**Introduction**

As a starting point, even if you already know the area well, you should carry out a rapid but thorough reconnaissance visit / walk-over survey to your study area. This will help to set the study area and any features you find there into context and can be done before any documentary research. The aim of this initial walk-over reconnaissance is to acquire an overview of your study area: its geology, topography, ecology and most obvious historic features, so do not spend too long examining any individual tree or other historic feature. A walk-over survey form can be completed and you can take photographs or make a few sketches on your map or in your notebook. This basic information will help you to structure any more detailed surveys.

A survey of a large area with multiple features/ different landforms can seem daunting so break the area down systematically into smaller, more manageable chunks, and agree a suitable timetable. If compartments already exist then it may be more meaningful if your surveys match these. It is recommended that a general survey (Level 1) of the whole area is carried out before a very detailed survey of a small area is carried out. This overview can then guide the more detailed work without possibly overlooking a unique feature.

For all surveys make a note of the following as a minimum: the date of the survey; who carried out the survey; where the survey was carried out (provide map references or GPS reference points where possible); and features found. Take pictures of or draft a sketch showing the dimensions and location of any important features.

An appropriate map and the skills to locate and record features onto a base map, is key to undertaking survey work. The 1:2,500 scale (1mm on the map = 2.5m on the ground) map is recommended for the general survey. It will have fixed point features already mapped which you can check they still exist and then use them as reference points for your more detailed mapping and to orientate yourself.

**How to Record Features onto a Background Map (Level 1 Survey)**

Using the survey form, note the surrounding land use, aspect/slope and any distinctive features of the study area as background information. If you are able to, walk around the boundary or if not, follow all the major footpaths and note down any distinctive features you can see from them. The sort of features you are looking for include, a ditch or bank; a fence or wall; any large, tightly clustered or mishapen trees or shrubs; any square, oblong, oval platforms; any round, oval or oblong hollows or pits; any entrances or gateways; and tracks or paths; any streams or other watercourses; distinct patches of ground flora; changes in vegetation and any standing building / structural remains.

Features are divided into three categories (point, linear and polygon) for mapping purposes.

**Point features** are those which are too small to usefully define their perimeters and which can be depicted as a single point on a map. Examples of these are a single tree, boundary stone or small hollow or pit. In practice it will be up to you to decide when it is worth recording a structural feature’s extent in more detail at a later stage. For example, recording inscriptions on boundary stones. See page 21 for recording worked and veteran trees. As a general rule, it is appropriate to record any feature smaller than 10m by 10m as a point feature.

**Linear features** are those which are long and narrow where their course can be defined as a line. Boundaries and tracks should always be recorded as linear features, even if only short lengths survive intermittently, in order to give a clear indication of their direction. A linear feature is recorded by using a sequence of Grid References with a minimum of two points (one at either end) if it is a straight line. For other lines more points are needed, with one at each major angle change, creating a ‘dot-to-dot’ effect. Curving lines are depicted as a series of short straight segments. Some linear features such as watercourses, hedges and the woodland’s boundary should already be shown on modern Ordnance...
Survey maps but note when the map was surveyed and if any recent management work has taken place. Straight linear features which appear on the modern Ordnance Survey maps and still exist on the ground are very useful as ‘fixed points’ for pin-pointing newly discovered features especially in dense woodland.

**Polygon features** are used to depict large features or clusters of similar features that you can group together. They require a sequence of Grid References to define the perimeter of the area they cover. They are recorded in a similar way to linear features except that the last Grid Reference point is identical to the first. Some such as ponds are obvious and may already appear on Ordnance Survey maps others such as old coppice compartments, less so and you may need to think carefully how you define these.

For each feature, you will need to work out a Grid Reference. This is of fundamental importance so that you and other people can locate the feature in the future. Grid references can be derived in several ways.

- Directly from an Ordnance Survey map if the feature has already been mapped.
- From an Ordnance Survey map if you can plot new features onto it using other details shown on the existing map.
- Using a hand-held Global Positioning System (GPS).

There are several low-tech survey techniques, which require only a few cheap items of equipment (tape-measures etc). Even if you have a GPS these more basic techniques may prove useful, for example, to plot angle changes in linear features or polygons. Two of the more useful and straightforward techniques are ‘baseline and off-set survey’ and ‘tape (or pace) and compass survey’. With the ‘baseline and off-set survey’ technique, you establish straight ‘baselines’ in relation to fixed features shown on your Ordnance Survey base map. You can then measure out ‘tape-off’ from the baseline at right angles, or ‘off-set’, to survey new points, whether individual point features or angle changes in linear or polygon features. The baseline is drawn on your recording map and the features plotted onto the map in relation to the baseline. The ‘tape (or pace) and compass survey’ may be the only way of penetrating into the heart of your woodland if there are no fixed reference points in its interior. Using a tape measure is obviously more accurate than pacing, especially on uneven ground or in undergrowth, but it is always slower and sometimes impossible. Here a single fixed reference point is used and new points you want to record are taken from that using a compass bearing in degrees towards the new point you want to record, and either pace or tape out the distance to the new point, keeping your pace length as close as possible to 1m. Write down the bearing and distance and use a 360-degree protractor and scale ruler to plot it onto your Ordnance Survey 1:2,500 background map, ideally straight away. Remember that Magnetic North and Map North (or Grid North) are not exactly the same: the angle of Magnetic North will be shown in the margin of the map sheet (so make a separate photocopy of this part of the sheet if you are planning to use a compass). Repeat this process, either from your original start-point, or starting again at the new point you have established. In this way, you will end up with a zig-zag line possibly with several side branches. It is useful to finish at another fixed reference point so that you can establish the accuracy of your survey.

Details of these techniques are described in more detail in the *Woodland Heritage Manual* and English Heritage’s free guidance publications *With alidade and tape* (2004) and *Understanding archaeological landscapes: a guide to good recording practice* (2007), which are both downloadable from English Heritage’s website.

Note down any features by numbering them in sequence, on your map and survey form or in a notebook with a brief description including a grid reference or GPS location for future reference. This will enable you to assess the data you collect to pinpoint where you will need to carry out more detailed work.
**Introduction**

Having undertaken a reconnaissance or walk-over survey and assessed the data collected you will be in a position to plan further more detailed survey work. This may involve doing a transect survey across the woodland or in a particular part of the woodland where you have identified clusters of features and more detailed mapping of the co- incidence of features is required. More usually, specific features will have been identified from the walk-over survey as worth recording in more detail.

**Transect / Grid Survey**

The technique uses the baseline and off-set method to set out the transects you will carry out across the distinctive features or habitats identified. Two or three 30m tape measures are used. One tape measure acts as the base-line and the other(s), placed at 90° to the first are used to set up transects spaced out at intervals across the feature or area of the woodland. The intervals used will depend on the size of the feature you are surveying.

Whilst this type of survey can be done alone, it is recommended and often easier to work in small teams of two or three people. One person, at the base-line is responsible for plotting distances measured on the squared / graph paper; one walking along the transect recording features and distances; and (if a third person is available) one monitoring the transects - keeping the line straight (90° from the base-line) and spotting features.

**The Transect Survey** can be used to record clusters of features such as old coppice stools or small pits within a polygon area identified from the walk-over survey. Individual sample or specimen records can be made of some of the point features separately. In this case the recording transects would be set at 5m spacings along the base-line. It can be done by one person doing the recording who walks along the length of the tape measure, writes down the features found, the distance from the base-line and plots the points onto squared graph paper. Gradually, you will end up with a 30m x 30m grid plot of all the features found. The survey can then be extended by starting again at the end point of the previous base-line or finished before the 30m end if the area is smaller. At least one of the base-line points should be related back to a grid reference on your base map so that it can be plotted with reference to other features in the woodland. Whilst carrying out this type of survey it is also worth looking at what is growing along the line of the transect and try to identify some of the tree / shrub and ground flora species. These may also indicate past industrial use.
The Plan Survey allows you to record individual surface features (point, linear or polygon) in detail. If the feature is part of a standing structure, it may already have been recorded on your Ordnance Survey map. The grid plan technique can be adapted where you may use one of the edges of the standing structure as the base-line or use further base-lines across the structure. There is also a separate type of survey for worked trees (see page 21). Here the base-line is set up along one edge of the feature and a tape measure placed at right angles across the feature at 0.5m intervals. The overall dimensions of the feature can then be measured by recording distances from the base-line and plotting these onto squared graph paper. The positions of any changes in levels or relevant objects within the feature can also be recorded in a similar way. This will enable you to build up a plan of the surface of the feature.

A Profile Survey is useful if the feature is a hollow, mound, a combination of these or shows a distinct change in levels from the front to the back. Note: if the feature is a hollow, test the depth and stability before going into it. The technique is basically the same as that described above but you will also need either a third tape measure or a ranging pole or can be marked out at intervals. Here a base-line and transect line is set up across the feature as previously described. For a hollow this is at ground level. For a mound, the tape needs to be suspended at the height of the mound tied to canes or poles or held by the survey team. Then using the third measuring device, measurements are taken at intervals along the tape transect vertically downwards to the surface of the ground or feature. The distance between the two surfaces is recorded and plotted on squared graph paper as before. There are standard archaeological symbols, in this case a triangle for denoting whether the change in surface level is a hollow or mound.
Where possible, photographs should be taken of the feature from different perspectives and these related to the plans made. The geographic orientation (North / South etc. should be marked on to the plan for future reference as should the reference number from your walk-over survey.

For all the surveys, it is important to plot the feature(s) whilst you are in the field so that any errors or discrepancies in the distances measured can be seen and corrected on site. This will also enable you to build up a picture of the woodland in a methodical way linking it back to your walk-over survey and any historical or ecological information you may gather.

**Basic Field Equipment**

Listed below are items needed to carry out field-based surveys. Some are optional and you will not need all of these for each survey.

- **Maps**: We recommend that you carry out all your field surveys at a scale of 1:2,500 (1mm on your plan = 2.5m on the ground). This scale will correspond to the largest scale maps produced by the Ordnance Survey.
- **Notebook and Pencil**: Waterproof notebooks can be bought in many outdoor shops and pencils are more effective in damp conditions than pens. Make sure you also take a pencil sharpener and eraser.
- **Ruler for Measuring Distances on the Map**: Preferably with mapping scales including 1:2,500. A set-square may also be useful for plotting points on a map.
- **Tape Measure**: At least one but preferably three: 30m or 50m.
- **Compass and 360-degree protractor**: (If no GPS).
- **Camera**: Preferably digital cameras.
- **Sticks (Bamboo Canes) and Hazard Tape**: To mark features to return to.
- **Torch**: Useful for examining hollow trees and building interiors (if safe to do so).
- **Identification Guides**: For tree, wildlife and vegetation surveys.
- **Hand-held GPS**: Not essential but useful especially now the up-to-date ones work better under woodland canopies.
- **Mobile Phones** (check mobile phone reception) or Two-way radios: For communication if your group splits up, as well as for emergencies.
- **Small First Aid Kit**.