Woodland Conservation Condition Survey Handbook

A method for assessing the nature conservation condition on non-statutory woodlands

Version 1.0

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1 Introduction

At the European scale, increasing attention is being given to contributing to Favourable Conservation Status and High Nature Value Forestry by assessing the whole woodland resource, rather than solely woodlands in statutory sites (i.e. the SSSI series in England and Wales). In 2011 a high level of detail on the extent, condition and trends of woodland types was available for the SSSI series. This resulted from Common Standards Monitoring (Kirby et al., 2002; Joint Nature Conservation Committee, 2004), but only covered c.15-20% of the total woodland resource in England and Wales.

Outside of the SSSI series there was very little information on the condition of woodland. Most of the information came from the National Inventory of Woodland and Trees (NIWT) and its replacement the National Forest Inventory (NFI) (Forestry Commission, 2003; Whitton & Bull, 2006; Forestry Commission, 2010). Other information came from the Countryside Survey 2007 (Carey et al., 2008). These surveys provided complete data on woodland extent in England and Wales, but condition data were collected using a sample survey of plots within woodland, providing results that could not be readily applied to woodlands as a whole.

The lack of information outside of the SSSI series was recognised as an important limiting factor on the ability to meet Conservation Status reporting requirements under the Habitats Directive. It also limited the ability to report against Biodiversity Action Plan targets for woodland outside of the SSSI series.

To ensure that these two reporting requirements were met it was necessary to develop a means of capturing evidence on the extent, condition and trends of non-statutory woodland. This needed to cover all BAP broad habitat, BAP priority habitat and Annex 1 woodland types. It also needed to be site, rather than plot based, to ensure complete data on woodland condition was collected. These data would permit more consistent and reliable reporting on woodland biodiversity strategies, provide context for SSSI condition data and contribute to Conservation Status reporting. It would also help to guide priorities for funding woodland management under agri-environment schemes, such as Environmental Stewardship’s Higher Level Scheme, the English Woodland Grant Scheme, Tir Gofal and Tir Cynnal.

exeGesIS SDM Ltd. were contracted to develop a suitable method for assessing the condition of non-statutory woodlands in England and Wales (Lush et al., 2012), one of the outcomes of which is this manual. The method has been designed to be rapid and readily used by surveyors without extensive ecological training. The long-term objective of the survey is to gain an insight into and monitor woodland condition in non-statutory sites, which will also provide an indication of the effectiveness of agri-environment and Forestry Commission management schemes.

2 Survey preparations

2.1 Landowner permission

If you do not own or manage the woodland to be surveyed it is important that you have clear permission to survey it. The landowner must also have consented to the survey data being incorporated into the survey database or any other database. They must be fully informed of the future use of and access to the data collected.
In addition, landowners must also have consented to their personal data being incorporated into the survey database and any other databases if appropriate. If this permission has not been sought and gained then only the survey data should be included in the database.

2.2 Route planning

A route should be planned through the woodland such that it passes through the main woodland variation. Where the woodland is not already known this can be best achieved by planning the route so that it passes through every part of the woodland. In order to do this it is useful to have a map of the woodland and draw the route on it (see Section 3.5). The route is used to ensure that a full appreciation of the woodland is gained during the survey, to help record information about the whole woodland.

The route should NOT stick to existing paths within the woodland. Moreover, as far as possible, the route should avoid existing paths. Paths and rides tend to locally influence the structure of the woodland, so if all the surveying is done from existing paths it will not paint a true picture of the woodland as a whole.

It is advisable to think carefully about the route through the woodland. In particular, the following should be considered:

- Avoid steep slopes, quarry faces, hidden shafts, etc. that would present a danger and would necessitate a major change to the route whilst undertaking the survey (see Appendix B).
- Avoid planning the route up and down slopes, following the contours instead. This will avoid tiring the surveyor out too much!
- Plan the route to start and finish at access points. This may not be possible in long thin woodlands, but in more regularly shaped woodlands it should be possible to plan the route to start and finish near to the point of entry.

Between five and fifteen ‘stops’ should be evenly placed along the route through the woodland. These are where more detailed recording will take place. The number of stops should increase with:

- The size of the woodland – a ten hectare woodland would require twice as many stops as a five hectare woodland in order to ensure the same sampling intensity.
- The variation within the woodland – a small woodland with lots of different woodland habitats would require more stops than a large woodland that was uniform throughout.

The important thing when determining the number of stops to use is to ensure that the variation in the woodland will be recorded by the survey. As a general guide, ten stops in a moderately varied thirty hectare woodland is considered adequate.

NB: To a large extent varying the sampling intensity is unavoidable. Following the ten stops in thirty hectares guidance then only one stop would be needed in a three hectare woodland for equivalent sampling intensity. However, this would be considered insufficient, as it would fall below the minimum number of stops allowed. Equally, to attain an equivalent sampling intensity in a sixty hectare woodland twenty stops would be needed, but this is more than can be achieved within a single day, making the survey arduous and time-consuming. As a result smaller sites are almost always going to be more intensively sampled than larger sites.

Examples of woodland boundaries, routes and stops are shown in Figure 2.1, Figure 2.2 and Figure 2.3.
Detours to the route are encouraged as long as the stops occur in roughly the right place. Small areas at the edges of the woodland are often excluded from the route, due to the difficulty of planning a sensible route through the woodland, so these areas should be investigated if they show significant differences from the main part of the woodland. Other areas that are different from the main part of the woodland or features of particular interest should also be investigated, as this will ensure a better knowledge of the woodland.

Figure 2.1 – Example of a survey route that aims to visit every major part of the woodland. The route has also been planned to start and finish at the road and follow the contours, as far as possible, to reduce the amount of walking and climbing that the surveyor has to do. © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 2011. [© Hawlfraint y Goron. Cedwir pob hawl. Cyngor Cefn Gwlad Cymru, 100018813 2011.]
Figure 2.2 - Example of a survey route that aims to visit every major part of an irregularly shaped woodland. Stopping and finishing at the road is not possible and the slope is not significant enough to worry about avoiding climbs. © Crown Copyright and database right 2008. All rights reserved. Ordnance Survey Licence number 100022021.

Figure 2.3 - Example of a survey route that aims to visit every major part of a linear woodland. The only possible way to plan the route through the woodland is straight up through, which inevitably means the surveyor must then walk back to the starting point. © Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 2011. [© Hawlfraint y Goron. Cedwir pob hawl. Cyngor Cefn Gwlad Cymru, 100018813 2011.]
2.3 Use of aerial photography and satellite imagery

It is by no means necessary to have access to aerial photography or satellite imagery to undertake the survey. However, if such imagery is available it can be useful for the following:

- Determining woodland habitat type and management stand boundaries, which will in turn assist with planning a route that passes through all the variability present in the woodland.
- Measuring and mapping open areas and any woodland destruction, which can help with completing the survey form and act as a baseline against which future change can be measured.
- Identifying features of interest that should be sought during the survey.
- Mapping habitat type and management stand boundaries. Whilst it is usually not possible to determine the exact habitat type from aerial photographs alone, aerial imagery can be used following the survey to identify boundaries observed during the survey.

Organisations using this survey methodology may have access to high resolution aerial photography, along with dedicated GIS software, and may wish to keep records of the points listed above. However, most surveyors will not have access to commercial aerial photography. Nevertheless, there are now a number of online sources of aerial photography that, whilst often not the same quality as those available commercially, could be beneficial when planning the survey.

2.4 Equipment list

This survey has been designed to require no specialist survey equipment. However, there are some items that should be considered essential for practical or health and safety purposes. Other items are optional, as they are not required for the survey, but using them may have additional benefits.

**Essential**

- Clipboard
- Survey forms and pencil/pen
- Waterproof jacket and overtrousers
- Warm clothing if working in cold weather
- Wellington boots and walking boots
- Compass
- Large plastic bags (for the protection of survey forms and maps in wet weather)
- Hand lens (x10)
- First aid kit and any medication if necessary
- Whistle
- Survival bag if working in remote or mountainous country
- Insect repellent and sun-tan lotion, if needed
- Mobile phone, in case of emergency
- Road atlas or OS maps if you do not know the location of the woodland well.

**Optional**

- Walking poles for use on steep slopes
- GPS – see Section 3.6.
- Camera
- Paper maps – see Section 3.5.
2.5 Health and Safety

The safety and wellbeing of woodland surveyors is paramount. However, woodlands can be dangerous places, as anyone who has every strayed off the path for any distance in a valley woodland can attest. A full generic Health and Safety and risk assessment can be found in Appendix B. It is recommended that an assessment is made of each woodland surveyed to identify the risks, including those not occurring on the generic risk assessment, so that potential hazards can be avoided.

Health and safety issues of particular concern whilst surveying woodlands include:

- Steep slopes – whilst these may be traversable in dry weather in wet weather they can become very slippery and dangerous.
- Insects – woodlands can be havens for biting insects.
- Ponds and wet areas – many woodlands contain ponds that can present hazards, whilst wet woodlands can contain marshy or boggy areas.
- Quarries, mines and cliff faces – steep drops can be well hidden in woodlands, so it is important to be observant whilst walking through.
- Lightning – lightning can boil tree sap, causing struck trees to explode. Survey should be postponed and you should seek shelter away from trees until the storm has passed.
- Strong winds – trees can be blown over in strong winds potentially causing serious injury.

The survey route should be altered if it is thought likely to reduce the likelihood of any risk. If a woodland is particularly hazardous and it is not possible to plan a safe route through then do not survey the woodland.

It is well worth checking the weather forecast before the survey, as rain, strong winds and thunder storms can all increase the risks associated with woodland survey. If the forecast is poor consider postponing the survey until the weather has improved.

It is extremely important for each surveyor to let someone know where they will be going and when they return, so that the alarm can be raised if the surveyor does not return from the survey. If the woodland has significant safety concerns then it is sensible to phone the contact more frequently and usual.

Additional health and safety risks come from the biosecurity measures required when visiting woodland. These risks are detailed in Section 2.6.

2.6 Biosecurity

The main biosecurity risk in woodlands is currently Phytophthora, which affects a wide range of tree species, both native and non-native, but is currently devastating larch plantations.

An additional biosecurity risk in woodlands is Acute Oak Decline. This disease, the cause of which is still currently unknown, affects both native species of oak and can result in the death of the tree.

The following procedures must be followed in order to prevent the spread of Phytophthora and other diseases:

- Before entering a woodland:
Footwear should be cleaned of all soil, needles and plant debris and then sprayed with Propeller™ disinfectant and left until it has evaporated.

Consider whether it is necessary to drive your vehicle into the woodland. Park your vehicle on roads, avoiding areas where there are larch needles and debris.

If driving in the woodland is required, stay on surfaced forest roads where possible, avoiding verges or muddy areas.

Ensure vehicle wheels and wheel arches are free from loose mud and soil and spray with Propeller™ before entering the woodland.

- When leaving a woodland:
  - Footwear must be washed off on a hard standing near the entrance to the wood using a stiff brush and water. All traces of soil must be removed. The brush used for this must be thoroughly disinfected.
  - After cleaning, footwear must be sprayed with Propeller™ and left until it has evaporated.
  - Care must be taken to ensure that any water run-off does not enter watercourses.
  - Clothing must be shaken out or brushed off to remove any needles and debris before leaving the site or getting into a vehicle.
  - Check inside footwear, hoods, outer pockets and collars and remove needles and debris.
  - Check your vehicle for mud or debris. Give the vehicle a brush down if necessary. If clumps of mud and debris are adhering to the tyres then the affected areas must be washed down and disinfected with Propeller™.

- Wet clothing must be changed before moving between woodland sites. Wet clothing must be bagged and laundered before re-use, or washed down and disinfected. The use of waterproof outer clothing and leggings will help with this precaution.

- Propellar™ is biodegradable so excess disinfectant may be tipped onto bare soil, away from watercourses, or disposed of as normal industrial waste. Empty Propellar™ containers may be washed with water and disposed with normal rubbish.

When using Propellar™ you must follow the guidance on the safety data sheet, which you should keep with the disinfectant at all times. When handling Propellar™ you should use protective disposable gloves and safety glasses when pouring the chemical.

### 3 General survey methodology

The general field method broadly follows Common Standards Monitoring guidance (Kirby et al., 2002; Joint Nature Conservation Committee, 2004). The practicability of the methodology was tested thoroughly for its ability to assess condition during a survey of 100 sample sites (Lush et al., 2012).

#### 3.1 Plots

At each stop along the route certain ‘attributes’ (see Glossary of terms) need to be recorded in two nested circular ‘plots’. The plots have a radius of 3 m and 10 m around the stop (see Figure 3.1). These distances should be accurately measured periodically, but otherwise it is only necessary to estimate them as this should be accurate enough. It may be useful to mark the stop before investigating the surrounding plot, which can be achieved by leaving a rucksack in the centre. The variables to record within each stop are detailed in Section 4.

The surveyor should locate where they think the plot should be and then walk an additional $n$ number of paces, the stop being located at the $nth$ pace. This will reduce bias, as it makes it impossible to subjectively select a ‘good’ stop. The number of paces can be varied depending
upon the size of the woodland, but a minimum of 10 are recommended. To ensure consistency within an individual woodland the number of paces must be consistent within each survey woodland.

![Diagram showing the two nested plots around a central stop (as indicated by the figure standing in the middle). The plots are 3 m (for ground flora recording) and 10 m (for all other attributes) radius.](image)

Figure 3.1 – Diagram showing the two nested plots around a central stop (as indicated by the figure standing in the middle). The plots are 3 m (for ground flora recording) and 10 m (for all other attributes) radius.

3.2 Recording percentage cover

This methodology requires that percentage cover is recorded for certain attributes, for example canopy cover and understorey cover. Because of the difficulty in accurately recording percentage cover accurately, it is acceptable to record to the nearest 5% by rounding the intervening values up or down if more precise values are hard to determine.

3.3 ‘Hugs’

Two measures are used by this methodology for determining the size of trees: perimeter at breast height and hugs. Hugs can be used following Ancient Tree Hunt guidance (Woodland Trust, undated).

Measuring perimeter at breast height is the most accurate way of assessing tree size, since the size of a hug varies from person to person. A tape should be used to measure the perimeter of the tree trunk at 1.5 m up the tree trunk and on the uphill side of any slope.

A hug is where an average adult can reach around the tree trunk at breast height (about 1.5 m up the trunk) and their fingers just meet. One hug is approximately equivalent to 150 cm perimeter at breast height. One and a half hugs would be equivalent to 225 cm perimeter at breast height, whilst half a hug (i.e. where it is possible to reach around the tree with one arm and touch your chest) is equivalent to 75 cm perimeter at breast height. Even if you plan to use hugs as your assessment method it may be useful to measure the first few trees using a tape, to help you calibrate the size of your hug.

After some practice, you should find that you are able to estimate tree size accurately enough by eye, without having to measure or hug the trees.
3.4 Native and non-native species

Non-native species, species outside of their native range, are considered to be a real issue in woodlands. However, the impacts of non-native species vary, with some having a neutral impact on woodland condition whilst others are very detrimental. There is also often uncertainty regarding the impacts of species that are native only to parts of the UK outside of their native ranges and non-native species that have been part of the UK flora for such a long time that they have become established parts of the British woodland flora.

For the purposes of this survey, species have been split into five classes: native, native only to part of the British Isles, non-native but with a long history in British woodlands, currently non-invasive non-native and invasive non-native.

3.4.1 Species native only to parts of the UK

Some trees and shrubs are native only to certain parts of the UK. For the Woodland Conservation Condition Survey they are regarded as native throughout the UK because they are believed to have little or no negative impact upon woodland condition, or because any impact will be observed in other attributes recorded during the survey. These species and their native ranges are:

- Beech *Fagus sylvatica* in southern England and Wales.
- Butcher's broom *Ruscus aculeatus* in southern England.
- Hornbeam *Carpinus betulus* in south-east England.
- Scot's pine *Pinus sylvestris* in Scotland.

Beech can be a particular problem outside of its native range, as it casts a heavy shade that can impact on woodland ground flora and can have a significant impact in sites where the ground flora is a primary concern. However, attitudes towards beech have started to soften in the light of climate change, which could see an expansion of its range north and west (Kirby, 2009). In addition, it is felt that if beech were having a negative impact on woodland condition this would be evident from other attributes (e.g. canopy cover and ground flora composition). Beech can be recorded as a threat to the condition of the woodland, where it is not currently having a significant impact but is felt likely to in the future.

The presence of beech in statutory sites can still be considered to have a negative effect on woodland condition where an informed assessment can be made and this course is felt appropriate. In non-statutory sites in the north and west there can still be a policy to manage against beech to achieve certain conservation objectives.

3.4.2 Non-native, but with a long history in British woodlands

There are a few woodland species that are not native but have been present in Britain for so long that they have become an established and accepted part of the British landscape and woodlands. These species are:

- Sweet chestnut *Castanea sativa*
- Sycamore *Acer pseudoplatanus*
- Dwarf cherry *Prunus cerasus*
- Wild plum *Prunus domestica*
- Pear *Pyrus communis*
- Wild pear *Pyrus pyraster*
- White willow *Salix alba*
- Crack willow *Salix fragilis*
- Almond willow *Salix triandra*
- Osier *Salix viminalis*
- Ground-elder *Aegopodium podagraria*

The above species are all archaeophytes recognised by the Botanical Society of the British Isles (BSBI), with the exception of sycamore. Sycamore has been included as an accepted non-native species for the following reasons:

- Its status as non-native has not been established beyond doubt (Harris, 1987).
- There is a consensus that it was introduced to the UK in the 15th or 16th century (Rackham, 2001; Mabey, 1996; Mitchell, 1974; Jones, 1945), which is around the latest date of introduction (1500) at which a non-native plant is considered to be an archaeophyte.
- Its value for wildlife is comparable to many native trees (Binggeli, 1994).
- There is increasing acceptance of it as a part of the British woodland landscape (Kirby, 2009).
- Many woodland managers will recognise it as a ‘British species’.

However, it should be noted that it is the policy of many nature conservation organisations to manage against sycamore, especially when it is invading and still at a low abundance within a woodland site.

The BSBI also recognises some woodland species as dubiously native, which are regarded as native for the purposes of this survey. If evidence becomes available that they are not native then they are most likely to be regarded as archaeophytes and could be added to the list above. These species are:

- Green hellebore *Helleborus viridis*
- English elm *Ulmus procera*
- Red currant *Ribes rubrum*
- Mezereon *Daphne mezereum*

3.4.3 Currently non-invasive non-native

There are an extremely large number of non-native species in the UK that are not currently considered to be invasive. However, they usually have a negative effect on woodland condition for nature conservation, as they do not benefit wildlife in the same way that native species occupying the same space would. Some species may also become invasive as the British climate changes. Some of the non-invasive non-native species likely to be encountered in British woodlands are:

- Alders *Alnus* spp. that are not native alder *A. glutinosa*.
- All conifers, with the exception of yew *Taxus baccata*, Scot’s pine *Pinus sylvestris* and juniper *Juniperus communis*.
- Birches *Betula* spp. that are not silver birch *B. pendula* and downy birch *B. pubescens*.
- Cotoneasters *Cotoneaster* spp.†
- Dogwoods *Cornus* spp. that are not common dogwood *Cornus sanguinea*.
- Garden Privet *Ligustrum ovalifolium*.
- Horse chestnuts *Aesculus* spp.†
- Maples *Acer* spp. that are not field maple *Acer campestris* and sycamore *Acer pseudoplatanus*.
- Poplars *Populus* spp. that are not aspen *P. tremula* and native black poplar *P. nigra* subsp. *betulifolia*.
- Purple beech *Fagus sylvatica* ‘Atropunicea’†.
- Red oak *Quercus rubra*†.
- Snowdrops *Galanthus* spp.
3.4.4 Invasive non-native species

Invasive non-native species are a serious threat to British woodlands and negatively affect the condition of individual woodlands. The most relevant invasive non-native species include:

- Buddleja *Buddleja davidii*
- Cherry laurel *Prunus laurocerasus*
- Common monkey-flower *Mimulus guttatus*
- Evergreen oak *Quercus ilex*
- False-acacia *Robinia pseudoacacia*
- Giant hogweed *Heracleum mantegazzianum*
- Himalayan balsam *Impatiens glandulifera*
- Japanese knotweed *Fallopia japonica*
- Rhododendron *Rhododendron ponticum*
- Snowberry *Symphoricarpos albus*
- Turkey oak *Quercus cerris*
- Western hemlock *Tsuga heterophylla*

3.5 Using maps for future reference

Whilst the survey has no need for maps, other than for planning the route and the stop locations, it may provide additional benefits for the woodland owners and managers or conservation bodies. This very much depends upon personal or corporate objectives and why the survey is being undertaken.

Maps may be useful for recording the following:

- Provide a record of where the route and stops were located. With this information comparisons can be made with repeat surveys, which will help to understand and interpret the different results gained through using different routes and stops. The survey data can also be interpreted, allowing individuals with a knowledge of the woodland to recognise that a feature was not recorded because it was not encountered along the route taken.
- Recording and mapping open areas or areas where the woodland has been destroyed. This can then assist with estimates of the amount of open space or destroyed areas.
- To record particular features of interest that otherwise would not be recorded. This could include mapping the locations of:
  - Management compartments
  - Woodland stand types or habitat communities
  - Veteran trees
  - Rare species
  - Bird, bat or dormouse boxes
  - Historic woodland features
  - Entry points and access paths
  - Site furniture, such as gates, styles, benches, etc.
3.6 Use of GPS

GPS (Global Positioning Systems) have a great benefit for navigating around the countryside and if used carefully can also assist in woodlands. GPS provides the surveyor with additional information to assist in navigating through woodland which can be valuable when there are few visual clues. However, it is important to note that the precision of GPS readings in woodland and under canopy cover is highly variable and is always less accurate that achieved in more open landscapes.

The accuracy of the readings will be affected by:

- The height of the trees – higher trees will block more of the satellite signals.
- The density of the woodland – trunk blocking is considered to be one of the main reasons for reduced GPS fixes, so the denser the woodland the greater the chance that a signal will not reach the GPS.
- The manner in which the GPS is used – see below.

The GPS technology used will also have an effect:

- The use of low cost GPS equipment will more reliably achieve a fix (although with reduced accuracy) because high cost units will not use reflected signals (i.e. signals bouncing off of leaves or trees). This means that in woodlands more precise units may not even achieve a fix due to a lack of direct signals.
- The newer SIRF star III low cost GPS receivers are very sensitive and achieve fixes better than older receivers.
- EGNOS correction signals will normally not be received. This is because the signals are transmitted from a single satellite at an elevation of 25 degrees due south, so in woodlands the signal is highly likely to be blocked by vegetation.

The manner in which a GPS is used will also affect the accuracy in woodland:

- Turn on the GPS outside the woodland in an area with a clear view of all the sky.
- Wait for the GPS to lock onto as many satellites as possible – once locked on, the GPS will hold the signals for longer in poor conditions.
- When moving through the woodland keep the GPS out of pockets where it will not lose signal.
- When fixing position ensure that you are not blocking signals with your body – i.e. hold the unit high and clear of your body.
- If possible use an external receiver (available from £25) and fix to the top of a pole extending out the top of your ruck-sack (i.e. slightly above your head).
- For more precise fixes use an external receiver on a telescopic pole which can be raised towards the canopy.

Finally, it is important to keep a close eye on the accuracy readout on the GPS so that you are aware of when the fix may be unreliable. Focus on the HDOP, which should be as low as possible. Note that some units will also give an estimated accuracy.

3.7 Impacts on legally protected species

A woodland may be designated as a Site of Special Scientific Interest, Local Nature Reserve, Local Wildlife Site or another local or national designation. However, it is important to note that a woodland may also be indirectly protected where it provides a habitat for a legally protected species under the Wildlife and Countryside Act 1981 (the Act), or the Conservation
of Habitats and Species Regulations 2010 (the Habitats Regulations). Where woodland surveys are being undertaken it is very important not to disturb such species unless you have been granted a licence to do so.

It is an offence under Section 1 of the Wildlife and Countryside Act 1981 to intentionally kill, injure or take any wild bird or to take, damage or destroy its nest or eggs. However, certain wild birds are afforded additional protection under the Act, which makes it an offence to disturb them at the nest. As a general rule surveyors should avoid any disturbance to all birds.

Section 9 of the Act has similar protection for some animals. It is an offence to intentionally or recklessly kill, injure or take any wild animal included in Schedule 5 of the Act or damage, destroy any structure or place it uses for shelter or protection, or disturb any such animal while it is occupying such a place. Furthermore, regulation 41 of the Habitats Regulations make it an offence to deliberately capture, injure or kill disturb or harm the European protected species of animals which are listed in Schedule 2 of the Regulations or damage or destroy a breeding site or resting place of such an animal.

Certain plants have some legal protection under the Act, in that no person may uproot any wild plant without the owner’s consent. However, some plants are afforded additional protection under Schedule 8 of the Act, which makes it an offence to pick, uproot, sell or destroy any of these plants. The Habitats Regulations offer similar protection to European protected species of plants which are listed in Schedule 5 of the Regulations. It should not be necessary to pick, uproot, destroy or intentionally damage any plants whilst undertaking this survey.

Some general guidelines that should be adhered to are:

- Do not touch, harass or otherwise disturb any protected species.
- Do not interfere with bat, bird or dormouse boxes or any other resting place or breeding site for any protected species.
- Do not pick, destroy or uproot any protected plant or its seeds or spores; nor uproot any other wild plant if you are not authorised to do so.
- Avoid surveying the woodland during periods where disturbance would have a detrimental effect on protected species known to be present in the woodland, such as during hibernation and breeding seasons.
- Follow any guidance specific to the woodland and the Defra regulatory guidance on disturbance to resting places and breeding sites.

Legally protected species likely to be found in woodlands include the following:

- Badgers
- Dormice
- All bats
- Great crested newts
- All birds
- All reptiles
- Certain plants

4 The survey forms

There are two survey forms to be used in this methodology: the whole site form and the plot recording form. The whole site form is used to record attributes that are only needed for the woodland site as a whole, rather than for individual plots, and is best completed at the end of
the survey once the site has been fully explored (see Section 4.1). The plot recording form is for recording attributes within the plots, with additional space for recording things that are not in the plots but are found in the woodland site as a whole.

The plot recording form is further split up into three main parts:

- The 10 m radius plot recording form (see Section 4.2)
- The 3 m radius plot recording form (see Section 4.3)

4.1 Whole site form

The first part of the survey form is used to record details about the whole site. This includes general details about the site, some things that can only be recorded for the whole site and some things that are recorded for the whole site and within individual plots.

4.1.1 General information

<table>
<thead>
<tr>
<th>Q1 Site name:</th>
<th>Q2 OS grid reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3 Surveyor(s):</td>
<td>Q4 Date: DD/MM/YYYY</td>
</tr>
<tr>
<td>Is a site map available? Yes No</td>
<td>Site ID:</td>
</tr>
<tr>
<td>Q5 Time on site (hours):</td>
<td></td>
</tr>
<tr>
<td>IFT(s) present:</td>
<td></td>
</tr>
</tbody>
</table>

Section 1 of the form is where all the basic information about the survey should be recorded, including the woodland site name, OS grid reference, surveyor name and date of the survey.

The Ordnance Survey (OS) grid reference should be a six-figure (100 m) grid reference for the centre of the woodland in the format AA000000, e.g. SO154338. For guidance on identifying OS grid references please see Ordnance Survey’s sheet entitled ‘Using the National Grid’, which is available from http://www.ordnancesurvey.co.uk/oswebsite/gi/nationalgrid/nationalgrid.pdf.

Dates should be recorded in the form DD/MM/YYYY, e.g. 16/02/2011. If the survey is conducted over more than one day then a single day should be chosen from the middle of the survey period. There is also a box for recording the time spent on site conducting the survey, to assist with future survey planning.

The survey can be conducted without a site map. However, there are a number of reasons why you may find it valuable to record information on a map of the woodland (see also Section 3.5):

- To act as a record of the course of the route through the woodland and the location of the plots.
- To record features of importance that might make a difference to the condition of the woodland or require special consideration.
- To map destroyed areas and act as a record of the original extent of the woodland and the current one, as well as the reasons for the destruction.
- To record management compartments or open space, which may assist with future management decisions.
- To assist with repeat surveys. Although repeat surveys are unlikely to use exactly the same route or plot locations, by comparing different surveys of the same woodland it may be possible to find explanations for differences in the data recorded.

If a map is available this can be indicated by ticking the appropriate box.
There are additional boxes for site ID and IFT(s), which can be used if the National Forest Inventory (NFI) (Forestry Commission, 2003) was used as a basis for the woodland site boundary. Each polygon in the NFI has a unique identification (ID) number and an Indicative Forest Type (IFT), so this information will be available before the survey commences. Multiple IFTs may be present where the site is made up of more than one polygon in the NFI.

4.1.2 Woodland loss

Any destruction of the area of a woodland is a cause for concern and should be recorded. Destruction in this sense is defined as permanent loss of woodland due to land use change in an area of 0.5 ha or 5% of the woodland area (whichever is smaller). Destruction encompasses housing development, car parks and conversion to arable, horticulture or improved grassland. It does not include events that are temporary and reversible, such as the creation of rides, glades, meadows within woodlands (which could regenerate if left unmown for several years), clear felled areas, windblown areas, etc. Woodland destruction should be a very rare event.

The total area of destroyed parts of the woodland should be recorded, either in hectares or as a percentage of the original woodland area. The cause of the destruction, i.e. what has now replaced the woodland in the destroyed area, should also be recorded.

Destroyed areas can also be recorded on a site map for future reference if required.

4.1.3 Open space

A significant number of woodland plant and animal species rely upon open space in or around the woodland for at least part of their lifecycle, because light levels in open space are higher. Open space is often a result of other habitats that add diversity to the woodland and may therefore be important in their own right, such as areas of fen.

Open space includes areas between 0.01 ha (10m × 10m) and 0.25 ha (50m × 50m) and at least 10 m wide that have less than 20% wooded cover. It can be permanent or temporary and can include the following:

- Canopy gaps from tree fall/death
- Rides and glades
- Rock outcrops
- Other treeless areas

Small fields within or even adjacent to the woodland can be considered to add open space to the woodland in certain circumstances. Examples of this include unimproved pasture, wildflower meadows and scrubby grasslands in close association with the woodland.

Exceptionally, gaps larger than 0.25 ha may be included as open space within the woodland where they are integral to the woodland habitat or its management. Where such large spaces
are included in the woodland this should be justified in Section 4 of the whole site form (see Section 4.4).

4.1.4 Water features

**Q10 Are any of the following water features present?**

<table>
<thead>
<tr>
<th>Pool</th>
<th>Pond</th>
<th>Lake</th>
<th>River</th>
<th>Stream</th>
<th>Wet ditch</th>
<th>Dry ditch</th>
</tr>
</thead>
</table>

Features such as streams, ponds and ditches provide additional ecological diversity to a site. Though not required for assessing the condition of the woodland, recording them provides useful supporting information that can aid in interpreting other data. The presence of water features under the following categories should be recorded for the whole site:

- **Pool** - a body of standing water less than 25 m².
- **Pond** – a body of standing water 25 m² to 2 ha in area which usually holds water for at least 4 months of the year.
- **Lake** - any inland water body larger than 2 ha.
- **River** - running water more than 2.5 m wide.
- **Stream** – running water less than 2.5 m wide.
- **Wet ditch** - a man-made waterbody more than 20 times long than it is wide, containing water at the time of survey.
- **Dry ditch** – as above, but dry at the time of survey.

4.1.5 Veteran trees

**Q11 Does the woodland as a whole contain one or more veteran trees?**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

The presence of veteran trees in the whole woodland should be recorded. This identifies where veteran trees are present but were not recorded in the plots. For details on how to identify veteran trees see Sections 4.2.4.

4.1.6 Symptoms of tree disease

**Q12 Are any of the following present within the woodland?**

<table>
<thead>
<tr>
<th>Obvious and profuse weeping sores on tree trunks and branches. <strong>Tick one.</strong></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerous trees with visible canopy dieback. <strong>Tick one.</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stem or leaf blackening on rhododendron or bilberry. <strong>Tick one.</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Tree diseases, such as Phytophthora and Acute Oak Decline, are serious threats to British woodlands, for conservation, timber production and other uses. The presence of such diseases is an important criterion for unfavourable condition, so the presence of the following symptoms should be recorded:

a. Whether any of the trees have obvious and profuse weeping sores. Weeping sores are considered to be an easy to recognise and reliable indication of the presence of serious tree diseases such as *Phytophthora* and acute oak decline.

b. Whether there is any visible canopy dieback that may be caused by tree diseases.

c. Whether there is any stem and leaf blackening on bilberry *Vaccinium myrtillus*.

As well as being an indication of condition these questions can also be used to identify outbreaks and monitor the spread of tree diseases.
4.1.7 Management

Recording management helps to explain the current condition and provide an indication of the likely future condition of the woodland. Both current and past management are recorded.

The presence of management should be recorded under the following categories. More than one category can be recorded at each stop, as many management operations are not mutually exclusive.

- **High forest** - woodland with at least 20% canopy cover that cannot otherwise be classified as coppice or pollard. Amongst a range of woodland types, most plantations and many neglected coppices fall under this category. This also covers many sites where there is an absence of or non-intervention management.

- **Coppice** – trees that have been cut at their bases and left to re-grow shoots from the base, with or without standard (i.e. uncoppiced) trees left. Neglected coppices that have developed into large multi-stemmed trees should generally be recorded as high forest and coppice management. This should also be recorded where only a small number of trees have been coppiced.

- **Pollarding** – a tree with branches that have been cut back to the trunk so that it may produce a dense growth of new shoots. Pollarding is frequent in wood-pastures and commons.

- **Established plantation** – a woodland planted for timber, seed production, Christmas trees, research purposes, as a nursery, arboreta or other planted woodlands that are more than 20 years old.

- **Recent plantation** – this includes any of the planted woodlands listed under established plantations that are less than 20 years old.

- **Ground prepared for planting** – open areas which have been made ready for tree planting, including areas that have been de-stumped, mounded, ploughed, ripped (a method of heather removal), scarified and windrowed.

- **Thinning** – any selective removal of individual trees, leaving trees forming greater than 20% canopy cover in situ. This includes cleaning, shelterwood and continuous cover forestry management.

- **Group felling** – removal of small groups of trees, leaving treeless areas less than 0.25 ha (50 m × 50 m).

- **Clear-felling** – removal of all trees in an area greater than 0.25 ha (50 m × 50 m).

- **Deadwood removal** – this includes brashing and burning of deadwood. The removal of felled timber is implicit in thinning, group felling and clear felling, and so should not also be recorded as deadwood removal.

- **Pruning/weeding**.

- **Non-native species control** – this includes clearance and herbicide treatment of non-native species.

- **Wood-pasture** – an area with at least 20% canopy cover that is actively grazed by livestock. Established wood-pastures are often valued for their veteran trees.

- **Agroforestry** – an integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock; combining agriculture and forestry.
• **Browsing control** – any structure designed to control browsing by wild or domesticated animals, including deer, rabbit and stock fencing and tree shelters.
• **Game bird husbandry** – evidence such as fences, bird feeders, etc.
• **Draining** - open trenches dug to drain water.
• **Management for public safety** – any activity designed to prevent injury to the public, such as tree surgery, protective barriers, etc.
• **Recreation** – including campsites, cabins/holiday houses, car parks, picnic areas, paintballing and other recreation.
• **Other management** – please specify the type of management.

4.1.8 Evidence of livestock

| Q14 Is there evidence that the following types of livestock are present within or have unrestricted access to the woodland? Tick all that apply. Evidence includes droppings, prints or visible livestock. |
|---|---|---|---|---|---|---|
| None | Cattle | Sheep | Pigs | Horses | Goats | Farmed deer (in a deer-proof enclosure) |
| Other/exotic (describe): |

The type of any livestock present should be recorded, as this helps to provide context for the assessment of grazing and browsing. As well as livestock that are present within the woodland any evidence that they were recently present should be recorded. This includes droppings, prints, or wool or hair on twigs and fences. Deer should only be recorded where they are farmed, rather than wild deer.

4.1.9 Public access and use

| Q15 Is there any public access infrastructure within the woodland? Tick all that apply. |
|---|---|---|---|---|---|---|---|---|
| Public Rights of Way | Open access areas | Interpretation/amenity |
| Public footpath | Car parks | Information panels/signs |
| Bridleway | Picnic areas | Information Centre |
| Cycle way | CRoW Access Land | Other amenity buildings |
| Public road | Other open access areas |
| Public greenway |
| Permissive/other access paths | |
| Forest paths |
| Other permissive paths |
| Off-road motorcycle tracks |

Recording obvious public access infrastructure provides an indication of the value of the woodland for recreation, has relevance with regard to site management and can ultimately affect the condition of a woodland. Examples of how public access may affect a woodland are the physical structures created, tree surgery for health and safety purposes and trampling.

Where discernible, public access infrastructure should be recorded for the whole site under the categories listed, which are defined as follows:

• **Public Rights of Way:**
  o **Public footpath** – paths along which the public have a right to walk.
  o **Bridleway** - tracks along which the public have a right to walk or ride horses.
  o **Cycle way** - segregated cycle facilities are roads, tracks, paths or marked lanes designated for use by cyclists from which motorised traffic is generally excluded.
  o **Public Road** - roads or footpaths over which the public has the right of access.
  o **Public greenway** - historical rights of way for any persons or vehicles usually denoted by a lack of surface, often used for recreation and pedestrian and bicycle traffic.

• **Permissive/other paths:**
• **Forest paths** - paths with markers to guide walkers along routes around the woodland.
  • **Other permissive paths** – paths whose use by the public is allowed by the landowner, but over which there is no right of access.
  • **Off-road motorcycle tracks** - tracks for off-road motorcycles.

• **Open access areas:**
  • Car parks.
  • Picnic areas.
  • **CRoW Access Land** – open access areas formally identified as a result of the Countryside and Rights of Way Act 2000.
  • **Other open access areas.**

• **Interpretation/amenity:**
  • **Information panels/signs** – interpretive material aimed at informing or educating the public.
  • **Information Centre** - primarily applies to a building and its immediate surrounds such as lawns and car parks.
  • **Other amenity buildings** – including public conveniences, shelters, etc.

• **Campsite** – a formal area used as a site for tents and caravans, including static caravans that are not attached to fixed structures.

• **Cabins/holiday homes** – more permanent, less mobile structures used for holidaymakers.

• **Outdoor education** - any outdoor education facility.

• **Other recreation** - includes all other facilities provided specifically for public enjoyment.

• **Other evidence of human use** – any other evidence of public access that is not included in the above.

<table>
<thead>
<tr>
<th>Q16 Rate the level of public use. Tick one</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
</table>

The perceived level of public use should be rated as high, moderate or low. This assessment can be based upon the number of members of the public actually seen using the woodland as well as visible signs of public pressure, such as trampling, litter, fires and dog faeces. A guide to the rankings is as follows:

• **High** – heavy public use across the whole woodland, leading to trampling of the ground flora.

• **Medium** – low level public use across the whole site or public use is restricted to small areas, such as paths.

• **Low** – levels of public use restricted to small areas of the woodland and low or no visible signs of public use.

4.1.10 Cultural and heritage features

<table>
<thead>
<tr>
<th>Q17 Are any of the following cultural/heritage features present? Tick all that apply.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built remains, e.g. buildings, ruins, deserted communities, signs of habitation, industry, burial or fortification</td>
</tr>
<tr>
<td>Traditional landmarks, e.g. memorial stones, boundary stones, milestones, standing stones</td>
</tr>
<tr>
<td>Physical features, e.g. boundary banks, ditches, old stone walls, charcoal hearths</td>
</tr>
<tr>
<td>Plant formations, e.g. parkland, avenues, clumps of trees, species rich hedgerows</td>
</tr>
<tr>
<td>Tree forms, e.g. old coppice stools, distinctive pollards, heritage trees</td>
</tr>
</tbody>
</table>

Recording the cultural and historic value of the woodland provides information on ways in which the woodland is valued other than for nature conservation and economic value. These should be recorded by ticking any of the categories listed that apply to the woodland. The
features can be of any period, including recent structures or artefacts of potential interest to future generations.

Heritage trees are trees of historical and cultural significance. They include old trees, wide trees, tall trees, rare trees, and "weird and wonderful" trees. Heritage trees do not have to be veteran trees. An example of this is the Glastonbury Thorn, where the only surviving trees are cuttings of the original that are still regarded to have cultural significance.

4.1.11 Woodland type

These questions are both optional. The two most prominent UK BAP and NVC habitat types can be recorded where the surveyor has sufficient expertise in identifying them.

NVC only needs to be recorded to community level, though there may be cases where recording to sub-community level will be beneficial.

Recording mosaics and intermediates is allowed. Mosaics should be recorded using a + symbol, e.g. W8+W12, whilst intermediates should be recorded using a / symbol, e.g. W11/W17.

If the habitat type cannot be determined for a particular plot it is likely that something significant is occurring and notes should be made on the whole site form (see Section 4.4) regarding the habitat within the plot where determining the habitat type is not possible.

4.2 10m radius plot recording form

The 10 m radius plot is described in Section 3.1. One form should be completed for each stop within the woodland and covers most of the information needed to assess the condition of the woodland.

4.2.1 Tree size structure

Knowing the size classes of the trees give an indication of structural variation and provides a measure of future continuity of woodland conditions. The smaller tree size classes are also an indication of regeneration.
Tree size structure should be recorded for all trees, including all ground-level regeneration of trees. Each tree size is recorded by placing a ✓ in the relevant box. For the smaller tree sizes this is split into size classes for native and non-native.

Suckers are shoots that are growing from the very base or the roots of a tree. They can therefore be right at the base of the tree or up to a few metres away. Only certain trees frequently sucker, including:

- Ash
- Aspen
- Blackthorn
- Cherry
- Elm
- Plum
- Poplar
- Rowan
- Wild service tree

Coppice regrowth includes regrowth from self-coppiced trees, i.e. where the trunk has broken off and the tree is regrowing from the base, as well as actively coppiced trees. Coppice regrowth where the largest stem on the coppice stool is greater than 22 cm girth is included in the appropriate pole stage or mature size class, regardless of any smaller stems that may also be present.

New planting can include any trees in the seedling or sapling category that have been clearly planted, either because they occur in a regular pattern or have stakes and tree guards. A ✓ should be placed in the appropriate box for newly planted trees as well as placing a ✓ in the relevant seedling or sapling box, as shown in Figure 4.1.

![Figure 4.1](example.png)

Figure 4.1 – Example of how to record a planted native species between 10 cm and 100 cm tall. Note that both boxes for new planting and seedlings 10-100 cm tall are ticked.

4.2.2 Canopy cover

The tallest layer in the woodland is the canopy (excluding rare lone trees that rise above the majority of trees). Canopy cover is recorded to the nearest 5%.

Canopy cover should be assessed using the outlines of the canopies; visible sky through tree canopies should not be excluded from canopy cover. From late autumn to early spring the canopy cover when the trees are in full leaf should be estimated, using the extent of the branches and twigs. The estimation of canopy cover is illustrated in Figure 4.2.
Figure 4.2 – Showing how canopy cover should be estimated. A shows where sky can be seen between the leaves within the canopy, which should not be excluded from estimates of canopy cover. B shows where quite large areas of sky are visible through the canopy because the leaves have not fully opened and where the canopy cover when the leaves are fully opened should be estimated. The shaded areas are those that should be excluded from estimates of canopy cover, as they are not simply gaps between the leaves and are unlikely to be closed over when all the trees are in full leaf. Original image © Natural England.

Where the plot contains a mixture of native and non-native trees or shrubs the percentage cover of each should be recorded separately. Non-native species should be recorded as such, regardless of whether they are invasive or not. Note that because native and non-native species may overlap it is possible for the sum of the native and non-native species cover to be greater than 100%.

4.2.3 Understorey cover

Where clear layers are visible in the woodland, both the canopy and the understorey should be recorded. The understorey is a distinctive layer below the canopy made up of plants that are woody species usually, but not always, between 1 m and 5 m tall and often branching abundantly from the base. The understorey includes regeneration from fallen trees, tree stumps, etc. It does not include basal shoots or low hanging branches from trees in the canopy, or dwarf shrubs such as heather and bilberry. It is something that we would expect to find in most mature woodlands.

Clearly, because a canopy layer should be present understorey should only be recorded for stops where a mature or pole stand age class was recorded. Understorey is not expected to be present in regenerating stands because the regenerating trees are likely to be too low or too closely spaced for a distinct understorey to be present.
Understorey cover should be recorded in the same way as canopy cover, estimating the outlines of native and non-native understorey trees and shrubs to the nearest 5% cover.

Where there is no clear distinction between canopy and understorey layers but both clearly exist then the midline between the lowest level of the understorey and the highest level of the canopy should be used to determine their limits. This is shown in Figure 4.3.

![Diagram](image)

Figure 4.3 – Showing how canopy and understorey should be recorded where there is no clear distinction between the two. Max is the maximum canopy height, Min is the minimum understorey height, Mid is the midline between the two and the effective boundary between understorey and canopy. Everything below the midline should be recorded as understorey, with everything above recorded as canopy.

4.2.4 Veteran trees

<table>
<thead>
<tr>
<th>Q25 How many veteran trees are present?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veteran trees</td>
</tr>
</tbody>
</table>

Veteran trees are important for their value to wildlife and often their cultural value. Some woodland sites may be important for veteran trees.

The number of veteran trees should be recorded. Veteran trees can be identified using Table 4.1.
Table 4.1 – Table to assist the identification of veteran trees. Potential veteran trees must be over the minimum size limit for the species and display three or more of the characteristics listed.

<table>
<thead>
<tr>
<th>Species of tree</th>
<th>Minimum perimeter of the tree at 150 cm up the tree trunk</th>
<th>Features present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspen, birch, hawthorn, hazel.</td>
<td>150 cm / 1 hug</td>
<td>Three or more of the following characteristics:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Major trunk cavities or hollowing.</td>
</tr>
<tr>
<td>Cherry, field maple, goat willow, grey willow, holly, hornbeam, rowan.</td>
<td>225 cm / 1½ hugs</td>
<td>• Naturally forming water pools in crevices in the tree.</td>
</tr>
<tr>
<td>Alder, Scot’s pine.</td>
<td>250 cm / 1½ hugs</td>
<td>• Small holes in the trunk, larger branches or larger roots caused by decay.</td>
</tr>
<tr>
<td>Ash, oak, yew.</td>
<td>300 cm / 2 hugs</td>
<td>• Physical damage to the trunks.</td>
</tr>
<tr>
<td>Beech, elms, horse chestnut, limes, poplars, sweet chestnut, sycamore, other willows, other conifers</td>
<td>450 cm / 3 hugs</td>
<td>• Missing or loose bark.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Large quantities of dead wood in the canopy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Areas where the sap is seeping through the bark and running down the trunk or larger branches.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Crevices in the bark, under branches or amongst the roots sheltered from direct rainfall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fungi on the trunk or larger branches.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plants growing on the trunk or branches (not including mosses or lichens).</td>
</tr>
</tbody>
</table>

It may be that the woodland should also be included and assessed in the wood-pasture and parkland Biodiversity Action Plan, so the main aim is to highlight the potential interest and the need for a veteran tree site assessment. Should a full veteran tree site assessment be required a full survey following Castle & Mileto (2005) is recommended.

It is recommended that the locations of the veteran trees are supplied to the Ancient Tree Hunt. The minimum information required for the Ancient Tree Hunt is the grid reference, the tree species and the girth in centimetres or the number of hugs, though other information is welcomed. Go to [http://www.ancient-tree-hunt.org.uk/](http://www.ancient-tree-hunt.org.uk/) for more information and survey forms. Permission should be sought from the landowner or manager before submitting veteran tree locations to the ancient tree hunt.

4.2.5 Deadwood

<table>
<thead>
<tr>
<th>Q26 How many quarters of the plot contain the following?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing or aerial deadwood</td>
</tr>
</tbody>
</table>

Deadwood is essential for a large number of fungi and invertebrate species. Large lumps of deadwood are generally of greater value than small lumps (which tend to be common in most woodland). The location of the deadwood is also important, as different fungi and invertebrates inhabit deadwood in different situations.

The method for recording deadwood is to divide the 10 m plot into quarters (see Figure 4.4). The number of quarters that contain the following types of deadwood should be recorded, giving a maximum score for each category of deadwood in each plot of 4. The deadwood categories are defined as:

- Standing or aerial deadwood – including dead trees (standing or partially fallen), dead branches on living trees and hanging dead branches.
• Lying deadwood – including fallen logs, fallen trees, cut timber that has been left in situ or used to create ‘eco-piles’ (woodpiles that are left to decay).
• Tree stumps less than 1 m high; tree stumps over 1 m high should be included in standing or aerial deadwood.

Qualifying deadwood must be >10 cm diameter and >50 cm long. This size limit will not always apply to the visible parts of tree stumps, but generally all tree stumps over 50 cm diameter should be included.

Figure 4.4 – Diagram showing the quartered 10 m radius plot used to record deadwood. The large arrow indicates the direction of travel along the route through the woodland. The plot should be divided along the direction of travel and at right angles to it from the centre of the plot.

4.2.6 Grazing and browsing

<table>
<thead>
<tr>
<th>Q27 Do the following apply?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 20% of the ground is clearly disturbed due to animal trampling (poaching).</td>
<td>Tick one.</td>
<td>Yes</td>
</tr>
<tr>
<td>There is a clearly visible browse line.</td>
<td>Tick one.</td>
<td>Yes</td>
</tr>
<tr>
<td>Bark below 2 m has been stripped from more than 10% of the trees and shrubs.</td>
<td>Tick one.</td>
<td>Yes</td>
</tr>
<tr>
<td>It is an unstable slope of loose scree or boulders.</td>
<td>Tick one.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Grazing (herbivore feeding on ground plants) and browsing (herbivore feeding on trees and shrubs) by domesticated and wild animals can prevent woodland regeneration and damage trees. Identifying all the signs of grazing and browsing can be difficult, so the series of questions in Section 8 of the survey form aim to make their identification simpler.

Poaching of the ground by animals occurs where livestock congregate in one place and churn up the soil, producing a muddy, rutted area free from vegetation (see Figure 4.5). This is frequently found around gates and feeding areas, though if it occurs elsewhere it is a sign that stocking densities are too high. It does not include flat and smooth areas of bare ground that have been caused by light trampling. The question should be answered yes where more than 20% of the plot has been poached.
Figure 4.5 – An example of poaching due to animal trampling. Image © Richard Thompson, Forestry Commission Scotland.

A browse line is where the lower branches and shoots of trees and shrubs have been browsed so that no leaves occur within reach of livestock (see Figure 4.6). The height of the browse line depends upon the types of grazing animals present, as taller animals can reach further up. A browse line is also an indication that the level of browsing is too high.

Figure 4.6 – An example of a browse line. Image © Richard Thompson, Forestry Commission Scotland.

Bark stripping is also an indication that grazing/browsing pressure may be high, though there are other reasons for bark stripping. It should only be recorded where it is within the reach of browsing animals (under 2 m), as bark stripping above this height is more likely to be cause by other animals, such as squirrels. The question should be answered yes where bark stripping is evident on more than 10% of the trees and shrubs in the plot.
Figure 4.7 – Red deer browsing on rowan. Bark stripping caused by smaller animals may be restricted to the lower parts of the trunk and may not be so obvious. Image © Richard Thompson, Forestry Commission Scotland.

New shoots at the base, on the trunk or on the lower branches of trees and taller shrubs are called epicormic shoots (see Figure 4.8). It is important to record the presence or absence of signs of browsing to epicormic shoots or low shrubs within the plots, as this helps to determine the level of grazing/browsing overall.
Figure 4.8 – An example of epicormic shoots (new shoots at the base, on the trunk or on the lower branches). Image © Richard Thompson, Forestry Commission Scotland.

The species listed in question 29 are considered to be species that are especially sensitive to grazing. This means that where there is grazing pressure within a woodland these are the plants most likely to be grazed first, as they are more palatable than other plant species. If they are present it indicates that grazing pressure is not very high, though evidence of grazing to these species should be recorded.

Grasses are better adapted to grazing than the majority of plants, whilst mosses are not browsed and tend to grow in abundance where other plants are not covering the ground. In situations where heavy grazing occurs it is not uncommon for grasses to predominate, with moss growing in areas between the grass. The cover of grass and moss combined should be recorded, as this helps to determine the grazing pressure. NB: in this instance liverworts are included as mosses.

The height of ground flora plants is a clear indication of the level of grazing, so the average height should be recorded.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Complete this question</th>
<th>Go to question 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q29 Are any of the following present? Tick one.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilberry, bluebell, bramble, common valerian, greater woodrush, honeysuckle, ivy, raspberry, wild angelica, wood crane’s-bill.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do any of the species listed show signs that they have been grazed? Tick one.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q30 What percentage is covered by grass and moss?^2</td>
<td></td>
<td></td>
<td>% of the plot</td>
<td></td>
</tr>
<tr>
<td>Q31 What is the average height of the ground flora plants, ignoring bare areas?</td>
<td></td>
<td></td>
<td>cm</td>
<td></td>
</tr>
</tbody>
</table>
4.2.7 Woody species

Botanists will recognise that some of the woody species listed can include more than one species. The survey has been designed so that identification mistakes should not affect the condition assessment, which means that non-botanists can record the species listed without fear of spoiling the results. However, to avoid confusion, the bullet points below provide the Latin names of the species that are especially relevant and clarify closely related species.

- *Alder* *Alnus glutinosa* – non-native *Alnus* spp. may be found within plantations which may be difficult to distinguish from *A. glutinosa*.
- *Ash* *Fraxinus excelsior*.
- *Aspen* *Populus tremula*.
- *Beech* *Fagus sylvatica* – other species that are rarely found in plantations, such as *Nothofagus* spp., are unlikely to be recognised as ‘beech’.
- *Birch* *Betula pendula* and *B. pubescens* – non-native *Betula* spp. may occur in plantations, especially in amenity plantations, which may be difficult to distinguish from *B. pendula* and *B. pubescens*, even for experts.
- *Blackthorn* *Prunus spinosa*.
- *Cherry* *Prunus avium* – this is the most likely and widely recognised cherry species to be found in woodland. *Bird cherry* *Prunus padus* may occur in woodland but is more likely to be found in hedgerows. Other species of cherry may occur in amenity plantations.
- *Dogwood* *Cornus sanguinea* – non-native species of *Cornus* and garden cultivars are only likely to be present as planted specimens, often in amenity plantations, and so should be readily separable from *C. sanguinea*.
- *Elder* *Sambucus nigra*.
- *Elm* *Ulmus* spp. – separating native and non-native species of *Ulmus* is difficult even for experts. Non-native *Ulmus* spp. are relatively unlikely in most woodlands.
- *Field maple* *Acer campestre*.
- *Guilder rose* *Viburnum opulus*.
- *Hawthorn* *Crataegus monogyna* and *C. laevigata*.
- *Hazel* *Corylus avellana*.
- *Holly* *Ilex aquifolium*.
- *Hornbeam* *Carpinus betulus*.
- *Lime* *Tilia cordata*, *T. platyphyllos* and *T. x europaea*.
- *Oak* *Quercus robur* and *Q. petraea* – non-native *Quercus* spp. are readily distinguishable from the native species and should be recorded under ‘Other non-native broadleaves’.
- *Rowan* *Sorbus aucuparia*.
- *Spindle* *Euonymus europaeus*.
- *Sycamore* *Acer pseudoplatanus*.
- *Whitebeam* *Sorbus* spp., except for *S. aucuparia* and *S. torminalis* – non-native *Sorbus* spp. may occur in plantations, especially in amenity plantations, which may be difficult to distinguish from native species of *Sorbus*, even for experts.
- *Willow* *Salix* spp.
- *Yew* *Taxus baccata*.
- Other non-native broadleaves – all non-native broadleaved species not included above.
- *Conifers (excluding yew*) – all conifers, other than *Taxus baccata*.  

---

**Q32 Are any of the following woody species present?** Tick all that apply.

<table>
<thead>
<tr>
<th>Alder</th>
<th>Birch</th>
<th>Blackthorn</th>
<th>Elder</th>
<th>Hawthorn</th>
<th>Lime</th>
<th>Oak</th>
<th>Sycamore</th>
<th>Whitebeam</th>
<th>Willow</th>
<th>Willow</th>
<th>Willow</th>
<th>Willow</th>
<th>Yew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash</td>
<td>Blackthorn</td>
<td>Cherry</td>
<td>Field maple</td>
<td>Hazel</td>
<td>Hornbeam</td>
<td>Conifers (excluding yew)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspen</td>
<td>Dogwood</td>
<td>Other non-native broadleaves</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.2.8 Invasive non-native species

**Q33 Are any invasive non-native ground flora species present?**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Invasive non-native plant species can have very significant impacts on woodland ground flora by outcompeting native ground flora. The presence of the species listed in Section 3.4.4 in any amount should therefore be recorded. It may also be appropriate to record the presence of such species outside of the plots in the site notes section of the survey form (see Section 4.4).

4.2.9 Ground cover composition

**Q34 What percentage is covered by the following?**

<table>
<thead>
<tr>
<th>Ground flora vegetation</th>
<th>% of the plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moss</td>
<td>% of the plot</td>
</tr>
<tr>
<td>Leaf litter</td>
<td>% of the plot</td>
</tr>
<tr>
<td>Deadwood</td>
<td>% of the plot</td>
</tr>
<tr>
<td>Bare ground</td>
<td>% of the plot</td>
</tr>
<tr>
<td>Other</td>
<td>% of the plot</td>
</tr>
<tr>
<td>Total = 100%</td>
<td></td>
</tr>
</tbody>
</table>

Whilst this information is not essential for determining the condition of the woodland, it is useful to know the structural composition of the field layer. This is done by recording the percentage of the field layer that is made up by ground flora vegetation, moss, leaf litter, deadwood, bare ground or by other things, such as rocks. Note that the sum of the values recorded should be 100%.

4.3 3 m radius plot recording form

The 3 m radius plot is described in Section 3.1 and is used for recording the composition of the plants in the ground layer. One form should be recorded for each stop within the woodland.

4.3.1 Ground flora groups

**Q35 Are any of the following ground flora groups abundant or characteristic?**

<table>
<thead>
<tr>
<th>Ferns (excluding bracken)</th>
<th>Tussocky grasses</th>
<th>Reeds</th>
<th>Sedges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mosses (excluding Sphagnum)</td>
<td>Other grasses</td>
<td>Rushes</td>
<td></td>
</tr>
</tbody>
</table>

Ground flora groups are groups of similar plants that are not readily separated by non-botanists and are therefore recorded as groups. Despite grouping them together they can still provide valuable information that may help to determine the woodland type. The bullet points below provide definitions of the species groups.

- Ferns - all ferns, other than bracken *Pteridium aquilinum*.
- Mosses – this includes all mosses and liverworts, with the exception of *Sphagnum* spp.
- Tussocky grasses – all fairly large grasses that form dense clumps. The species of particular interest that should be recorded here are tufted hair grass *Deschampsia caespitosa*, cock’s-foot *Dactylis glomerata* and tall fescue *Festuca gigantea*.
- Reeds – all large grasses over 1 m tall. The species of particular interest that should be recorded here are common reed *Phragmites australis*, reed canary-grass *Phalaris arundinacea* and reed sweet-grass *Glyceria maxima*; these generally grow in wet areas. Small-reeds *Calamagrostis* spp. are less likely but can also be included under reeds.
- Other grasses – all grasses not included under tussocky grasses or reeds.
- Rushes – in the sense used here, this refers to *Juncus* spp. with stems and leaves that are circular or oval in cross section and contain pith. They generally grow in damp areas and can be readily distinguished by breaking a leaf and looking at the cross section.
- Sedges – including all *Carex* spp.
As a guide, ground flora groups should be recorded only where they cover at least 5% of the 3 m plot, though there may be occasions where they are considered characteristic at a lower cover. Very small quantities of these plants should not be recorded as they are unlikely to be characteristic of the woodland habitat.

4.3.2 Ground flora plants

The bullet points below provide the Latin names of the ground flora species that are especially relevant and clarify closely related species. Some species are not easily distinguished when not in flower and so may be missed by non-botanists.

- **Bedstraw** Galium spp. – this should not include similar looking species that may be found, such as madder Rubia peregrina.
- **Bilberry** Vaccinium myrtillus.
- **Bittersweet** Solanum dulcamara.
- **Bluebell** Hyacinthoides non-scripta – the non-native Spanish bluebell H. hispanica, and its hybrid with the native bluebell H. x massartiana, may also occur within woodland and may be difficult to distinguish from H. non-scripta.
- **Bracken** P. aquilinum.
- **Bramble** Rubus fruticosus.
- **Buckooflower** Cardamine pratensis.
- **Dog’s mercury** Mercurialis perennis.
- **Enchanter’s nightshade** Circaea lutetiana.
- **Golden-saxifrage** Chrysosplenium oppositifolium and C. alternifolium.
- **Greater stitchwort** Stellaria holostea – could be confused with lesser stitchwort Stellaria graminea and marsh stitchwort Stellaria palustris, but the leaves of both of these are smaller.
- **Ground-ivy** Glechoma hederacea.
- **Gypsywort** Lycopus europaeus.
- **Heather** Calluna vulgaris, Erica tetralix and E. cinerea - other ericoids and non-native heathers may not be easy to distinguish, but are unlikely to be encountered in woodland.
- **Hemp agrimony** Eupatoria cannabina.
- **Herb Robert** Geranium robertianum.
- **Honeysuckle** Lonicera periclymenum.
- **Ivy** Hedera helix.
- **Lesser celandine** Ficaria verna.
- **Marsh marigold** Caltha palustris.
- **Meadowsweet** Filipendula ulmaria.
- **Mint** Mentha spp. – the main species to record is water mint M. aquatica, though other species of Mentha may be found in woodland.
- **Nettle** Urtica dioica.
- Pignut *Conopodium majus*.
- Primrose *Primula vulgaris*.
- Ramsons *Allium ursinum*.
- Red campion *Silene dioica* – may be difficult to distinguish from white campion *Silene alba* when not in flower.
- Sanicle *Sanicula europaea*.
- Speedwell *Veronica* spp. - the main species to record is wood speedwell *V. montana*, though other similar species of *Veronica* may be found in woodland, especially germander speedwell *V. chamaedrys*.
- Bog mosses *Sphagnum*.
- Thistle *Cirsium* spp., *Carduus* spp., etc. – the main species to record are marsh thistle *Cirsium palustre* and melancholy thistle *Cirsium heterophyllum*, though other species of thistle may be found in woodland.
- Tormentil *Potentilla erecta* – could be confused with other *Potentilla* spp.
- Valerian *Valeriana officinalis* and *V. dioica*.
- Violet *Viola* spp.
- Water avens *Geum rivale* – may be difficult to distinguish from wood avens *Geum urbanum* and the hybrid *G. x intermedium*.
- Wild angelica *Angelica sylvestris*.
- Wild arum *Arun maculatum* and *A. italicum*.
- Wood anemone *Anemone nemorosa*.
- Wood avens *Geum urbanum* – may be difficult to distinguish from water avens *Geum rivale* and the hybrid *G. x intermedium*.
- Wood crane’s-bill *Geranium sylvaticum* – may be difficult to distinguish this from other species when not in flower.
- Wood sage *Teucrium scorodonia*.
- Wood sorrel *Oxalis acetosella*.
- Yellow iris *Iris pseudacorus* – may be difficult to distinguish from similar species, such as *Typha* and *Sparganium*, though this will not matter as they all grow in wet conditions. It should not be confused with stinking iris *I. foetidissima* or other species that are found in drier conditions.
- Yellow pimpernel *Lysimachia nemorum* – may be difficult to distinguish from creeping-Jenny *L. nummularia*, though this will not matter as they indicate similar conditions.

### 4.4 Notes on the whole site and individual stops

<table>
<thead>
<tr>
<th>Q18 The following box can be used to make notes on the site. The notes can cover:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Clarifications of things recorded elsewhere on the form</td>
</tr>
<tr>
<td>- Additional information on the management, e.g. when it occurred and in which areas</td>
</tr>
<tr>
<td>- Threats and opportunities</td>
</tr>
<tr>
<td>- Features that are present in the site as a whole but were not recorded in the plots</td>
</tr>
<tr>
<td>- The types and permanence of the open space present within the woodland</td>
</tr>
<tr>
<td>- The surrounding landscape, including notes on the surrounding woodlands</td>
</tr>
<tr>
<td>- Further information on cultural or heritage features present</td>
</tr>
</tbody>
</table>

| Q37 The following box can be used to make notes about the plot. |

The notes sections are to be used to record information that has no effect on woodland condition but may be useful in interpreting the condition survey information or for guiding future surveys.
5 The survey database

This section describes how data from the original survey form was entered into the database. It is hoped that this will be converted into an online database, at which point the database will be redeveloped to work with the finalised version of the survey form.

5.1 The Site Details form

5.1.1 Entering basic woodland site information

When the database is first opened you will be presented with the Site Details form.

First click on the drop down under 'Select a site to edit' and select the IFT of the site you have surveyed.

This will populate the form with Interpreted Forest Types and area. Add the site name, location and grid reference. Adding location is optional, but should be included to support the grid reference.
5.1.2 Adding ownership details to the woodland site

If the owner is already in the database, i.e. as an owner of another woodland, then they can be selected as the owner of the woodland by using the drop down menu and clicking Add. If the owner is not already in the database then they can be added to the database by hitting the Enter new owner button. This will open the 'Owner Details' form, where the woodland owner can be added. It is only necessary to enter the owner name, though if other information is known it should also be entered.

If the address is entered over multiple lines then the end can be seen by using the scroll buttons on the right hand site of the box. The postcode must be a valid postcode including the space in the middle (i.e. XX0 0XX). The telephone number can be entered without spaces. The email address must be a valid email address.

Click Save And Return to add the owner to the database and return to the Site Details form, with the owner added to the site.

Multiple owners can be added to an individual site, so all owners should be added.

5.1.3 Altering owner details

If any of the owner details are found to be incorrect they can be altered by selecting the owner in the drop down list and clicking Edit. This will bring up the Owner Details form where the details can be changed.

5.1.4 Removing owner details

Owner details can be removed from the woodland site and from the database. Note that removing the owner from the database will also remove them from any other woodlands in the database that they own and so should only be done where the owner details are mistaken and relate to a single woodland.

In order to remove an owner from a site select them in the drop down list and press Remove.

The database will confirm that the owner will be removed from the woodland site and ask whether the owner should be removed from the entire database as well. Generally you should
press **No**, as pressing **Yes** will remove the landowner from any other woodlands that they are associated with. Press **Cancel** to return to the form without removing the owner.

Once all the basic woodland site details have been completed press **Next >>** at the bottom right of the form. This will open the Survey Details form.

### 5.2 The Survey Details form

The Survey Details form is where the whole site survey information is added. It will be automatically populated with the **Site ID** (as used by the database) and the **Site Name**.

Because of the amount of data included the form is split over a number of tabs, which are shown across the top of the form. Details should be entered working left to right through the tabs to avoid missing anything, though it is possible to click on a previous tab if any information has been missed or is erroneous.

#### 5.2.1 Section 1 – General information

**Adding the survey date**

Enter the date of the survey in the format DD/MM/YYYY. ‘Today’s date’ can be entered by pressing **CTRL-;**, so this can be used if the data is entered on the same day as the survey is undertaken. Alternatively, click the **calendar** button displayed to the right of the date box and select
the date from the calendar popup. If the survey was conducted over more than one day then one date should be selected for adding to the database.

Adding surveyor(s)
The ‘add surveyors’ section of the Survey Details form works in the same way as the ‘add owners’ section of the Site Details form.

If the surveyor is already in the database, then they can be selected for the current survey by using the drop down menu and clicking Add. If the surveyor is not already in the database then they can be added to the database by hitting the Enter new surveyor button. This will open the ‘Surveyor Details’ form, where the Surveyor can be added. It is only necessary to enter the surveyor name, though the other information may be useful if the data is ever queried in the future.

Click Save And Return to add the surveyor to the database and return to the Survey Details form, with the surveyor added to the survey.

Multiple surveyors can be added to an individual survey, so all surveyors should be added.

If any of the surveyor details are found to be incorrect they can be altered by selecting the owner in the drop down list and clicking Edit. This will bring up the Surveyor Details form where the details can be changed.

Surveyor details can be removed from the survey and from the database. Note that removing the surveyor from the database will also remove them from any other surveys in the database that they have surveyed and so should only be done where the surveyor details are mistaken and relate to a single survey.
In order to remove a surveyor from a survey select them in the drop down list and press *Remove*.

The database will confirm that the surveyor will be removed from the survey and ask whether the surveyor should be removed from the entire database as well. Generally you should press *No*, as pressing *Yes* will remove the surveyor from any other survey that they are associated with. Press *Cancel* to return to the form without removing the surveyor.

**Recording the time spent on site**

Recording the time spent on site will provide useful guidance on the time required to undertake a survey. The time should be entered in hours.

5.2.2 Section 2 – Woodland loss

One of the radio buttons must be clicked to determine whether any part of the woodland has been destroyed. If *No* is clicked than the form will move automatically to the next tab. If *Yes* is clicked than the rest of Section 2 will become active and must be completed.

5.2.3 Section 3 – Open space

The amounts of temporary and permanent open space must be recorded by filling in one of the boxes or ticking *None* for each. The types of open space present must be recorded.
5.2.4 Section 4 – Features of limited extent
This section is for recording features that are of limited extent and may therefore not be recorded within any of the plots (see Section 0). If any of the features listed are present in the woodland they should be recorded, whether they occur within plots or not.

5.2.5 Section 5 – Expert assessment
Section 5 is split over four tabs.

Tick any opportunities and public access infrastructure that is present within the woodland, entering a description in the box where ‘other’ is ticked. The level of public use must be rated and the woodland must be characterised by clicking one of the radio buttons.

Tick any factors that threaten the nature conservation value of the woodland, entering a description in the box where ‘other’ is ticked.
Tick any cultural or heritage features that are present within the woodland, entering a description in the box where ‘other’ is ticked. Whether the character of the woodland matches those in the landscape must be recorded by clicking Yes or No. Notes on the landscape value of the woodland may be recorded where appropriate.

Record whether the woodland is being managed correctly for nature conservation objectives appropriate to the site and whether the woodland is in favourable condition. Provide justifications for the answers where required.
5.2.6 Section 6 – Expert notes

Enter any notes in the four sections, where appropriate. Note that in the example below, ‘Notes on heritage trees’ could have been left blank.

At any point during the Survey Details form Save And Finish Later can be clicked, allowing the user to come back to the data entry at a later time. Once the survey details are completed press Next >>. The database will validate the data and incomplete fields will be flagged. If all the details are valid than the Stop Details form will be opened.
5.3 The Stop Details form

The Stop Details form is where the plot-based information is added. It will be automatically populated with the Site ID and Survey ID (as used by the database) and will default to stop number 1.

As with the Survey Details form, the Stop Details form is split over a number of tabs, which are shown across the top of the form. Details should be entered working left to right through the tabs to avoid missing anything, though it is possible to click on a previous tab if any information has been missed or is erroneous.

5.3.1 Section 7 – Woodland structure

Record the tree size structure for native and non-native species by ticking the relevant boxes. Enter the native and non-native species canopy cover in the relevant boxes as a percentage of the plot area, using zero where native or non-native species are absent from the canopy.

Tick Yes where an understorey is present and enter the native and non-native species understorey cover. Where no understorey is present tick No - it is then not necessary to complete question 15.
5.3.2 Section 8 – Veteran trees and deadwood

Enter the number of veteran trees recorded within the plot. Enter the number of quarters of the plot that each category of deadwood was recorded within, which must be an integer from 0 to 4. Enter the number of pit and mound features recorded within the plot.

5.3.3 Section 9 – Grazing and browsing

Section 9 is split over two tabs. On the first tab tick Yes where any of the options in question 19 apply or No where they don’t.

On the second tab tick Yes where epicormic shoots or low shrubs are present and then tick whether there is evidence of browsing to the epicormic shoots or low shrubs, or tick No where epicormic shoots and low shrubs are absent. Do the same for the grazing sensitive species listed and, if appropriate, tick whether they are grazed. It will not be possible to complete the second part of each question unless the answer to the first part is Yes.
Enter the percentage of the plot that is covered by grass and moss combined and the average height of the ground flora plants in centimetres. Tick any livestock that are present, entering a description if Other/exotic is ticked.

5.3.4  Section 10 - Management

Tick the boxes for any past or current management, as appropriate. At least one current management type is expected. Where Other management is ticked enter a description of the current and/or past management.

5.3.5  Section 11 - Woody species composition

Tick the woody species that are present within the plot.
5.3.6 Section 12 – Ground flora species composition

Tick the ground flora species and species groups that are present within the plot.

<table>
<thead>
<tr>
<th>Q27: Are any of the following ground flora groups abundant or characteristic?</th>
</tr>
</thead>
<tbody>
<tr>
<td>F ferns (excluding bracken)</td>
</tr>
<tr>
<td>M mosses (excluding sphagnum)</td>
</tr>
</tbody>
</table>

Q28: Are any of the following ground flora plants present?

<table>
<thead>
<tr>
<th>Bedstraw</th>
<th>Enchanting's nightshade</th>
<th>Ivy</th>
<th>Red campion</th>
<th>Wild angelica</th>
</tr>
</thead>
<tbody>
<tr>
<td>B bilberry</td>
<td>Greater stitchwort</td>
<td>Lesser celandine</td>
<td>Speedwell</td>
<td>Wild arum</td>
</tr>
<tr>
<td>B bittersweet</td>
<td>Ground ivy</td>
<td>Marsh marigold</td>
<td>Sphagnum</td>
<td>Wood anemone</td>
</tr>
<tr>
<td>B bluebell</td>
<td>G gyspwort</td>
<td>Meadowweet</td>
<td>Thistle</td>
<td>Wood avens</td>
</tr>
<tr>
<td>B brasson</td>
<td>H heather</td>
<td>Mint</td>
<td>Tormentil</td>
<td>Wood cranes-bill</td>
</tr>
<tr>
<td>B bramble</td>
<td>H hemp agrimony</td>
<td>Nettle</td>
<td>Valerian</td>
<td>Wood sage</td>
</tr>
<tr>
<td>B cuckoo flower</td>
<td>Herb Robert</td>
<td>Pignut</td>
<td>Violet</td>
<td>Wood sorrel</td>
</tr>
<tr>
<td>B red/blackcarrant</td>
<td>H honeysuckle</td>
<td>Primrose</td>
<td>Yellow iris</td>
<td>Yellow pimpernel</td>
</tr>
<tr>
<td>D dog's mercury</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3.7 Section 13 – Woodland type

Enter the BAP and NVC code(s) that describe the woodland within the plot. There are two ways in which this can be done:

- Select the relevant code from the dropdown list, whereupon it will be transferred to the pink box.
- Type the code directly into the pink box.

Whichever method is used to select the habitat type, in order to add mosaics (+) and intermediates (/) the relevant symbol must be typed into the pink box. It is important that the notation follows the convention used, as confusing notations or incorrect usage may prevent the data from being accepted by the database and will certainly lead to difficulties when analysing the data.

Incorrect habitat types can be deleted from the pink box using the delete or backspace keys.

5.3.8 Section 14 – Supplementary information

Enter the percentage of the plot that is covered by the ground cover categories listed, noting that the sum of the figures entered must equal 100%. Tick any water features that are present within the plot.
5.4 Adding stops 2 - onwards

After the details for stop 1 have been completely entered into the Stop Details form click on the Next Stop button to move onto stop 2. In order to move to a previous stop click on the Previous Stop button (note that the current stop must be complete, otherwise it will ask for the incomplete fields to be completed).

Continue adding stop data until all the stops have been entered. Once the data for all the stops have been entered press Save And Finish on the last stop to finish entering the survey information.

6 Glossary of terms

Agroforestry: integrating agriculture and forestry by exploiting the benefits that one has upon the other.

Archaeophyte: A species recorded as naturalised in the wild before 1500 AD.

Attribute: characteristics chosen to describe woodland condition. Targets are set for each attribute against which condition is assessed.

BAP: see Biodiversity Action Plan.

Biodiversity Action Plan: The UK Biodiversity Action Plan is the UK Government’s response to the Convention on Biological Diversity. It describes the biological resources of the UK and plans for the conservation of these resources. Significantly, action plans have been written to aid the recovery of threatened species and habitats, which are reported against to monitor progress.

Browse line: where the lower branches and shoots of trees and shrubs have been browsed so that no leaves occur within reach of livestock.

Browsing: herbivore feeding on trees and shrubs.

Canopy: the foliage and small branches of the tallest layer of trees in a wood.

Common Standards Monitoring: standard methods used for assessing and monitoring the condition of Sites of Special Scientific Interest.

Coppice: a tree that has been cut at its base and left to re-grow shoots from the base.

CSM: See Common Standards Monitoring.

Destruction, woodland: permanent loss of woodland due to land use change. For woodland conservation condition survey the area lost should be whichever is smaller or 0.5 ha or 5% of the woodland area. See Section 4.1.2.
**Epicormic shoots**: new shoots at the base, on the trunk or on the lower branches of trees and taller shrubs.

**GIS** (Geographical Information System): specialist mapping software that captures, stores, analyzes, manages, and presents data that are linked to location.

**Glade**: a medium to large open space within a woodland.

**Grazing**: herbivore feeding on ground plants.

**Ground layer**: the lowest layer of the woodland, comprising especially low growing plants, mosses, lichens and fungi.

**Heritage trees**: trees of historical and cultural significance, including old, wide, tall, rare and "weird and wonderful" trees. Heritage trees do not have to be veteran trees.

**High forest**: trees capable of growing to be suitable for timber production, i.e. cannot otherwise be classified as coppice or pollard.

**Hug**: for tree and woodland survey, a hug is where an average adult can reach around the tree trunk at breast height (about 1.5 m up the trunk) and their fingers just meet. See Section 3.3.

**IFT**: See Indicative Forest Type.

**Indicative Forest Type**: woodland parcels mapped within the National Forest Inventory that clearly separated ‘types’ within a block of woodland.

**National Forest Inventory**: an inventory of all woodland in the British Isles produced by the Forestry Commission, mapped from colour aerial photographs.

**Native species**: plants that developed, occur naturally or existed for many years in the area in which they are found, i.e. plants within their native range.

**NFI**: See National Forest Inventory.

**Non-native species**: Species outside of their native range. See Section 3.4.

**Permanent open space**: an area between 0.01 ha and 0.25 ha and at least 10 m wide that has less than 20% wooded cover and where trees are not expected to regenerate due to the ground conditions or under current management.

**Pit and mound**: occurs where trees fall and decay leaving mounds, and roots are pulled out of the ground leaving pits. This is a natural process and a typical feature of old-growth forest.

**Plot**: an area around a stop within which the woodland is recorded in greater detail. Plots come in two sizes: 3 m radius and 10 m radius around the stop. See Section 3.1.

**Poaching**: where livestock congregate in one place and churn up the soil, producing a muddy, rutted area free from vegetation.

**Pole stage**: generally refers to a plantation in the early stages of thinning, where the canopy has closed and the trees are tightly spaced. In the woodland conservation condition survey this term is applied to any tree of an equivalent size.

**Pollard**: a tree with branches that have been cut back to the trunk so that it may produce a dense growth of new shoots.
Pollarding: where the branches of a tree are removed at head height or a little above to encourage shoots to arise above the reach of browsing animals.

Ride: a linear open space, generally derived from a need to access the woodland.

Route: for woodland survey methodology, a route is a planned course through the main variation in the woodland that should be walked during the survey. Stops are planned equally spaced along the route. See Section 2.2.

Site of Special Scientific Interest: areas that have been legally designated for their wildlife and geological importance.

SSSI: See Site of Special Scientific Interest.

Stand: an area within a woodland that contains a woodland habitat type or management compartment that is different to those in adjacent woodland.

Stool, coppice: the base of a tree that has been repeatedly coppiced.

Stop: a point on the survey route that identifies the position where a plot should be used to for more detailed recording. See Section 2.2.

Sucker: a shoot growing from the very base or the roots of a tree.

Temporary open space: an area between 0.01 ha and 0.25 ha and at least 10 m wide that has less than 20% wooded cover and where trees are expected to regenerate naturally over time.

Understorey: a distinctive layer below the canopy made up of plants that are woody species usually, but not always, between 1 m and 5 m tall and often branching abundantly from the base. See Section 4.2.3.

Veteran tree: a tree that, because of its great age, size or condition, is of exceptional nature conservation value. See Section 4.2.4.

Wood-pasture: an area with at least 20% canopy cover that is actively grazed by livestock.

Some definitions adapted from Forest Research (2011).

7 References

Appendix A  Example completed form

The following are examples of a completed original Whole Site Recording and Plot Recording form. Note that some questions have been removed and others added in the finalised version of the form.
# Woodland Conservation Condition Survey

## Whole Site Recording

Do not write outside of the grey areas

### Section 1 - General Information

<table>
<thead>
<tr>
<th>Q1 Site name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2 OS grid reference:</td>
<td></td>
</tr>
<tr>
<td>Q3 Surveyor(s):</td>
<td></td>
</tr>
<tr>
<td>Q4 Date:</td>
<td></td>
</tr>
<tr>
<td>Q5 Time on site (hours):</td>
<td></td>
</tr>
<tr>
<td>Is a site map available?</td>
<td>Yes</td>
</tr>
<tr>
<td>Site ID:</td>
<td></td>
</tr>
<tr>
<td>IFT(s) present:</td>
<td></td>
</tr>
</tbody>
</table>

### Section 2 - Woodland Loss

Q6 Has any part of the woodland been destroyed? Yes | Complete the rest of this Section  
No | Go to Section 3

Q7 Approximately what area of the woodland has been destroyed? Provide either the area in hectares or % of the woodland.

| hectares or | % of the woodland |

Q8 To what has this area been lost? Describe

### Section 3 - General Information

Q9 What area of the woodland is open space? Provide either the area in hectares or % of the woodland

| hectares or | % of the woodland |

Q10 Are any of the following water features present? Tick all that apply.

| Pool | Pond | Lake | River | Stream | Wet ditch | Dry ditch |

Q11 Does the woodland as a whole contain one or more veteran trees? Tick one.

| Yes | No |

Q12 Are any of the following present within the woodland? Obvious and profuse weeping sores on tree trunks and branches. Tick one.

| Yes | No |

Numerous trees with visible canopy dieback. Tick one.

| Yes | No |

Stem or leaf blackening on rhododendron or bilberry. Tick one.

| Yes | No |

Q13 Record any evidence of management. Tick all that apply.

- High forest
- Coppice
- Pollarding
- Established plantation (> 20 years old)
- Recent plantation (< 20 years old)
- Ground prepared for planting
- Recent thinning
- Recent group felling
- Recent clear felling
- Deadwood removal
- Pruning/weeding
- Non-native species control
- Wood-pasture
- Agroforestry
- Browsing control
- Game bird husbandry
- Current draining
- Management for public safety
- Recreation
- Other management (describe):

Q14 Is there evidence that the following types of livestock are present within or have unrestricted access to the woodland? Tick all that apply. Evidence includes droppings, prints or visible livestock.

<table>
<thead>
<tr>
<th>None</th>
<th>Cattle</th>
<th>Sheep</th>
<th>Pigs</th>
<th>Horses</th>
<th>Goats</th>
<th>Farmed deer (in a deer-proof enclosure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other/exotic (describe):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q15 Is there any public access infrastructure within the woodland? Tick all that apply.

- Public Rights of Way
- Open access areas
- Public footpath
- Car parks
- Bridleway
- Picnic areas
- Cycle way
- CRoW Access Land
- Public road
- Other open access areas
- Public greenway
- Interpretation/amenity
- Permissive/other access paths
- Information panels/signs
- Forest paths
- Information Centre
- Other permissive paths
- Other amenity buildings
- Off-road motorcycle tracks

Q16 Rate the level of public use. Tick one

| High | Moderate | Low |

Q17 Are any of the following cultural/heritage features present? Tick all that apply.

- Built remains, e.g. buildings, ruins, deserted communities, signs of habitation, industry, burial or fortification
- Traditional landmarks, e.g. memorial stones, boundary stones, milestones, standing stones
- Physical features, e.g. boundary banks, ditches, old stone walls, charcoal hearths
- Plant formations, e.g. parkland, avenues, clumps of trees, species rich hedgerows
- Tree forms, e.g. old coppice stools, distinctive pollards, heritage trees
WOODLAND CONSERVATION CONDITION SURVEY

SECTION 4 – NOTES

Q18 The following box can be used to make notes on the site. The notes can cover:
- Clarifications of things recorded elsewhere on the form
- Additional information on the management, e.g. when it occurred and in which areas
- Threats and opportunities
- Features that are present in the site as a whole but were not recorded in the plots
- The types and permanence of the open space present within the woodland
- The surrounding landscape, including notes on the surrounding woodlands
- Further information on cultural or heritage features present

There is a chance the site was once wood pasture. The stocking density is not high enough to affect regeneration.
Much of the surrounding woodland is Forestry Commission Crown land, but is on steep slopes and most likely not very accessible.
Allow extra survey time due to steep slope part of a nurse or clear block of forestry land.

SECTION 5 – WOODLAND TYPE (OPTIONAL)

Q19 What BAP type(s) is the woodland?
Use the following codes to record the main and any subsidiary type, recording mosaics of up to three communities with a + symbol and intermediates with a / symbol.

Main type: LW

LBWYE Lowland beech and yew woodland
LMDWO Lowland deciduous woodland
UMASH Upland mixed ashwood
UOAKW Upland oakwood
WWOOD Wet woodland

Subsidiary type: UMASH

Q20 What NVC type(s) is the woodland?
Record the main and any subsidiary type, recording mosaics of up to three communities with a + symbol and intermediates with a / symbol.

Main type: W3

Subsidiary type: W9

NOTES ON COMPLETING THE WHOLE SITE AND PLOT RECORDING FORMS

Percentage cover values can be estimated absolute values, recorded to the nearest 5% as a minimum precision.

The numbered notes below are included as quick reminders. Please see the survey handbook for the full methodology.
1. Destruction includes any permanent loss of woodland due to land use change in an area of 0.5 ha or 5% of the woodland area (whichever is smaller). It does not include events from which the woodland could regenerate.
2. Open space includes areas 0.01 ha (10 m x 10 m) to 0.25 ha (50 m x 50 m) and at least 10 m wide that have less than 20% wooded cover.
3. See the survey handbook for further information on this question.
4. The primary habitat data is the BAP type, which is supported by the NVC community recorded. Standard NVC codes should be recorded. It is not necessary to record NVC sub-communities, though in some instances this may be beneficial when a community can fall within two BAP habitats.
5. Where a plot contains a smaller tree size class that includes both native and non-native tree species put a tick in both of the relevant boxes. See survey handbook for descriptions of the size classes and lists of native species. Perimeter measurements and hugs are made at 1.5 m up the tree trunk and on the uphill side of any slope.
6. See survey handbook for instructions on how assess canopy and understorey cover.
7. Understorey plants are usually, but not always, woody species 1-5 m tall and often branching abundantly from the base.
8. This section is used to assess the impact of grazing (herbivore feeding on ground plants) and browsing (herbivore feeding on trees and shrubs).
9. This does not include bare ground caused by trampling where the soil surface is flat and smooth.
10. Where the lower branches that are within reach of browsing animals have been stripped of leaves and twigs.
11. Bark stripping at heights over 2 m is unlikely to have been made by browsing animals and should not be recorded.
12. Estimate the cover of grass and moss together. Do not estimate the cover of grass and moss separately and then add the two together, as they may overlap where moss is beneath grass.
13. See survey handbook for a list of invasive non-native species.
14. Ground flora groups should cover at least 5% of the 3 m plot to qualify. Very small amounts should be ignored. See the survey manual for definitions of the species group types.
### Woodland Conservation Condition Survey

**10 m radius plot recording**

Do not write outside of the grey areas

---

#### SECTION 6 – Woodland Structure

**Q21** Please record the tree size structure present.⁵ Tick all that apply.

<table>
<thead>
<tr>
<th>Trees with a trunk girth greater than 22 cm:</th>
<th>Trees with a trunk girth less than 22 cm:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mature &gt;225 cm perimeter or &gt;1.5 hugs</td>
<td>Native species</td>
</tr>
<tr>
<td>Mature 150-225 cm perimeter or 1-1.5 hugs</td>
<td></td>
</tr>
<tr>
<td>Mature 75-150 cm perimeter or 0.5-1 hugs</td>
<td></td>
</tr>
<tr>
<td>Pole 22-75 cm perimeter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saplings &gt;100 cm tall</td>
</tr>
<tr>
<td></td>
<td>Seedlings 10-100 cm tall</td>
</tr>
<tr>
<td></td>
<td>Seedlings &lt;10 cm tall</td>
</tr>
<tr>
<td></td>
<td>Suckers</td>
</tr>
<tr>
<td></td>
<td>Coppice stool with regrowth &gt;100 cm tall</td>
</tr>
<tr>
<td></td>
<td>Coppice stool with regrowth &lt;100 cm tall</td>
</tr>
<tr>
<td></td>
<td>New planting</td>
</tr>
</tbody>
</table>

**Q22** What is the canopy cover⁶ of native and non-native species (%)?

<table>
<thead>
<tr>
<th>Native species</th>
<th>% of the plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-native species</td>
<td>% of the plot</td>
</tr>
</tbody>
</table>

**Q23** Is an understorey⁷ present?

- Yes [ ] Answer question 24.
- No [ ] Go to question 25.

**Q24** What is the understorey cover⁸ of native and non-native species (%)?

<table>
<thead>
<tr>
<th>Native species</th>
<th>% of the plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-native species</td>
<td>% of the plot</td>
</tr>
</tbody>
</table>

#### SECTION 7 – Veteran Trees and Deadwood

**Q25** How many veteran trees are present?⁹

- Veteran trees [ ]

**Q26** How many quarters of the plot contain the following?³³

- Standing or aerial deadwood [ ]
- Lying deadwood [ ]
- Tree stumps [ ]

#### SECTION 8 – Grazing and Browsing

**Q27** Do the following apply?

- More than 20% of the ground is clearly disturbed due to animal trampling (poaching).¹⁰ Tick one.
- There is a clearly visible browse line.¹¹ Tick one.
- Bark below 2 m has been stripped from more than 10% of the trees and shrubs.¹² Tick one.
- It is an unstable slope of loose scree or boulders. Tick one.

**Q28** Are there either of the following? Tick one.

- New shoots at the base, or on the trunk or on the lower branches of trees and taller shrubs, or
- Any shrubs with branches less than 2 m high.

**Q29** Is there evidence of browsing to the shoots or low shrubs? Tick one.

**Q30** What percentage is covered by grass and moss?¹²

**Q31** What is the average height of the ground flora plants, ignoring bare areas?
WOODLAND CONSERVATION CONDITION SURVEY

10 m RADIUS PLOT RECORDING

SECTION 9 – SPECIES COMPOSITION

Q32 Are any of the following woody species present? Tick all that apply.

- Alder
- Birch
- Aspen
- Cherry
- Beech
- Dogwood
- Ash
- Blackthorn
- Elder
- Field maple
- Guelder rose
- Hawthorn
- Hazel
- Hornbeam
- Conifers (excluding yew)
- Lime
- Oak
- Rowan
- Spindle
- Sycamore
- Whitebeam
- Willow
- Yew

Q33 Are any invasive non-native ground flora species present? Tick one.

- Ground flora vegetation
- Moss
- Leaf litter
- Deadwood
- Bare ground
- Other

Q34 What percentage is covered by the following?

- Ground flora vegetation
- Moss
- Leaf litter
- Deadwood
- Bare ground
- Other

Total = 100%

3 m RADIUS PLOT RECORDING

SECTION 10 – GROUND FLORA SPECIES COMPOSITION

Q35 Are any of the following ground flora groups abundant or characteristic? Tick all that apply.

- Ferns (excluding bracken)
- Tussocky grasses
- Other grasses
- Reeds
- Rushes
- Sedges

Q36 Are any of the following ground flora plants present? Tick all that apply.

- Bedstraw
- Enchanter’s nightshade
- Lesser celandine
- Red campion
- Wild angelica
- Bilberry
- Golden-saxifrage
- Marsh marigold
- Sanicle
- Wild arum
- Bittersweet
- Greater stitchwort
- Meadow sweet
- Speedwell
- Wood anemone
- Bluebell
- Gypsywort
- Mint
- Sphagnum
- Wood avens
- Bramble
- Heather
- Nettle
- Thistle
- Wood crane’s-bill
- Cuckooflower
- Hemp agrimony
- Pignut
- Tormentil
- Wood sage
- Red/black currant
- Herb Robert
- Primrose
- Violet
- Wood sorrel
- Dog’s mercury
- Honeysuckle
- Ramsons
- Water avens
- Yellow iris
- Yellow pimpernel

PLOT NOTES

Q37 The following box can be used to make notes about the plot.
Appendix B  Woodland condition survey Risk Assessment

Introduction

All surveyors, whether volunteer, contractor or employee, have a responsibility for their own health and safety and they also have a ‘duty of care’ to any other persons they may encounter whilst carrying out the survey, including members of the public.

The risk assessment below is provided as a guide to assist surveyors to assess and mitigate the effects of any hazards they may encounter whilst surveying. The risk assessment is not exhaustive and surveyors are responsible for identifying and dealing with any hazards that have not been included. They are also responsible for the interpretation of the risk assessment in the context of the prevailing circumstances in their survey areas. The assessment indicates that any risks posed by the identified hazards may be mitigated by adherence to the guidance provided. A copy of the risk assessment and the associated guidance is provided below.

General advice

- Always let someone know where you are going and when you expect to return.
- Take a mobile phone and a whistle with you.
- Plan escape routes – particularly if you are working in a remote area.
- Always wear clothing and footwear appropriate to the terrain, the weather and the season.
- Take spare clothing and an emergency blanket/survival blanket.
- Ensure that you have sufficient food and water – including a small reserve in case of emergencies.
- Always carry a small first-aid kit.
- Obtain an up-to-date weather forecast before setting out.
- Remember that the weather can change quickly.
- Beware of domestic and farm animals.
- Take care when approaching or walking along the highway – especially trunk and other A roads – wear an appropriate high visibility jacket.
- Park carefully, so as not to cause a hazard.
- Avoid confrontation.

Risk Assessment

<table>
<thead>
<tr>
<th>Hazard Title</th>
<th>Ref</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>H1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Farm Animals</td>
<td>H2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Insects</td>
<td>H3</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Rats</td>
<td>H4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Snakes</td>
<td>H5</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Ticks</td>
<td>H6</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Wild Animals</td>
<td>H7</td>
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<td>3</td>
<td>6</td>
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<td>Electric Fences</td>
<td>H8</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Ground Conditions</td>
<td>H9</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>12</td>
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<td>Wet woodland</td>
<td>H10</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>10</td>
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<td>Steep slope</td>
<td>H11</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>12</td>
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<tr>
<td>Hedges, fences, walls, gates and stiles</td>
<td>H12</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>11</td>
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<tr>
<td>Quarries, mines and mineral waste tips</td>
<td>H13</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Septic tanks and slurry pits</td>
<td>H14</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Hazard Title</td>
<td>Ref</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>Risk Rating</td>
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<tr>
<td>Water</td>
<td>H15</td>
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<td>2</td>
<td>5</td>
<td>10</td>
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<tr>
<td>Agricultural Machinery</td>
<td>H16</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>10</td>
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<tr>
<td>Encountering vehicles</td>
<td>H17</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>12</td>
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<tr>
<td>People</td>
<td>H18</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>11</td>
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<tr>
<td>Fly-tipping of refuse, toxic materials and “sharps”</td>
<td>H19</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Crops</td>
<td>H20</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Irritant and dangerous plants</td>
<td>H21</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Pollen and dust</td>
<td>H22</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>9</td>
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<tr>
<td>Dense fogs and mists</td>
<td>H23</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Hot sun, extreme heat and high humidity</td>
<td>H24</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Lightning</td>
<td>H25</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Heavy rain</td>
<td>H26</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>11</td>
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<tr>
<td>Strong winds</td>
<td>H27</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>10</td>
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<tr>
<td>Cliffs</td>
<td>H28</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Risk Rating: 1 to 7 - No specific measures. 8 to 12 - Advise/instruct project manager as required. 13 to 15 - Significant risk mitigation measures required.

**Risk Assessment key**

**A.** The likely frequency of exposure to each hazard, should be assessed against this scale.

<table>
<thead>
<tr>
<th>1</th>
<th>Very infrequent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Infrequent</td>
</tr>
<tr>
<td>3</td>
<td>Frequent</td>
</tr>
<tr>
<td>4</td>
<td>Very Frequent</td>
</tr>
<tr>
<td>5</td>
<td>Constant</td>
</tr>
</tbody>
</table>

**B.** The likelihood of the potential danger becoming a reality, should be assessed against this scale.

<table>
<thead>
<tr>
<th>1</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Low possibility</td>
</tr>
<tr>
<td>3</td>
<td>Possible</td>
</tr>
<tr>
<td>4</td>
<td>Probable</td>
</tr>
<tr>
<td>5</td>
<td>Near certainty</td>
</tr>
</tbody>
</table>

**C.** The most serious likely consequence of the potential danger becoming a reality, should be assessed against this scale.

<table>
<thead>
<tr>
<th>1</th>
<th>Minor injury or illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Injury requiring medical attention</td>
</tr>
<tr>
<td>3</td>
<td>Injury or illness resulting in absence in excess of 3 days</td>
</tr>
<tr>
<td>4</td>
<td>Serious injury or long-term sickness</td>
</tr>
<tr>
<td>5</td>
<td>Fatal</td>
</tr>
</tbody>
</table>

A + B + C will give a risk rating – the higher risks having the higher rating numbers. Where necessary to prepare safe working practices, or to devote resources to measures to reduce the likelihood or seriousness of the effects of the risk, higher rated risks should take priority.

**Hazards**

**Dogs**

Dogs will generally be in the control of their keepers and it is unlikely that they will attack an adult under these circumstances but an unaccompanied dog should be treated with suspicion. Dog bites and scratches can cause infection. Dog attacks should be reported to the police, even where the owner cannot be identified.

Measures to reduce the risk:

- Wear appropriate clothing for walking in the countryside and keep a sharp lookout for loose dogs.
• Carry an ultra-sound dog deterrent such as a “dog dazer”.
• Avoid physical contact with all animals.

Measures to reduce the effect:
• Seek medical attention as soon as possible after being bitten or scratched.

Farm animals
There are a number of indigenous farm animals that may be found in the countryside. They are likely to be encountered in fields and farmyards and occasionally on linking roads on the approaches to woodland. Cattle, sheep and horses are the most common animals likely to be encountered, but goats, pigs, chickens, geese and other fowl will also be seen.

Few farm animals are likely to hold their ground at the approach of humans but caution should always be exercised as the behaviour of all animals is unpredictable, particularly when they are accompanied by their young.

Extreme caution is necessary in respect of bulls, stallions, boars and rams. Increasingly, non-indigenous species are being introduced into the countryside including ostriches and llama, these animals are likely to be in special enclosures but they are particularly unpredictable and they should always be regarded as being potentially dangerous.

Measures to reduce the risk:
• Check with landowners for any hazards on the approach to the woodland.
• If contact is unavoidable, avoid sudden moves and do not place yourself between a female animal and its young. Do not run or show signs of fear. Leave the animal enclosure as quickly as possible, without running.

Measures to reduce the effect:
• Seek immediate medical attention for any injuries.

Insects
Some of the very many insects indigenous to the United Kingdom are harmful to health. The stings of wasps, bees and hornets may cause an allergic reaction, which, if untreated, can cause death, in rare cases. Mosquito, midge and horse-fly bites can also result in allergic reactions, leading to irritation and discomfort. (Also see Ticks.)

Measures to reduce the risk:
• Wear long trousers (tucked into socks) and long sleeved top, to cover arms and legs.
• Take care not to disturb hives or nests and keep well clear of swarming bees.
• Use insect repellent at all times and in areas where insects are known to be active, particularly if you suffer severe reaction to insect bites or stings.

Measures to reduce the effect:
• Seek medical attention in cases of severe reaction.
• Carry antidote for any known, personal allergy.

Rats
Rats fall within the wild animals category but they are dealt with separately because they carry Weil’s Disease (Leptospirosis). This is a serious, infectious disease which can be spread to humans through water contaminated by infected animals, particularly rats and can occur after immersion of any part of the body in infected water.
Measures to reduce the risk:
- In the right conditions the Leptospirosis bacteria can survive for a number of days after leaving the host animal and it has the potential to infect during that period.
- Avoid contact with potentially infected water, such as ponds, ditches, rivers and streams. Alter the route around the site rather than attempting to cross a potentially hazardous water feature.
- After contact with water that may be infected, or with contaminated boots or clothing, wash affected parts of the body thoroughly with soap and water, paying particular attention to fingernails. Do not eat until you have thoroughly cleaned your hands and arms.
- Wet clothing and footwear should be thoroughly cleaned as soon as possible after use.

Measures to reduce the effect:
- If you suffer from symptoms similar to influenza (headache, fever and muscle pain; may also be mistaken for pneumonia, tonsillitis or rheumatic fever) or have other reason to suspect that you may have become infected, seek immediate medical attention and inform the doctor that you may have been in contact with contaminated rats or their excrement.

Snakes
Adders are the only indigenous, poisonous snakes in the United Kingdom. They are most likely to be encountered basking on warm lowland heaths, including coastal slopes, and so are mostly likely to be encountered when walking to woodland survey sites. They are retiring animals and it is unlikely that they will hold their ground at the approach of humans. The bite of an adder is poisonous and medical attention should be quickly sought, but only young children are at serious risk. Healthy adults may suffer but they should survive.

The risk is slightly greater earlier in the year when snakes are more likely to be encountered ‘sun-bathing’ and will be more sluggish.

Measures to reduce the risk:
- Wear stout boots (with ankle protection) and gaiters to protect lower legs.
- Keep a sharp lookout, especially in the circumstances described in the notes above, to avoid stepping on or disturbing an adder.

Measures to reduce the effect:
- Seek immediate medical attention.

Ticks
Ticks present a special hazard in the countryside since they may carry Lyme Disease. They are tiny spider-like creatures that live in woodland, moorland and grassy areas. Ticks cling to the ends of vegetation and attach themselves to passing animals and humans. Having attached to the clothing of a human being, it may be some time before the tick makes contact with the host’s skin and makes the bite that may transmit the disease. Unlike spiders, ticks press themselves close to the skin of the host as they crawl.

Lyme Disease is a bacterial infection which can affect the skin and occasionally cause serious illness of the nervous system, joints or heart, the disease may first show itself between three and thirty days after infection, as an expanding, reddish, round rash in the area of the bite. Early symptoms may resemble influenza with swollen glands near the bite, mild headaches, aching joints and tiredness.
Measures to reduce the risk:
- Wear long trousers (tucked into socks) and long sleeved top, to cover arms and legs. Ticks can be seen more easily on light coloured clothes.
- When working in tick infested areas inspect body for ticks every few hours and if possible, at the end of the day’s outdoor activity, undress and inspect body for ticks.
- Remove ticks by grasping them close to the skin with fine tweezers. Current CDC recommendations are not to twist the tick whilst pulling them out, instead pull them straight out with a slow and steady motion. Then clean your skin with soap and warm water.
- When removing, avoid crushing the tick’s body. Do not be alarmed if the tick’s mouthparts remain in the skin. Once the mouthparts are removed from the rest of the tick, it can no longer transmit the Lyme disease bacteria. If you accidentally crush the tick, clean your skin with soap and warm water or alcohol.

Measures to reduce the effect:
- Save any removed ticks in a jar, for later analysis if symptoms occur.
- See immediate medical advice if symptoms occur.

Wild animals

There are many indigenous wild animals to be found in the countryside but they are most relatively small mammals and they pose no direct threat to humans. Most are retiring animals and it is unlikely that they will hold their ground when approached. They can, however, carry diseases and any bite or contact with their excrement could cause infection. Injured animals, no matter how small, should be treated with extreme caution.

Measures to reduce the risk:
- Keep a sharp lookout for animal movements. Avoid contact with animals and their excrement. Do not disturb their dens or interfere with their young.

Measures to reduce the effect:
- Seek medical attention for any serious injury. Keep inoculations up-to-date.

Electric fences

Electric fences are very commonly used as temporary barriers to control short-term grazing. They are being increasingly used as semi-permanent barriers, to control stock movements. They may be composed of one or more strands of thin wire or sometimes a wire mesh usually to control sheep. Whether the electricity is supplied from a battery or from the mains, a healthy adult, whilst feeling an unpleasant sensation and short-term pain, will not suffer any lasting ill-effects.

Measures to reduce the risk:
- Always assume that electric fences are “live”.
- Avoid contact. Close proximity can result in a shock in damp conditions.

Measures to reduce the effect:
- Treatment will not normally be required.

Ground conditions

Poor ground conditions are an ever-present feature of the countryside. Such conditions include deep ruts caused by vehicles, animals and water run-off, boulders, large stones and other debris on or near the surface, puddles and other small areas of standing water, soft ground
and boggy areas, unstable soil structures, including thioxtropic mud, quicksand and thick weed growth.

Measures to reduce the risk:
- Avoid dangerous areas and choose the safest possible routes over ground that is in a poor condition.
- Wear strong boots with good ankle support and well-treaded soles.
- Wear appropriate protective clothing.

Measures to reduce the effect:
- Seek medical treatment for any serious cuts, bruises or strains.
- See also Rats – in relation to immersion in water that may be contaminated.

Wet woodland
Wet woodland is likely to be encountered during this survey and presents particular risks given that the survey requires all parts of the woodland to be surveyed. In particular, the route through the woodland may take the surveyor through boggy and/or swampy ground conditions.

Measures to reduce the risk:
- Make an assessment of the route and completely avoid potentially dangerous areas. Alter the route through the woodland and stop locations as necessary. Do not take risks.
- Choose the safest possible routes over ground that is in a poor condition.
- Wear suitable footwear, such as walking boots with gaiters, Wellingtons, or waders in very wet woodland.

Measures to reduce the effect:
- Always ensure that your mobile phone and whistle are readily accessible in case of an emergency.
- See also Rats – in relation to immersion in water that may be contaminated.

Steep slope
Many woodlands are on steep valley slopes, as these are areas that could not be cultivated. The steepness of these slopes makes woodland dangerous, especially in wet or slippery conditions. Though the route has been planned to take account of contours, the actual steepness of the slope cannot be adequately assessed in the office due to inaccuracies in the contour data and small scale variations. Slopes that would present no issues in dry conditions may become very dangerous when wet.

Measures to reduce the risk:
- Make an assessment of the route and completely avoid potentially dangerous areas. Alter the route through the woodland as necessary.
- If the slope starts to feel unsafe, stop and return to take a safer route through the woodland, even if this means potentially missing a part of the woodland. Place stops at appropriate places along the new route.
- Wear suitable footwear.

Measures to reduce the effect:
- Always ensure that your mobile phone and whistle are readily accessible in case of an emergency.
- Avoidance is the most sensible way to mitigate for this danger.
**Hedges, fences, walls, gates and stiles**

These features are all very common in the countryside and generally speaking, provided that they are in a reasonable state of repair, they should not pose a danger.

**Measures to reduce the risk:**
- Take care when climbing stiles, particularly in wet conditions.
- Take care when opening or closing gates, particularly when the gate is in a poor state of repair or is badly hung.
- Avoid climbing walls – always use gaps, stiles or gates.
- Take care when walking along paths that are bounded by vegetation or where barbed wire has been used in a fence.

**Measures to reduce the effect:**
- Wear stout boots with firm ankle support and appropriate protective clothing.
- Seek medical attention for any serious injuries.
- Keep anti-tetanus injections up-to-date.

**Quarries, mines and mineral waste tips**

Active quarries, mines and mineral waste tips are potentially very dangerous places. They give rise to a large number of different hazards, including uneven and unstable ground conditions, heavy machinery and plant, steep rock faces and falling debris. In addition there are potential dangers associated with blasting, dust inhalation, noise, chemicals and hot materials such as bitumen.

Generally speaking, such sites will not be an issue during this survey. However, woodlands may be on or around inactive, or adjacent to active, quarries, mines or mineral waste tips, in which case the risk may apply.

**Measures to reduce the risk:**
- Wear high visibility clothing, safety hat and safety footwear if appropriate.
- Inform Quarry/Mine Manager of your presence on site if appropriate.
- Keep well clear of all vehicles, plant and machinery.
- Keep well clear of quarry faces, excavations, lagoons and other areas where mining/quarrying operations are taking place.
- Wear face mask if it is necessary to enter an area where dust is present in the air.

**Measures to reduce the effect:**
- Seek immediate medical attention for injuries or when material volumes of dust or fumes have been inhaled.

**Septic tanks and slurry pits**

Septic tanks are frequently used for sewage disposal for residential developments in rural areas and slurry pits are common place in the vicinity of farm buildings. These are mostly likely to be encountered when walking to the woodland site.

**Measures to reduce the risk:**
- Septic tanks are generally enclosed vessels and should not pose a risk. Avoid slurry pits and associated run-off.

**Measures to reduce the effect:**
- Wash hands thoroughly, before eating.
• Also see Rats – in relation to immersion in water which may be contaminated.

**Water**
Bodies of water can range from natural ponds and lakes containing relatively clear water of varying depth, to active silt lagoons containing murky water with a bottom of deep silt and with steep, muddy banks.

**Measures to reduce the risk:**
- Avoid banks that appear to be unstable.
- Alter the route around the site rather than attempting to cross a potentially hazardous pond, ditch, river or stream.
- Avoid hazardous situations and locations.

**Measures to reduce the effect:**
- Ensure warm dry clothes are available in case of accidental immersion in water.
- Also see Rats – in relation to immersion in water which may be contaminated.

**Agricultural machinery**
Although designed to comply with strict health and safety requirements, agricultural machinery is inherently dangerous because of the operations it is designed to carry out. Machinery is usually heavy and cumbersome, particularly since it is usually towed by a tractor and operated in conditions where its operators do not expect to encounter members of the public. Agricultural machinery is most likely to be encountered whilst walking to a survey site.

**Measures to reduce the risk:**
- Good observation, keep a sharp lookout at all times.
- Be aware of any spraying operations that may be in progress.
- Recognise areas where machinery may be operating and machinery that may start automatically.
- Keep well clear of all machinery, but if you do need to approach, ensure that the operator is aware of your presence before proceeding.

**Measures to reduce the effect:**
- Seek immediate medical attention for any injury or the inhalation of chemicals.

**Vehicles**
Vehicles are most likely to be encountered whilst travelling to a woodland survey site. Apart from normal road vehicles whilst driving to the site, the most common encounters will be with farm tractors and off-road vehicles used by farmers. There may also be encounters with recreational four-wheel drive and other off-road vehicles, including motorcycles and pedal cycles. There is also the possibility of encountering trains at level crossings over railways.

The most frequent contact with vehicles is likely on all-vehicle highways. Encounters with tractors and farm vehicles are also likely to be frequent. Recreational vehicles will generally be encountered less frequently, but there are high levels of recreational use in some areas of the countryside. Where recreational vehicles are most likely to occur there will often be visible signs, such as deeply rutted tracks, etc.

**Measures to reduce the risk:**
- Keep a careful lookout in areas where encounters are likely – road junctions, on byways, farm accesses and farm tracks, railway and airstrip crossings.
- Wear high visibility clothing as appropriate.
Measures to reduce the effect:
- Obtain immediate medical treatment for any injuries.

**People**
A few landowners are, to a greater or lesser extent, hostile to access to their land and ecological survey, which they often perceive as affecting their privacy and threatening the security of their buildings, land, crops, animals and livelihood.

Permission has been obtained for all woodland sites included in this survey, though there is still a small possibility of meeting with hostility that can occasionally escalate into violent action. In particular, it is worth remembering that some woodland have multiple owners, though it may not always be possible to know this and obtain survey consent for the whole site.

As this woodland survey is generally carried out alone and sometimes in remote areas of the countryside, there is also a risk of assaults of all descriptions, by less stable members of the community.

All assaults or threatening behaviour should be reported to the police.

Measures to reduce the risk:
- Tact and situation avoidance.

Measures to reduce the effect:
- The availability of a mobile telephone to summon help in the case of an actual assault or an indication that an assault may be threatened.
- Seek medical attention following injury resulting from physical assault.

**Fly-tipping of refuse, toxic materials and ‘sharps’**
In recent years, fly-tipping has become a growing problem. Increased charges at licensed disposal sites, strict controls on the disposal of certain types of waste and in some cases the distance which must be travelled to authorised, domestic waste disposal facilities have all encouraged the irresponsible, illegal and clandestine tipping of waste in the countryside. Refuse may include some hazardous materials, such as metal, glass, chemicals and medical waste, including discarded syringes. This is likely to be a particular problem where woodland entrances meet secluded roads.

Measures to reduce the risk:
- Wear stout boots and gaiters.
- Do not disturb waste – inform the local authority responsible for environmental cleansing or the Environment Agency of the existence of the refuse.

Measures to reduce the effect:
- Seek immediate medical attention for any cuts or following the inhalation of toxic fumes.
- Also see Rats – in relation to immersion in water which may be contaminated.

**Crops**
Probably the main hazard associated with crops is the use of chemicals to control weeds and pests. The dust and pollens present with the crops at certain seasons can also constitute a hazard. These hazards are mostly likely to be encountered when walking to the woodland site.
Measures to reduce the risk:
- Thorough knowledge of the types of chemicals used in the countryside, their effect and the first aid measures to be used in the event of contamination.
- Avoid any area being treated with pesticides or insecticides and for at least 24 hours after the application.
- Check with landowners for any hazards on the approach to the woodland.
- See Pollen and dust.

Measures to reduce the effect:
- Seek immediate medical attention in the event of exposure to pesticides or insecticides.
- See Pollen and dust.

Irritant and dangerous plants

Plant hazards vary considerably from skin irritation caused by contact with stinging nettles and plants such as giant hogweed, to the serious, possibly fatal consequences of ingesting parts of plants such as hemlock and deadly nightshade.

Measures to reduce the risk:
- It is expected that all surveyors will be able to identify and avoid dangerous plants.
- Avoid ingesting any plant parts.
- Wear long trousers, long sleeved top and stout boots and gaiters when working or walking in dense vegetation.

Measures to reduce the effect:
- Seek medical attention for any unusual or suspicious symptoms after contact with vegetation.
- Also see Pollen and dust.

Pollen and dust

Pollens and dust can set off attacks of hay fever or other reactions in anyone who is allergic to any of the elements present in the dust or pollen.

These are seasonal hazards with peaks during dry conditions in spring, when tree pollen is common, and in summer, when grass pollens are prevalent in the atmosphere.

Measures to reduce the risk:
- Avoiding the irritant can solve the problem but this is not always possible.
- Sensitive individuals should check pollen forecasts and consider cancelling or re-arranging outdoor work if appropriate and possible.

Measures to reduce the effect
- Seek medical advice regarding antihistamine treatments.

Dense fog and mists

Increased vulnerability, predominantly in upland and coastal areas. This is unlikely to be a big problem during woodland survey.

Measures to reduce the risk:
- Take into account any extreme weather conditions or forecasts.
- Regular training and re-training in map reading skills and use of compass.
Measures to reduce the effect:
- Wear clothing appropriate to seasonal weather conditions.
- Availability of a mobile telephone to summon help.
- Carry emergency equipment (whistle, food, waterproofs).

**Hot sun, extreme heat and high humidity**

Prolonged exposure to ultraviolet rays from the sun, even through a light cloud cover, can cause sunburn. High temperatures and high humidity can result in heat exhaustion. Woodland shade may only provide limited protection from these factors.

Measures to reduce the risk:
- Adjust work programme to suit extreme weather conditions.
- Avoid strenuous activity in conditions of high humidity.
- Carry plentiful supplies of water and drink frequency.
- Dress for the conditions i.e. light clothing, protecting body, arms and legs from UV rays, sunglasses.
- Use barrier cream on exposed areas of skin.

Measures to reduce the effect:
- Rest and reduce body temperature
- Obtain medical attention if required.

**Lightning**

Many areas of the country are prone to isolated, local thunderstorms, particularly following spells of hot weather.

Working in woodlands is particularly risky during thunderstorms, as lightning can boil tree sap, causing struck trees to explode and sending projectiles that could injure or kill anyone nearby. The high current from lightning can also travel along ground radially away from the tree and cause lethal shocks. Lightning may also jump from the tree being struck to the person taking shelter there.

Measures to reduce the risk:
- Postpone survey in thunderstorms, taking shelter in a car or building.
- Be alert for approaching storms and seek shelter away from trees before they arrive.
- Avoid using radios/mobile telephones during thunderstorms.
- Be aware of weather forecasts and the conditions that can give rise to thunder storms.
- Avoid using any metal tools or equipment during a thunderstorm.

Measures to reduce the effect:
- Seek immediate first-aid followed by urgent medical attention.

**Heavy rain**

Exposure to heavy rain can increase the risks and the adverse effects of other hazards, particularly those arising from extreme cold, strong winds and adverse ground conditions.

Measures to reduce the risk:
- Take into account extreme weather conditions.
- Dress for the conditions, i.e. warm, waterproof and wind-proof clothing and well-treaded, waterproof boots.

Measures to reduce the effect:
• Seek shelter and if necessary wait for rain to abate.

**Strong winds**

Strong winds can be particularly hazardous in high, exposed areas, particularly in woodland areas where trees may be toppled and branches may fall and also near coasts. Materials may be blown from buildings, particularly derelict buildings.

Strong winds can also increase the risk and the adverse effects of other hazards.

Measures to reduce the risk:

• Take into account extreme weather conditions. Avoid vulnerable areas.

Measures to reduce the effect:

• Wear appropriate weatherproof and safety clothing, including safety helmet.

**Cliffs**

Working both above and below cliffs can present a hazard. Cliffs edges may be hidden, especially in woodland, increasing the risk of falls. Cliff edges are also often unstable, so the risk of a fall is present even when the drop can be avoided. When working beneath cliffs there is a particular risk of falling material and landslides.

Measures to reduce the risk:

• Avoid working near cliffs.
• Be vigilant for cliff edges. If working in an area where cliffs are likely do not rush.

Measures to reduce the effect:

• Wear appropriate safety clothing if necessary, including safety helmet.

**Lone Working Procedure**

When working alone surveyors should have and implement a lone working plan that will ensure that a nominated contact(s) will be aware if they do not make a safe and timely return from each day’s surveying. Surveyors must also have the ability to raise an alarm / seek assistance from the field in so far as mobile phone coverage will allow.

Before starting a day’s survey the surveyor should ensure that an appropriate person is aware of:

• The broad area that the surveyor will be visiting that day.
• The expected time of return.
• The procedure to follow if the surveyor does not return or otherwise make contact by the expected time of return.