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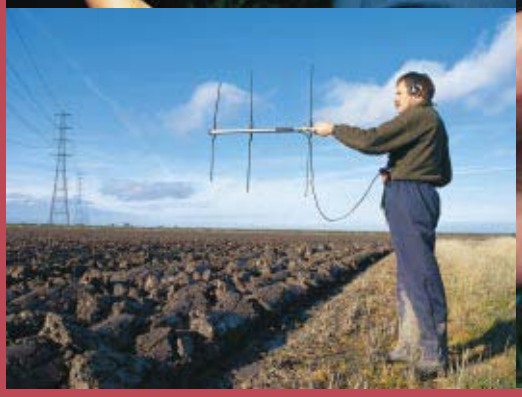
Objective setting and condition monitoring within woodland Sites of Special Scientific Interest

English Nature Research Reports



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Objective setting and condition monitoring within woodland Sites of Special Scientific interest

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Preface

The nature conservation agencies for Northern Ireland, Scotland, Wales and England* agreed, through the Joint Nature Conservation Committee (JNCC), a common approach to setting objectives and assessing the condition of Sites (Areas) of Special Scientific Interest. The Woodland Lead Coordination Network (LCN) was charged by JNCC with producing guidance on objectives and condition assessment for woodland SSSIs under this approach. This document sets out the results of a series of workshops, discussions and drafts across the agencies. It supercedes as far as the LCN is concerned such previous guidance as was circulated in 1999 for Annex 1 habitats in England, and previous versions of this document sent round in April 2000 and 2001.

It will be used as a basis for further training of agency staff and linked to a validation-monitoring programme over the next two years. It will also be subject to systems of quality assurance and quality control. Some of that work has already taken place and other is being developed. Note that because of some minor terminology differences throughout the document SNH staff should read Conservation Objectives as Condition Objectives.

This is a working document aimed at staff in the agencies. We are happy that it should be made more widely available, as long as its status as an internal working document is recognized. It will be being used in conjunction with other guidance and so some issues such as management planning and explaining what the procedures mean for owners are not considered here at all.

Any general comments or feedback should be addressed to the relevant LCN members.

Finally I would like to stress that though this document has been developed by the LCN any errors in it are my responsibility.

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April 2002

**Environment and Heritage Service, Scottish Natural Heritage, Countryside Council for Wales and English Nature*

Contents

1. Introduction

1.1 This report contains guidance, developed by the Woodland Lead Coordination Network (LCN) for the Joint Nature Conservation Committee (JNCC) on setting objectives and condition assessment in woodland Sites (Areas) of Special Scientific Interest (S/ASSIs) as part of the Common Standards Monitoring approach (Box 1) agreed by the agencies (JNCC1998). We were charged with producing a system that was relatively simple and quick, such that it could be applied consistently by local conservation staff, with training, across the full range of woodland S/ASSIs in the UK. The approach we have come up with is based on a structured walk with notes made at ten stops across the site.

1.2 The guidance should be used on all 'woodland habitat sites'; much of the approach is applicable to scrub (excluding montane willow scrub) and wood-pastures, but some further guidance on these and other less conventional woodland structures (such as bog woodland) may be required (Appendix 1). The guidance will need to be used in conjunction with that for other features that may be relevant on a site, particularly species interests. We believe this integration with other interests should be possible by tailoring the targets set under the different attributes, particularly those for woodland structure. Further work is in hand on combining attributes to provide a unified condition assessment table for multiple interest sites.

Box 1. Common standards for monitoring of designated sites (JNCC 1998)

The basic framework of common standards for monitoring covers the following:

- Interest features: these are those features for which the site has been notified.
- Conservation objectives: these are set for interest features to define what constitutes favourable condition for that feature, by describing broad targets which should be met if the feature is to be judged favourable.
- The condition of site features: to be assessed in the following terms:
  - Favourable
  - Unfavourable - recovering
  - Unfavourable - no change
  - Unfavourable - declining
  - Partially destroyed
  - Destroyed.

- Activities and management measures: things affecting the condition of the feature on a site will be recorded.
- Interest features for all statutory sites will be monitored at least once within six years.
- Information on the SSSI/ASSI series will be presented at a GB/UK level by JNCC.

JNCC 1998. *A Statement on Common Standards Monitoring*. Peterborough: Joint Nature Conservation Committee (unpublished report).

1.3 This report gives basic guidance on how objectives for woodland sites should be set and their condition assessed in the field. There are then a series of examples (section 14) and appendices. Condition assessment is only a small part of the whole management planning process. How these objectives are presented to owners, how

the results from condition assessment are used in guiding future management are separate issues that are not discussed here.

1.4 Condition assessment as described here is a critical part of the site monitoring work that the agencies carry out, but it is only one part of that monitoring. It will be complemented on some sites by other types of surveillance, including permanent plot and transect recording, detailed species recording, management compliance checks etc. This report is only about the basic condition assessment process.

Condition/conservation objectives

1.5 The agencies are concerned to maintain or restore the features of interest on woodland S/ASSIs to favourable condition as defined in terms of the conservation objectives for those features on that site. The objectives are therefore used in two ways: first as a basis for monitoring - how does the state of the relevant feature as assessed on a monitoring visit match against the state defined in the objectives. Depending on the outcome so that feature is put into one or other condition classes (Box 1).

1.6 Conservation objectives are also used as part of the process for deciding whether proposals for changes to the management of the site or other impacts are acceptable or not in nature conservation terms. They help determine what action agency staff take in a particular circumstance. Conservation objectives need therefore to be set with care: other government bodies, owners and managers, and environmental NGOs will have an interest in how they are used. The responsibility for setting the objectives lies with the agencies, but the experience and knowledge of owners and others should not be ignored where this is relevant to determining what the objectives should be.

1.7 Conservation objectives for a feature on a site, once properly set, should remain stable for some while; our view is ideally they should hold for at least the next 20 years. However they may need to be changed, particularly if a feature on a site changes unexpectedly or our understanding of its significance/requirements changes. As the implications of climate change become more apparent this will need to be reflected in the objectives and targets. In addition in this first round of "objectives setting" we may not get some quite right and adjustments will need to be made later.

Links to non-designated sites and to the wider landscape context

1.8 The objective setting and condition assessment approach described in this report applies to S/ASSIs. The agencies are exploring with the Forestry Commission and others whether a simplified version can be applied more widely to assess the condition of woodland outside the designated site system in order to measure progress on the Habitat Action Plan targets. There is a potential link for example between what is expected under the UK Forestry Standard for any semi-natural woodland and the types of attributes and targets used in condition assessment on S/ASSIs. This will be explored in a separate paper.

1.9 The approach described here is for assessing woodland condition within sites. The agencies recognise that there is a need to assess the "condition" of the landscape within which sites sit: for example how connected are the woods; what are they next to; how well can species move between different woods; what is the total range of

conditions encompassed by a suite of woods within a landscape. This landscape condition assessment will be developed as a separate exercise, bringing in the ideas of forest habitat networks.

1.10 The nature and management of surrounding woodland can however also affect how we set the objectives and judge the condition of a particular site: it may be less critical that some structures or conditions are always maintained on site, if they are present as necessary in the adjacent (non-scheduled) woodland or open habitat. We have done some work on this and will be producing a separate paper on this exercise (see also paragraph 5.6 and Box 8).

Country differences

1.11 The guidance has been produced and agreed by the inter-agency woodland specialists, but there may be some differences in the detail of how it is applied and the data recorded because of, for example, differences in the information systems between the agencies. This should not affect the principles set out here. There may also be or develop some differences in the terminology used. Scottish Natural Heritage has adopted the term 'Condition objectives' to make it clear that the objectives developed and used in line with this guidance are primarily for condition assessment purposes. Throughout the document therefore SNH staff should read Conservation Objectives as Condition Objectives. In England there may be potentially some confusion over the previous use of the term conservation objectives in relation to site management statements that will need careful explanation to owners and managers who have been involved with such documents (Box 2)

Box 2. Site objective statements and site management statements in England in relation to conservation objectives

English Nature has over the past few years had a programme of developing Site Objective Statements and Site Management Statements for its SSSIs. The Conservation Objectives largely replace Site Objective Statements. The Site Management Statements may still be relevant in that they are based on individual ownerships or tenure units. The sections in these referring to our objectives should be an interpretation of the Conservation Objectives as they apply to that particular unit. There is a risk of potential confusion of terminology that will need to be considered in how SMS are written in future. There is separately a need to review SMSs in the light of CROW Act.

IMPORTANT NOTES FOR USERS OF THIS GUIDANCE

Condition assessment for woodland relies on the judgement of the person carrying out the assessment: it is not a statistical sampling process. The guidance provided is however designed to make this judgement process more consistent between surveyors and over time.

The guidance on targets throughout this report is for guidance only; we expect the targets to be customised to the woodland feature and site being considered. This is the only way that local knowledge and distinctiveness can be brought to bear on the objective-setting process.

This is a working document aimed at staff in the agencies. We are happy that it should be made more widely available, as long as its status as an internal working document is recognized. It should be used in conjunction with other guidance and so some issues such as management planning and explaining what the procedures mean for owners are not considered here at all.

The process is still being developed and any feedback on use of this guidance should be sent to the relevant LCN member.

This is version 4.2 (July 2002) and supersedes earlier versions issued by the LCN.

2. Setting Objectives

Objectives are expressed in terms of attributes and targets.

2.1 The approach adopted within Common Standards Monitoring has been first to identify the feature\(s) of interest (habitat, species, and earth science interest) in sites and then to draw up for each type of feature a series of attributes that cover what is likely to be important for that feature. Targets are then developed for these attributes on a site-by-site basis taking account of generic guidance developed by inter-agency working groups. There are some differences in level at which the attributes have been defined between different working groups; what we have proposed for woodland reflects what we consider necessary to cover its structural complexity and variability across the country. This approach has been the subject of local testing.

2.2 For most woodland habitats conservation objectives can be expressed in terms of five broad attributes and associated targets using the following general format.

"The conservation objective for [*Woodland Habitat Feature X*] on [*Site Y*] is to maintain (or to restore it where not currently favourable) it in favourable condition where favourable condition is expressed in terms of the following *attributes* and *targets*."

This is illustrated by the example in Box 3 and in the examples in section 14.

Box 3. An example of the Objective, Attributes and Targets for a particular lowland woodland SSSI

Objective: to maintain the oak-hazel (NVC W10) stands in the wood in favourable condition where this is expressed in terms of the following attributes and targets.

Attribute	**Targets**
1. Area	• No loss of ancient woodland area
2. Natural processes and structural development	• At least 25% of woodland mature to over-mature growth (south-west corner); elsewhere no more than 25% of woodland as stands of under 20 years at any one time. • well-developed ride structure • some dead wood (3-5 trees/ha equivalent either standing or fallen) in any clear-fell; • 2-3 living trees per ha left to grow on to over-maturity in managed areas. • mature stands (>80 yrs, as marked on map with understorey >20%, canopy cover > 50%
3. Regeneration potential	• <20% of regeneration areas restocked by planting (local stock only). • restocked area with closed canopy within 15 years.
4. Composition (trees and shrubs)	• >95% native species in tree and shrub layers • no rapid dieback (>10%) of native trees and shrubs over a five year period • oak present in canopy over at least 50% of the wood
5. Quality indicators	• at least 80% of the woodland areas referable to relevant NVC communities (transitions to W8 ash-maple in the north, but the majority W10 oak hazel) • wild service tree *Sorbus torminalis* frequent in north-west corner; • scrubby 'green lane' present along the edge (past populations of hairstreak butterflies)

2.3 The precise wording and how the attributes and targets are presented may vary between countries. Additional explanation as to what they mean and how they have been derived will be needed if they are to be the basis for discussions with owners and other regulators who may not be familiar with the process. It will also need to be stressed that these targets represent the minimum requirements for a site to be in favourable condition. Often sites may be in a much better state and we would encourage management to go beyond just meeting the minimum; similarly we would not accept reduction of the condition of an exceptional site down to the point where it only just meets the basic targets.

2.4 To set the conservation objectives agency staff need to be familiar with the woodland feature on the site in question and with why it was selected as part of the S/ASSI series. The "feature of interest" for a woodland site is seldom confined to a single vegetation type within the site (whether vegetation type is defined in Stand Type, Merlewood Type or National Vegetation Type terms) (see section 3). Therefore the guidance developed has moved away from trying to assess each NVC or Stand Type separately towards assessing woodland at the BAP Broad Habitat Level, i.e. across a mixture of NVC types in some cases.

The attributes to be used

2.5 The five attributes that should be used as part of the process for defining conservation objectives for woodland features are Area, Structure and Natural Processes, Regeneration Potential, Tree and Shrub Composition and what we have called Quality Indicators. Each of these is capable of sub-division but beyond this level they start to lose generality. There may be some changes to the precise names given to these attributes to improve harmonization with the guidance being developed for other habitats and species. Subsequent sections 4-8 go through each of these attributes in more detail, but in summary they cover the following.

- *Area* - includes the extent and, where appropriate, distribution of the woodland feature across the site. Internal variations are considered under other attributes.
- *Structure and Natural Processes* - includes the balance between canopy and shrub layers; the importance of old trees versus open space on a site; the level of dead wood present; the extent to which we wish the structure to be determined by natural processes rather than defined by a management regime.
- *Regeneration potential* - includes the level and distribution of saplings and young trees we expect to see; extent of regrowth from coppice or pollarding; what limits there may be on planting. We have stressed potential since there are circumstances where we would not expect to see any actual regeneration, for example because the wood consists of a young dense canopy layer.
- *Composition* (trees and shrubs) - includes the level of native trees and shrubs we expect to see overall; any minimum requirements to maintain particular species; plus (in most cases) a target to alert us to rapid declines in native trees and shrubs, for example as a consequence of a new disease coming in.
- *Quality indicators* - includes (usually) the broad ground flora composition (as indicated by NVC type or typical common species), but also no more than 4

other things that are particularly important about that wood, that contributed towards its selection as S/ASSI and have not have been covered adequately by the previous attributes. Examples might be the occurrence of particular species, a series of rich flushes, or a good transition zone to another habitat.

2.6 The LCN considers that it would be very exceptional for any of these attributes not to be relevant to a feature on a particular site; *they are mandatory attributes* and any proposed exceptions must be checked with the relevant specialist staff.

2.7 The five attributes we have chosen because they are relevant to assessing the condition of woodland S/ASSIs. However there is a read-across to how Favourable Conservation Status is defined in terms of Area, Structure and function, and Typical Species under the Habitats Directive. There is also a read-across to the requirements of the UK Forestry Standard and associated policies to maintain the area of ancient semi-natural woodland, promote a diversity of structures in them, encourage natural regeneration and use of local provenance, and maintain the special interest of these woods (see Appendix 2).

2.8 There is however considerable flexibility in how the targets are set for each attribute, as is discussed in sections 4-8. The degree to which targets are specified varies in part according to the expected degree of intervention. Highly prescriptive targets imply a likelihood of high levels of intervention in the form of management. The more that the state of the wood is to be determined by natural processes the less prescriptive do the targets need to be. Therefore the targets may in general be less prescriptive in the Scottish uplands than in the English lowlands.

Targets are site-specific

2.9 The five attributes are mandatory. Therefore at least one target must be set for each attribute for a feature on a given site. In sections 4-8 we have provided some generic guidance on target setting for each attribute and some specific examples (with others in the appendices). However it is essential that local staff tailor the guidance as appropriate to any particular site. A wide variation in composition, structures and associated fauna can occur within woods of the same vegetation type (whether defined in BAP, NVC or Stand Type terms) according to their different histories and past treatments. Therefore the composition and structure targets need to take account of the needs of relevant species or species groups. Further guidance on target setting for species groups is being developed by other JNCC groups.

Targets must be relevant and practical

2.10 The targets set for particular attributes must be capable of being assessed consistently in a relatively brief visit to the site. In developing the approach we have assumed that the assessment will be done by Agency staff on a visit to a site of say 10-20 ha that lasts between about 2-5 hours (i.e. half day to a day per site). The procedure is described in more detail in section 9. As far as possible therefore targets should be set that have a wide window for recording and do not rely too heavily on specialist woodland experience. Any limitations in this respect should be noted and it may be possible to give only a provisional assessment, if for example one target could not be

checked because it was the wrong time of year, or the surveyor did not have the necessary skill to assess it.

2.11 Some targets may only apply to part of a site: in the example in Box 3 the area of frequent *Sorbus torminalis* was confined to the northwest corner. Significant transitions between types may be confined to quite small parts of the site; veteran trees may be only in some compartments. There is no reason why targets should not be geographically defined/limited as long as this fact and the reasons behind it are clearly documented, for example through being marked on the recording base map. Outside these defined areas these targets then do not apply. It is not necessarily the case that every stand/ownership unit must meet all targets. Mature trees may be in one place, temporary open glades in a second, dense young growth in a third. Box 4 illustrates how not only may some stands not meet a particular target at a given time, but the stands that do meet that target may change over time, without compromising the favourable condition assessment.

2.12 We have carried out some training exercises, which indicate that the above are reasonable assumptions and approaches to take, provided adequate training and quality assurance procedures are in place. Further work on consistency testing and other types of quality assurance is taking place.

Box 4. Targets apply at the woodland feature level - not necessarily to individual stands within the feature

(a)

	xxx	
yyy		

(b)

		xxx
yyy	yyy	

Open space (xxx); stands over 100 years (yyy)

(a) and (b) show the same wood at two different times, twenty years apart. It consists of nine separate stands (defined by differences in their composition or structure) represented by the different cells. Part of the definition of favourable condition for this woodland feature is that there should always be some open space and some mature stands present. This is fulfilled at the feature level at both dates, but most of the stands meet neither target. If the top row of three cells were stands in a different ownership to the rest, and if this were to be assessed with no consideration of what was happening in the rest of the wood then it would fail on one target at time (a) and two and time (b). A spurious conclusion might be reached that part of the wood is unfavourable when it is not.

Major and minor targets

2.13 We judge that for a woodland feature on a site to be in favourable condition all the attributes must be in an acceptable state. Failure on any one attribute for the feature as a whole means that the feature should be classed as unfavourable. However there may be more than one target for an attribute. Experience to dates suggests two or three targets per attribute are not uncommon, although we recommend that there should not be more than five per attribute. Does failure on any one target constitute failure of the attribute? Staff developing conservation objectives should aim to set targets such that a major failing on any one of them would count as failure of the attribute (and hence the whole feature becomes unfavourable). However, particularly in this first round, there may be circumstances where it is felt that some targets are very much more important than others. If for example two minor targets were set, it might be that one alone failing would not compromise the attribute overall, but both failing would. If there is a significant difference in the importance of different targets this must be made clear in the description of the objectives for a site.

2.14 Experience to date has been that while dead wood should be a valid target under the Structure attribute we are not certain that our targets can be judged reliably in the field. At this stage therefore we suggest that any dead wood targets set be considered provisional, while we gain more experience in their assessment (see also 5.9). Caution should therefore be exercised in classing a wood as unfavourable where the dead wood target is the only one on which it fails. We would welcome views on this and will be doing further work on this over the next few months.

Targets should describe state, not management

2.15 An essence of condition assessment is that we are using the targets and attributes to describe the desired state of the woodland feature that we wish to achieve on that SSSI, not the management systems or operations that lead to that state. In the past we have often expressed our objectives in terms of "managing woodland feature X as coppice" or "managing pinewood as high forest". There may be exceptional circumstances where this is still an appropriate format, but as a rule such objectives should be re-written as the desired states (in terms of mosaics, open space, old trees etc) that we wish to see. This has proved a difficult shift to make (even for the woodland specialists) and some of the objectives produced over the last two years have not made the full transition to the new style.

2.16 Objectives written in the form of management prescriptions are unsatisfactory at this level because our overall aim is to bring the features into favourable condition; favourable management is a step on the route to favourable condition, but does not necessarily mean it has been achieved. The examples below illustrate this point.

Scenario 1. Beech woodland, southern England. In the past we might have specified that our objective was "to manage the site as beech high forest on a selection system". As long as the owner carried out the appropriate silvicultural operations he/she would be meeting our stated objective. However if a major windstorm knocked numerous gaps in the canopy there would be no need for any further selection-felling. If the owner continued to fell areas he/she would not be going against our stated objective

but the wood might become too open, i.e. it would be moving into unfavourable condition. A better objective might therefore be to maintain a canopy with beech as a significant element (>30%), with 15% canopy gaps for regeneration.

Scenario 2. Western oakwood, important for ground living bryophytes. A management-focussed objective might be to "manage the oak woodland for its bryophytes by light summer sheep-grazing". The owner agrees this, but then goes out of sheep farming and takes his stock out of the wood. However (fortunately) the local deer population increases to the point where it is keeping the grass layer sufficiently suppressed to allow the bryophytes to thrive. In this instance the management objective *as specified* is not being met (the grazing is by deer, not sheep), but the feature is still in favourable condition.

2.17 Specifying objectives in terms of the state that we want rather than management prescriptions allows for more flexibility (both from the owner's and agencies' point of view) in how the woodland is treated as long as the results (in conservation terms) are the same. It does not constrain the owner to follow one particular pathway if his/her other objectives change (or if the owner changes), again as long as the conservation objectives are not being compromised.

2.18 In practice we will often indicate to an owner what our preferred management is to achieve our objectives (see Appendix 3) but this is a separate stage from the definition of the desired state through the conservation objectives.

Targets as ranges rather than single figures

2.19 Targets do not need to be (in most cases cannot be) single thresholds that a feature either passes or fails. Rather they will tend to be broad ranges within which fluctuations may occur. Thus in a native pinewood we might want to see a proportion of birch (say 10% minimum), but we might not be happy if there were less than 50% pine in the canopy. The acceptable range for pine is then set as between 50% and 90%. The targets should reflect the level of precision that can be assessed - in this case probably no better than 5% canopy cover.

Targets as triggers for action

2.20 The target may not be critical in itself - it is unlikely that in the example above any species would be lost, or that the wood would stop functioning as a pinewood in the short-term, if pine cover dropped below 50%. Rather the target/target range is there as a trigger for action: if the feature is at or moving towards the threshold values some change in the management (or in our understanding of the dynamics of the system) is needed.

2.21 The action triggered by an unfavourable assessment may be a change in management recommendations, but it could also be a more detailed survey to discover more about the changed state of the wood. In some cases the cause of the unfavourable condition may be outside the wood, eg long-distance pollution effects on lichens. In which case the action needed may be in terms of policy shifts. Finally, in extreme cases, if there is no chance ever of restoring favourable conditions, even in the long-term, we may consider denotifying the whole or part of a site.

2.22 Achieving/restoring the desired state immediately an attribute is no longer favourable may not be possible or even desirable in some cases; for example restoration of native trees and shrubs through removal of introduced conifers may often be better done gradually than by a single clear-fell. This should be recognized in the notes and comments that accompany any assessment. It is important to start the recovery process; how long it takes should be determined by conservation needs, not the political expediency of having more sites in favourable condition.

3. Defining the "feature of interest"

3.1 How much of the woodland S/ASSI should be included in the assessment?

3.2 Woodland SSSIs have (with a few long-standing exceptions) been selected according to the woodland chapter in the *Guidelines for the Selection of Biological SSSIs*, published by NCC in 1989. The information as to why a particular site was initially selected may be more-or-less precisely documented. The citation for a site is the starting point; there may also be separate Criteria Sheets that were produced for some notification packages. However these latter usually only indicate the particular vegetation type (Peterken Stand Type, Merlewood Type, NVC type) for which the site was chosen as an example. In practice the criteria actually used to select that site as the example were applied to the whole wood. Having identified what appear to be the best candidate *stands* of a particular vegetation type the guidelines state (paragraph 4.5 in the Woodland chapter), that the *woods* in which these stands occur should be assessed according to their size, richness, structural features, associated habitats, historical features, unique elements and lack of (severe) deleterious influences (paragraphs 3.4.3 - 3.4.8 in the woodland chapter). Relevant extracts are given in Appendix 4.

3.3 Not surprisingly there is a close link between factors used in the selection process (size, structure, vegetation types, associated habitats and unique features) and the five attributes used in condition assessment. Only regeneration potential has no direct link back to the selection process *per se*, but is inherent to the concept of maintaining the sites.

Box 5. How much of the woodland is the feature of interest?	
Do any of the following apply	*Include as part of the interest feature for assessment purposes?*
a) Woodland area is one of the types listed as one of the criterion features for the SSSI?	Yes
b) Small intrusions of other types (including plantations) within the criterion types?	Yes
c) Woodland that forms part of the same ecological functional system as the criterion types?	Yes
d) Plantations on ancient sites that must be restored to native species in the short to medium term to maintain the interest of the existing semi-natural stands?	Yes
e) Extent of whole ancient/semi-natural woodland used as part of justification for selection of site?	Yes
f) Overall richness of flora and fauna of whole woodland (not confined to criterion types) used as part of justification?	Yes
g) Associated habitats and species associated with them (e.g. open space, water bodies rock features, dead wood, old trees) across whole woodland used as part of justification?	Yes
h) Woodland (usually on sites designated for particular species groups) that forms the matrix within which the species' habitat occurs without contributing significantly to the interest of the site?	No
i) Recent Semi-natural woodland that is to be cleared to restore open heath etc?	No
j) Plantations included as part of boundary convenience only.	No

3.4 Not all of every woodland S/ASSI consists of the specific vegetation type that is listed on the criterion sheet or which receives most attention in the citation, because the woodland S/ASSI selection process focused on whole woods, not just selected stands. We have been encouraged to approach condition assessment at the BAP Broad Habitat level and so the feature of interest is normally the whole woodland on the site. The questions in Box 5 may help to clarify whether plantations or areas of recent semi-natural woodland should and should not be included.

3.5 However as Box 5 indicates there will be on some sites significant areas of woodland that are not subject to the woodland condition assessment (points h, i, j) because they do not contribute to the interest of the site. Such excluded areas may still be the subject of discussions over management with the owner; it is simply that the outcome of this does not affect the overall assessment of condition of the site. Excluded woodland where our aims are to clear the woodland to restore open habitats of one sort or another (point i) should be assessed as unfavourable grassland, heathland etc.

3.6 Where there are two different woodland types on site it may be that one is in favourable condition and the other is not. Where the S/ASSI is also an SAC the interest feature defined by the Annex 1 type plus small additions covered by the second, third and fourth questions in Box 5 has to be reported on separately. Where the Annex 1 habitat and woodland SSSI area are not coincident then either two assessments (two sets of forms) should be made; or a combined assessment may be done provided that any difference in condition between the Annex 1 habitat and the rest is recorded.

Box 6. Summary of stages in woodland objective setting and condition assessment process

1. Five common attributes defined to be applied to woodland features (Area, Natural process and structure, Regeneration potential, Tree and shrub composition, Quality indicators) by the LCN and generic guidance produced on target setting by the country specialists.

2. For each site the Local Officer decides what is the woodland feature of interest based on the Criterion sheet, SSSI citation, Files, site visit as appropriate.

3. The Local officer produces first set of targets tailored to the site, with at least one target for each of the five common attributes (e.g. Box 3).

3a. Quality control by specialists on conservation objective tables.

3b. Checking of condition assessment approach against more detailed methods on a small number of sites.

4. First field condition assessment, including assessment of whether the feature is recovering, declining etc, based on any clear signs from management/recent changes.

4a Appropriateness of/practicality of assessing targets used to revise conservation objective table if necessary.

5. Some years on, (revised) conservation objective table and first field assessment used as basis for second field assessment, including direction of change (if any) in condition.

4. Area

4.1 This attribute is concerned with assessing gross changes in the overall habitat extent. The targets should relate to the overall desired habitat extent within the SSSI; its distribution across the site (if it does not occupy the whole site already); its relationship to other significant open habitat areas, for example how far might woodland be allowed to spread up the hill on to open upland; where are the transitions to open fen in a wetland site? In setting targets for this attribute (usually best accompanied by an annotated map) consider the following.

What is the current area of the feature that is to be conserved (see also Box 5)?

How much, if any, could be lost without the value of the woodland being reduced? A net decrease in the area of semi-natural woodland may be acceptable where this is to re-create other habitats judged to be more important in the context of the site. The area lost and the justification must be recorded. Equally where the current tree-covered area is less than the SSSI as a whole it may be that the target is for an increased area.

Some parts of the woodland may be more important/higher quality than others such that damage to them is more significant. This should be recognised in the target setting and assessment process.

In some sites the boundary of the woodland may change without their being a net change in area. On some large native pinewoods an interchange over time between moor and forest may be normal part of the functioning of the system and therefore the boundary change is not a sign of unfavourable condition. However more commonly it would not be acceptable to lose an area of ancient woodland on the SSSI even if a corresponding area of recent woodland was created. Hence the target may need to distinguish (e.g. through a map) areas, which must be kept as woodland and any where interchange with other habitats is acceptable.

4.2 Small glades, rides etc within the wood are normally treated as part of the woodland: changes in their extent would not normally be recorded here as a threat to the area of the woodland. Similarly internal patterns of woodland types are normally dealt with under Quality Indicators. On some sites there are plantations of introduced species and our aim is to restore these to semi-natural broadleaves. In this case the extent of the wood against which the assessment is made includes the conifers; it is not just the area of existing semi-natural woodland. The restoration process is recorded (in condition assessment terms) through the reduction in the extent of non-natives under the Tree and Shrub composition attribute. Loss of area does not normally include the conversion of areas to plantation or dense rhododendron: these should however be picked up as a shift towards an unfavourable state under the Tree and shrub composition attribute.

4.3 While in principle we wish to see no loss of area, this could be taken to extremes - is a 2 square metre loss worth making a fuss about in a very big site? How big a loss counts as being significant? Our generic guidance is that anything over 0.5 ha or 0.5% of the target area (whichever is the smaller) should be considered as a significant “loss”; stricter targets may be set where it is deemed appropriate.

Repeated smaller losses (e.g. 0.1 ha per year over 5 years) would come to be considered unacceptable.

4.4 If part of the area of woodland has been lost permanently then that section should be classed as destroyed (rather than the whole site being classed as unfavourable). We then have to reconsider whether the remaining woodland is still of sufficient quality and extent to remain as an S/ASSI and what is the condition of the remainder; once that process has been carried out there will need to be any necessary adjustments to the objectives.

4.5 During the development of the guidance discussions were held as to whether we could set a minimum size for a woodland S/ASSI; any sites below this would then be permanently in unfavourable condition unless opportunities arose to expand the sites on to adjacent (usually non-designated) land. Various minimum sizes have been suggested for woodland sustainability, often in the range from 5 - 50 ha, although even the latter would not be large enough to support the full suite of large herbivores or to buffer the site against extreme events such as the 1987 storm. We concluded that it was not helpful to set such a minimum size.

- The minimum viable size depends on the nature of the woodland; a site with a rare species or community has a smaller viable area than one where we wish to see the full range of stand dynamics taking place.
- Most of these sites have been small for centuries; it is not clear that continuing species losses are occurring purely as a consequence of the size effect.
- The effects of small size can be partly off-set by management (a succession of open space can be maintained in a small wood by management)
- Focusing on the need to expand small sites in order to meet some theoretical minimum size would not necessarily be a good use of resources, compared to addressing other issues.
- Logically we would have to designate the surrounding land within which the expansion should take place. If that land were unimproved open habitat this might be possible, but expansion of woodland might then be unacceptable; if it were arable land it is doubtful if we could legally designate it.

4.6 Examples of how targets for the Area attribute for a particular feature (beech woodland, pine woodland) might be expressed are as follows.

Target (a beech woodland site)	**Comment**
• No loss of ancient semi-natural stands Area and location of stands in northern part were mapped by Richard Collingridge in 1999.	Loss = 0.5 ha or 0.5% of stand area, whichever is smaller. 20% canopy cover is conventionally taken as the lower limit for an area to be considered as woodland.
• The area of ancient woodland retained. Boundary is shown in Ancient Woodland Inventory.	The areas of ancient woodland that have been replanted retain historical features, remnant ground flora and open space elements. The long-term aim should be to restore them to native woodland cover. Therefore the target is no loss of area, because this would otherwise compromise the aim.

Target (a beech woodland site)	Comment
Expansion of native woodland by 5% in 10 years on to adjacent areas cleared of exotics and higher ground to restore treeline. Maintain current area (430ha) of woodland.	Due to the mobile nature of pinewoods the actual location of stands may change but there should be no overall reduction in total woodland area. This feature may be most easily assessed using aerial photographs.

4.7 To assess whether this attribute is in favourable condition in the field you will obviously need a map (or if available a recent aerial photograph) of the baseline condition. The map used as the baseline should be referred to in the target statement. If a suitable map (or equivalent) does not exist it will need to be created on an initial visit. The map can also be used to show NVC types and other significant variations even if the feature is defined at a higher level (e.g. all semi-natural woodland) since there may be times when types may need to be disaggregated. If there is a significant difference in the condition between different parts of the woodland this must be indicated on the map and in subsequent assessments.

4.8 For parkland sites the actual area of the site is may not be as useful as the numbers and distribution of veteran trees. Even so there is likely to be a concern that there is not encroachment on (say) the area of unimproved grassland or heath around the trees, so defining the area within which the trees are concentrated may still be valid. Further guidance on parkland and wood-pasture sites may need to be developed, but could be fitted into the general format as follows.

Attribute	Target	Comments
Area	No loss of semi-natural wood pasture mosaic area No reduction in the number of veteran trees	This thus brings in the open vegetation between the trees This picks up what is frequently the distinctive element of these sites.

Generic targets table

This and the generic target tables produced at the end of subsequent sections are based on those produced by English Nature for SACs in 1999. They attempt to summarise some of the key points about target setting for each attribute.

Attributes	Measures	Targets	Comments
1. Area	Extent/location of stands	• No loss of ancient semi-natural stands • At least current area of recent semi-natural stands maintained, although their location may alter. • No loss of ancient woodland	• Stand loss due to natural processes e.g. in minimum intervention stands may be acceptable. • Stand destruction may occur if the understorey and ground flora are irretrievably damaged even if the canopy remains intact. • Loss = 0.5 ha or 0.5% of the stand area, whichever is the smaller. • 20% canopy cover is conventionally taken as the lower limit for an area to be considered as woodland. • Area and location of stands may be assessed remotely or by site visit.

5. Structure and natural processes

5.1 Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect what is the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context. The targets should be set in terms of the desired state of the wood, not in terms of a management regime egg the target should be something like ' a mixture with at least 10% open space, 30 % of stands providing dense young growth...', not 'the woodland should be managed as coppice ...'. How prescriptive the targets are will vary on how tightly our requirements for the structural state are (see also paragraph 2.13-2.16, and 5.7).

5.2 One reason for concentrating on the state of the woodland we want to establish/maintain, rather than the management regime, is that different ways may exist to deliver a particular woodland state: dense young growth for example could be created by coppicing whole stands or by having rideside strips in a wood otherwise managed as high forest. A high level of fallen dead wood could come from leaving a site alone or by managing it without removing all the timber; veteran trees could be standards in coppice or trees left in perpetuity in high forest. Circumstances may change so that while the objectives and targets remain the same the appropriateness of a particular regime changes.

- For example prior to the 1987 great storm there were woods in southern England where our open space target was not being met; hence we were encouraging small-scale felling to create gaps. After the storm there was no need to promote management to create open space - the gaps had been created by the wind.
- In many pine woods we are concerned that there is a lack of understorey/ young trees because of browsing; we might set a target of (say) 10% understorey. If this is not being met we then might encourage exclosures or an active culling programme to reduce deer numbers and so promote the understorey development. However if deer numbers crashed the need for such action might disappear as the target level of understorey could be met without any intervention.

In practice the nature of our objectives and targets may suggest a preferred management regime (see Appendix 3 for example and section 2.14- 2.17) but it is important to keep this as a separate stage.

5.3 Depending on the size of the wood and the way it is treated so a greater or lesser variety of structures may be maintained within the one site. However many woods are too small to maintain the full potential range. Specifying the desired structural state then becomes important because two woods with the same botanical composition may have very different invertebrate, bird, and lower plant assemblages depending on, for example the amount of dead wood, the extent of glades, whether there is a dense shrub layer or not. Whether or not these faunal groups are referred to in the citation they are as much a component of the woodland type as are the ground

flora. Our objectives should take account of what is known about the species assemblages in that particular woodland feature (Box 7).

Box 7. The process of setting structural objectives

In each case points 1 and 2 form part of the conservation objective setting process, point 3 is not.

Example (a):

1. Site is notified as an example of ash-maple woodland with a rich butterfly fauna and high populations of scrub-nesting warblers. The 'ash-maple' element can be maintained in a variety of different structural states, but the butterflies need temporary open space in which the food-plant grows and the warblers need dense young growth.
2. The structural targets therefore include:
   At least 5% of area in temporary open space at any one time;
   At least 15% of area in stands between one and 10 years old.
3. The above targets (and hence this bit of the conservation objective) can be met either by coppicing or by some form of management of ride edges in a high forest system: the choice is up to the manager as long as the targets are met.

Example (b):

1. Site is a western oak woodland with a scatter of large old oaks with a rich lichen flora. The lower trunks of the trees need to be kept reasonably free from shading.
2. The structural target then includes:
   Canopy around large old trees not more than 20% cover; no shrub layer.
3. It is up to the manager whether the open nature of the woodland around the old trees is maintained through a grazing regime or by thinning any regrowth that occurs as part of a forestry operation.

Example (c)

1. Site is wet alder woodland, with a mixture of open and closed conditions, generating a rich flora, across a series of back channels to a stream that is actively moving, undermining some trees, creating natural gaps.
2. The target is to maintain a mixture of canopy conditions with at least 10% open canopy at any one time.
3. This could be achieved by minimum intervention since the stream is moving and that might be the preferred approach. However in terms of meeting the specific target of open space a small scale coppice programme or a managed high forest system could also be acceptable.

5.4 In setting your objectives in relation to this attribute consider the following:

- Species requirements - are there a particular set of structural characteristics (open space, dense shrub layer or young stands, old trees, abundant dead wood) that it would be desirable to maintain because the woodland is known for particular associated species? This should be clear from the site file, citation or other easily available records. If there is no direct information to guide you use the size of the wood, its current structure, its past treatment, the history of the site and how other woods in the region are being treated as a guide to desirable structures (Box 3). Further guidance on structural targets for different species groups is being developed. If there is no initial assessment of what the structure of the woodland is like then this will need to be explored in an initial visit.

- What are the minimum levels of different structural elements required?

  The targets will usually reflect what have been the dominant structural characteristics of a feature in the past, but this does not mean that they cannot be improved upon. Our main interest in a wood may be to promote species associated with young growth and open space but targets for some dead wood and old trees should be included providing these do not compromise achieving the young growth structural targets. In high forest stands important for dead wood there may be merit in having a target to keep some permanent open space. The larger the wood the more opportunities there are to develop/maintain a variety of woodland structures and this should be reflected in the objectives and targets; in small woods we may need to concentrate on just the one key element of woodland structure.

5.5 As a minimum, we will normally want to see:

- some open space (a mixture of temporary and permanent areas is desirable) e.g. a minimum of 10% of the woodland;
- some areas of relatively undisturbed mature/old growth stands or a scatter of large trees allowed to grow to over-maturity/death on site (e.g. a minimum of 10% of the woodland or 5-10 trees per ha);
- a build-up of the fallen and standing dead wood resource from less than 10m³ per ha (typical of most managed woods at present) to two to three times this level (but see paragraph 2.12 on setting dead wood targets);
- at least three age classes spread across the average life expectancy of the commonest trees.

5.6 The targets do not have to be applied within just one vegetation type where the woodland is a mixture of types. Thus at a given time the open space might be mainly in the ash-elm (W9) area whereas old trees are more in the oak-birch (W11) area. At some future date this may be reversed (see Box 4). Often the species that depend on a particular structural form are less fussy about which tree species they use. Similarly if some structural elements can be provided by adjacent woodland the need for a specific target to be met actually on a particular SSSI, at least in the short term may be reduced. Thus if there is an adjacent (unscheduled) meadow next to the wood then this might be functioning in the same way as a glade within the wood. Failure to meet the open space target within the wood could then be accepted. However if on a subsequent visit the meadow had gone then it would be critical that the open space target was met within the wood (see also section 1.8-1.10).

Box 8. A diversity of woodland structures at a landscape level.

We may not be able to maintain the full range of possible structures within any one wood because it is too small, but we should try at least to maintain them across the range of woods present at a landscape-scale level. This would lead to open space and young growth being made the main aim in one wood, whereas in an adjacent one more attention was paid to dead wood and old trees. The choice as to which structures to focus on should still be lead by the characteristics of the site itself, but, where there are often several possible options that could be of equal value in nature conservation terms at the site level, then the landscape-level assessment should also be considered. Further papers on this are being produced.

Latham, J. 2000. *A management framework for woodland in Wales: principles and progress.* CCW Natural Science Report 00/7/01. Countryside Council for Wales, Bangor.

5.7 An example of how targets for the Structure and Natural Processes attribute for a particular feature (beech woodland) might be expressed is as follows:

Target	Comments
• At least the current level of structural diversity maintained. See 1999 survey by GS for baseline description.	Any changes leading to exceedance of these limits due to natural processes are likely to be acceptable.
• Understorey (2-5m) present over 10-80% of total stand area. • Canopy cover present over 30-90 % of stand area.	The understorey in beech woodland ranges from virtually non-existent to impenetrable holly, box or yew. At present this site is towards the lower end of the range. If the understorey becomes very dense it may affect the ground flora although this is often sparse anyway.
• A minimum of 3 fallen lying trees >20 cm diameter per ha and 10 trees per ha allowed to die standing.	The wood is predominantly even-aged high forest with some understorey, with regeneration in places. No ancient trees currently present.

5.8 An example from the pinewoods is as follows.

Target	Comments
Natural processes to prevail in the structural development of the native woodland; therefore no specific state has been stated.	Ongoing deer management will need to be continued to ensure natural processes are not disrupted.

5.9 Where dead wood is particularly important on a site, this might be specifically picked up as follows (example based on beech woodland in the New Forest), but see also paragraph 2.12 about dead wood targets.

Target	Comments
Deadwood to be scored as 'good' across 80% of units containing ancient pasture woodland	Assessment is based on 10 samples per unit. 'Good' equals '1or 2 large (>50cm diameter) fallen trees or trunks visible with plenty of 5-50 cm pieces in view at each sample point.
Within the old inclosure units dead wood should be scored as at least average to good.	Average = 1 or 2 large pieces visible, little smaller material, or only smaller (5-50cm) material in view. Poor = Even smaller material is scarce.

5.10 Be realistic in target setting. Estimates of canopy cover, understorey cover are unlikely to be made with better than 10% accuracy. Therefore do not try to be too precise when giving the acceptable range. The default assumption is that the targets

set apply across the woodland feature as a whole, but bear in mind that the structure will usual vary across the site. Thus if the target is 50% shrub layer this could be met by having 100% cover in part of the woodland and 0% in the other half. If that is not acceptable the targets will need to be made more specific, e.g. in any one compartment the understorey should not be less than 10% or more than 70%. (See also Box 4).

Dealing with natural change

5.11 The key to dealing with natural change in woodland is to be clear about what is important about the site (which may or may not be clear from the stated interest features).

5.12 For some woodland sites and features of interest natural change could be as damaging as direct human intervention. If a site is important for butterflies associated with open space, 'natural change' that lead to the glades scrubbing up will put the site in unfavourable condition. In another site important lichens might occur on just six specific veteran trees: if wind blow uproots the trees (leaving them lichen-side down) the site becomes unfavourable with respect to the lichen interest feature.

5.13 Where the interest feature is more general, for example the semi-natural woodland community the impact of 'natural change' may be viewed more benignly. A shift in the relative abundance of vernal flowers or in the relative dominance of oak versus other site native trees may be acceptable, or at most slight changes in management may be recommended to off-set it, without the need to alter the overall condition assessment.

5.14 A third situation is in sites where out aim is to develop as near-natural a woodland state as we can under the prevailing conditions. Since we do not know what 'near-natural' actually is in 'state' terms we must judge success by the degree to which natural processes operate. Almost any composition/structure is acceptable. Natural change is positively welcomed as a sign of success. Thus if the wood blows down (as many did in the 1987 storm) this is not an undesirable event and does not make the site unfavourable. On the other hand if the wood was flattened by felling this would be unfavourable – the process is as important as the state created.

Structural aspects and process aspects for wood-pastures

5.15 These present some differences to other woodland and further work is needed but a possible approach might be as follows.

Attribute	Target	Comment
Structure and natural processes	Mosaic of 25% open vegetation, 15% scrubby stage and 60% 'grove-stage'. Transitions between stages over time occur.	The figures here are arbitrary, but illustrate a way of capturing the mosaic nature of the habitat, using Vera-type stage categories. This reflects that we are not looking for a fixed mosaic pattern.

Generic targets table (based on English Nature 1999 SAC guidance)

Attribute	Measures	Generic targets	Comment
2. Structure and Natural processes	Age/size class variation within and between stands; presence of open space and old trees; dead wood lying on the ground; standing dead trees Age class structure appropriate to the site, its history and management [Insert what is appropriate!]	• Understorey (2-5m) present over at least 20% of total stand area (except in parkland). • Canopy cover present over 30-90 % of stand area (except in parkland stands). . • A minimum of 3 fallen lying trees >20 cm diameter per ha and 4 trees per ha allowed to die standing.	• Any changes leading to exceedance of these limits due to natural processes are likely to be acceptable. • Different woodland types will differ in their expected cover in different layers. In beech woodland and oak woods the shrub layer is often sparse. This should be reflected in the tailoring of these targets to particular sites. • In coppiced stands a lower canopy cover (of standards) can be accepted, as will also be the case in parkland. • Assess this attribute by field survey.

6. Regeneration potential

6.1 The regeneration potential of the woodland being assessed must be maintained in the long-term if the wood is to survive, both in terms of quantity of regeneration and in terms of appropriate species. Include regeneration of the trees and shrubs from saplings or suckers, regrowth from coppice stools or pollards, and where appropriate planting.

6.2 The nature of that regeneration potential, how it is assessed and what targets are set, varies according to the past and present condition of the site and its treatment. The regeneration needed to maintain the wood in a favourable state from a nature conservation point of view may be much less than that required to meet (say) wood production objectives; species that might be acceptable in the regeneration from a wood production point of view may not be from a conservation angle. Therefore the wood may be in favourable conservation condition, but not be regenerating enough to meet the owner's objectives, or *vice versa*.

6.3 The distribution of regeneration is unlikely to be uniform in either space or time under natural conditions. In some woods there will be years where regeneration is limited for some species by a lack of seed (poor mast years) but this may be compensated for a few years later by a bumper crop. For light-loving species such as oak few if any seedlings would be expected under stands where there is a dense canopy; instead the regeneration should be looked for around the edge of a wood. Moderate shade-bearing trees (including ash when it is young) are however capable of establishing a bank of saplings under the canopy, ready to take advantage of any gaps that appear.

6.4 Periods of heavy grazing limit sapling growth, but if there are times when the grazing level drops then these may be sufficient to allow regeneration to take place. Only if grazing is fairly heavy and sustained over long periods may there be a concern from a regeneration point of view. Grazing levels that permit regeneration vary from site to site, but the following table may help in judging what the current grazing level is and whether grazing is likely to be the main factor limiting regeneration. More guidance on assessing over-grazing is being developed.

Box 9. Grazing and browsing indicators	
Heavy	Absence of shrub layer. Topiary effect on shrubs and young trees. Browse line on mature trees. Ground vegetation <10cm tall, mostly grasses and mosses or other unpalatable species. Abundant dung, paths, or other signs of grazing animals.
Moderate	Patchy understorey, with some evidence of pruning or browse line. Ground vegetation about 30cm high, with a mixture of palatable and unpalatable species, locally some close-cropped areas. Tree saplings projecting above ground vegetation in at least some areas, but may show signs of browsing.
Light	Well-developed understorey with no obvious browse line. Lush ground vegetation with some grazing sensitive species such as bramble, honeysuckle, ivy. Tree seedlings and saplings common under canopy gaps.

Box 10. Is planting an acceptable way of maintaining the regeneration potential of a woodland feature?

The agencies have accepted planting on S/ASSIs in the past, but there is increasingly a view that we should be promoting more use of natural regeneration particularly on SACs.
If planting is acceptable, should there be any restriction on the use of non-local provenance?
Decisions on these questions need to be reflected in conservation objectives and in condition assessments for a site.

While there may always be exceptions the starting point should be that natural regeneration is preferred and management should promote conditions that will allow it to happen. In particular we should not introduce it to areas where there is no recent history of planting (e.g. no planting within the last 15 years) and for species that have not been subject to widespread planting in the past (most native trees and shrubs other than the main timber -producing species oak, beech, pine and locally ash). Planted trees become a negative indicator. Where planting is acceptable then the presumption should be that it is only used as a support for natural regeneration and that it should be of locally native origin material only.

The sort of targets that might be written to reflect the above might be:
No (new) planted material on site; or
No (new) planted material other than species x; or
Planted trees to be no more than 20% of any regeneration block; and
All planting stock of local provenance.

6.5 There could be periods (even decades) where no regeneration is present anywhere in a particular site without the long-term potential of regeneration and the interest of the woodland being compromised. For example, we could easily assess a wood as being favourable condition with no regeneration present at all, if the woodland were all closed-canopy high forest stands in the age range 20 - 50 years. No regeneration would be expected nor would it be necessary in the near future. Most woods are not however in that state.

6.6 While we may accept periods where no regeneration is successful future regeneration (say in 20 years time when it is needed) may depend on action being taken **now**, not in 20 years time. Since condition monitoring is to be used as a trigger to management we should consider conditions for future, as well as present, regeneration. Except in minimum intervention stands we are unlikely to be willing to accept as favourable a situation where no successful regeneration (of the appropriate species) is likely in the next 20 years.

6.7 Decide what sort of regeneration is appropriate/acceptable for your site e.g. from natural regeneration, planting, coppice regrowth, pollard restoration, planting (see Box 10). What levels of regeneration are required to maintain the desired structures and composition in future? The management plan for a site, site management statement or general survey accounts should provide you with guidance as to what level of regeneration is either present now or might be expected in the woodland. If there is no prior guidance you will have to assess this in the field through a pre-assessment visit, taking into account the structure and history of the wood.

6.8 In assessing this attribute it may be helpful to take a retrospective view. Has there been regeneration in the recent past; for example are there groups of young trees under the canopy (for shade bearing species such as beech) or in gaps or on the edge of the wood (for light-demanding species such as oak). Are there saplings and young

trees up to 2m managing to grow up in gaps? Are there signs of significant browsing on stems less than 2m high? Is the regeneration that is occurring of acceptable species?

6.9 An example of how targets for the Regeneration attribute for a particular feature (beech woodland) might be expressed is as follows:

Target	Comment
• Signs of seedlings growing through to saplings to young trees at sufficient density to maintain canopy density over a 10 yr period (or equivalent regrowth from coppice).	A proportion of gaps at any one time may develop into permanent open space; equally some current permanent open space/glades may in time regenerate to closed canopy. Regeneration may occur more on the edge of woods if there are insufficient gaps within it.
• No more than 20% of re-stocked areas regenerated by planting. • Any planting material used to be of locally native stock	The minimum level of regeneration to be acceptable from a nature conservation viewpoint may be less than that needed where wood production is also an objective.

6.10 For woodland where the objectives are to promote young growth (and which consequently are being managed as coppice) the targets might be set as follows:

Target	Comment
• At least 75% of stools showing regrowth at the end of the first summer after cutting. • At least 75% of regrowth at least 1 m high at the end of the first summer after cutting.	If the regrowth does not show this vigour it is unlikely that it will be possible to continue with the coppice cycle in the long-term and hence to create and maintain the open-space/young growth mosaic that is desired.

6.11 For open wood-pastures only a very low density of new trees might be needed to retain the characteristic structure in the long term so the target (in this case for part of the New Forest beech stands) might be expressed as follows:

Target	Comment
• At least one native sapling with leader out of reach of grazing animals within 30 minutes walking. • Oak and beech forming at least 10% of saplings seen.	Saplings are defined as >1.5 m high but < 15 cm dbh for this purpose. The nature of the New Forest is such that it is easier to define a density in terms of time spent walking through the woodland than on a per ha basis. Oak and beech are key species for the associated lichens and invertebrate on the site so both must be present in the regeneration.

6.12 Where part of our objective in parkland may be a prolongation of the habitat found within veteran trees (through restoring pollarding) then a target might be:

Target	Comment
Regeneration from the boles should normally be at least 50cm -1m long two years after cutting on about 80% of boles	A higher rate of failure might be acceptable where young trees are being pollarded for the first time.

6.13 An example from a Scottish birch-hazel woodland is as follows.

Target	Comment
Regeneration of site native species in areas left open by fallen trees: at least 10% cover in gaps of more than one tree height that have existed for more than 10 years.	This will require some judgement with respect to what is expected in younger gaps: we must judge them according to whether they are moving in the right direction.

6.14 Under minimum intervention treatment there are no hard and fast rules as to what the stand should look like or how it should function - the whole point of minimum intervention treatment is that the wood should develop with as little direct input from human management a possible. Once an area has been properly launched on a minimum intervention trajectory targets should not be set for gap creation, the composition of the regeneration, or the speed at which regeneration occurs since these are all part of the internal stand dynamics. However even in such stands the levels of deer browsing may become unacceptable, because this is controlled not by factors internal to the wood, but by conditions over the surrounding landscape. Therefore a regeneration or a maximum browse damage target is still required.

Generic targets table (based on English Nature's 1999 SAC guidance)

Attribute	Measures	Generic targets	Comment
3.Regeneration potential	Successful establishment of young stems in gaps or on the edge of a stand	• Signs of seedlings growing through to saplings to young trees at sufficient density to maintain canopy density over a 10 yr period (or equivalent regrowth from coppice stumps). • No more than 20% of areas regenerated by planting. • All planting material of locally native stock No planting in sites where it has not occurred in the last 15 years.	• A proportion of gaps at any one time may develop into permanent open space; equally some current permanent open space/glades may in time regenerate to closed canopy. • Regeneration may often occur on the edges of woods rather than in gaps within it. • The density of regeneration considered sufficient is clearly less in parkland sites than in high forest; in coppice most of the regeneration will be as stump regrowth. • The minimum level of regeneration to be acceptable from a nature conservation viewpoint is likely to be much less than that needed where wood production is also an objective. • Assess this attribute by walking through the wood in spring/summer.

7. Tree and shrub Composition

7.1 This attribute covers the composition of the tree and shrub layer and any sudden changes in its composition through rapid dieback. Ground flora layer targets are considered under Quality Indicators. For the woodland feature to be in favourable condition it should (with a few exceptions) be composed predominantly of native species and there should not be signs of rapid (> 10% over a five year period) loss of native trees and shrubs.

7.2 In most woodland there can a wide variation in the composition of the tree and shrub layer within the limits of any particular type: beech stands may in part lack beech, oak woods lack oak over much of the stand. Internal patterns may alter over time. The composition in regenerating stands may be very different to that of the mature stand from which they are derived. Within an oak-beech woodland the distribution of oak and beech-dominated stands may alter without affecting site condition. Following major windblow of a beech stand, for example, the regeneration phase may be mainly oak or ash. Under climate change conditions, where beech currently occurs in only small amounts (but as a native species) stands may move more towards beech dominance. In these cases the change would not necessarily affect the condition class assigned to the stand. Targets must be set such that they allow for such changes where we think they are acceptable in nature conservation terms.

7.3 The converse of the stand being mainly composed of native trees and shrubs is that the area occupied by introduced species, whether in the tree and shrub layers should be small. Introductions within the field layer are considered under the next attribute (Quality Indicators) since they will influence how far we consider that the ground flora reflects the relevant semi-natural woodland vegetation.

7.4 The decision as to what should be classed as an introduced species is usually clear-cut for a site, but any possible causes for future uncertainty should be stated in notes accompanying the objectives for the site. For example in some western oak woods beech may be accepted as a future-natural component whereas in others the aim is to remove it. There may be circumstances where sycamore eradication is the aim; in other cases this would cause more significant disturbance than leaving the trees alone. The target for percentage native species will therefore be lower where sycamore is to be left than where it is to be eliminated. The position for each species should be set before the assessment is made.

7.5 The ideal might be to have no introduced species at all, but it becomes counter-productive if, for example, a single (non-regenerating) mature Douglas fir in a wood leads to it being classed as unfavourable, when the tree is having no significant adverse impact on the woodland community and may be acting as a raptor nesting-site! On the Isle of Wight non-native pine may be retained as a food source for red squirrels. On the other hand even one rhododendron bush on a sensitive site could be a potential problem. Grey squirrel damage, although very significant in wood production terms, may be judged not that worrying for nature conservation if most of it is on sycamore, but more important if it is on (native) beech or oak. The levels of introduced species and their impact that are judged to be acceptable therefore vary according to the nature of the site and the introduced species. Higher target levels (i.e. a lower percentage of exotics) should be set where the threat is from ‘spreading’

species or is a recent event, whether the spread is through natural regeneration or by assisted planting. Long-established stands (e.g. 19th century conifer plantings) that have already had their main impact may be accepted at a higher level, at least in the short term, than recent plantings that have still to exert their full influences. We suggest as an initial guide that site-native species should be over 95% of the cover in both the tree and the shrub layers. Existing surveys should indicate the level of non-native species and the degree to which their future spread or impact may threaten the integrity of the site. If this information is not available it will have to be collected on a pre-assessment visit.

7.6 General accounts of the different woodland types provide indications of typical composition of tree and shrub layers. However NVC tables and the like should not be used prescriptively to set minimum targets for particular native trees that should be present in the canopy at all times. They are 'averages' and may not be appropriate for particular sites. There are however circumstances where prescribing minimum levels for certain species is appropriate. In Scottish aspen woods loss of the aspen would remove the key element of the interest; the same is true for lime in the Lincolnshire limewoods. It is usually the minor, unusual components where we will regard continued presence of these species (the *Sorbus torminalis* in Box 3 for example) as part of the definition of favourable condition. Maintaining a mosaic of types (both oak and beech woodland, pine and oak woodland, wet birch and alder woodland on site) may also be a reason for specifying at least some minimum level of the different native species.

7.7 Explanations must be given as to how species are treated, in order that your successors know why they are accepting sycamore or beech at this site, but not another, why we need a minimum of 30% oak in the canopy (or whatever). This is true even if the generic targets are used.

7.8 In some woods it could be argued that even non-native species should be allowed to spread as they will, but in practice invasion by non-native species is likely to be one case where intervention is accepted even in minimum intervention woods. (Hence we refer to minimum intervention rather than non-intervention.). However no limits should otherwise be set in terms of the native composition of the wood.

7.9 An example from a pinewood is as follows. In this case no target has been set for the minimum proportion of pine in the canopy. If it turns into a birch woodland the site is still favourable for this attribute.

Target	**Comment**
No exotics in the canopy. Not more than 3% of non-native species in the sapling layer.	Regeneration of exotics will be recorded along a transect at 5 yearly intervals.

7.10 A more complicated example of how targets for the Composition attribute for a particular feature (beech woodland) might be expressed is as follows.

Target	Comment
• At least 90% cover in any one layer composed of site-native species (but see comment about sycamore). (Current state indicated in 1999 survey by CP).	Up to 30% sycamore in the shrub layer is acceptable but no more than 10% in canopy on this site. Sycamore is judged not to be having a significant negative effect on the flora at this site compared to some other woods and through management has been maintained in a stable state over the last century.
• Beech present in mature canopy at least 30% for the feature on the site as a whole.	The native tree % in the canopy has been dropped to 90% in recognition of the sycamore issue and the scatter of mature conifers from early 20th century plantings that are present, but are having little impact on current condition at this site. These latter will not be replaced, but there are no plans to remove them.
• No evidence of rapid (>10% in any five-year period) loss of native trees and shrubs.	Some tree death is acceptable, even desirable, but sudden loss of major tree species is likely to require action, if only further study of what is the cause and likely future course of the disease/damage, e.g. if signs of major alder dieback suddenly appear on a wetland site. If the cause is natural then we may still accept it as favourable, whereas if through unnatural causes it becomes unfavourable.

7.11 In parkland veteran non-native trees may be of value and should not automatically be removed. The target may be best set in terms of a proportion of numbers of trees rather than their area.

Generic targets table (based on English Nature's 1999 SAC guidance)

Attribute	Measures	Generic targets	Comment
4. Composition	Cover of native versus non-native species (all layers)	• At least 95% of cover in any one layer of site-native or acceptable naturalised species.	• In sites where there might be uncertainty as to what counts as site-native or as acceptable naturalised species this must be made clear (e.g. the position of sycamore).
	Death, destruction or replacement of native woodland species	• Minimum levels of native species, if appropriate	• Where cover in any one layer is less than 100% then the 90% target applies to the area actually covered by that layer. • Factors leading to the death or replacement of woodland species could include pollution, new diseases. • Damage to species by non-native species that does not lead to their death is not necessarily unacceptable. • Excessive browsing/grazing by even native ungulates may be undesirable if it shifts in the composition/structure of the stand. • Assess this attribute by a walk through site.

8. Quality indicators (distinctive species, communities, microhabitats, functional processes associated with a feature on a given site)

8.1 This attribute includes targets related to ground flora, but also to other things that make the wood special and hence were likely to have contributed to its selection compared to other similar woods in the county or region. The ground flora should normally correspond to a relevant NVC type; there may be rich woodland rides or small boggy hollows; there may be a good representation of ancient woodland indicators; elements needed by species that are also features of interest in their own right may also be picked up here. We do not expect that more than five (usually less) targets will be justified under this attribute.

8.2 Quality indicators should be apparent from the SSSI citation Criteria sheets (if available), or past surveys. In selecting them ensure that they are also capable of relatively simple assessment. A pre-assessment visit may help to identify or check the ease of recording of appropriate indicators. A test as to whether something is an appropriate quality indicator or not is to ask whether the value of the woodland would be significantly reduced in nature conservation terms if that thing were removed or damaged. It is possible to have negative 'quality indicators' if there is a species (other than trees and shrubs which have been covered in the previous section) e.g. Himalayan balsam that you do not want to spread, for example undesirable erosion, poaching of the soil, areas affected by herbicide usage, etc.

8.3 Under this attribute therefore two sets of questions need to be asked:

- what are the vegetation types present that are relevant to the selection of this site;
- what are the other 'quality indicators' associated with this site?

8.4 For most woodland features, one quality indicator is likely to be that most of the flora corresponds to a relevant woodland NVC type/Stand Type (including mixtures and mosaics). We do not expect surveyors to be able to instantly recognize NVC types by eye to sub-community level, although recognition of communities should in most cases be straightforward. However even if this is not possible surveyors should be able to assess whether the ground flora is a predominantly woodland vegetation rather than having abundant exotics, improved grasses, or extensive bare ground. Other semi-natural vegetation may be important locally (e.g. patches of mire/fen) and in wood-pastures the bulk of the ground flora may be closer to non-woodland vegetation types.

8.5 Unlike for habitats such grassland, simply being able to allocate a stand to a particular vegetation type does not automatically help in assessing its quality. Many good stands are not 'better fits' to their relevant NVC type than poor-quality ones, because the classifications are biased to some extent towards the average stands. If a woodland has been selected as a herb Paris-dominated (rather than dog's mercury) example of W8, or as an ungrazed version of W9 (such as on the west coast of Argyll) we would not consider that the site was still in favourable condition if mercury

replaces the Paris or the W9 site becomes grazed - but the NVC type would probably not have changed in either case.

8.6 An example of how targets for the Quality indicators attribute for a particular feature (hornbeam woodland) might be expressed is as follows:

Target	Comment
• 80% of ground flora cover referable to relevant NVC community i.e. W10 +W16 (see Collingridge report 1998).	Changes leading to these targets not being met may be acceptable where this is due to natural processes.
• Distinctive elements maintained at current levels and in current locations (as shown on attached maps): a) Patches of *Luzula sylvatica* present b) Relatively undisturbed stream channels. c) Bryophytes, particularly *Dicranum* species on stream banks. (refer to map / Simon Davey's Lower plant Survey 1998). d) Patches of *Melampyrum pratense* (common cow wheat) a locally rare species. e) Extensive stands of *Anemone nemorosa.*	The *Anemone* target could only be assessed in spring.

8.7 For riverine woodland the quality indicators may relate to characteristics of the channel structure and flow dynamics.

Target (examples)	Comment
Back channels present Debris dams present No artificial channel works	The assumption here is that the functioning of the riverine woodland and hence its quality in part depends on the natural functioning of the river system. Note that one of the indicators is a negative one.

8.8 At Craigellachie birch wood the following has been suggested.

Target	Comment
Maintain existing population size of juniper. No more than 50% of juniper bushes showing evidence of browsing.	Baseline extent of juniper to be established by photography. Browsing to be monitored in detail once every six years.

8.9 At Birkham Wood key elements in the selection of the site (as compared to other examples of these woodland types in the county) were the transitions between three woodland communities and the only large colony of herb Paris in the area of search. These could be expressed in target form as follows.

Target	Comments
• 80% of ground flora cover to be referable to communities W7, 8, 10. • Transition areas between W10/W8, W8/W7 to be maintained. • Herb Paris colony at X (see map) to be maintained.	The second and third targets bring out the fact that a loss of the transition area or of the herb Paris colony would be seen as a more serious degradation of the quality of the woodland than an equivalent loss of area elsewhere.

Generic targets table (based on English Nature 1999 SAC guidance)

Attribute	Measures	Targets	Comment
5. Quality indicators	Ground flora type Distinctive and desirable elements for a given site e.g. unusual species or assemblages, veteran trees, abundant deadwood. Patches of associated habitats and transitions.	• 85% of ground flora cover referable to relevant NVC community • Distinctive elements maintained at current levels and in current locations (where appropriate). • Patches and transitions maintained in extent and where appropriate location.	• Changes leading to these targets not being met may be acceptable where this is due to natural processes. • Distinctive elements and patches should be marked on maps for ease of checking in the field wherever possible. • If there are species groups/assemblages that cannot be assessed directly on a general site visit then surrogate features should be given where possible, e.g. dead wood concentrations for associated invertebrates.

9. Carrying out the assessment

Pre-visit: information gathering

9.1 Check that you are clear about the conservation objectives for the relevant woodland feature and the targets set. If there has been a previous assessment find the field record. Is there any indication from the files that you would expect change since the last assessment, e.g. management work, exceptional events (drought, storm), ongoing problems (continuing heavy deer pressure)? If there is not already a set of targets draw them up for each of the five attributes, including at least one target for each attribute (Box 11).

Box 11. Information likely to be helpful in drawing up a conservation objective table.

Attribute	Relevant Information
1. Area	1:10,000 map of site, showing boundaries and major internal variation.
2. Natural processes and structural development	Survey record summarising main structural types, variations in structure across site, main natural processes operating and management type. Amount of dead wood.
3. Regeneration potential	Notes on past regeneration, grazing.
4. Tree and shrub composition	Surveys showing tree and shrub variation across site.
5. Quality indicators	Main NVC types present (or equivalent vegetation descriptions). Any particular species, assemblages, transition zones, or subsidiary habitats of interest.

9.2 Is there a recent aerial photograph for the site or can one be easily obtained? This may help with establishing whether there has been any change in extent of the woodland feature, but also may indicate other areas where change appears to have taken place. Is there other recent survey work/notes from visits that will be useful in interpreting the current condition or change since the last assessment: e.g. a file note about the owner using the wood for winter sheep feeding, a WGS application?

Planning the assessment

9.3 Is the whole of the woodland feature to be checked on this visit or only part? If only part decide what area is to be assessed. Do any of the targets only apply to areas that will not be visited on this occasion? Are any of the targets ones that cannot be assessed on this visit given the time of year or skill of the surveyor? What are the implications of any such omissions for the overall assessment?

9.4 The assessment should normally consist of a structured walk around the site with a series of observation stops along the way. On an appropriate-scaled map (usually 1:10,000) mark a route that gives a reasonable coverage of the area to be assessed, taking account of any known variability, e.g. from previous visits, aerial photographs etc and any areas under high risk of change. Checking that important glades are still open may need to be done more often than assessing overall canopy cover. Within limits imposed by health and safety considerations the route should not be confined to

paths but should go across the middle of stands, across the contours etc. Allow about 2-3 hours on site for straightforward woods up to about 20 ha; larger or more tricky sites may need most of a day if the whole feature is to be assessed.

9.5 The simplest approach to ensuring systematic coverage is to mark ten "stops" on the map along the route, evenly spaced or to cover the expected variation. These will be the main assessment points, but the state of the wood between the stops should be used as well. It is not essential that that the same points will be re-surveyed on future visits, but it may be helpful if there is at least some overlap. In particular, if there are areas that raised concerns previously these should be included on this visit.

9.6 Check if there is an assessment form for the site. If it has not already been customised for the site add the relevant notes to the generic template for use in the field (see appendices).

9.7 Contact the owner and arrange the practicalities of visiting the site. The usual procedures for fieldwork including risk assessments, lone working considerations will need to be carried out.

In the field

9.8 Having arrived at the site follow the arranged route and stops.

9.9 The aim is to gain as good an overview of the woodland feature as possible within a limited time, to enable you to judge whether the targets are being met or not. The pre-determined route and ten stops are there to help you be consistent in your assessments between sites and between recorders. Do not be too constrained by the route or precise position of the stops if minor deviations will give you a better picture of the wood. However do record any major variations in the route.

9.10 Do not rely on your memory to assess the area at the end of the walk. Make notes relevant to the targets at each of the ten stops. There will be additional comments worth making on the state of the wood between stops. A balance needs to be struck between this assessment and carrying out a full Phase 2 survey, which is not the intention. Make notes even if a woodland feature is so uniform that the notes at each stop start to be the same as those at the start. The feature may be changing gradually and by the next assessment we will want to be sure of what it has changed from across the whole of the area assessed.

9.11 At each stop consider the woodland around you that you can see easily. In most sites this will equate to about a 50 x 50 m plot. You are not however expected to measure out a plot. This is not meant to be a quantitative sampling process and the results should not be treated as if it was.

9.12 Make a brief note at each stop against each of the attributes and the targets associated with them. If the area around the stop is atypical of what you had been walking through up to that point note this.

9.13 The "stops" are not intended to be a formal statistical sample; the targets cannot just be ticked as favourable/unfavourable at each stop and then totalled at the end to give

the overall state of the wood (cf Box 4). Rather the notes made at each will contribute to your overall judgement. So make the notes helpful to you and to the surveyor who will come after you. If the target is a quantitative one try and give your estimate of what the cover/density/etc is, rather than simply saying whether it meets the target or not. This may help in judging trends at the next visit.

9.14 Be prepared to alter your ideas as you go through the wood, particularly if you are not that familiar with the site. The first few stops may look in very bad condition but subsequently it may become clear that this state applies to only a very small area (or *vice versa*). Alternatively what appears to be a favourable state initially - a well-structured stand with old trees and dense under-storey - is, because it is repeated across the whole site, undesirable: the wood lacks any open space and too many of the old trees are in danger of being over-topped by younger growth.

9.15 You are assessing condition, not management, but make a note of any recent management or other activity that may help in interpreting your condition assessment and what should be done as a consequence. Condition assessment is only one part of the management control cycle.

10. Making the assessment at the end of the walk

10.1 At the end of the walk review each Attribute for the woodland that you have covered. Ideally all applicable targets will have been met but some targets may not have been. For these consider how significant are the "missed" targets compared to those that were met and what was the cause of the failure.

10.2 Some of the targets have relatively arbitrary thresholds in them. There is not a sudden step-change in condition at the threshold point. Just missing (or indeed just achieving) such thresholds is less significant than knowing whether the trend is up or down, and what factors are influencing that trend. If the reason for a target not being met is some unforeseen natural event, or a temporary management glitch that is being rectified, this may be less serious than if the failure were due to deliberate vandalism.

10.3 As an initial guide (to be reviewed in the light of experience) no major target should be significantly missed. If some targets are clearly more minor, or if a major target has failed by a very small margin then a single failure of these is allowed. This will however need a full written justification and should probably be followed up within one to two years to ensure that the failure was not symptomatic of a more serious problem. A failure on any one attribute should lead to an Unfavourable Condition rating for the area assessed.

10.4 The assessment is made on the targets and attributes assessed. If for some reason some targets cannot be considered (wrong season, wrong bit of the wood, inadequate expertise) then a provisional assessment is made on the basis of the targets that were assessed. A judgement will then be needed as to when the missing targets will be picked up.

10.5 If the area assessed corresponds to that entire feature on that site, i.e. the whole woodland, then the assessment you come up with is that for the feature as a whole. However, if the feature is large and the assessment is done over a number of visits then a further stage may be needed. For example, if a woodland feature includes several stands of different ages, which happen (for convenience) to be assessed independently then each might be judged Unfavourable in structural terms (because it was even-aged) but the woodland feature as a whole has a Favourable (multi-aged) structure. This issue will come up particularly with large sites. It is also an issue for English Nature where assessments may be made separately for each unit within an SSSI (Box 13).

10.6 We also need to know, if the wood is judged unfavourable whether it is recovering, declining or there is no change. On a first visit this may be difficult to assess. Even with a previous assessment it may not be obvious. Two approaches should be used.

(a) Where the targets are quantitative then it may be possible to make some comparisons between successive records, but this assumes that the stops are reasonably representative of the whole and that a quantitative estimate for the target has been made (rather than just judging it as favourable or

unfavourable). While this appears attractive there is such a high degree of variation likely that it may not yield much that is useful.

(b) On the first assessment this option is not available anyway. Therefore a judgement based on what is happening in the wood should be made. This must be made on evidence on the ground not on good intentions in a management plan! Signs that exotics are spreading (invasion fronts), that deer browsing is likely to continue, would count towards a 'declining' verdict. Signs that introduced conifers are being removed (stumps and recently cut stems), recently coppiced areas, or opened out rides in woods otherwise lacking in open space, point to recovery. The default position is unfavourable, no change.

10.7 The process does inevitably involve your judgement. That is why it is important to record notes as you go round the feature and to explain how you came to the decision that you have. Box 12 represents the decision-making process in a qualitative way.

Record keeping

10.8 Once back in the office check that the field sheets are legible and intelligible and store them on the file. Make sure there is a date on them and note any factors that may have influenced the completeness or otherwise of your record (woods always look worse in the rain). The computer systems (e.g. ENSIS in England) will not hold all the notes from your visit that will be needed to assess change at the next visit.

Box 12. A feel for condition class assessment.

Overall did the woodland look/feel all right with respect to the objectives?	*Do I think that the management is about right?*	*Probable Condition Class.*
Yes	Yes	Favourable
Yes, but a few areas seem to be not as good as before	Yes	Favourable, but might wish to visit more frequently in case interest is declining or the management needs adjusting.
Yes	No	Favourable, but might wish to visit more frequently in case interest is declining to consider how the management needs adjusting.
No, but it is getting better than it was	Yes/No	Unfavourable, recovering. Management may need tweaking to speed recovery process.
No, but not apparently getting better or worse	Yes	Unfavourable, maintained but cause of unfavourability beyond management control
	No	Unfavourable, maintained. However changing the management may bring the woodland into recovery.
No, and it is getting worse.	Yes	Unfavourable, declining but cause of decline is beyond management control.
	No	Unfavourable declining, but a shift in management might bring it into at least Unfavourable maintained and preferably recovering.

Box 13. Dealing with management units in England.

In England SSSIs are split into units and these form the basis for recording on ENSIS. In some cases the units can be treated effectively as separate woods for assessment purposes. However it is not usually possible to assess an individual woodland unit in isolation from the rest of the site. For example if the target is to have 10% of the feature as open space, this may not need to be evenly spread across all units but could be in (say) Unit 1 at the first assessment and Unit 4 at the second (because the stand in Unit 1 has grown up, while a new set of gaps have appeared in Unit 4). Each Unit might be very uniform in its structure but because they are all at different stages of growth this could lead to an acceptable diversity of structure could be present in the feature as a whole.

Therefore if there is more than one unit comprising a woodland feature ideally all should be assessed before coming to a conclusion on the condition of the individual units.

We also will have to decide what is the condition of the feature as a whole where some units are favourable and some not (since for UK reporting purposes we have to report at the site feature level). The way to tackle this is to imagine that the records from the different units were combined into one. Would the area that is considered unfavourable (at the unit level) still be a significant part of the whole?

For example suppose one unit has only a small part of the woodland: by itself it is unfavourable; however the rest of the wood is favourable, so when the two parts are combined the unfavourable bit does not push the whole area below the limits of acceptability.

More work is needed on how this is to be resolved in terms of recording in the field and on ENSIS.

11. Making use of the results

11.1 The results from condition assessment should be useful at a variety of levels. To the local officer they should provide a check that the management in place is achieving the desired state, or alternatively that some changes are required. At a regional and national level the simple estimates of numbers/areas of woods in unfavourable condition may be helpful in judging future resource needs. A breakdown by attributes on which woods might be failing provides an indication of where changes in practice, incentives or advice may be needed.

11.2 A separate paper is being prepared which looks at some of the preliminary results from woodland condition assessments to illustrate the possible uses.

12. Quality control/assurances issues

12.1 Each agency is putting in place its own quality assurance procedures. This section simply outlines those that have taken place in the process of developing the guidance and plans for subsequent validation.

12.2 As part of the test of practicality local team staff were involved from the outset (1998) in discussions on methodology. During 2001 this was taken further with widespread trialling of the system and training courses in England and Scotland involving over 100 local staff. Further training and trialling is being undertaken.

12.3 JNCC and agency operational specialists have had the opportunity to comment on the drafts throughout each stage of the development process.

12.4. A formal Quality Assurance check for consistency between guidance was carried out in autumn 2001 on the previous version of this guidance. The key points have been incorporated in this version.

12.5 In March 2002 a consistency trial was carried out involving between 10 and 15 staff independently assessing a site. This was carried out at four locations. The results will be written up separately.

12.6 Consistency in target setting will be an issue. This will require some sort of specialist checking and peer review of a proportion of sites. Arrangements for this have yet to be agreed.

12.7 There will need to be some quantitative assessments of changes taking place within a small number of woods to check on trends that are being picked up in condition assessment and also to identify issues that may not be obvious during the condition assessment process. Details of this are being worked on.

13. A draft condition assessment form for woodland

(Version 29/3/01)
(superscript letters refer to accompanying notes). Ideally the left hand column should be customised with the specific targets for a particular site - see subsequent Sheephouse example

Area to be assessed[a] Site name, subdivision, feature details.	
Details of visit[b] Surveyor, date, time taken	
Supporting details[c] available...	
1. Area attribute[d] Semi-natural area. Ancient area Patterns/boundaries *Replace by site specific targets*	
Overall assessment -area[f]	
2. Processes/structure[d] Minimum intervention areas Glades/temporary open space Old growth/veteran trees Patterns of age classes Cover of different layers Fallen/standing dead *Replace by site specific targets*	1[e] 2 3 4 5 6 7 8 9 10
Overall assessment - processes/structure[f]	
3. Regeneration[d] Type of regen. Abundance of regen. Recent annual growth Competition from ground flora Browsing damage Composition Planting levels *Replace by site specific targets*	1 2 3 4 5 6 7 8 9 10

Overall assessment - regeneration.[f]	
4. Composition[d] % cover exotics - each layer Impact intro. fauna Minimum levels - native trees *Replace by site specific targets*	 1 2 3 4 5 6 7 8 9 10
Overall assessment - composition[f]	
5. Quality indicators Vegetation fits NVC/Stand type Transitions/mosaics Dead wood Microhabitats (rocks, streams, etc) Distinctive species/elements *Replace by site specific targets*	1 2 3 4 5 6 7 8 9 10
Overall assessment - quality indicators[f]	
Supporting notes[g] Management/other events that have taken place recently and their impact. Work that would be desirable.	
Overall assessment[h] *Favourable* - maintained - restored *Unfavourable* - recovering - declining - no change *Partially destroyed* *Destroyed*	Notes to support overall assessment
What other areas[i] need to be considered before adopting this as the assessment for the whole feature on this site?	

(letters refer to superscripts on the forms)

a. *Area to be assessed* should give details of where you are assessing: site, any sub-divisions and what the feature is that you are considering.

b. *Details of visit*: who, when and how long was spent on site. If there are reasons (like foul weather or having to go round with the owner) that may affect the detail of the assessment this should also be note.

c. *Supporting details*: a map should be attached showing the route taken and any local variations noted. It may however also be helpful to note where any background information on the feature is kept.

d. *Attribute*s: assess the woodland you are considering against the targets for each attribute. The key words in the box below are memory joggers, not definitions of what must be considered. Where possible they should be replaced by the site-specific targets for this feature.

e. *Stop numbers*. These numbers can refer to the stops on the route.

f. *Overall assessment*. At the end of the visit consider whether, just on this attribute, targets have been met and whether or not it is in favourable condition.

g. *Supporting notes*. Anything that has happened or not happened in the assessment area that you think might help with interpreting changes, including justification to your successors as to why you have made the decision you have.

h. *Overall assessment* for the area that you have looked at, taking account of the individual assessments for each attribute. Except in exceptional circumstances all attributes should score Favourable for a Favourable rating overall.

i. The area assessed may not cover all the features on a site. Is it a representative sample that can be used as a basis for judging the feature as a whole; or are there other areas that need to be assessed before the feature can be assessed across the whole site?

14. Examples

SSSI Citation for Sheephouse Wood

COUNTY: BUCKINGHAMSHIRE **SITE NAME:** SHEEPHOUSE WOOD

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authorities: Aylesbury Vale District Council

National Grid Reference: SP703235

Ordnance Survey Sheet 1:50,000: 165 **1:10,000:** SP62 SE, SP72 SW

Date Notified (Under 1949 Act): 1981 **Date of Last Revision:**

Date Notified (Under 1981 Act): 1986 **Date of Last Revision:**

Area: 56.9 ha 140.7 ac

Description and Reasons for Notification

Sheephouse Wood is a large, well-structured block of ancient pedunculate oak woodland carrying a wide range of stand types, some of which are relatively uncommon in the region. The site has a characteristically diverse woodland flora, a typical range of breeding birds and is of particular interest for its invertebrate fauna which includes notable and local species.

The woodland, which rises gradually to the north and is cut by numerous small clay-lined streams and channels, is situated in the low-lying Vale of Aylesbury on heavy, very poorly drained Oxford Clay. The soils range from deep, sticky neutral to basic in the east half to a drier acid soil containing pebbles in the west half.

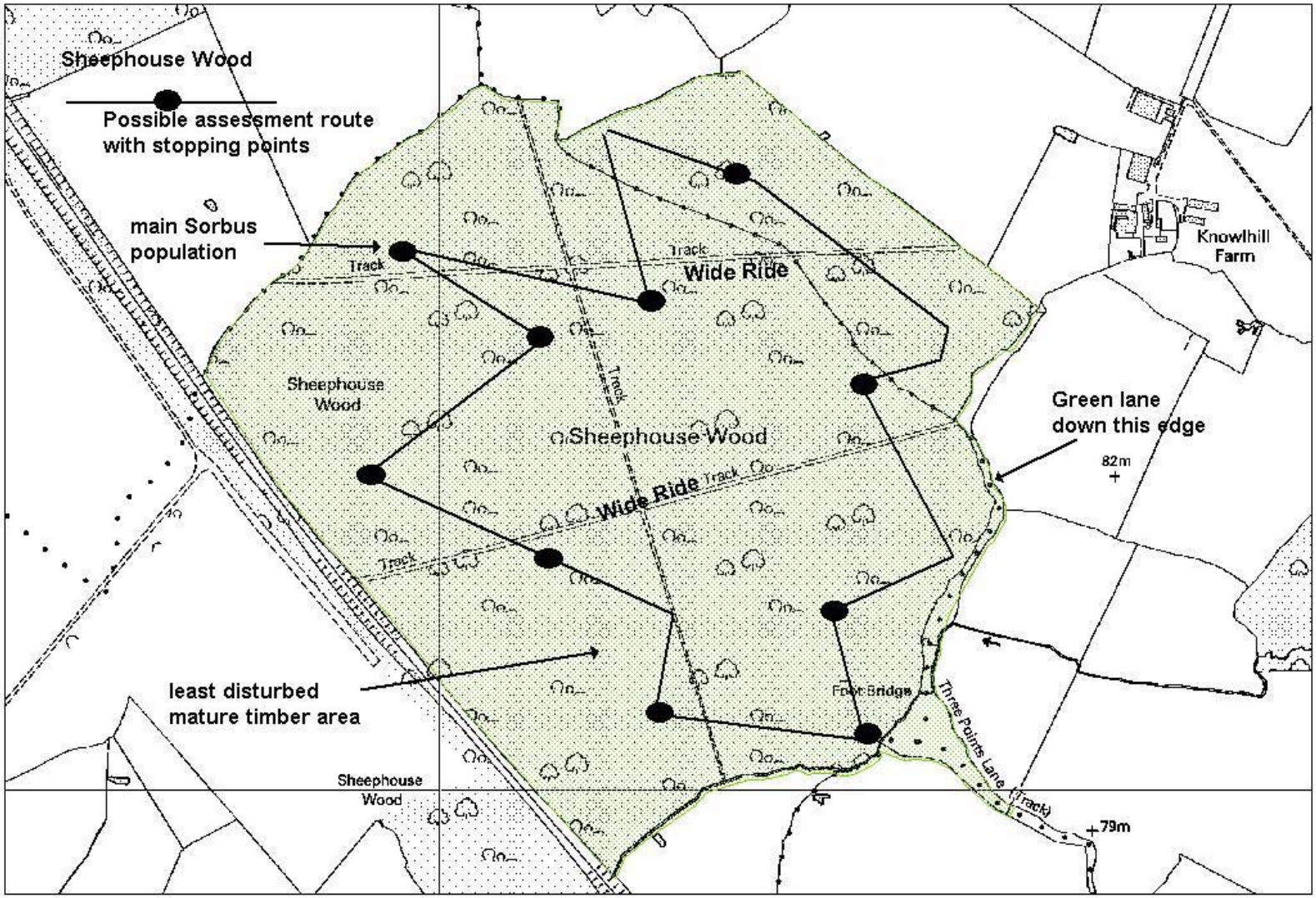
The structure of the woodland is coppice with standards with much of the coppice grown into the canopy. The oak standards, which range from about 30 years in age to about 150, are closely spaced and in the west part of the wood have been promoted by singling the coppice. The dominant stand type is lowland hazel-pedunculate oak. In addition, there are stands of the less common wet maple type concentrated along the north and east margins and these grade locally into small stands of the typical wet ash-maple type. Ash is thinly distributed and combines with oak locally to form a stand of acid pedunculate oak-hazel-ash. Of the remaining stand types, wet ash-wych elm and suckering English elm are fragmentary. The western half of the wood contains large populations of wild service tree *Sorbus torminali*s, a species normally confined to ancient woodlands; also thickets of aspen *Populus tremula* and areas of silver birch *Betula pendul*a, while goat willow *Salix capre*a, grey willow *Salix cinerea* and crab apple *Malus sylvestris* are well distributed throughout. Very locally a small amount of coniferous planting has taken place.

The shrub layer is diverse and well-developed. There are dense areas of coppiced hazel and much honeysuckle, also field maple, hawthorn, Midland hawthorn *Crataegus laevigat*a, blackthorn, dogwood, guelder rose, dog rose and field rose, the blackthorn forming dense thickets on the south-east margin of the wood. Present, but less frequent, are elder, holly, privet and redcurrant.

The ground flora varies according to soil types and moisture content, but is largely dominated by bramble *Rubus fruticosus* or bluebell *Hyacinthoides non-scripta* in association with tufted hair-grass *Deschampsia cespitos*a, yellow archangel *Lamiastrum galeobdolo*n, wood millet *Millium effusum,* enchanter's nightshade *Circaea lutetiana* and patches of dog's mercury *Mercurialis perenni*s. In the drier areas wood anemone *Anemone nemorosa* occurs with sweet vernal-grass *Anthoxanthum odorat*um, Yorkshire fog *Holcus lanatus* and locally pale sedge *Carex pallescens* and common cow-wheat *Melampyrum pratens*e. The rides are mostly very wet, supporting species that include wild angelica *Angelica sylvestri*s, greater pond sedge *Carex ripari*a, meadow-sweet *Filipendula ulmari*a, floating sweet-grass *Glyceria fluitan*s, greater bird's-foot trefoil *Lotus uliginosus* and creeping-Jenny *Lysimachia nummulari*a.

The invertebrate fauna includes the butterflies white admiral *Limenitis camill*a, purple hairstreak *Thecla quercus* and also black hairstreak *Strymonidia prun*i, a nationally restricted species largely confined to relics of ancient forest on the clay belt running through Oxfordshire and Buckinghamshire to the East Midlands. Other local species of insect include the uncommon slender ground-hopper *Tetrix subulat*a, the Cicadellid bug *Ledra aurita* (a species typically associated with mature oak) and a beetle *Glischrochilis hortensis* which is associated with dead wood.

SSSI Map for Sheephouse Wood



Conservation Objectives Table for Sheephouse Wood

Objective: to maintain the oak-hazel (NVC W10) stands in the wood in favourable condition where this is expressed in terms of the following attributes and targets.

Attribute	Targets
1. Area	• No loss of ancient woodland area • No decline in the area that is considered semi-natural.
2. Natural processes and structural development	• At least 25% of woodland left as mature to over-mature growth (south-west corner); elsewhere no more than 25% of woodland as stands of under 20 years at any one time. • well-developed ride structure: wide rides with scrubby edges, plus some left narrow and overgrown. • some dead wood (3-5 trees/ha equivalent) left lying in any clear-fell; dead trees left standing where practical; 2-3 living trees per ha left to grow on to over-maturity in managed areas. • mature stands to have understorey of at least 20% and canopy cover of at least 50%
3. Regeneration potential	• No more than 20% of regeneration areas restocked by planting. • any planting material to be of local oak stock. • restocked area with closed canopy within 15 years.
4. Composition (trees and shrubs)	• >95% native species in all layers • no significant change (>10% of area) to woodland composition/structure attributable to unnatural external factors (e.g. pollution) or introduced fauna (deer) over a five year period • oak present in canopy over at least 50% of the wood
5. Quality indicators	• at least 80% of the woodland areas referable to relevant NVC communities (with transitions to ash-maple woodland in the north (W8) but the majority W10 oak hazel woodland in the south); • good population of wild service tree *Sorbus torminalis* maintained; • scrubby 'green lane' along the edge (past populations of hairstreak butterflies)

Customised condition assessment form for Sheephouse Wood (version 29/3/01)

Area to be assessed[a] Site name, subdivision, feature details.	
Details of visit[b] Surveyor, date, time taken	
Supporting details[c] available...	
1. Area attribute[d] • No loss of ancient woodland area • No decline in s.n. area	
Overall assessment -area[f]	
2. Processes/structure[d] • 25% of woodland mature to over-mature growth; *elsewhere no more than 25% of woodland as stands < 20 years old. • well-developed ride structure: wide rides with scrubby edges, plus some left narrow and overgrown. • dead wood (3-5 trees/ha equivalent) left lying in any clear-fell; dead trees left standing; 2-3 living trees per ha left to grow on to over-maturity • mature stands at least 20% understorey; canopy cover of at least 50%	1[e] 2 3 4 5 6 7 8 9 10
Overall assessment - processes/structure[f]	
3. Regeneration[d] • No more than 20% of regeneration areas restocked by planting. • any planting material to be of local oak stock. • restocked area with closed canopy within 15 years	1 2 3 4 5 6 7 8 9 10

Overall assessment - regeneration.[f]	
4. Composition[d] • >95% native species • no significant change (>10% of area) to composition /structure attributable to unnatural external factors over a five year period • oak present in canopy over at least 50% of the wood	1 2 3 4 5 6 7 8 9 10
Overall assessment - composition[f]	
5. Quality indicators • at least 80% of the woodland areas referrable to relevant NVC type (mainly W10) • transitions to ash-maple woodland in the north; • good population of wild service tree *Sorbus torminalis* maintained; • scrubby 'green lane' along the edge	1 2 3 4 5 6 7 8 9 10
Overall assessment - quality indicators[f]	
Supporting notes[g] Management/other events that have taken place recently and their impact. Work that would be desirable.	
Overall assessment[h] *Favourable* - maintained - restored *Unfavourable* - recovering - declining - no change *Partially destroyed* *Destroyed*	Notes to support overall assessment
What other areas[i] need to be considered before adopting this as the assessment for the whole feature on this site?	

SSSI citation for Roche Abbey Woods

File ref: SK 58/3

County: South Yorkshire **Site Name: Roche Abbey Woodlands**

District: Rotherham

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981

Local Planning Authority: Rotherham Metropolitan Borough Council

National Grid Reference: SK 542899 **Area:** 52.8 (ha) 143.8 (ac)

Ordnance Survey Sheet 1:50,000: 111 **1:10,000:** SK 58 NW, SK 59 SW

Date Notified (Under 1949 Act): 1979 **Date of Last Revision: -**

Date Notified (Under 1981 Act): 1984 **Date of Last Revision:** 1984

Other Information:
1. The boundary has been modified by extension and deletion at renotification.
2. This site incorporates the former Kings Wood SSSI.

Reasons for Notification:
The Roche Abbey Woodlands lie on the Magnesian limestone immediately south east of Maltby and include the wooded valley slopes and rocky crags around Roche Abbey. Although the majority of the site comprises woodland it includes also areas of marshy grassland and calcareous grassland.

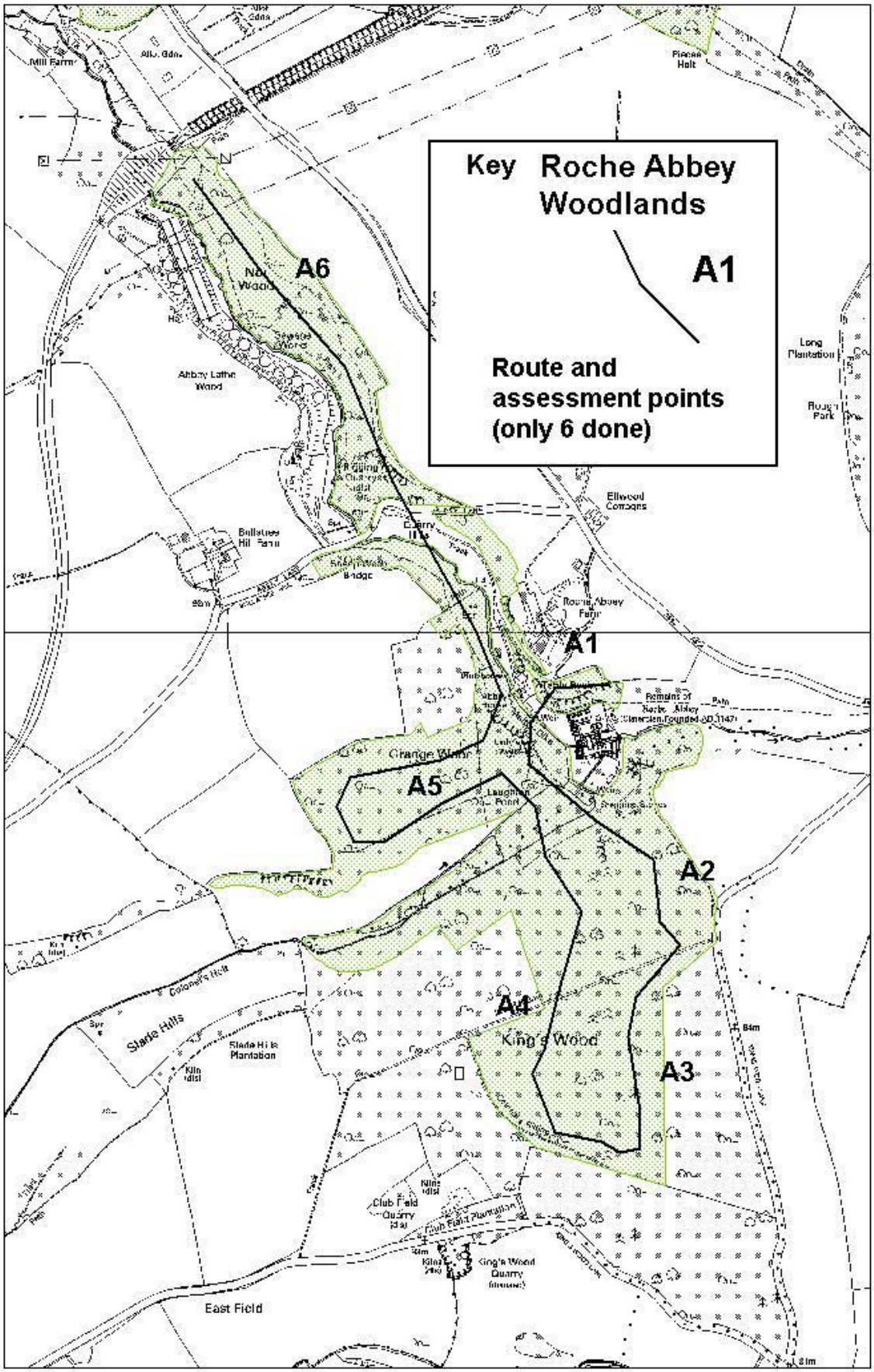
This site is the most important woodland for nature conservation on the southern parts of the Magnesian limestone in Great Britain and is the largest of its type in South Yorkshire. The semi-natural parts include examples of rare woodland types, notably calcareous sessile oak-ash-wych elm and sessile oak-ash-lime, and the structure approximates to a natural state which is very rare indeed amongst lowland mixed broadleaf woods. Large-leaved lime is unusually common and like other ancient semi-natural woods this site contains a range of natural soils.

The main tree species are sessile oak, ash, lime (both small-leaved and large-leaved), wych elm and silver birch. Hazel, holly and yew are common in the understorey while less frequently occurring shrubs include buckthorn *Rhamnus catharticu*s, field maple, spindle, wild privet and wild service tree *Sorbus torminali*s.

The field layer contains a number of species largely confined to ancient woodlands including lily-of-the-valley *Convallaria majali*s, yellow star of Bethlehem *Gagea lute*a, green helleborine *Helleborus viridi*s, toothwort *Lathraea squamari*a, hard shield fern *Polystichum aculeatum* and wood barley *Hordelymus europaeu*s.

In the valley bottom alder and willow carr is developing to replace marshy grassland and the swamp vegetation around the margins of Laughton Pond. Together with areas of calcareous grassland and scrub on the northern most valley slopes of Norwood these habitats, although subsidiary to the main woodland interest of the site, contribute significantly to the botanical and entomological interest of the site as a whole.

SSSI Map for Roche Abbey Woods



Conservation objectives for Roche Abbey Woods

To maintain the semi-natural woodland (predominantly ash-maple woodland with significant component of lime) in favourable condition.

Attribute	Target	Comment
Area	Area of ancient woodland maintained Area of semi-natural stands at least maintained.	Ancient and semi-natural areas defined from GFP surveys and Phase 1 habitat maps; areas of scrubby elm regrowth count as part of the woodland. There is potential in increase the semi-natural area through restoration of some of the marginal plantations.
Natural processes and structural development	Near-natural structural development under minimum intervention (Kings and Grange Wood) Nor Wood - diverse structure 10-20% open space 50-80% canopy cover 20-40% shrub layer 40-100% ground flora Wood edge/glade conditions in valley bottom No felling/removal of veteran trees Fallen dead wood left on site.	If minimum intervention is accepted for much of the site then we must accept whatever composition and structure develops, but with the following limits Invasive exotics (notably snowberry) should be controlled. Deer may need to be managed more heavily in future Large leaved lime populations may require attention if they were found to be in decline. In Nor Wood the young growth structure and high public access mean that minimum intervention is less appropriate.
Regeneration potential	Regeneration in minimum intervention area not limited by deer or invasive exotics. In Nor Wood regeneration sufficient to maintain canopy cover from natural regeneration or coppice regrowth No planting.	
Composition	Whatever native species balance develops in minimum intervention area, subject to continued presence of large-leaved lime Exotic trees and shrubs to be less than 5% cover In Nor Wood the current mix of native species should be maintained.	In the management of Nor Wood the following species should be favoured in order of preference: lime, elm, sessile oak, ash, birch. Beech should be treated as potentially native on this site. Although beyond the currently accepted range it is a long-established component of the site and it is the sort of site where an outlier of the past range Or advance invasion (in response to climate change) might be expected.
Quality indicators	No increase in extent of pheasant pens, feeders, camp fires etc in minimum intervention zone Significant (5%) occurrence of lime through the woods At least 85% of woodland vegetation referable to relevant NVC communities mainly W8) Associated pockets of acid woodland, yew on crags, and transitions to wet woodland maintained. Locally rare plants e.g. *Gagea lutea, Hordelymus europaeus* maintained. (See survey maps on file)	Precise map of current use needed. Location of stand and NVC types from GFP and other surveys. Locally rare plants would not be assessed directly on most visits, but opportunities should be taken to get them checked periodically.

A condition assessment for Roche Abbey woods - using the uncustomised form

A draft condition assessment form for woodland (version 2/6/00)
(superscript letters refer to accompanying notes)

Area to be assessed[a] Site name, subdivision, feature details.	Roche Abbey Woodland Ash-lime stands: about 60% seen.
Details of visit[b] Surveyor, date, time taken	IK Kirby, 21/7/00, c 3-4 hrs (including other survey work).
Supporting details[c] available...	Survey records attached.
1. Area attribute[d]	c ✓ ✓ ✓ ✓ ✓ ✓
Semi-natural area. Ancient area Patterns/boundaries	Target: no loss of area; no loss of S.N. character. A1. No observed threat. A5 No observed threat A2 " " " A6 " " " A3 " " " A4 " " "
Overall assessment -area[f]	Favourable: further spread/siting of pheasant pens will need to be ~~not~~ considered with the estate.
2. Processes/structure[d]	c ✓ ✓ ✓ ✓ ✓ ✓
Minimum intervention areas Glades/temporary open space Old growth/veteran trees Patterns of age classes Cover of different layers Fallen/standing dead	A1. Mixture mature lime high forest; open scrubby regrowth. A2. Mature lime mixed u/storey; single tree gaps; some fallen dead wood; clumps of young growth. A3. Mixed high forest, some mature trees, single tree gaps. A4. Mixed high forest. mature trees, single tree gaps + over track; dense u/storey of ash poles. A5. ~~Mature~~ Mixed high forest; mature trees single tree gaps. A6. Part open scrubby, 40-60 yr growth. Few old trees. Bramble dominated gaps.
Overall assessment - processes/structure[f]	Overall diverse structure with large areas of relatively undisturbed mature high forest. Gaps within wood small but adjacent rough grassland provides glade equivalent. FAVOURABLE
3. Regeneration[d]	c ✓ ✓ ✓ ✓ ✓ ✓
Type of regen. Abundance of regen. Recent annual growth Competition from ground flora Browsing damage Composition Planting levels	A1. Ash regeneration in gaps; some elm regrowth. A2. Ash seedlings; too dark for them to get further. Saplings under nearby gaps. A3. Young ash trees getting away. A4. Regeneration (mainly ash) present. A5. Young ash getting away. A6. Mostly pole-stage or younger anyway.
Overall assessment - regeneration[f]	Ash showing good regeneration wherever even small canopy gaps. Lime ~~regn~~ and oak regeneration unlikely to be picked up, but nothing to inhibit them if conditions come right. FAVOURABLE.

4. Composition[d]	[e]	✓	✓	✓	✓	✓	✓				
% cover exotics - each layer Impact intro. fauna Minimum levels - native trees	A1 5-10% exotics in canopy. A2 100% native A3 >95% native; occasional maple sapling A4 100% native. Patch of box seen elsewhere. A5. 100% " " " snowberry seen elsewhere A6 5-10% sycamore/Norway maple.										
Overall assessment - composition[f]	Beech accepted as native. Level of exotics within limits though & needs to watched in places. FAVOURABLE. No sign of deer damage.										
5. Quality indicators	[e]	✓	✓	✓	✓	✓	✓				
Vegetation fits NVC/Stand type Transitions/mosaics Dead wood Microhabitats (rocks, streams, etc) Distinctive species/elements Lime Mature structure Ground flora	A1. Lime frequent; yew on crags. Reasonable g/f. W8 Localised rubbish dumping and erosion. A2. Lime present. W8 g/f. Transitions to W10 A3. W8 g/f. Small pheasant pen, feeders. Bare tracks A4 " Lime present. A5 Lime elm W8 g/f. Transitions to W10. Pheasant pen. A6. Yew lime on crags. W8 g/f. Small scale disturbance.										
Overall assessment - quality indicators[f]	FAVOURABLE, but level of pheasant pen usage and disturbance needs to be watched as could lead to localised deterioration. Casual recreational use aesthetically undesirable but not significant damage to site.										
Supporting notes[g] Management/other events that have taken place recently and their impact. Work that would be desirable.	No obvious recent management other than game work.										
Overall assessment[h] Favourable - maintained Favourable - restored Unfavourable - recovering Unfavourable - declining Unfavourable - no change Partially destroyed Destroyed	Remaining ash-lime zones and valley bottom woods need to be checked, but on the basis of areas seen: FAVOURABLE. Likely to continue so provided game management not intensified.										
Are there other areas[i] that need to be considered before adopting this as the assessment for the whole feature on this site?											

Appendix 1 - Draft Bog Woodland SCM Methods, produced by Jenny Bryce SNH

The following table and methodology have been produced by Jenny Bryce (SNH). In its current form it does not correspond quite to the pattern that has been used in the rest of the guidance. However without changing the essence of the table, but merely re-arranging elements and treating age structure as a measure of regeneration for this type even this extreme woodland can be brought into the same 5 attribute structure - see my revised table at the end.

Keith Kirby June 02

Summary table

Attributes	Sub-attributes	Targets	Methods of assessment
Area	Distribution and extent.	'No loss' or where possible 'expansion' through restoration.	Over whole site from aerial photographs and ground survey.
Structure	Tree cover	a. Are there stunted trees present? Y/N (Y is favourable)	Over whole site
		b. Does the woodland have an open structure? Y/N (Y is favourable)	Map location and extent of tree cover and fixed-point photography.
	Age-structure	Is there a range of tree ages? Y/N (Needs field trials to assess if this is feasible)	Estimate tree ages (cohorts; regeneration, established, old) recorded at each sample point (10m by 10m), but target assessed over whole site.
	Ground vegetation	Browsing scored as H, M or light. (Browsing should be light to medium across the site).	Assessed at each of 10 sample points (2m by 2m) – Target to be met at 80% of samples
	Micro-topography	a. Is the hummock/ hollow patterning maintained? Y/N (Does not need to be met to be favourable)	Assessed at each of 10 sample points (2m by 2m).
		b. Bare ground (erosion, peat cutting) should represent less than 5% of the total area.	Over whole site
Water level	Indicators	Water table at, or just below the surface for the majority of the year. Y/N Characterised by: • Soft ground • Frequent *Sphagnum cuspidatum/recurvum* • No or few active drains • Peat cutting absent • No/few erosion channels	Assessed at each of 10 sample points (2m by 2m), but target assessed over whole site. (*S.cuspitatum or S.recurvum* to be recorded in at least 40% of sample points).
Composition	Exotics	Non-native trees, shrubs or herbs accounting for no more than 1% of plant cover.	Over whole site.

Attributes	Sub-attributes	Targets	Methods of assessment
	Vegetation	No loss of characteristic species. Should include at least three of the following; *Calluna vulgaris, Erica tetralix, Trichophorum cespitosum, Eriophorum vaginatum, Eriophorum angustifolium, Narthecium ossifragum, Drosera rotundifolia, Sphagnum spp.*	At each of 10 sample points (2m by 2m) - Target to be met in at least 80% of samples.
Quality indicators	Site specific quality attributes	Monitor the presence of special site features or locally rare species.	Over whole site Map extent, assess frequency or target note occurrence of species.

Field notes for bog woodland monitoring

Methodology

1. Not all pockets of bog woodland will need to be assessed, for example in some of the larger SAC complexes, e.g. Cairngorms, a sample of pockets of bog woodland could be assessed as representative of the resource within the SAC. However, distinct hydrological units should be assessed separately.

2. The surveyor should select a representative route around the site, taking in the range of structural variation and record this on a site map. The attributes should then be assessed at each of approximately 10 sample areas along the route (for each unit of bog woodland assessed).

3. Sample areas for assessing tree age-structure should be approx. 10 x10m, while for ground vegetation characteristics: browsing, micro-topography and water levels should be 2m by 2m.

4. The best time for surveying bogs is between April and November. For the purpose of picking up broadleaved saplings in fixed-point photographs the ideal timing would be June/July.

Attributes to be assessed

Area

As bog woodlands occur in relatively specialised and localised conditions there may be limited potential for expansion other than through restoration. The most common target will most likely be for 'no net loss'. Loss of bog woodland area to woodland can be assumed when the trees have a closed canopy and the ground vegetation looses the characteristic *Sphagnum sp.* dominance. If conditions get wetter, loss of bog woodland to bog might be assumed when there are no trees within approx. 1/2 hectare (70m by 70m square). Changes in the boundary should be noted on the SCM map.

Structure

Tree cover – Bog woodland has been defined as the stable condition whereby both the woodland and the bog elements are maintained. This may encompass quite a range of canopy covers from very scattered trees to considerable tree cover, however, canopy closure will lead to the loss of the bog elements. Therefore closed canopy is unlikely to be classed as

'favourable' for bog woodland. In light of such an assessment, we may review the management of the site and choose either to intervene or not to depending on the factors leading to this change. However, it would be useful to assess this sub-attribute to highlight this trend.
In the same way, an absence of trees could be interpreted as loss of condition (assuming they *were* present, if this site is being assessed as bog woodland). This could be attributed to browsing pressure, wind throw or water-logging. Unless there has been management to restore water levels using dams, we are unlikely to be able to/want to intervene to make the bog drier to promote tree growth, but we may want to influence grazing pressure. An increase in tree seedling establishment and survival may indicate that the bog is likely to be degraded, hence it would be useful to sketch the area of tree cover and take some fixed-point photographs for reference (comparison of sequential aerial photographs may also be useful).

Range of tree ages – Our difficulty to date has been in determining age of bog pines based on physical characteristics, as some stunted pines appear to be of considerable years. However, recent research[1] has found that on some sites there does appear to be a relationship between bog pine age and tree height and tree age and diameter at breast height (DBH). On other sites no strong linear relationship was found, indicating that other factors were accounting for much of the variation in tree size. However, based on this work we might be able to make some broad generalisation. If trees are less than 1.5m in height and less than 5cm dbh and are relatively lichen free, we might assume they are less than 20 years old. Regeneration of bog pines may only occur sporadically following a succession of dry summers; therefore we may not expect evidence of regeneration all the time. But in order to ensure some continuity of tree presence, we might want to ensure that there are at least some trees that appear to be in this <20 year old cohort. We would also expect that there are some older trees, either of greater height or diameter and perhaps also some dead trees. Lichens tend to be more abundant on older pine trees, hence older specimens may have significant cover of crustose species. If all trees appear to be dead, this should also be noted. The target may therefore simply be that there should be a range of tree ages. However, a description of what the current balance between these cohorts appears to be, would assist future comparisons. However, this sub-attribute requires further field testing to determine if it is possible to broadly distinguish between cohorts.

Ground vegetation/ *Browsing Impact*– As an indicator of vegetation structure we are likely to want to record trampling and grazing. As with other communities, this could be categorised as high, medium or low.

High – Frequent and conspicuous bare peat, may be actively eroding. Conspicuous tracks of sheep and deer. Obvious evidence of grazing in associated flushes. Most saplings with leaders browsed, evidence of browsing of lateral shoots. Medium – localised bare peat with little active erosion. Localised tracking restricted to ridges or fence lines. Localised evidence of grazing of dwarf shrubs and sedges. Localised browsing of saplings.

Micro-topography

Most natural, undisturbed bog surfaces usually show distinctive fine scale variation with small drier hummocks and wetter hollows related to growth of *Sphagnum* and other plants. We might therefore expect bog woodland sites to contain some of the following. These may be absent or reduced on cut-over or recently formed bogs.

- Hummocks - mounds of *Sphagnum* which can be up to 1m high and 1-2m in diameter
- High ridges - characterised by a dominance of dwarf shrubs, particularly heather (*Calluna vulgaris*), often growing in a senescent *Sphagnum* carpet.
- Low ridges - distinguished from high ridge because it tends to be far less dominated by dwarf shrubs. It is characteristic of soft, undamaged mire systems, in which it is the major ridge component.
- *Sphagnum* hollows - Although free water is often not visible, the dense carpet of *Sphagnum* sits in an aqueous matrix and cannot support any great weight.
- Mud-bottom hollows – as above but limited in its moss cover, but with a significant occurrence of higher plants.

The presence of hummocks and hollows could be recorded on all sites, but need not contribute to the overall assessment decision, *i.e.* a bog woodland lacking typical bog micro-topography may not be unfavourable unless other factors are also unfavourable.

Bare ground – Bare patches in peatlands may be caused by herbivore trampling and/or considerable fluctuations in water levels. Some erosion is thought to be natural, however, bare ground would generally be perceived as a negative indicator of condition. Therefore, we would want to highlight if this was an issue on a particular site. The target could be for a maximum acceptable area and/or proportion of the site, e.g. no more than 5% of site area and no individual area greater than 100sq m.

Water levels

There are long-term natural cycles (decades) of drying and wetting related to natural variations in climate, which cause changes in the bog vegetation. However, we would expect the water table to be just below the surface for the majority of the year. A combination of the following factors can be used to assess if this appears to be the case.

- *Sphagnum cuspidatum* or *Sphagnum recurvum* is frequent over the majority of the site
- there are no/few active drains
- peat cutting/extraction is absent
- there are no/few erosion channels which are not vegetated
- ground feels soft/ wet underfoot

As the water level can vary through the year, vegetation is probably the best indicator of year round water levels. *Sphagnum cuspidatum* or *Sphagnum recurvum* will only grow when the water level is high for the majority of the year. Therefore, if the species is frequent over the majority of the site (*i.e.* occurs in around 40% of sample points), the water level is likely to be favourable.

Composition

Exotics – Self-seeding of exotics such as Sitka spruce from adjacent plantations and rhododendron are likely to be the greatest threats to bog woodlands. As tree cover will generally be sparser on bog woodlands than other woodland types and growing conditions harsher, exotic removal will presumably quite realistic. Hence although exotic seedlings may regenerate, we are likely to set a low target for exotics e.g. less than 1% of tree cover and no individual exotic saplings established for more than 10 years (*i.e.* spanning monitoring cycles).

Vegetation composition – The suggested target is that 3 of the 8 species listed should be present in at least 80% of sample points. It is also suggested that if any other species covers more than 20% of the 2m by 2m quadrat, that it is recorded and its abundance assessed using the DOMIN scale. This may help to detect changes towards a more minerotrophic community, e.g. the spread of *Juncus effusus* and *Polytrichum communis*. Where mildly minerotrophic species are already present we would also want to monitor any changes in the species balance.

Species list: Calluna vulgaris, Erica tetralix, Trichophorum cespitosum, Eriophorum vaginatum, Eriophorum angustifolium, Narthecium ossifragum, Drosera rotundifolia, Sphagnum spp., Carex rostrata

Quality indicators

These are site specific features, for example rare species or the presence of an intact lagg fen. An example of a rare species might be white beak-sedge (*Rhynchospora alba*) at Pitmaduthy Moss, the only site in Easter Ross where it occurs. Rare species can be mapped, highlighted as target notes or the frequency assessed in each sample area depending on the species concerned. Targets for acceptable levels of change should be stated, e.g. mapped area of species distribution not to drop by more than 5% of current extent.

Making the SCM assessment

If any one of the 5 attributes are assessed as unfavourable, the feature is judged to be unfavourable overall. Where there are several sub-attributes which contribute to an attribute, again all targets need to be met for the site to be favourable, with the exceptions of micro-topography and age–structure. Age-structure needs to be assessed on a number of sites to test if this is a reasonable methodology. Until it has been validated, is proposed that a site will not be considered unfavourable if the sole target it fails to meet is that of age-structure.

[1] Anderson, A.R. & Harding, K.I.M. (*submitted to Botanical Journal of Scotland.)* The age structure of Scots pine bog woodlands.

J.Bryce 7.2.02

Revised Summary table to make it more compatible with rest of guidance

Attributes	**Targets**	**Methods of assessment**
Area	'No loss' or where possible 'expansion' through restoration.	Over whole site from aerial photographs and ground survey.
Structure	Stunted trees present	Over whole site
	Woodland has an open structure	Map location and extent of tree cover and fixed-point photography.
Regeneration	Range of tree ages present	Estimate tree ages (cohorts; regeneration, established, old) recorded at each sample point (10m by 10m), but target assessed over whole site.
Composition	Non-native trees, shrubs or herbs accounting for no more than 1% of plant cover.	Over whole site.
Quality indicators	Presence of special site features or locally rare species.	Over whole site Map extent, assess frequency or target note occurrence of species.
	Ground vegetation browsing scored as Medium to light.	Assessed at each of 10 sample points (2m by 2m) – Target to be met at 80% of samples
	No loss of characteristic species. Should include at least three of the following; *Calluna vulgaris, Erica tetralix, Trichophorum cespitosum, Eriophorum vaginatum, Eriophorum angustifolium, Narthecium ossifragum, Drosera rotundifolia, Sphagnum spp.*	At each of 10 sample points (2m by 2m) - Target to be met in at least 80% of samples.
	Hummock/ hollow patterning present	Assessed at each of 10 sample points (2m by 2m).
	Bare ground (erosion, peat cutting) less than 5% of the total area.	Over whole site
	Water table at, or just below the surface for the majority of the year. Characterised by: • Soft ground • Frequent *Sphagnum cuspidatum*/*recurvum* • No or few active drains • Peat cutting absent • No/few erosion channels	Assessed at each of 10 sample points (2m by 2m), but target assessed over whole site. (*S.cuspitatum or S.recurvum* to be recorded in at least 40% of sample points).

Appendix 2 - Condition assessment attributes matched against UKWAS, the UK Forestry Standard and FCS

Targets for non-SSSIs (1) - the UK Forestry Standard

The requirements under Note 5 (for semi-natural woodland) in the UK Forestry Standard could be re-interpreted as follows.

Attribute	Targets	Comment
Area	No loss of woodland area No reduction in semi-natural area	National policy is that any felling should normally be followed by restocking. Clearance for biodiversity is a special case - in effect such areas are (say) heathland in poor condition!
Structure and natural processes	Diversity of woodland structure present including <10-25% young growth (under regeneration) Some old/dead trees present throughout Permanent and temporary open space present	These indicate the broad requirement for a mix of age classes and structures. They can obviously be made more specific for the particular wood, for example by considering how the current structure has evolved as a consequence of coppice, wood-pasture, high forest etc.
Regeneration potential	Sufficient natural regeneration to restock canopy No new planting except in specified circumstances Any planting to be of locally native stock Regeneration not significantly restricted by grazing/browsing	Natural regeneration is strongly preferred. Planting is likely to be more acceptable where the current crop of native trees is planted, where it is to enrich with a highly valued native species, or where natural regeneration is of non-native species.
Tree and shrub composition	All currently present native trees and shrubs remain present. Reduced cover of non-native species	These again could be made more specific, but are a start.
Quality indicators (the things that are special to particular site)	Semi-natural ground flora retained Cultural boundaries and features retained. Micro-habitats such as wetland rock outcrops, etc retained.	Low disturbance methods promoted.

Targets for non-SSSIs (2) - the UK Woodland Assurance Standard

An increasing number of wood are managed in accordance with the UKWAS. Its requirements can be set out according to the common attributes approach. (This is only a first outline - it could be refined).

Attribute	Targets	Comment
Area	No loss of woodland area (unless agreed clearance of biodiversity/cultural purposes)	
Structure and natural processes	> 10% open space <10% in stands under 5yrs old 15% long term retentions Dead wood habitats provided throughout woodland (eg 3 standing, 3 fallen trees per ha)	There is a requirement for initial surveys to detail the interest of the site. The long-term retentions target can be substituted for managed reserve areas.
Regeneration potential	Grazing/browsing impacts not sufficient to limit regeneration No introduction of non-natives	
Tree and shrub composition	< 65% primary species >20% secondary species % non-native and invasive species reduced. Local provenance material used in any planting	There is a separate section with targets for restoration of areas of plantations on ancient woodland sites.
Quality indicators	Open habitats kept clear/restored Areas, species and features of importance for biodiversity maintained.	Any special elements must be identified in management plans.

Matching the attributes against guidance on defining Favourable Conservation Status under the Habitats Directive

Attribute	FCS component	Comments
Area (extent/location of woodland stands)	Habitat extent	
Structure and natural processes (age/size class variation within and between stands; presence of open space and old trees; dead wood lying on the ground; standing dead trees)	Habitat structure and functions Typical species	Attributes and targets cover the structural elements of woodland. The emphasis is on defining the 'desired' condition of the woodland: the current woodland structure may not be adequate. The importance of 'natural' processes is stressed. The needs of typical species is likely to be used in setting structural targets.
Regeneration potential (successful establishment of young stems in gaps or on the edge of a stand)	Habitat structure and functions	Regeneration is a key function of woodland.
Tree and shrub composition (cover of native vs non-native species)	Typical species Habitat structure and functions	Long-term changes may be considered acceptable under certain conditions. The composition of the tree and shrub layer determines much of the structure and functioning of the woodland.
Quality indicators (distinctive species, communities, micro-habitats, functional processes associated with a feature on a given site)	Typical species Habitat structure and functions	Assessment of NVC types provides a proxy measure of some woodland processes and typical species. Others are covered indirectly through maintaining key microhabitats such as streams etc. In some cases species occurrence may be picked up directly.

Appendix 3 - Conservation objectives and preferred management

COUNTY: SUFFOLK SITE NAME: ABBEY WOOD, FLIXTON

DISTRICT: WAVENEY DISTRICT

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: WAVENEY DISTRICT COUNCIL

National Grid Reference: TM 315859 Area: 18.5 (ha.) 45.7 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 38 NW

Date Notified (Under 1949 Act): 1972 Date of Last Revision: -

Date Notified (Under 1981 Act): 1986 Date of Last Revision: -

Other Information:

Description and Reasons for Notification:
Abbey and Packway woods are ancient woodland on a plateau of boulder clay overlain by sand. The woodland structure consists of coppice with standards although there is some 19th and 20th century planting of broadleaves and a few conifers. The woods have a varied flora including ancient woodland plants and one scarce species.

The dominant stand type is pedunculate oak-hazel-ash of the heavy soil form. Wet ash-maple and pedunculate oak-hornbeam (typical ash-maple) stands are also present along with small suckering elm wood stands around the woodland edge. Hazel *Corylus avellana* coppice occurs over much of the wood with some Hornbeam *Carpinus betulus* to the south-east. Oak *Quercus robu*r, Ash *Fraxinus excelsior* and Field Maple *Acer campestre* standards are found with the coppice. Scattered groups of planted Turkey Oak *Quercus cerri*s, *Picea* spp and *Populus* spp are also found.

Dogs Mercury *Mercurialis perennis* dominates the shaded woodland floor. Where the light penetrates the canopy, patches of the grass *Poa trivialis* are present. Brambles *Rubus fruticosu*s, Ground Ivy *Glechoma hederacea* and nettles *Urtica dioica* are frequent. Interesting occasional species include Early Purple Orchid *Orchis mascul*a, Bugle *Ajuga reptan*s, Wavy Bitter Cress *Cardamine flexuos*a, Yellow Archangel *Lamiastrun galeobdolo*n, Wood Millet *Milium effusu*m, Primrose *Primula vulgaris* Ramsons *Allium ursinu*m, Broad Helleborine *Epipactis helleborine* and the rare thin- spiked Wood Sedge *Carex strigos*a.

The woods have a long and varied history ranging from the medieval association with the Augustinian Abbey of Flixton to its more recent use in the Second World War. The concrete ride in the centre of Abbey Wood dates from this time.

Abbey Wood Flixton, TM 315859
Criteria sheet: woodland stand types 2Aa, 3As, 9Ab

Attribute	Target	*Current state (from citation)* and comments
Area	No loss of ancient woodland area No loss of semi-natural area	*18.5 ha, ancient woodland*. The whole site appears to be woodland; no reduction (beyond *de minimus*) acceptable
Structure and natural processes	>20 % of woodland as open space, including both temporary and permanent open areas. > 30% as stands less than 20 yrs old > 5 trees per ha > 50 cm dbh 5 dead trees and 5 dead lying trees per ha	*Coppice with standards. Hazel coppice over much of wood. Standards of oak and maple*. The wood appears to be important for open space and young growth in structure terms. The open space should be a mixture of permanent rides, but also temporary open space as in recently cut-over areas. There is no indication that old trees are an important feature - hence the minimalist target.
Regeneration potential	Any coppice regrowth > 1 m high by end of first growing season, and > 75% of stools showing such successful regrowth No new planted trees Sufficient natural regeneration sapling/young trees developing in gaps to replenish standards and fill gaps > 4 m in stool density. No signs of significant browsing on regeneration	The likelihood is that the best management for this site would be coppice. There is no evidence of extensive recent planting of native species, hence no new planting target. Assuming coppice regrowth is successful then only limited natural regeneration from seed is needed to fill gaps.
Tree and shrub composition	> 95% native trees and shrubs Mix of native species (predominantly oak, ash, hazel, present including locally abundant hornbeam, in areas indicated by recent survey (map needed). No rapid dieback/death of trees and shrubs (10% of a species in less than 5 years)	*Some 19th and 20th C planting of broadleaves, including groups of turkey oak and poplar, a few conifers Picea spp; oak-ash-maple with some hornbeam*. There are clearly some exotics, which will need to be reduced to < 5% to bring the wood into favourable condition. The hornbeam is worth noting as it is getting towards the north of its range in Suffolk and it is likely that the presence of hornbeam stands was one of the features behind the selection of the site. Hence a map of its occurrence is needed.
Quality indicators	> 85% of ground flora referable to relevant NVC types (mainly W8, ?some W10) *Carex strigosa* present (map of current locations needed) Suckering elm stands at wood-edge	*Varied flora including scarce species (Carex strigosa. Mercury, Poa, Glechoma, Urtica (W8) common; suckering elm stands at wood-edge*. On the basis of the citation there is nothing else particular about the wood.

Preferred management strategy: coppice over about half the wood, possibly as blocks alongside the rides. The rest could be managed high forest or left undisturbed.

COUNTY: SUFFOLK SITE NAME: ARGER FEN

DISTRICT: BABERGH

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: BABERGH DISTRICT COUNCIL

National Grid Reference: TL 933357 Area: 48.7 (ha.) 120.3 (ac.)

Ordnance Survey Sheet 1:50,000: 155 1:10,000: TL 93 NW

Date Notified (Under 1949 Act): 1956 Date of Last Revision: 1972

Date Notified (Under 1981 Act): 1986 Date of Last Revision: -

Other Information:
The boundary of this site has been reduced.

Reasons for Notification:
This site consists of two parts, both of which are sections of scarp slope on which sand and gravel overlie clay, with springs emerging at the junctions. Much of the site is woodland, with a wide range of stand types reflecting the range of soil conditions. Most of the woodland appears to be of ancient origin. The lower slopes contain areas of fen and wet grassland whilst the top of Tiger Hill supports dry, acidic grassland.

Parts of the lower slopes are occupied by alder wood, the ground flora of which reflects the fact that much of it has developed on very wet ground with many small streams and seepage areas. Great Horsetail *Equisetum telmateia* is very abundant whilst other species include Water Mint *Mentha aquatica* and Opposite-leaved Golden Saxifrage *Chrysosplenium oppositifoliu*m. Drier areas also occur and these support species such as Wood Avens *Geum urbanum* and Enchanter's Nightshade *Circaea lutetiana*.

On drier, sandy ground above the spring lines there are extensive areas of woodland. Hazel, Ash and Oak *Quercus robur* are all major components of the canopy along with Wild Cherry *Prunus avium* which occurs here in unusual abundance. Elm was dominant in two areas but much has now succumbed to disease. Small-leaved Lime *Tilia cordata* also occurs in one area and Sweet Chestnut *Castanea sativa* has become established in several stands. Bracken-dominated glades are found within the woodland and Birch occurs in abundance around their margins.

Much of this woodland shows evidence of coppicing and some at least appears to be of ancient origin. Two areas, Spouse's Grove and Arger Fen, are enclosed by well-defined wood-banks.

Arger Fen, the largest single block of woodland, has been partly replanted by conifers but the natural woodland vegetation was never completely suppressed. It is now re-establishing itself wherever the confer canopy has failed to close.

The ground vegetation of this woodland is largely dominated by Bracken and Bramble. Bluebells *Hyacinthoides non-scripta* are also found in abundance over wide areas. Other species include Wood Anemone *Anemone nemorosa*, Yellow Archangel *Lamiastrum galeobdolon*, Primrose *Primula vulgaris*, Wood Spurge *Euphorbia amygdaloides*, and White Climbing Fumitory *Corydalis claviculata*.

The area of short, acidic grassland on Tiger Hill is dominated by Bent Grasses *Agrostis sp*p. and Fescues *Festuca sp*p. Other abundant species include Heath Bedstraw *Galium saxatile*, Sheep's Sorrel *Rumex acetosella* and Harebell *Campanula rotundifolia*. The sward also includes a number of mosses and lichens whilst old anthills provide additional interest.

In the valley bottom there are a series of neglected wet meadows and fens. The wet meadows are dominated by Meadowsweet *Filipendula ulmaria*, Great Hairy Willow Herb *Epilobium hirsutum* and patches of nettle, reflecting the lack of recent grazing or mowing. A range of wet meadow and fen margin species does however persist, including Purple Loosestrife *Lythrum salicaria*, Marsh Marigold *Caltha palustris*, Blunt-flowered Rush *Juncus subnodulosus*, Ragged Robin *Lychnis flos-cuculi*, Creeping Jenny *Lysimachia nummularium* and Lady's Smock *Cardamine pratensis*. Brown Sedge *Carex disticha* and Jointed Rush *Juncus articulatus* also occur in the sward.

In the wettest areas tall fen has developed, dominated by Great Horsetail with comparatively few other species.

The juxtaposition of several different habitats increases the value of the site for birds and insects. The steep sandy banks attract Badgers and there are a number of active setts within the site boundary.

Arger Fen TL 933357
Criteria sheet: woodland and scrub – no detail

Attribute	Target	*Current state (from citation)* and comments
Area	No loss of ancient woodland No net loss (>0.5h) of semi-natural woodland	*Site area is 48.7 ha, but includes area of acid grassland, neglected wet meadows and fen. Some area of replanted woodland. Some recent woodland present*. We do not want to lose any ancient woodland, but some clearance of recent woodland may be acceptable to restore open fen; however there should be a concomitant shift from plantations to more natural stands so that the target of no net loss of semi-natural woodland is maintained.
Structure and natural processes	10-20% open space within wooded area 10-30% understorey 40-70% canopy cover 5 standing dead and 5 fallen dead trees per ha	*Evidence of past coppicing* Open space and scrubby edges are likely to be adequately provided on this site by the open grass and fen habitats. Therefore there seems no particular need to promote young growth and temporary open space. There is similarly no indication that old growth and dead wood is particularly important. Therefore a rather generic set of structural targets are given.
Regeneration potential	Any coppice regrowth to be > 1m high by end of first growing season. Saplings and young trees present in gaps more than 7 years old, sufficient to fill gap. Any new planted trees to be of local stock and to constitute not more than 25% of any regeneration area. No signs of significant browsing on regeneration	Coppice might be an option here; hence the target for regrowth is included. High forest gap regeneration more likely to be the model. There is work needed to restore quite a large area within the site to native broadleaves and planting may be desirable to speed this process up. However the amount of this should be limited.
Tree and shrub composition	> 80% native trees and shrubs Range of site native species present including elm, lime and alder (map of locations needed) No rapid dieback/death of trees and shrubs (>10% in five years)	*Sweet chestnut present; much of Arger Fen replanted with conifers, but native woodland recovering. Elm was dominant in two areas* Given past disturbance to the site a lower 'native species target' is suggested. I have assumed sweet chestnut should be counted as an exotic, unless other data shows this to be one of the sites where its very early introduction means it should be counted as an honorary native.
Quality indicators	> 80% of site is referable to relevant range of NVC types (W7/6, W10, W8) Open grassland and fen present in historical locations (see map). Springs and streams relatively undisturbed by drainage, pollution etc.	*Range of stand types reflecting range of soil conditions; mixture of habitats; Alderwood (W7/W2?) around streams and seepage areas; lime in one area; sandy areas with much bracken and bluebell (W10?); elm ash areas probably W8 (Geum, Circaea*)

Preferred management strategy: managed high forest over c60% since there is active work needed to restore the plantations. Some possibility for coppice or minimum intervention over the rest.

COUNTY: SUFFOLK SITE NAME: BURGATE WOOD

DISTRICT: MID SUFFOLK

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: MID SUFFOLK DISTRICT COUNCIL

National Grid Reference: TM 076757 Area: 30.5 (ha.) 75.36 (ac.)

Ordnance Survey Sheet 1:50,000: 144 1:10,000: TM 07 NE

Date Notified (Under 1949 Act): N/A Date of Last Revision: N/A

Date Notified (Under 1981 Act): 1987 Date of Last Revision: N/A

Other Information:
A new site.

Reasons for Notification:
Burgate Wood is a particularly good example of the type of oak-hornbeam woodland characteristic of this part of north Suffolk. It is ancient, with a coppice-with-standards structure and continues to support entirely semi-natural stands. Many giant coppiced stools are present which indicate its great antiquity. The ground flora is diverse and includes several species that are indicators of ancient woodland, including one rarity.

Pedunculate oak-hornbeam woodland occupies the central plateau in the wood. Hornbeam *Carpinus betulus* is present as coppice with Ash *Fraxinus excelsior* and Hazel *Corylus avellan*a. Some Field Maple *Acer campestre* occurs on the edge of the plateau and standard trees are of Oak *Quercus robur* and Ash. Mixed oak-hazel-ash woodland is present on a number of shallow valley sides that radiate from the central area with wet ash-maple woodland on the more calcareous boulder clays in the valley bottoms. Dogwood *Cornus sanguine*a, Guelder Rose *Viburnum opulus* and Spindle-tree *Euonymus europaeus* are characteristic of the calcareous soils.

The ground flora contains much Dog's Mercury *Mercurialis perennis* with frequent Primrose *Primula vulgari*s, Enchanter's Nightshade *Circaea lutetian*a, Sanicle *Sanicula europaea* and Water Avens *Geum rival*e. A number of uncommon species are present including Herb Paris *Paris quadrifoli*a, Yellow Archangel *Lamiastrum galeobdolo*n, Hairy Woodrush *Luzula pilosa* and the rare Lungwort *Pulmonaria officinali*s. The acidic sands on the central plateau are dominated by Bracken with Honeysuckle *Lonicera periclymenum* and Wood Sorrel *Oxalis acetosell*a. Wide rides are present and they have a distinctive flora including Tufted Hair-grass *Deschampsia cespitos*a, Meadowsweet *Filipendula ulmari*a, Yellow Pimpernel *Lysimachia nemorum* and Creeping Buttercup *Ranunculus repen*s.

A moated site is present and a massive woodbank and ditch surrounds much of the wood.

Burgate Wood TM076757
Criteria sheet: woodland stand type 2Aa, 3Ab, 9Ab

Attribute	Target	*Current state (from citation)* and comments
Area	No loss of ancient woodland area No loss of semi-natural woodland area	*30 ha, ancient wood, entirely semi-natural; massive woodbank and ditch round much of site*
Structure and natural processes	10-25 temporary/permanent open space 10-25% young growth/shrub layer >60% tree layer 5 standing dead trees and 5 lying dead trees per ha Wide rides present	*Coppice with standards; wide rides* No indication that particularly good for either young growth or old growth, so a rather middle of the road set of targets that could be met by a range of different treatments. Rather low target for shrub layer as hornbeam likely to cast a heavy shade
Regeneration potential	Any coppice regrowth >1m high at end of first growing season over 75% of stools Saplings and young trees present sufficient to fill gaps > 7yrs old No significant browsing impact on regeneration No new planted trees	
Tree and shrub composition	> 95% native trees and shrubs Hornbeam at least frequent in plateau area No rapid dieback/death of native trees/shrubs (>10% in five year period)	*Oak-hornbeam wood on central plateau; ash maple round edge*. Hornbeam appears to be the key distinguishing feature of the tree and shrub layer.
Quality indicators	> 80% of ground flora referable to relevant woodland communities (mainly W10 on plateau, W8 round edges) Giant stools present *Pulmonaria officinalis* present (map needed)	*Giant coppice stools; diverse ground flora, one rarity (Pulmonaria officinalis); calcareous soils present as well. Bracken honeysuckle on central plateau (W10); mercury, Circaea, herb paris on richer soils (W8); distinctive ride flora (wet grassland). Moated site present*

Preferred management strategy: The giant stools may be the factor that swings the direction of management on this site. They will survive at least in the short to medium term under a minimum intervention approach; and could probably be re-coppiced with care. Managed high forest would eventually lead to their disappearance. However hornbeam coppice is not necessarily going to give much in the way of a diverse flora/fauna compared to coppice on the richer soil areas. Therefore probably up to 20% coppice if practicable, otherwise minimum intervention for much of the plateau and perhaps some managed high forest round the edges.

Appendix 4 - Extracts from the SSSI Guidelines for woodland

3 Habitat Selection Requirements

3.4 Judging the quality of stands and sites

3.4.3 Some sites consist of characteristically species-poor woodland types, but, within their type, sites richer in species are more valued than species-poor sites. The standard recording form covering all woodland contains about 400 species. As a rough guide, sites with 100 – 200 of these (24 – 50% of the total possible) can be considered rich in absolute terms. For any Area of Search, however, factors such as woodland history and area, intensity of recording, woodland type, the regional species pool and the population size of a particular species affect assessments of species-richness (Kirby 1988)

3.4.4 Coppiced woodland which is still worked on a regular rotation with a wide range of standard trees and mixed composition is to be preferred to single species stands of neglected growth (40 – 70 years old) with few standards. For high forest stands (including abandoned coppice which is now effectively high forest), mature timber (more than 100 years old) and some canopy irregularity are preferred to young, even-aged growth. Abundant pollards, including old hollow trees, scattered through a site are more valuable as invertebrate and lichen habitat than a few concentrated on the boundaries.

3.4.5 Woods which adjoin or are in a mosaic with other habitats tend to be more valuable than those sharply abutted by arable or improved grassland. Diffuse, bushy or open edges are better than sharp boundaries. Within the wood, clearings (natural glades and managed rides), variable topographic features (such as steep ground, rock outcrops and wet habitats), variations in drainage and abundance of dead wood increase the importance of a site through greater diversity.

3.4.6 Documentary information may be used to determine whether or not a site is ancient, but in addition evidence about the past management of the site and surviving features that throw light on land-use history, such as earthworks and old pollard trees, improve our understanding of woodland processes. The past or present use of a woodland for ecological or other research is also a factor that raises the level of scientific interest of a site.

3.4.7 Special features must also be considered, for example outstanding populations of uncommon species, well developed scrub communities (where these are not found on sites selected on other grounds), extensive limestone [pavements or moss carpets, the highly wind-pruned woods of Dizzard (Cornwall) or the massive boulder scree of Carn a Mhadaidh (Sutherland)

3.4.8 Negative features about a site may include abundant or spreading exotic species such as rhododendron, rubbish tips and grossly polluted streams. Closeness to sources of air pollution will reduce the potential for epiphytic lichens. Heavy grazing, whether by stock of deer tends to restrict the diversity of the ground flora. Forestry operations may eliminate over-mature timber and dead wood important for invertebrates, and

even coppicing (which is desirable on some sites) may elsewhere break the continuity of canopy cover necessary for the survival of some shade-demanding bryophyte and fern communities in western Britain.

4 Selection procedure within an Area of Search

4.5 Woods in which the best candidate stands occur, usually in combination with other stands, should be assessed (see 3.4.2 – 8) for their overall value on the same basis. Woods selected for the presence of more than one type should normally be over 5ha and preferably over 20ha and should be mainly semi-natural. Smaller areas may have to be chosen in an AOS where very little semi-natural woodland exists in blocks of more than 20ha, often because most of the larger sites have been replanted. Some woods may have to be selected to include the rarer features which do not meet this size requirement, and some groups of small woods (separated by less then 1km) may be treated as a single ecological unit. The SSSI series should include also some sites selected because they contain a wide variety of types, even if other examples of each particular type are represented elsewhere in more uniform sites.

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Middle left: English Nature bat warden with a whiskered bat near Holme, Devon.
Paul Glendell / English Nature 24,795
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
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