	CWA Info Note 7:
Community Woodlands Association	Woodland Survey

This information note is one of a series produced by the Community Woodlands Association. It gives a brief introduction to the processes of woodland surveying, identifies various online resources and signposts to sources of more detailed information, including other CWA information notes or publications by other bodies. The principles of woodland management and survey are relevant everywhere, but many references to grants and data sources are applicable to Scotland only.

Introduction

To manage a woodland effectively you have to know what it contains, both in terms of the trees themselves and all the other features, habitats and species that are present, and how it is changing over time.

An accurate and reasonably comprehensive description of the woodland types, other habitats and underlying environmental factors such as soils and drainage is the foundation of an effective woodland management plan and will inform species choice for new planting or restocking after felling. If you are planning a significant development project, it is important to know and be able to demonstrate that this will not adversely affect important features or rare species or habitats.

CWA info notes 5 and 6 provide a more detailed guide to writing Woodland Management Plans and Long Term Forest Plans.

Some survey work must be carried out by external specialists or contractors, but much can be done by volunteers; indeed it can be an effective way of involving those who aren't interested in or able to do the more usual manual tasks around a community woodland: path-building, tree-planting, etc.

Mapping and GIS

Accurate and detailed maps are a necessary and critical part of presenting your survey data. Meeting the mapping criteria set by Scottish Forestry for forest plans and grant applications requires digital mapping skills, and you will need to buy an up to date Ordnance Survey basemap.

Many large forest owners and managers use Geographic Information Systems (GIS), which store different categories of information (vegetation, soils, public access) in a spreadsheet or database, to be displayed in different layers overlaying various base maps. Such systems are very powerful but learning to use them takes time and money. Software can be expensive, although there are excellent open source programmes (e.g. QGIS) available.

Most modern mobile phones can now be used with Geographic Positioning Systems (GPS), so you can see where you are on a map on the screen and save routes and waypoints to download later into your mapping programme, where you can also make your own maps that can be loaded into an app on your phone. GPS watches can also be helpful for recording your tracks through the forest.

myForest

myForest is a free online tool for mapping and writing forest plans developed by the Sylva Foundation. It is compatible with Scottish Forestry requirements for forest plans and felling licences and is a great resource for developing your forest management plan and mapping skills without needing to acquire specific mapping software. Greater mapping functionality is available with a myForest premium subscription.

Why survey?

Gathering data takes time, both in the field and in the office afterwards, so you should be clear about why you are collecting information and what you will do with it. Your motivations for collecting survey data will go a long way to determine the detail into which you should go. Generally, the higher the value of a feature the more detailed your survey should be.

If you are writing a management plan the Scottish Forestry templates require certain

information, such as forest type, species, age, growth rates (yield class), wind-throw risk and area of each sub-compartment. The scoping phase provides an opportunity for statutory agencies and local voluntary organisations (e.g. archaeology, entomology, ornithology groups) to indicate where you might need to carry out specialist surveys or where you have features of interest that will benefit from special management.

Desktop survey

The first step in any survey project is usually to gather as much existing map-based information as possible from online and other sources. If you have recently acquired the wood, the previous owners may have information that they are willing to share, perhaps in digital form as maps and spreadsheets.

A great deal of information can be found online:

- Aerial imagery is invaluable for identifying habitat and species boundaries and is available from Google, Bing, and Marine Scotland (despite the name, the National Marine Plan Interactive has a wide range of datasets and covers all of terrestrial Scotland).
- The Scottish Forestry Map Viewer includes data from the Native Woodland Survey of Scotland and the Caledonian Pinewood inventory as well as information on previous grants and climatic site suitability for a range of species and native woodland types. The associated SF Open Data Download site allows you to view, query and download a wide variety of geospatial data that can be used in a Geographic Information System.
- The Land Information Search is a map-based tool that allows you to check for a range of environmental features and designations such as Scheduled Monuments, Sites of Special Scientific Interest and Native Woodland that may fall within your area of interest and within a 500m buffer zone.
- SiteLink provides access to data and information on Protected Areas. You can view site boundaries, designated features and download supporting documents.
- Canmore is a map-based catalogue of Scotland's archaeology, buildings, industrial and maritime heritage.

- Detailed topographic information collected by LiDAR is available for many areas of Scotland.
- Finally, your woodland may have been mapped by the local orienteering club. O-maps focus on the "runnability" of terrain rather than identifying different species, but are usually fairly accurate in their depiction of paths, fences and topographic features.

The objective of this desktop analysis is to facilitate identification of different woodland types and other habitats which, along with roads, rides and other features will help you divide the forest into management units (compartments and sub-compartments) and focus survey efforts on key areas or topics.

Field Survey

Key topics for woodland survey typically include the trees themselves, soils, vegetation and habitats, wildlife and archaeology and the historic environment.

Trees

In addition to identifying the species growing in your woods, it is essential to know the age of stands as well as the stocking density and size (height, diameter) of the trees. This process - forest inventory - helps understand the dynamic nature of the woodland and quantify not only the standing volume but also the annual sustainable harvest.

CWA info note 8 provides a more detailed guide to the process of tree measurement and Forest Inventory.

Soils

Soil has a huge influence on the growth of trees (and other flora) but is often overlooked. Classification of soils for forestry is concerned with both the physical factors (depth of soil, soil water regime, aeration, presence of compacted layers, etc) that influence root development and thus tree stability and with the chemical properties which affect nutrient availability.

One approach is to dig a soil pit in each of the main woodland stand types or open ground habitats (e.g. grass, heather, bracken, rushes) that you have identified, to observe soil quality and characteristics such as rooting depth. The

Forestry Commission field guide [The Identification of Soils for Forest Management](#) is aimed at those with little or no previous experience of soil classification.

Soil pit

Natural vegetation can serve as a proxy for soil types across the rest of the site. Indicator species, such as dog's mercury, can indicate localised variation to the general site qualities; in this case calcium enrichment.

Vegetation and habitats
Woodlands are home to a wide range of ground flora; even dense conifer plantations usually incorporate glades and rides which can be very valuable habitats. Habitat surveys are often described as "Phase 1" or "Phase 2".

A Phase 1 habitat survey is a rapid walkover survey designed to provide a basic habitat map. It is best conducted between April and October when deciduous and annual plant species are identifiable and will assess and classify boundary features as well as large habitat areas. The main output is a colourful map with target notes to provide further information on any points of interest and habitats too small to map. The [JNCC handbook](#) is a very useful reference.

A Phase 2 survey provides a more detailed assessment and classification by National Vegetation Classification (NVC) type and is only likely to be required if you have particularly valuable habitats or species present, or you are proposing major changes, such as afforestation, of semi-natural habitats.

Species
Whilst some evidence of wildlife will be present at any time (e.g. badger setts, raptor nests), in most cases the species list for a woodland will have to be built up over time, with some species only present in specific seasons.

Deer are an important consideration for woodland managers as they can damage both young and mature trees. Woodland deer are rarely counted directly, instead populations are estimated from dung counts or from the extent of browsing damage.

Open ground
If you are surveying open ground e.g. for planting and have very little data available from your desktop analysis it is best to conduct the survey using a grid-based system with grid lines spaced according to the accuracy you need and the time/cost budget available. When walking the grid lines, in addition to sampling at fixed points, e.g. every 100m, make a note of the transition between habitat types, e.g. from marsh to dry grassland or from wet heath to dry heath. You should also note the location of drainage lines, or rocky outcrops and other significant features that might affect your management decisions, e.g. possible archaeological features.

Archaeology and the historic environment
Scottish Forestry estimate that over 25,000 archaeological features lie in or around Scotland's woodlands, and many forests were previously planted on top of such features in a way that would not be permitted today. Identification of features is critical to ensure they are protected during operations or during development. Remember: historic features do not have to be ancient to be valuable! FCS's guide to [Identifying the historic environment in Scotland's forests and woodlands](#) is very helpful for non-specialists.

CWA info note 22 provides a more detailed guide to managing woodlands and the historic environment.

Ongoing survey work
Whilst management plans, grant applications and development projects provide an impetus for one-off surveys, there is also a need for ongoing assessment and monitoring of management, e.g. for natural regeneration or species of interest.

Transects

Transects, routes that are walked repeatedly on a regular cycle, are a well-established method to assess variation over time. Transect lines do not need to be straight: they can follow a watercourse, rides or tracks, the important thing is that the same route is taken every time.

Transect surveys are ideal for volunteers, especially for breeding birds (dawn walks recording territorial songs) and butterflies (mid-day on good weather days). Survey results may be of interest to other organisations and it is worth checking with them to fine-tune the survey methodology, detailed examples of which are available from e.g. The British Trust for Ornithology and the UK Butterfly Monitoring Scheme.

Permanent Sample Plots

An alternative method of recording change over time and for assessing the impact of management is to establish permanent sample plots. If using circular sample plots, the plot centres can be marked with a fence post: make sure this cannot easily be moved and is marked to help you relocate it. The principal trees within your sample plot may also be marked with paint bands or numbers so you can assess growth rates and change over time.

If monitoring natural regeneration or changes in the ground flora, sample plots can be combined with photographic monitoring, with a photo taken annually on each cardinal direction (N,S,E,W). FC's information note may be helpful.

Tree health

Recent years have seen a number of high profile pests and diseases threatening out woodlands, and citizen science has become a key part of the response. This is also an opportunity to increase local involvement and engagement: the Observatree project has a wide range of information and training resources.

Resources

Community Woodlands Association (advice and support for community woodlands)
http://www.communitywoods.org
Making Local Woods Work (advice, tools and resources for woodland social enterprises)
https://makinglocalwoodswork.org

QGIS (free open source GIS programme) https://www.qgis.org/en/site/
MyForest https://myforest.sylva.org.uk/

SF Map Viewer https://forestry.gov.scot/support-regulations/scottish-forestry-map-viewer
SF Land Information Search https://forestry.gov.scot/support-regulations/land-information-search
NatureScot Sitelink https://sitelink.nature.scot/home
Soil Survey of Scotland https://maps.nls.uk/series/soils/info.html
Canmore: National Record of the Historic Environment https://canmore.org.uk/
LiDAR https://remotesensingdata.gov.scot/data#/list
National Biodiversity Network https://scotland.nbnatlas.org/
Observatree https://www.observatree.org.uk/about/