accumulation of new knowledge and experience.

Please remember that Guidance Notes are intended to help, but are not necessarily the 'last word' on the subject. They will be updated as necessary. Any comments or feedback would be welcome. Please pass your comments to Douglas Wright at the FC National Office for Scotland.

CALEDONIAN PARTNERSHIP

SCOTTISH WOODLAND INVENTORY

*GUIDANCE NOTES FOR COMPLETION OF WOODLAND SURVEY
CARDS*

INTRODUCTION

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WOODLAND INFORMATION CARD

WOODLAND SURVEY CARD I (GENERAL)

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Caledonian Partnership

Mar. 1998

TC/draft4/03. 98

CALEDONIAN PARTNERSHIP

SCOTTISH WOODLAND INVENTORY

GUIDANCE NOTES FOR COMPLETION OF WOODLAND SURVEY CARDS

INTRODUCTION:

Information to satisfy the 'key parameters' which will form the framework of the Scottish Woodland Inventory can be collected at three distinct levels:

Level 1:

A range of information that can be assessed from remote sources [maps, aerial photos, NCC Ancient Woodland Inventory and existing surveys].

This information is recorded on the **Woodland Information Card** and provides a basic level of background detail on the wood which is complementary to that collected by subsequent field survey at levels 2 and 3.

Some of this information is already collected in a systematic way for woods being managed under the Woodland Grant Scheme but is generally not available for other woods. It is envisaged that all the information from this card will eventually be available on the computerised *Scottish Woodland Inventory*, after which the card will become obsolete

Meantime the functions of this card are:

1. To provide additional background information for woods managed under WGS.
2. To provide a consistent level of information directly compatible to that held for WGS woods for those woods that are not managed under this scheme.

Level 2:

Basic field survey at about 'phase 1' level. Simple subjective information that can be gathered fairly quickly from a 'walkabout' type survey with the purpose of validating, refining and enhancing the information collected at level 1 and indicating whether more specialised and expensive survey work at level 3 is required/worthwhile.

Information at this level is recorded on a two related and complementary survey cards which together build up a simple but comprehensive picture of the woodland:

General information about each wood is recorded on **Woodland Survey Card 1 (general information)** which is accompanied by an OS map(s) at the largest scale possible to fit onto one A4 sheet. This map should be annotated as directed on the survey card. Information recorded on this card and the accompanying map relates to the **whole woodland** [division into discrete compartments is not necessary].

More specific information about trees/shrubs and the timber resource and its potential for utilisation is recorded on **Woodland Survey Card II (trees, shrubs & timber)** which is also accompanied by OS map(s) at the largest scale possible to fit onto one A4 sheet each. To enable a realistic assessment of the timber resource the wood is divided into discrete compartments based on dominant tree species and **one card completed for each compartment**.

These two cards record different but complementary information. To obtain a comprehensive picture of the wood it is important that they are both completed wherever possible.

Information collected at this level can also be supplemented by fixed point photographs if this will clarify the assessment further [see appendix].

All cards at levels 1 & 2 have a standard header panel for recording locational and administrative information about the whole wood.

Level 3:

More specialised and detailed survey work only required for a sub-sample of woods [as indicated from levels 1 and/or 2].

Survey at this level requires specialised knowledge and skills. Examples include mapping of NVC sub communities, timber mensuration and survey of lesser known groups such as invertebrates and lower plants. Surveys at this level require woods to be compartmentalised in different ways depending on the type of survey.

The Caledonian Partnership has not developed specific survey cards for the recording of information at this detailed level. Existing survey proformas should be used [eg. 'Rodwell' NVC Record Card; BRC Record Cards] in conjunction with the Caledonian Partnership 'Standard Header Panel' giving locational data for the wood. Annotated maps and fixed point photographs can be used to supplement the information provided on these cards but must also be cross referenced to the 'Standard Header Panel'.

STANDARD HEADER PANEL [all 3 cards] - GUIDANCE NOTES

NOR:

National grid reference at central point of wood; 2 letters for 100 km square followed by six digits. [eg NH425763].

WOODLAND RECORD NO:

Leave this blank. It relates to the the record number allocated by the computer database.

AREA:

This relates to the whole woodland and should be measured to the nearest 0.1 ha. from the most up-to-date OS map and checked against the aerial photo [for a 'remote' survey] and from the field survey map [for field surveys]. Measurement can be by means of a scaled grid overlay or a planimeter.

COMPLETED BY:

Record names of all surveyors present using initial and full surname.

WOOD SURVEY NUMBER:

Where a number of woods are being surveyed this is the number allocated by the sponsoring organisation or, where this has not been done, by the surveyor(s)

WOODLAND NAME:

Record the name used on the OS 1:10,000 map. If none, give a name which relates to a feature nearby noted from the OS map or a name agreed with the woodland owner.

ALTITUDE:

Record the maximum and minimum altitude of the wood from the latest OS map[1 :25,000 or 1:10,000].

DATE:

Record day/month/year. If the field survey has taken more than one day record start and completion dates.

ASPECT:

Record predominant aspect [not minor variations]. Individual woods may have more than one predominant aspect [eg. both sides of a glen].

TIME TO COMPLETE CARD:

Estimate the time taken to complete each of the *Level 2* field survey cards to the nearest 30 minutes.

LA AREA:

This refers to the new Local Authority Administrative Area following re-organisation [eg Sutherland Area].

FA CONSERVANCY:

This is the Forestry Authority administrative unit.

SNH AREA:

Record the new Scottish Natural Heritage Area [eg East Highland, Argyll & Stirling].

SPONSOR:

Record who has commissioned the survey [usually who is paying for it].

WOODLAND INFORMATION CARD GUIDANCE NOTES [Level 1]

INTRODUCTION:

This card is completed as a 'desk exercise' prior to field survey. Its function is to gather information which is complementary to that recorded on the two field survey cards at ~ LEVEL 2. It is *important* that this card is always completed as a prerequisite before field survey.

HEADER PANEL:

Standard for all survey cards and provides the link between cards - see specific guidance notes.

OWNERS:

If possible record all owners in multi-ownership sites.

TENANT(S):

If possible record all tenants.

AGENT/MANAGER:

Details of main contact point who has responsibility for management of the woodland.

LAND-USE CONTEXT:

Tick one box only to record the predominant land-use class. These classes are the same as those recorded on the WGS application form (WGS 1), with the addition of a *Conservation* class.

Farm = farming or horticulture

Mixed Estate = large areas of both farming & woodland

Mainly Woodland = mainly woodlands/forest

Private Residence = area around a family house, but not a farm

Recreation = primarily used for recreation, such as golf course, hotel or country park

Conservation = areas where the primary land-use is the conservation of habitats and/or wildlife species

Public Building = school, hospital, retirement home, whether publicly or privately owned

Industrial = office, mine, factory, either in use or derelict

OWNERSHIP STATUS:

Tick the categor(ies) that best describe the woodland ownership type. Larger woods may have more than one type. If so record all types [1 = largest area, 2 = next largest etc.]. These classes are the same as those on the WGS application form (WGS 1), with the addition of classes for Forestry Commission owned and Common Land.

<i>Personal Occupier</i>	=	privately owned or leased property, or held as a family trust, partnership or family farm
<i>Business Occupier</i>	=	company, forestry investor, business partnership, syndicate or pension fund
<i>Voluntary Organisation</i>	=	funded by public subscription or a charitable trust or company organisation
<i>Public Ownership</i>	=	local authority or government department/agency, other than the Forestry Commission
<i>Forestry Commission</i>	=	all land owned by Forest Enterprise as a 'next steps' agency of the Forestry Commission, whether currently woodland/forest or not
<i>Common Land</i>	=	land belonging to the local community as a whole, and is open to common use

TENANCY STATUS:

<i>Crofting Common Grazings</i>	=	land which forms the common grazings of a crofting community (usually administered by a 'grazings clerk'), usually 'outrun' which is owned by the landlord.
<i>Crofting (other)</i>	=	all other land (usually inbye) held under crofting tenure, including crofting sub-tenancies, which is landlord owned.
<i>Agricultural Tenancy</i>	=	all forms of agricultural tenure where the land is not owned and is held under a lease or similar agreement for a period of one year or more.
<i>Grazing License</i>	=	land which is let for grazing of stock for any period of less than one year.
<i>Sporting</i>	=	land let for sporting purposes, usually to a third party

GROWTH STAGE [stage of canopy closure]:

Tick each relevant box and record approximate percentage of whole wood covered by each category.

<i>Open Ground</i>	=	No trees.
<i>Developing Canopy</i>	=	natural regeneration and planting where canopy has not yet closed.
<i>Fragmented Canopy</i>	=	<50% Canopy cover.
<i>Degrading Canopy</i>	=	49-99% canopy cover.
<i>Closed Canopy</i>	=	100% canopy cover.

GRANTS & FELLING LICENSES:

Tick relevant box(es) and quote reference numbers if known for existing grant schemes and licenses currently extant over part or all of the wood. Give details of proposed/planned grants/licenses. The primary sources of information are Forestry Authority, Scottish Natural Heritage, SOAEFD and the Millennium Forest for Scotland Trust.

STATUTORY DESIGNATION:

Tick relevant boxes for all statutory designations covering all or part of the wood.

SAC = Special Area of Conservation [under EC Habitats Directive]; SPA = Special Protection Area [under EC Birds' Directive]; Area of Great Landscape Value includes 'Local Nature Conservation Area'. The primary sources of information on statutory designations are the Forestry Commission, Scottish Natural Heritage, SOAEFD and local government.

OTHER DESIGNATION:

Tick relevant boxes and/or specify any other designations.

ARCHAEOLOGICAL INTEREST:

Record information from 'Sites & Monuments Record' held by Local Authority archaeology section. It is important to record sites which are not listed in this database but where map sources and/or aerial photographs indicate that there may be archaeological features/interest. Tick the appropriate boxes.

EXISTING SURVEY INFORMATION:

A knowledge of the type of survey information that already exists for a wood and how recent it is can be important in assessing the quality of semi-natural woodland and maximising the use of resources. The primary sources of woodland survey information are SNH, Forest Enterprise, Forestry Authority, Scottish Wildlife Trust, RSPB, Tayside Native Woods, Woodland Trust and other local/regional native woodland initiatives.

The survey types are as follows:

H1	=	Habitat - phase 1
H2	=	Habitat - phase 2 (includes NVC)
V	=	Vegetation type/community
S1	=	Vascular plants
S2	=	Lower plants
S3	=	Invertebrates
S4	=	Birds
S5	=	Mammals
S6	=	Amphibians/Reptiles
T	=	Timber reconnaissance
A	=	Historical/archaeological
L	=	Designed landscape
R	=	Recreation

GEOLOGY:

Tick relevant boxes and add type(s) from British Geological Survey maps.

SOILS:

Record all soil types from MLURI 1:50,000 provisional soil maps or 1:63,360 colour soil maps.

WOODLAND SURVEY CARD I (GENERAL) GUIDANCE NOTES [Level 2]

INTRODUCTION:

This is the first of a series of Woodland Survey Cards for recording information at **level 2** (basic field survey) from a simple 'walkabout' type survey. It is designed for the collection of very basic information on the location of the wood, habitats & species groups, woodland management, threats & damage to the wood and general land-use. It also provides for a broad assessment of overall woodland condition once the survey has been completed.

It is important that this card is used **in conjunction** with Woodland Survey Card II (trees, shrubs & timber). Even if information on the timber resource is not being collected, it is essential that side one of Woodland Survey Card II (other than the 'terrain' and 'access quality' boxes) is completed in conjunction with this card as the information is complementary and a comprehensive picture of the woodland is not gained without it.

One 'Woodland Survey Card I (General)' should be completed for each discrete woodland (division into separate compartments is not necessary for the completion of this card). The information is recorded by ticking the appropriate box in each table and/or providing an estimate of the percentage of the wood falling within a particular category, or in some cases a simple assessment of abundance indicated by '**F**' for frequent and '**O**' for occasional. Space for descriptive comments is provided on side two of the card.

Prior to commencing the survey it can be very useful to view the whole wood from a vantage point. This is particularly valuable in the assessment of **landscape quality, surrounding land-use** and **woodland perimeter**. Alternatively, good quality large scale aerial photographs can provide useful information.

MAPS:

The card should be accompanied by a **two** good quality photocopies of the most up-to-date OS map of the wood at at 1:10,000 or 1:5,000. These should be labelled '**Map A**' and '**Map B**', and ideally each should fit onto one A4 sheet. However, for large woods more than one A4 sheet may be required for each map and these should be numbered sequentially '1 of 3', '2 of 3' etc. Maps should be annotated as directed on the survey card:

Map A should be used to record details of *Surrounding Land-use* and *Habitats within the Wood*.

Map B should be used to record details of *Woodland Perimeter Type/Condition*, *Woodland Management* and *Threats/Damage*.

Additionally each map should be titled 'WOODLAND SURVEY (General) and should include an indication of north and details of the map scale, the woodland name, the surveyors name(s), the date the survey was done and the centroid grid reference. The grid reference should be recorded to 6 figures and should include the reference letters of the 100 km square (eg. NH471563).

HEADER PANEL:

Standard for all survey cards - see specific guidance notes.

Remember one card is completed for the whole woodland during a general 'walkabout' type survey.

WOODLAND PERIMETER:

Make use of vantage point(s) if they exist. Tick one box only.

Wood totally enclosed = any wood totally enclosed by some man-made boundary intended to keep stock and/or deer in or out. Includes woods enclosed in a larger fenced area [eg native woodland enclosed with other non-woodland habitats, native woodland enclosed within a larger managed commercial forestry block].

Wood partially enclosed = any wood where a reasonable area is entirely enclosed within the wood, while leaving other areas unenclosed. This does not include small experimental plots and game rearing/release pens.

Wood unenclosed = any wood where there is no stock and/or deer-proof boundary

PERIMETER TYPE(S)/CONDITION:

Identify each perimeter type and tick the appropriate box(es). For each type assess whether the boundary is **completely effective** in excluding the target herbivore(s) and tick the appropriate box(es). Annotate the map to show all perimeter types and conditions.

SITUATION:

Tick the box(es) which best describe where the wood is situated (eg *Inland/Hillside/Treeline*)

SURROUNDING LAND-USE:

Woods, particularly in the Highlands, are intrinsically dynamic and mobile. Left alone some would probably 'oscillate' around a permanent or semi-permanent core (eg. oakwoods and pinewoods) whilst others would 'migrate across the landscape through ecological time scales' (eg. birchwoods). The edges of these woods or '*ecotones*' where the woodland merges with other surrounding semi-natural habitats are usually areas of high biodiversity and wildlife value. Other things being equal the habitat quality of a native woodland is likely to be higher where the surrounding land-use is semi-natural and the woodland edge can move.

Surrounding Land-use is defined as any land-use immediately adjacent to the woodland perimeter. These categories are based on NCC Phase I Habitat Classification (see Appendix 1 for habitat definitions). **Annotate map A** as accurately as possible using the codes provided on the survey card [this is particularly important when defining the boundaries of wood edge regeneration, where the map may be used to calculate the area of regeneration on the wood edge]. Make use of vantage point(s) if they exist and tick the relevant box(es).

WOODLAND MANAGEMENT:

The current state of the woodland is an expression of its management up to the time of the survey visit. Management tends to occur in 'pulses' of activity and can have both damaging and beneficial effects on native woodland, usually dependant on the levels of disturbance and the overall impact on the woodland ecosystem. 'Modern' management can differ radically in extent and impact from past 'traditional' management and the woodland 'recovery rate' can vary as a result of this.

Current:

Active management since 1988, usually as part of an 'ongoing' process (eg. natural regeneration following enclosure, phased programme of thinning or coppicing).

This will cover most of the management activities falling within the Woodland Grant Scheme (versions I, II and III).

Past-recent:

Management that has taken place between approximately 1974 and 1988, but has not been active since about 1988. Indications of this may include remains of old fences, trees in straight lines and uniform distances apart as a result of planting, overgrown rides and paths.

This will include most of the management activities falling within *Dedication Scheme (Type III), Small Woods Scheme, Forestry Grant Scheme and the Broad-leaved Woodland Grant Scheme.*

Past-neglected: Past management occurring before about 1974, including management during the last century (eg. felling for timber during two World Wars, Victorian 'walkways/paths' and Rhododendron planting). Indicators include cut stumps and log piles, growth form (eg. abandoned coppice), trees in straight lines or other artificial patterns, the presence of exotic species including ornamental trees and shrubs and the remains of fences.

Includes management activities under *Dedication Scheme (Types I & II)*, *Small Woodland Planting Grant* and *Approved Woodland Scheme*.

Tick relevant boxes and **annotate map B** to show area(s) under management as accurately as possible using the codes on the card.

Definitions:

Exclosure: any fenced area with the purpose of protecting trees/shrubs and/or ground vegetation from browsing/grazing by domestic stock and/or wild herbivores. Includes small fenced 'experimental' plots but not pheasant release pens and other small fenced areas for game management.

Planting: trees of any age/size that have been established by planting rather than natural regeneration. Can usually be discerned by spacing and planting pattern.

Thinning: the removal of a proportion of the trees from a stand to increase the growing space for those that remain. It includes both 'selective thinning' (low, intermediate & crown) and systematic thinning.

Other felling: the cutting of trees under any one of the three most common British silvicultural systems, 'clear cutting', 'shelterwood' and 'group regeneration'.

Coppicing/Pollarding: trees/shrubs cut close to the ground (coppice) or above the reach of grazing/browsing animals (pollards) so as to produce shoots from the resulting stools, giving rise to successive crops of poles and sticks cut over a rotation.

Ground preparation: all mechanical disturbance of the ground vegetation and/or soil profile to provide an optimum planting site or to assist natural regeneration. Includes 'Scarification' (patch scarifier, disc trencher, by hand including turf planting), 'Mounding' (excavator, continuous acting moulder, by hand) and 'Ploughing' (deep ploughing, ripping, deep subsoiling).

Drainage: all drains and channels cut to reduce waterlogging, including forestry main drain systems associated with different types of ground preparation and past small scale hand drainage.

- Timber extraction:* any recent or long-standing impact from the removal of timber from the wood. Includes access routes for forwarders/skidlers/cable-cranes and areas for stacking/conversion at roadside, brash mats and areas of eroded vegetation/soils as a result of extraction operations.
- Domestic grazing:* native woods are often used for shelter and grazing for domestic stock. Evidence of domestic grazing can include trampled areas, dunging, wool, a grass dominated herb layer, a sparse or non-existent shrub layer (with few/no seedling trees/shrubs) and seedling trees/shrubs present beneath the field layer vegetation but not 'getting away'.
- Game management:* management of all quarry species within woodland. Includes feeding of deer within wood, deer lawns, small enclosures such as pheasant release pens and feeder sites.
- Glade/ride management:* active management of open space within the woodland where this doesn't relate primarily to access for timber production and game management. Includes management to maintain open habitats and enhance biodiversity.
- Recreation:* all management to actively provide for recreational use including the provision of paths, car parks, interpretative signs, leaflets, ranger service, visitor centre.

THREATS/DAMAGE:

What are the primary threats to the integrity and condition/viability of the woodland and what proportion of the wood if any is damaged as a result of these?

- Threat Importance:* rate on a scale with 1 = most important, 2 = next etc.
- % Damage:* give percentage of whole wood affected by each type of damage to the nearest 5%. **Annotate map B** as accurately as possible using the codes shown on the survey card [roman numerals].

Please note: the roman numerals codes have nothing to do with the assessment of threat importance, they are provided only as an aid to annotating the map.

NATIVENESS:

The nativeness of any wood is determined by a combination of criteria including the species present, the history of regeneration, genetic status of the trees and shrubs, site continuity and level of anthropogenic disturbance.

Any one woodland may comprise more than one category. Tick the appropriate box(es). Text to validate/confirm/qualify any assessment should be included in the 'Notes' section at the end of the card.

The five categories provided on the survey card are those defined in *the "Classification of Highland Woodlands according to Nativeness"* produced by the Forestry Commission's *Advisory Panel on Native Woodlands in the Highlands* [see Appendix 2]

Genuinely Native Woods [Type 1]

Woods of naturally occurring locally native [local genotype] tree/shrub species [usually although not always including the associated field layer vegetation] maintained by natural regeneration.

Includes both *Primary Woodland* with a very long continuity of woodland cover maintained by natural regeneration, [usually since trees first colonised the site following the last de-glaciation], and *Secondary Woodland* which has become established by natural regeneration [either recently or at any time in the past] on an appropriate site type following a period when woodland has been absent.

Near Native Woods [Type 2]:

Woods of locally native [local or regional genotype] trees/shrubs on an appropriate site type, originating from either a past or present planted generation.

Includes woods of native species regenerating naturally from a planted generation;

Partially Native Woods [Type 3a]:

Woods of native tree/shrub species appropriate for the site, originating from either a past or present planted generation but of a genetic origin outside the region.

May include some woods of native species regenerating naturally from a planted generation.

Partially Native Woods [Type 3b]

Woods of native tree/shrub species of the appropriate local or regional genetic origin, originating from planting on an inappropriate site type [eg. Scots pine on oakwood sites, alder on dry ground].

Non-Native [introduced]:

Woods comprising tree/shrub species not native to Scotland or to the Region of Scotland under consideration.

This includes species foreign to the United Kingdom such as Sitka Spruce and naturalised species such as Sycamore and Horse Chestnut, species which are native in parts of the United Kingdom but not in Scotland such as Beech, Field Maple and English Elm and species which may be native to some parts of Scotland but not others such as Purple Willow.

The assessment of nativeness can often be difficult and requires a value judgement by the surveyor based on the current status of the wood as determined in the field and other 'remote' sources of information such as the Ancient Woodland Inventory and the Caledonian Pinewood Inventory [for Scots pine].

ARCHAEOLOGICAL FEATURES:

Tick the relevant box(es), noting whether the feature is within or adjacent to the wood.

Within = more than 75% of the feature within the boundaries of the wood.

Adjacent to = feature within about 200 metres of the woodland perimeter; also features which cross into the woodland but where more than 25% of the feature is outwith the woodland perimeter.

For the purposes of this evaluation the woodland perimeter should encompass any areas of seedling and sapling regeneration at the woodland edge.

Pictures showing examples of features are given in Appendix 3.

HABITATS WITHIN THE WOOD:

Tick the relevant box(es) and estimate the approximate percentage of the whole wood covered by each of these 'internal' habitat types.

The categories are broadly based on the NCC Phase I Habitat Classification (see Appendix 1 for habitat definitions). **Annotate map A** using the codes shown on the card.

DEAD WOOD AND RELATED HABITATS:

The purpose of this tick box is to broadly assess the diversity of niches for plants/insects which depend on or exploit deadwood. Woods may have more than one 'deadwood habitat' but only one abundance category should be ticked for each habitat.

The categories are largely self explanatory: *Over mature trees* often exhibit crown die back and in the more extreme cases appear 'stag headed', they may also include some of the other categories such as *rot holes*, *broken limbs*, *heartrot/canker* and *sap runs*, in which case all categories should be ticked under the appropriate abundance category [*frequent* or *occasional*].

The absence of a tick against any category implies that this habitat is not present within the wood.

WOODLAND LAYERS:

Tick relevant box(es). For each layer select **only one** category for *Cover* and **one** for *Species Diversity*.

Moss layer: should include mosses, liverworts and lichens growing on the ground.

Grass/herb layer: should include all grasses, sedges, rushes, herbs and soft shrubs such as bramble and honeysuckle. Also tree/shrub seedlings and dwarf shrubs such as heather, blaeberry, cowberry, crowberry and bog myrtle.

Woody shrub layer: should include all tall shrubs whether classified as trees [for timber purposes] or not - ie hazel, but not dwarf shrubs. Also stands of saplings and young planting which are below the main canopy level.

Canopy layer: this is the layer formed by the crowns of the dominant and usually tallest trees in the wood.

Cover: means overall cover for the whole wood; a variable cover which is dense in parts and open in others should be rated as Medium.

As a rough guide:

- Dense* = approx 75-100% overall cover
- Medium* = approx 50-74% overall cover
- Open* = approx 25-49% overall cover
- Bare* = 0 to 24% overall cover

Species Diversity: How many species are there in each woodland layer? Despite a few dominant uniform elements, is there still good variety? The number of species that constitute diversity will vary according to the layer, with the grass/herb layer generally containing the greatest number. Species richness will also vary in relation to the woodland type and in relation to individual site characteristics such as aspect, altitude and soil type.

NVC WOODLAND COMMUNITY TYPES AND % OF WOODLAND:

This refers to the **woodland** communities identified in the National Vegetation Classification [NVC] as occurring in Scotland [see Appendix 4, the Tayside Native Woods NVC cards] It does **not** include NVC communities for other non-woodland habitats within the overall boundaries of the wood.

Record the NVC community by code (W11) and type (Grassy Birch/Oak) and the percentage of the wood it covers. The total of NVC types should equal 100%. There may be intergrades between distinct communities, these should be recorded in the form.... 'W17/W18 intergrade'

In some cases the flora may not be consistent with what is expected because it has been greatly affected by management and is no longer easy to recognise as a woodland flora. In this case make a reference in the 'Notes' box and annotate the map accordingly.

FERNS & LOWER PLANTS:

This is a broad assessment of the abundance of all ferns (excluding bracken), mosses and liverworts and lichens growing on the full range of substrates.

For each of these record as **frequent (F)** or **occasional (O)** in each location. The absence of an entry means an absence of the species group in the listed location(s).

Brief definitions of *powdery*, *crustose*, *leafy* and *shrubby lichens* are given in Appendix

WOODLAND LIFE STAGE:

The purpose of this assessment is to give a broad indication of the overall age structure of the wood.

Mark only one relevant 'abundance' box for each of the *Life Stages*. For suckers, seedlings and saplings consider all species together and estimate what percentage of the total number are browsed/grazed.

Suckers:

Includes both suckering and layering.

Suckers = regeneration from the root system underground [produced by species such as elm, bird cherry, aspen, English elm].

Layering = regeneration from branches dropping down and re-rooting [produced by willow species].

Seedlings:

Usually young trees and shrubs less than 50 cm tall but also includes older trees kept below this height by browsing/grazing. In many upland woods seedlings are below or just at the field layer height and they represent the immediate 'regeneration potential' of the wood. To achieve this potential may require a change in management.

Saplings:

Trees and shrubs greater than 50 cm tall, less than 7 cm dbh [diameter at 1.3 m above ground level] and less than about 4 - 5 metres tall. These represent 'actual regeneration' that is getting away.

Young Trees:

Trees more than 7 cm dbh and generally taller than 4 - 5 metres. Usually found in the shrub layer or lower canopy but may form patches in which they are the canopy. Includes most mature shrubs.

Mature Trees:

Usually those which make the major contribution to the woodland canopy. Usually although not always, taller than 5 metres and greater than about 20 cm dbh.

Over-mature Trees:

Often the largest trees in a wood in terms of overall 'biomass' but not always the tallest. Generally 'past their best' and beginning to show a decline in vigour such as the crown beginning to die back and dead branches. Very difficult to give hard and fast size categories but usually more than about 75 cm dbh for larger trees such as oak and about 50 cm for birch and Scots pine.

LANDSCAPE QUALITY:

This is an assessment of the broad landscape value of the wood in the context of the surrounding landscape. Tick the relevant boxes. Only one 'scoring' box should be ticked for each woodland attribute.

Woodland Shape:

This applies to both the shape of the whole wood and any obvious internal compartments. Does the wood have a geometric shape with straight edges or are the shapes irregular and organic?

Other habitats within the Wood:

Is the wood uniform or are there a diverse range of other habitats within the wood (running/standing water, mire, rock outcrop)? Information already recorded under 'Habitats Within the Wood' can be used to complete this assessment.

Size/age structure:

This relates to the variation in the size/shape of stands of trees which effect the texture and density of the overall woodland at a landscape scale. Information already recorded under the assessment of 'Woodland Life Stage' can be used to assist this assessment.

Woodland Topography:

Hillside woodlands generally have a greater impact on the landscape as their overall shape and scale can be more obvious. The steeper the slope the more obvious the overall shape of the wood becomes.

Distance from key access routes:

How visible is the wood from key access routes outside the wood [public roads, railway, public footpath)?

Shapes follow Land Form:

Is the overall shape of the wood in sympathy with the shape of the land? For example, on the upper edge of the wood does the woodland boundary follow up burns and valleys and skirt below shoulders and bluffs or does it run against the contours?

Other Discrete Woods:

Woodlands are discrete when greater than 500 m separation exists. Is the wood being assessed within a generally wooded landscape or does it exist in isolation?

OVERALL WOODLAND CONDITION:

This is a general assessment of the overall ecological condition of the woodland to include age/size structure and vigour/health of the tree/shrub component, ground vegetation, natural regeneration; dead wood habitats and more generally representativeness and diversity [it does not include the condition or value of the standing timber]. It is primarily based on a synthesis of the information already recorded on this card. However, if there is additional information relevant to this assessment that has not been recorded it can also be used.

Optimal-maintained: a wood can be recorded under this category when its condition/abundance in relation to the factors mentioned above is optimal ,or at least within what are considered to be the limits of acceptable change.

Optimal-recovered : a wood can be recorded as recovered if it has regained optimal condition following a sub-optimal period.

Sub-optimal-recovering: a wood can be recorded as recovering [after a damaging activity] if it has begun to show, or is continuing to show, a trend towards the condition defined by the limits of acceptable change.

Sub-optimal-no change: the condition of a wood may be retained in a more or less steady state by repeated or continuing damage [or lack of positive management]. It is sub-optimal but neither declining nor recovering.

Sub-optimal-declining: this category is used where there is evidence for a continuing decline in the condition of a wood. This may be a consequence of a damaging activity. Recovery is possible either spontaneously if the damaging activity ceases or if a suitable management regime is implemented.

Partially destroyed: this category is used where there has been destruction of sections or areas of a wood with no hope of recovery because the supporting site fabric has been lost. If the fabric is still present a sub-optimal category should be used.

CALEDONIAN PARTNERSHIP - LIFE'94
WOODLAND SURVEY CARD II (TREES, SHRUBS & TIMBER)
GUIDANCE NOTES (Level 2)

INTRODUCTION:

This is the second of the Woodland Survey Cards designed for recording information at **level 2** from a basic 'walkabout' type survey. It is important that this card is used in **conjunction** with Woodland Survey Card I (General Information). Even if information on the timber resource is not being collected, side one of the card (other than the 'terrain' and 'access quality' boxes) must be completed as this information is complementary to that recorded on Woodland Survey Card I (General). **One card should be completed for each compartment.**

MAPS:

The card(s) should be accompanied by a good quality photocopy of the most up-to-date OS map of the wood at 1:10,000 or 1:5,000 scale with the grid lines shown and numbered and north indicated.

This should be labelled '**Map C**' and should ideally fit onto one A4 sheet. However, for large woods more than one A4 sheet may be required or alternatively A3 sheets can also be used but these can be unwieldy in the field. In some cases it may be sensible to have a separate map for each compartment. If this is the case a smaller scale 'key map' showing the position of the compartments in relation to each other will be required.

The map(s) should be annotated as directed on the survey card to include the *compartment boundaries* and details of 'Access', 'Native Trees & Shrubs' and 'Exotic Trees, Shrubs & Herbs'. Compartments should be numbered sequentially '1 of 3', '2 of 3' etc.

Each map should be titled 'WOODLAND SURVEY [trees, shrubs & (timber)] and should include details of the map scale, the woodland name and centroid grid reference, the date the survey was done and the surveyors name(s).

HEADER PANEL:

Standard for all survey cards - see specific guidance notes.

Remember the header panel relates to the whole woodland. The remainder of this card describes just one compartment of the wood. One card should be completed for each compartment.

COMPARTMENTS:

The wood should be compartmentalised in the simplest way possible that is meaningful in terms of the timber resource.

The selection should be based on **dominant tree species** which can be determined before the field survey commences, either from aerial photographs or from a vantage point giving a full view of the site, or using both methods. In some cases where woods are on flat terrain and aerial photographs are not available an initial reconnoitre of the wood may be required to define the compartments.

The dominant tree species is usually the one of greatest biomass covering the greatest area [or present in the greatest number]. When viewed from a vantage point or on aerial photographs dominance is defined by **canopy cover**.

A secondary criterion for the selection of compartments is **stocking density**. For example birch may be the dominant tree over an 18 ha area of a larger wood. Within this area however 10 ha. may be mature trees at low stocking and 8 ha. young trees at dense stocking. Under these circumstances it would be sensible to treat the 18 ha. area as two separate sub-compartments.

In some circumstances where there is an intimate mixture of 'timber trees' this may have to be treated as a single compartment but even in mixtures it should be possible to determine the dominant species in most cases and to define the compartment boundaries on this basis.

The minimum compartment size is determined by the overall size of the woodland as follows:

wood < 2 ha.	min. compt. size 0.25 ha.
wood 2-20 ha.	min. compt. size 0.5 ha.
wood > 20 ha.	min. compt size 1.0 ha.

However, small scattered patches of very different woodland can occur within compartments determined on the basis of dominant species. An example might be ash/wych elm woodland following flush lines in a valley side oakwood. In these circumstances the area(s) and location(s) of these patches or 'components' should be marked as accurately as possible on the map(s) and, if the total area reaches one of the thresholds identified above they can be assessed together as timber trees if access, terrain and timber quality make this a feasible proposition. Small patches/areas which may not be part of the timber resource, such as natural regeneration, shrubs and open areas can be included in any compartment where this makes sense in terms of the compartment boundaries.

COMPARTMENT NUMBER:

Compartments should be numbered sequentially 1, 2, 3 etc and the compartment number should be recorded on the card as one of the total number eg. 1 of 3. All compartment numbers should also be recorded on the map(s).

COMPARTMENT AREA:

This is the actual area of the compartment after field survey measured from the final map from a scaled grid overlay or with the use of a planimeter.

BRIEF DESCRIPTION:

This is a general description of the tree/shrub component for each compartment and any other notable features eg. *"Dominated by low density large straight oak with a patchy understorey of hazel and occasional holly, occasional scattered large Douglas fir and mature, wide crowned Scots pine"*. This **'pen picture'** is of particular importance in providing the **background context** against which the more detailed information in the boxes can be assessed.

TERRAIN:

This relates to the use of forest machinery *within* the compartment which will depend on various factors relating to the terrain:

GROUND CONDITIONS:

This is the *bearing capacity* of the soil, determined by soil type and moisture regime.

GROUND ROUGHNESS:

This relates to the presence of obstacles which may obstruct the movement of machinery across the land surface.

SLOPE:

This can be classified in terms of the gradient and topographic form of the slope and can be assessed from the contours on the OS map or measured in the field using a clinometer.

For full details see Forestry Commission Technical Note 16/95 in Appendix).

Tick the appropriate boxes and give the overall Terrain Class Eg. 2.3.2 which indicates *good ground conditions, uneven ground* and *gentle slope*.

ACCESS:

Access, both to the wood and within the wood, is of primary importance where timber production is an objective. Access quality determines the types of vehicles that can reach the wood and, once there, operate within it. A good internal access network reduces damage to the soil and ground vegetation by encouraging vehicles to re-use the same routes.

DISTANCE TO LORRY LOADING POINT:

This is the distance from any edge of the woodland to the nearest lorry loading point. A 'Lorry Loading point' is defined as a hard standing capable of supporting a fully loaded timber lorry of c.38 tonnes and large enough for an articulated lorry to turn, connected by a suitable hard access route to the public highway.

ACCESS TYPE:

This defines the type of access route that exists from the Lorry Loading Point to the wood, from the nearest main access point at the edge of the wood to the compartment and within the compartment. For each of these tick the box which describes the highest quality access type for each situation.

The compartment map should be annotated to show the Lorry Loading Point(s) and the main access type(s).

NATIVE TREES & SHRUBS:

Within each compartment or sub compartment the abundance of each native tree and shrub should be recorded. The location and extent of the dominant species and 'any other significant species' within the compartment should be **marked on Map C**. Any other significant species' may include small patches of different woodland types [eg. an aspen grove or patch of montane willow] or individual trees and shrubs of interest [eg. large granny pines or old yew trees].

Use the **DAFOR** scale to estimate the abundance of each species of native tree and shrub.

D = Dominant

A = Abundant

F.= Frequent

O = Occasional

R = Rare

Only one abundance class should be recorded for each species.

EXOTIC TREES, SHRUBS, HERBS:

Within native woodlands exotic trees, shrubs and herbs are likely to effect both the ecology and management of the site. They can represent both a threat [eg. Rhododendron] or an opportunity [eg. scattered large Douglas fir at an oakwood site where removal would improve the quality of the native woodland whilst realising some cash for the timber].

The abundance of each species should be recorded using the **DAFOR** scale in the same way as for 'Native Trees & Shrubs' and the location and extent of each should be **marked on Map C**.

GROUND VEGETATION TYPE:

Estimate the percentage of the compartment covered by each of the vegetation types. The purpose of this assessment is to give a broad indication of the *Timber Production Potential* of the ground using very broad vegetation types as a surrogate for soils and drainage, without the necessity of actually examining the soils. It is **not intended** to be a description or classification of the field layer vegetation.

CANOPY:

Canopy is defined as the layer formed by the crowns of the dominant tree species within the compartment. This can be more or less continuous [closed canopy] or discontinuous and fragmented.

CANOPY HEIGHT RANGE:

Give the maximum and minimum height of the canopy in the compartment in metres and what you feel is the average for the compartment.

Understorey refers to the shrub layer but also includes younger/shorter sub-canopy trees and includes areas outside the main canopy. Again the layer formed by the crowns of the understorey can be continuous or discontinuous.

UNDERSTOREY HEIGHT RANGE:

Give the maximum and minimum height range of the understorey in the compartment in metres and the average for the compartment.

CANOPY COVER RANGE/UNDERSTOREY COVER RANGE:

Estimate the maximum, minimum and average cover of both the canopy and the understorey expressed as a percentage of the whole compartment.

NOTES:

Use this box to expand details of 'NATIVE TREES & SHRUBS', 'EXOTIC TREES, SHRUBS, HERBS' and 'CANOPY'. For example it may be useful to indicate what percentage of the compartment is covered by different Peterken Stand Types [see Appendix]

ASSESSMENT OF TIMBER TREES: [second side of the card]

In the context of this assessment 'timber' should be interpreted widely as all utilisable wood, including firewood and charcoal

The three identical "Species" boxes combine an assessment of broad classes for **stocking [stems/ha.]** and size [**diameter at breast height (1.3 m.) - dbh**] with the **form** determined by the number of stems/tree and the straightness of the stems.

This is intended as a 'quick and dirty' estimate of the timber resource without the need for detailed measurements and plot sampling although some basic measurements will be needed at the outset to 'pitch the eye'.

As compartments are chosen on the basis of dominant species it is unlikely that more than three boxes will be required for any one compartment in most cases except where intimate mixtures occur. Where more than three 'timber tree' species occur within one compartment, additional 'Assessment of Timber trees' sheets can be completed for the same compartment but it is **essential** that the woodland name, the NGR, the compartment number and size, the date of survey and the surveyors name are entered in the 'Notes' box at the end of the form.

Marked variations in the stocking and size of any one species of tree may occur in what would otherwise seem to be a reasonable compartment. For example a mixed oak/birch wood may have a well geographically defined birch component where 85% of the area of birch comprises large mature trees at low stocking and 15% small regenerating saplings at high stocking. Whether this smaller area is treated as a separate compartment depends on the size of the wood as outlined under 'selection of compartments' above.

The instructions for assessing *form* are given at the top right hand corner of the second side of the survey card. The assessment of *Diameter at Breast Height [dbh]* and *Average Stocking* is done **by estimation by eye** but some 'calibration' is required at the outset. This can be done by measuring *dbh* for a range of tree sizes to 'get your eye in'. As the *dbh* classes on the card are quite wide exact accuracy is not required although it is important to have a fairly accurate impression of the *dbh* threshold sizes of 7, 15, 25 and 40 centimetres. **In all cases dbh is assessed at 1.3 metres height up the bole on the uphill side of the tree.**

The assessment of *Average Stocking* can be calibrated by counting the trees within one or more quickly marked plots of known area [eg 10mx10m is equal to 1/100 ha] . The number and size of plots will be determined by the variation in stocking but actual measurement should be kept to the minimum necessary to 'pitch the eye'. Alternatively the average distance between trees can be used to assess stocking. Approximate conversions are given below:

<50 trees/ha	=	> 15 metre spacing
> 50 < 100 trees/ha	=	10 - 15 metre spacing
> 100 < 200 trees/ha	=	4.5 - 10 metre spacing
> 200 < 500 trees/ha	=	4.5 - 7 metre spacing
> 500 < 1000 trees/ha	=	3 - 4.5 metre spacing
> 1000 < 2500 trees/ha	=	2 - 3 metre spacing
> 2500 trees/ha	=	< 2 metre spacing

If distances are used then some calibration of estimates by a limited set of measurements to 'pitch the eye' will also be required.

A separate box is completed for each species of tree capable of producing utilisable timber now, or with potential to produce it in the future. This can include the assessment of exotics such as Douglas fir, sycamore, beech etc.

An example of a completed box for Silver Birch is shown below. This indicates that:

*There is low stocking [**<50 stems/ha**] of largish trees [**>40cm dbh**] over 98% of the compartment, of which between 50 and 75% are single stemmed and 50 to 75% of stems are straight, and that there is a high stocking density [**>1000 < 2500 stems/ha**] of small 'saplings' [**< 7 cm dbh**] which are predominantly single stemmed and straight, covering 4% of the compartment.*

SPECIES:	Silver Birch					
Average stocking	Diam at breast height (cm)					
(stems/ha)	<7	7><15	15><25	25><40	>40	
<50					B11	F
>50<100						O
>100<200						R
>500<1000						M
>1000<2500						
>2500	A1					
If more than one stocking/diameter class present in compartment give approx % area for each below and annotate map						
A1 = 4% ; B11 = 98%						

In this example, the figures of 98% cover for mature Silver Birch and 4% for sapling trees indicate that there is an overlap of young regenerating trees into the sparsely stocked area of mature trees and that this is too small to be considered as a separate compartment. As the overall compartment size is recorded the area covered by these trees can be determined. However, in this case, it should be noted that the total area covered by both components of this compartment will be greater than the area of the compartment because of the overlap.

It should also be noted that the assessment of the straightness of stems is independent of the proportion of trees that are single stemmed. It is an assessment of the total resource for each stocking/dbh class for each species.

If more than one stocking/dbh combination is present in a compartment record the approximate percentage of the compartment covered by each and **annotate the map** as accurately as possible [showing areas of overlap where they occur].

The "Species" boxes on the form are not suitable for recording details of coppice shrubs such as hazel and, where these are considered to be a significant timber species, details should be provided in the notes boxes and the map annotated accordingly. Critical information would include: *the area of the resource*
number of stools/ha,
number of stems/stool less than 5 cm diameter
number of stems/stool greater than 5 cm and less than 7 cm
number of stems/stool greater than 7 cm
diameter straightness of stems.

ADDITIONAL NOTES:

Use this space to clarify points about the assessment of timber trees, also further details of exotic species including management potential and threat.

APPENDIX 3

ARCHAEOLOGICAL FEATURES

Examples of “Upstanding Remains”