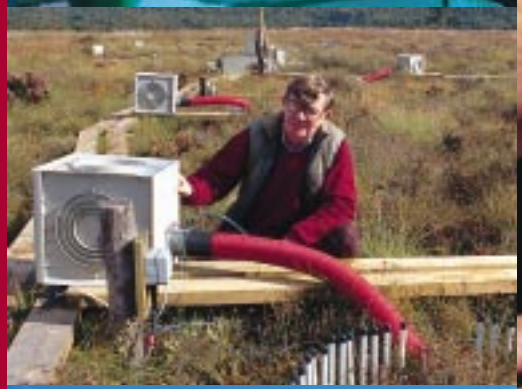
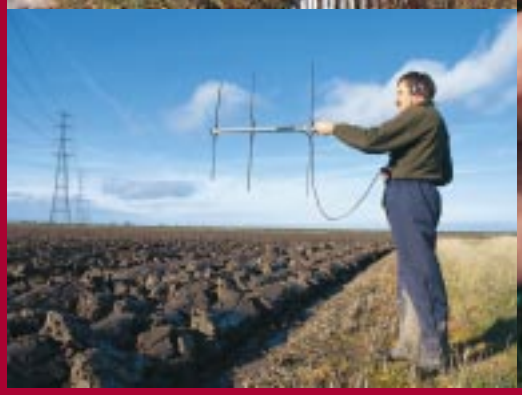
ENGLISH NATURE

Report Number
628

Development of a veteran tree site assessment protocol

English Nature Research Reports





working today
for nature tomorrow

English Nature Research Reports

Number 628

Development of a veteran tree site assessment protocol

Gill Castle & Rob Mileto
Eco Tech Ecological Consultancy
61 Copthorne Road
Shrewsbury
Shropshire
SY3 8NW

ISSN 0967-876X

Acknowledgements

Thanks are due to a large number of people who contributed to this project and particularly to the owners of the sites visited.

English Nature staff in the three trial regions were involved in site selection and providing background information and feedback during the field trials, notably David Clayden, Melanie Heath, Sam King and Anna Gundrey.

Staff at Peterborough provided valuable support, particularly Andrew Harfoot who dealt with all our mapping queries, Rebecca Isted who organised the seminar meticulously and Keith Kirby who oversaw the project.

Various people attended the seminar and commented on early drafts of this report. This input was really appreciated and proved invaluable in revising and developing the protocol.

Summary

To date, where species data are not available, there have been no guidelines to allow the grading of sites for their veteran tree interest, or designation of these sites as Sites of Special Scientific Interest (SSSIs). A protocol was needed that would enable assessment of a site for its veteran tree interest, primarily in terms of the size and quality of the veteran tree population *per se* rather than solely in terms of the associated species these trees support. Such a protocol would enable the subsequent development of guidelines for the selection of SSSIs specifically for their veteran tree interest.

Initial ideas for an assessment method were put together by the inter-agency Woodland Lead Co-ordination Network for the Joint Nature Conservation Committee (JNCC). The initial guidelines were then trialled in the field, across a range of sites, to see whether the approach could be used successfully to distinguish sites of different values.

The aim was the development of a rapid non-specialist field survey to enable the evaluation of sites for their veteran tree interest and inform selection of sites as SSSI for this interest through comparison or ranking of sites.

The project involved:

- field trial of initial draft guidelines;
- developing field measures and assessment criteria to produce a survey and assessment protocol which is both practical to use in the field and can enable a meaningful evaluation (ranking) of sites for their veteran tree interest.

The draft protocol was trialled on 30 sites: 15 in Dorset; six in the Thames Basin and nine in North Yorkshire. Initial results and recommendations were circulated widely during summer 2004 and discussed at a seminar in September 2004.

The field trials demonstrated that it is possible to undertake meaningful rapid assessments of sites for their veteran tree interest. The protocol developed as a result of field trials and consultation adopts primary and secondary criteria by which sites of particular value in terms of their veteran tree resource can be identified.

Further field measures which are relatively easy to record and that provide valuable information are recommended to assist with guiding future management and setting management priorities but are not considered appropriate to assess or compare sites.

Contents

1. Introduction

1.1 Background

The significance of veteran trees, and sites supporting veteran trees, has become much more widely recognised since the 1980s when the majority of work relating to site evaluation was undertaken, including the publication of Guidelines for the Selection of Biological Sites of Special Scientific Interest (SSSIs) (Nature Conservancy Council 1989).

This wider recognition of the national and international value of veteran trees can, in part, be credited to:

- the Veteran Trees Initiative which ran from 1996 to 2000 and was responsible for:
  - the promotion of the management and continuity of England's veteran tree heritage;
  - raising the public's awareness of the conservation importance of ancient trees;
- the Ancient Tree Forum which was established in 1993, bringing together a wealth of expertise and knowledge;
- the realisation that the UK supports a significant proportion of Europe's ancient trees.

However, to date, the majority of sites that have been identified as important for their veteran tree interest, either locally or nationally, have been designated on the basis of a species interest, usually the presence of saproxylic invertebrates or epiphytic lichens. The trees themselves and the wood-pasture/parkland systems of which they are a part have rarely been specifically recognised. To date, where species data are not available, there have been no guidelines to allow the grading of sites for their veteran tree interest, or designation of these sites as SSSIs.

This has resulted in at least two major concerns:

a) sites for which no recent species information is available have not been assessed or designated;

b) even where sites with a veteran tree interest have been designated, advice on management and site condition are likely to be limited to factors affecting the species or habitat interest features for which the site is designated, rather than the trees.

Where information is available on key species groups associated with wood-pasture/parkland and veteran trees, this should still be used in site assessment. However it is desirable to develop an additional site assessment system that can be applied relatively quickly by non-specialists; and that will assess a site for its veteran tree interest, primarily in terms of the size and quality of the veteran tree population *per se,* rather than solely in terms of the associated species these trees support. An appropriate assessment protocol would enable subsequent development of guidelines for the selection of SSSIs specifically for their veteran tree interest. Such guidelines would enable the designation of sites which have previously been excluded from the SSSI series and would also enable the appropriate recognition of the veteran tree interest on many existing SSSIs.

1.2 Developing an assessment protocol for veteran tree sites

Initial ideas for an assessment method were put together by the inter-agency Woodland Lead Co-ordination Network for the Joint Nature Conservation Committee (JNCC). The starting point for developing guidelines for selection of SSSIs for their veteran tree interest was the NCR criteria (Ratcliffe 1977). An initial 'brainstorm' suggested a number of possible features that might reflect each of the NCR criteria. Each of the features was then considered to select those which were

i) most relevant to the selection of SSSIs;

ii) reasonably easy to assess and interpret.

To develop a system for recording and assessing appropriate field measures the group drew up a list of 'major' field measures and suggested some possible thresholds for high, medium and low priority sites (Table 1).

From experience with woodland criteria, the group did not expect to produce a simple tick-box system whereby all sites above a certain threshold would automatically go forward for notification. Rather it was expected that a site which scored highly across a range of field measures, or exceptionally on a few measures, would receive more detailed consideration, at which point some of the other more difficult to measure or qualitative factors, for example site history, might come into play. A final decision would inevitably involve elements of value judgement on the part of the relevant agency staff.

English Nature undertook to trial the initial guidelines (Table 1) in the field, across a range of sites, to see whether the approach could be used successfully to distinguish sites of different values.

The aim was the development of a rapid non-specialist field survey, based on the guidelines, to enable the evaluation of sites for their veteran tree interest and inform selection of sites as SSSI for this interest. This would allow the comparison or ranking of sites but would not set the threshold above which sites might be considered for SSSI status.

Field trials were undertaken between autumn 2003 and spring 2004. The initial findings and recommendations were widely circulated during summer 2004 and presented at a seminar held in September 2004. Feedback from both the consultation and seminar contributed to the further development of the assessment protocol as described in this report (a list of contributors is included in Appendix 1). Further testing of this protocol is planned for early 2005.

Table 1 Initial guidelines for veteran tree site assessment

Field measure	Possible thresholds		
	High	**Medium**	**Low**
Area characteristics			
1. Extent of mosaic	>50ha	11-50ha	10ha or less
2. % tree-ed land	>50%	11-50%	10% or less
Tree population characteristics			
3. No of veteran trees	>100	11-100	<10
3a Cover of exotic species	<5%	5-25%	>25%
4. Density of veteran trees	>5/ha	2-5/ha	<2ha
5. Tree cohort continuity (assessed by tree size)	At least 1 cohort per 100 yrs	At least 1 cohort >100 yrs as well as veterans	Largely veterans & trees under 150 yrs
6. Trees >1.5m dbh	>15	5-15	<5
Vegetation/habitat characteristics			
7. Ground vegetation	Good quality, unimproved	Semi-improved or significantly disturbed	Mainly arable or improved
8. Scrub present (but not shading all the lower trunks of trees)	10-20% bramble or scrub	Bramble/scrub patches at least present	Scrub/bramble present as single scattered bushes or absent
9. Dead wood, rot holes, sap-runs, hollow trunks	Much dead wood in crowns, large limbs and stems left *in situ*	Some dead wood left on trees & ground, evidence for removal	Little dead wood either in the trees or on the ground of any size
10. Water-bodies or other wet habitats	Significant	Present	None present
General context			
11. Shape	Compact	Elongated/ irregular	Linear
12. Surrounding land	>75% semi-natural	25-75% semi-natural	<25% semi-natural
Other measures (not necessarily recorded in the field)			
12a Proportion of known veteran tree resource in AoS	>20%	5-20%	<5%
12b Other veteran tree sites nearby	Adjacent	Within 1km	>1km away
12c Local pollution load	Low	Medium	High
Associated species characteristics			
13. Interest for associated species (eg lichens, saproxylic invertebrates)	Known to be high	Some interest known	No known interest

1.3 Relationship between this and other survey methods

A detailed Specialist Survey Method (SSM) for veteran trees already exists (Veteran Trees Initiative 1997) and has recently been reviewed (Fay & de Berker 2003). The aim of this project is not to seek to replace this, but to develop a way of assessing sites/tree populations as opposed to individual trees. The results of SSM, where available, could inform this process.

Other related work includes:

- the Staffordshire county survey of parkland sites (Webb & Bowler 2001). Selection of Sites of Biological Importance here is based primarily on the number of veteran trees present within a given area with other criteria assuming a secondary role;

- the Thames and Chilterns parkland and wood-pasture veteran tree phase II survey (Rose, Forbes and Fay 2004) which was undertaken to confirm the extent of the wood-pasture and parkland resource in the region and identify areas suitable for expansion or restoration of this UK priority habitat. 5986ha of wood-pasture or parkland and a further 2194ha of relict wood-pasture or parkland were recorded;
- databases of parkland/ veteran tree sites and of veteran trees include WAPIS (www.wapis.org.uk) and the ancient tree hunt (www.woodland-trust.org.uk/ancient-tree-hunt/index.htm). Data from these sources could be used to inform site evaluation where available. Conversely, information collected during veteran tree site assessments could subsequently be entered into these databases, subject to agreement of the landowner;
- the pilot survey of veteran trees in north-west Europe (Smith & Bunce 2004).

2. Methodology

The project involved:

- field trial of the initial draft guidelines (Table 1);
- developing field measures and assessment criteria to produce a survey and assessment protocol which is both practical to use in the field and can enable a meaningful evaluation (ranking) of sites for their veteran tree interest.

2.1 Site selection

The draft protocol was trialled on 30 sites: 15 in Dorset; six in the Thames Basin and nine in North Yorkshire (Table 2). Sites were selected by English Nature regional staff and included a variety of sites which display a range of characteristics.

Table 2 List of sites included in the field trials (alphabetical order by region)

Sites in Dorset	Sites in Thames Basin	Sites in North Yorkshire
Game Copse	Aldermaston Park	Beningborough Hall
Goathorn Plantation (parts)	Baylis House	Castle Hill
Herringston House	Caversham Park	Duncombe Park
Holt Forest	Easthampstead Park	Freeholders Wood
Holt Wood	Silwood Park	High Wood
Kings Wood	Sunningdale Park	Ripley Park
Kingston Lacy		Studley Royal
Langton West & Talbots Woods		'Yorkshire site A'
Melcombe Park/Hill Wood		'Yorkshire site B'
Minterne Park		
Minterne Seat Coppice		
Stock Gaylard		
Sutton Common/Boys Wood		
The Oaks		
Turnworth Common		

Maps were obtained for each site at a range of scales (generally by fitting each site onto one A4 or A3 sheet). A scale of approximately 1:5000 was considered ideal.

Access was arranged with the relevant landowner/manager to all but two of the sites. The Yorkshire A and B sites were small sites surveyed from public rights of way only.

2.2 Site boundary definition

Sites were identified by English Nature staff prior to survey, but boundaries were sometimes modified during, or following, field survey to follow readily identifiable features on the ground (field boundaries etc) or to omit areas which were found to support no (or very few) veteran trees. Fringing woodland around the margins of parkland was usually omitted unless it appeared to support significant numbers of veteran trees.

Defining site boundaries is discussed further in section 3.2 below.

2.3 Veteran tree definition

Veter*an Trees - A guide to good management* (Read 2000) gives the following 'definition' for a veteran tree:

- trees of interest biologically, aesthetically or culturally because of their age;
- trees in the ancient state of their life;
- trees that are old relative to others of the same species.

Some veteran trees are instantly recognisable and identifying veterans in the field can be possible where the surveyor is particularly experienced (ie is very familiar with what is 'normal' for a tree/shrub of that species). However, there is a continuum from mature trees or shrubs displaying few signs of antiquity, to trees and shrubs which display veteran characteristics at a relatively early stage of development (for example as a consequence of environmental stress) through to ancient trees in their late stages of life. Therefore, some guidance is required to encourage objective recording by non-specialists and to enable a consistent approach to site assessment.

Some individuals make a distinction between veteran trees (trees of any age displaying 'veteran characteristics') and ancient trees (trees which are in beyond full maturity and in an ancient life stage). In practice it can be difficult to distinguish between these in the field, especially during a rapid survey. Therefore, the current project took the approach that all trees which might be termed veteran or ancient should be recorded, though some distinction is recommended at a later stage (see section 4.2.2).

Box 1 sets out English Nature's initial guidance as to which trees to record as veterans during this project. These guidelines result in the recording of the majority of trees which fit the above definition, generally erring on the side of caution (ie 'borderline' veterans often meet the criteria), an approach encouraged by the Specialist Survey Methodology (Veteran Trees Initiative 1997). Note that some modifications to the guidelines were proposed during field work (see section 3.1).

Box 1 A simple objective method for consistent recording of veteran trees (or potential veteran trees), based on that used by Smith & Bunce (2004).

Tree size

The following estimated dbh size categories should be used to determine veteran trees by species:

- 75 cm: field maple, rowan, yew, birch;
- 100 cm: oaks*, ash, Scot's pine, alder;
- 150 cm: sycamore, lime, horse chestnut, elms, poplar species, beech, willows, other pines.

* No differentiation made in recording of *Quercus petraea, Q. robur* or hybrids of the two.

Tree attributes

Based on the veteran tree recording methodology (English Nature 2000; Fay & de Berker 2003).

Rot holes: These holes can develop through limb loss and bark wounds and are expanded by micro-organisms and invertebrates. They may be occupied by birds and bats

Rot sites: Wood may be digested by the colonisation of rot holes (see above) by decay fungi. These sites can then become important for saproxylic species.

Dead wood: Dead wood is often colonised by decay fungi with fallen and attached dead wood supporting a different suite of species.

Hollowing: Any hollowing in the trunk or major limbs.

Trees that show over three of the above features should be recorded as veterans for the purposes of this survey whether or not they also exceed the diameter limits.

These trees show the habitat characteristics of veteran trees which are thought to be important in terms of biodiversity. Their smaller size may reflect the influence of environmental factors (eg poor growing conditions) or the tree management (lopping and topping, which reduces annual increments).

2.4 Field survey

The aim was to develop a field survey methodology which can be undertaken by a non-specialist surveyor and can be completed in less than one day per site, but which will gather as much useful information as possible in relation to a site's veteran tree interest. Field measures need to be practical to record and provide meaningful information.

A field survey form was developed to record each of the features presented in Table 1. As the project progressed, further field measures were added and some of the initial measures were modified (see section 3).

Individual veteran trees were identified using the guidelines provided (Box 1 and section 3.1), and mapped approximately, including a note of species, trees >1.5m and ancient trees (trees which appeared to be significantly old, eg oaks at least 400 years old).

Other features of the site were recorded including quantity of visible dead wood, habitats, scrub cover, adjacent land use and current management.

Parts of the survey form were completed in the field, with other sections (eg site extent, number of veteran trees and veteran tree density) completed subsequently.

2.5 Data output

Approximate veteran tree positions at each site were later entered into a Geographical Information System (GIS) (including notes of significantly large trees and ancient trees).

Note that tree positions did not need to be mapped accurately for this project. Maps were produced to assist with assessing the size (and distribution) of the veteran tree population at a site (and defining site boundaries) and were not designed to provide a definitive map of exact locations of all veteran trees.

Survey forms were completed at this stage.

Examples of completed assessment forms for selected sites are included in Appendix 2.

2.6 Timing required for completion of field survey and assessment forms

The approximate times needed to complete the assessment at individual sites is detailed in Box 2.

Box 2 Approximate timing required

A. Survey preparation (maps/access permission): 1 hour

B. Field survey:

Parkland < 50ha:	1-4 hours
Parkland > 50ha:	4-8 hours
Woodland < 50ha:	2-6 hours
Woodland > 50ha:	5-8 hours

The maximum areas covered in one (8 hour) day were:

Parkland:	167ha with 350-400 veteran trees (Studley Royal)
Woodland:	90ha with *c*300 veteran trees (Holt Forest)

C. Report completion:

Sites with <50 veteran trees:	1 hour
Sites with 50-100 veteran trees:	2 hours
Sites with > 100 veteran trees:	3-4 hours

2.7 Consultation and seminar

Following the circulation of the initial results of the field trials, assessment methods were further developed as a result of discussions and consultation with interested individuals and groups, including a seminar held in September 2004 (Appendix 1).

This report incorporates feedback received during the consultation process.

3. Veteran tree recording and site definition

3.1 Identification of veteran trees

3.1.1 Size

Read 2000 states:

> "Size alone is a poor characteristic for determining veteran status although some rules of thumb exist….Different species of tree may grow to very different maximum sizes. In addition the same species can grow to very different sizes in different situations and conditions."

The use of the English Nature dbh (diameter at breast height) guidelines can result in the inclusion of large numbers of trees at some sites, particularly in the south of England where mature oaks of around 1m dbh can be relatively common. Conversely, dbh can be restricted by environmental factors or management, such as pollarding, and therefore some trees (particularly pollarded oaks) may fall below the dbh guidelines despite considerable age.

The perception of tree size varies between sites. For example, a 1m dbh oak can appear relatively insignificant at a site with numerous huge trees but will appear significant in a suburban setting with few mature trees. Some care is therefore required to ensure dbh is estimated reasonably consistently.

The recording of veterans primarily by reference to dbh thresholds can result in the inclusion of more trees than has been the case in other surveys. For example, at Kingston Lacy (a National Trust site in Dorset) the current survey recorded over 200 veterans using the dbh guidelines. However, previous National Trust (NT) surveys considered far fewer trees to be veterans at this site. There could be several reasons for the discrepancy between surveys:

- the current survey is based on estimated dbh whereas the NT surveys measured girth accurately;
- mature oaks of 1-1.5m dbh displaying few obvious signs of ageing were probably not included in the NT surveys;
- small tree species and shrubs do not appear to have been included in the NT surveys (for example, field maples)
- small individuals displaying veteran characteristics do not appear to have been included in the NT surveys (which appear to have concentrated on large trees).

The inclusion of 'borderline' veterans means that an assessment takes into account trees that are likely to develop into veterans in the near future (the next generation).

Although dbh is not as easy to measure accurately as girth, it is easier to estimate and hence more useful in rapid site assessment. The accuracy of estimates should be checked by occasional girth measurements.

Additional guidance on use of dbh includes the following:

- Dbh is a valuable tool for rapid assessment in the field but it may be necessary to develop the guidelines further, for example to take regional variation into account. Trees with a history of pollarding may also require revised guidelines.
- 75cm dbh may be too large for birch which rarely attains this size.
- 75cm dbh may be too small for yew (which can still be in an early life stage at this size).
- 150cm dbh is too large for most willow species, in particular grey and goat willows for which 75cm would be more appropriate.
- Hornbeam, holly and cherry species are not included in the guidelines. 75cm might be an appropriate dbh guideline for these species.
- Sweet chestnut is not included in the guidelines. 150cm might be an appropriate dbh guideline for this species.
- The guidelines do not cover shrubs, fruit trees or coppiced individuals but these are perhaps best dealt with separately (see below).

3.1.2 Veteran tree attributes

During field trials, the requirement that a tree should show three of the four specific attributes listed in Box 1 would have resulted in the omission of a number of trees which displayed significant veteran characteristics but of only one or two types. Other veteran characteristics mentioned in Read 2000 (Box 3) such as loose/missing bark, water pools or fungal fruiting bodies were often present and readily observed. Identifying and differentiating between rot holes and rot sites can be time consuming where these are not clearly visible from a distance.

Competition within closed canopy woodland ('self-thinning') can produce an abundance of trees which show several veteran attributes but which are small diameter and often young. Such individuals were not recorded as veterans during the current survey even where they displayed three features listed in the English Nature guidelines.

The attribute guidelines (Box 1) should therefore be broadened to include all characteristics listed in Read 2000 (Box 3), that **mature** trees are recorded as veterans where they show either:

- three or more of these characteristics or
- significant signs of one or more of these characteristics, eg hollowed trunk

are recorded as veterans.

Collapsed trees, naturally layered trees and individuals displaying phoenix regeneration should also be recorded as veterans where the main stem or a sizeable stump is still present.

Box 3 Characteristic features of veteran trees
READ. 2000. ***Veteran Trees - A guide to good management***

- girth large for the tree species concerned;
- major trunk cavities/progressive hollowing;
- naturally forming water pools;
- decay holes;
- physical damage to trunks;
- bark loss/loose bark;
- large quantities of dead wood in the canopy;
- sap runs;
- crevices in the bark, under branches or in the root plate sheltered from direct rainfall;
- fungal fruiting bodies (eg from heart rotting species);
- high number of interdependent wildlife species;
- epiphytic plants;
- an 'old' look;
- high aesthetic interest.

In addition a tree may also:

- have a pollard form or show indications of past management;
- have a cultural/historic value;
- be in prominent position in the landscape.

3.1.3 Dead trees

The initial guidelines did not state whether dead trees should be included as veterans. During the field trails only live trees were included under the heading of 'number of veteran trees'. Large standing and fallen dead trees were recorded and taken into account in the assessment of dead wood.

However, a dead veteran tree continues to be valuable for wildlife because of the slow rate of decay and such trees are often greatly under-valued (Read 2000). Standing and fallen whole (or nearly whole) dead trees which meet the dbh guidelines should therefore be recorded as veterans for the purposes of site assessment but recorded separately from the of live veterans.

3.1.4 Shrubs and fruit trees

Shrubs and fruit trees are not included in the initial dbh guidance and may be overlooked. However, veteran shrubs and fruit trees (in old orchards) may be of cultural/historical value and can support notable species assemblages, particularly lichens.

Shrubs which appeared to be of significant age or size were recorded as veterans during the field trials. These were generally found in close proximity to veteran trees and usually displayed some veteran attributes, particularly hollowing.

Veteran shrubs should be recorded for the purposes of site assessment, although more guidance is needed on identifying these objectively in the field. Their numbers should be recorded separately to those of veteran trees.

Orchards were not included in the field trials but a similar methodology could be applied to this habitat with dbh guidelines and other field measures adjusted accordingly.

3.1.5 Coppice stools

Coppice stools are not well covered by the initial guidance and may be overlooked, other than exceptional individuals. Veteran coppice stools are likely to be of cultural/historical value but may not provide as many ecological niches as veteran trees and shrubs. Coppiced individuals generally comprise mainly young/small diameter timber although the stool may be of significance to a variety of species groups, for example epiphytic lichens or saproxylic invertebrates.

During the current survey, coppice stools >1m diameter and mature stools showing signs of significant hollowing or rotting were generally recorded as veterans. Additional coppiced/laid individuals were included where they appeared ancient (crevices, gnarled bark, large stools), especially along boundaries.

Coppice stools are likely to be most numerous in ancient woodlands which are covered by existing guidelines for SSSI selection. However, there may be instances where coppiced individuals occur in association with veteran trees and contribute to the overall value of a site for its veteran trees.

The presence of veteran coppiced and laid stools, including boundary shrubs and trees, should contribute to site assessment, but further guidance is needed on identifying these objectively in the field.

3.2 Site definition

Exceptional individual or scattered veteran trees, may be significant landscape, cultural and ecological features in their own right. However, JNCC has recommended against the use of SSSI designation for individual trees. Therefore the assessment protocol is based on a ‘site or population’ based approach (in line with the SSSI system).

A ‘veteran tree site’ is as an area of land, generally bounded by physical features, with a veteran tree interest occurring (but not necessarily evenly distributed) throughout the area. The site may comprise one or more of a variety of habitats such as parkland, wood pasture

(including former wood pasture), shelterbelts, woodlands, riverside habitat, orchards or formal gardens.

In most cases a site is relatively easily identified, for example following historical park boundaries. Defining the 'site' can be less straightforward where the veteran tree interest is concentrated in a core area but with other veterans extending out into the surrounding land.

During the field trials, site boundaries were sometimes amended following survey to omit areas which were found to support no (or very few) veteran trees.

A minimum density threshold might be used to distinguish a 'veteran tree site', as opposed to a broader landscape where scattered veteran trees occur ('treescape'). Areas of open land, particularly at the margins of sites, with few veterans (falling below the density threshold) would then be omitted from a 'site'. However, inclusion of open habitat with few, or no, veteran trees can be justified, for example where this is central to the site (between veteran trees) or could provide space for future generations of trees to establish.

The 30 sites visited during the field trials supported veterans at the following densities:

Region	**Density of veteran trees**				
	>10/ha	**5-10/ha**	**2-5/ha**	**1-2/ha**	**<1/ha**
Dorset	1	5	9	0	0
Thames Basin	0	0	1	3	2
N. Yorkshire	3	1	3	2	1
Total	4	6	13	5	3

A threshold of one mature tree per hectare has been suggested as the minimum density at which land can be termed parkland (Cox and Sanderson 2001). Similarly, a threshold of one veteran/ha might be considered an appropriate guideline to apply to veteran trees sites, below which the veteran population may be too diffuse for a site-based assessment. Appropriate density thresholds should reflect regional or local differences in veteran tree populations and borderline sites should be considered on an individual basis.

Only three sites included in the field trails fell below this threshold: Caversham Park and Easthampstead Park in the Thames Basin and Beningborough Hall, North Yorkshire.

Another consideration raised during the project is the need to extend any site definition designation beyond veterans which occur at the site boundary to ensure that the underground parts of the tree are also protected. An extension to include land beyond the boundary of the veteran population might also be justified where management of this land is required to ensure the long-term survival of the veteran population.

Where a veteran tree population is to be added to the list of qualifying features for existing SSSIs as a result of application of the assessment protocol, there may be a need to revise the boundary to ensure it does sufficiently protect the veteran tree interest.

4. Discussion concerning assessment criteria/field measures

4.1 Overview

During the course of the project, each of the field measures (Table 1) was tested in the field along with a number of additional measures, leading to recommendations with regard to field measures and assessment criteria.

- Criteria relating specifically to the size and quality of the veteran tree population should be of greatest significance in evaluating a site for its veteran tree resource.
- Secondary criteria which reflect the condition of the veteran tree resource and overall ecological value of the site will be of use in providing further information and comparing sites which support veteran tree populations of similar size and quality.
- Other field measures, which can easily be recorded during a rapid survey, may provide useful information to guide future management or identify threats but are less relevant to site assessment.
- Some of the suggested criteria are either difficult to measure objectively or are considered to be of limited value in assessing sites.

4.2 Primary criteria

4.2.1 Number of veteran trees

The number of veteran trees occurring on a site should be treated as a primary criterion. The more trees, the more alternative niches there are, and organisms that require precise micro-habitats are more likely to find enough to support viable populations (Read 2000).

All trees which meet the guidelines as discussed in section 3.1 above should be recorded. Dead veterans, veteran shrubs and coppice stools should be included in the total although these latter categories should be noted separately (for example a site might support 145 veterans of which five are dead and 32 are shrubs).

Practical measurement

Estimating the number of veteran trees at any particular site is reasonably straightforward. The numbers may be under- or over-estimated (particularly at large sites) unless individual, or groups of, veteran trees are mapped during survey. Mapping need not be detailed and locations need only be approximate (bearing in mind this is a rapid site assessment). Such mapping was found to take very little extra time and provides several additional benefits including:

- reducing the chances of double counting or omitting individual trees;
- providing an illustration of veteran tree distribution within the site (sometimes helpful in identifying appropriate site boundaries);

- providing an opportunity to record other information such as species and notes of ancient or particularly large/special trees;
- providing a base for future surveys.

Assessing veteran tree numbers was more difficult and time consuming within woodland habitat than in open parkland. Identifying trees of appropriate size, or with veteran attributes, was often difficult amongst dense stands of trees, particularly where the majority of trees present were 'borderline' (eg just over and just under the relevant dbh guideline). Where dense scrub (particularly holly) obscures trunks, the assessment becomes difficult (eg at Holt Forest, Dorset). However, missing a few individuals, or including a few which don't quite meet the guidelines, is unlikely to affect significantly the overall assessment so it is not necessary to spend excessive time ensuring that every tree has been accurately measured and mapped.

Thresholds

The initial guidance suggests the following thresholds:

>100 veterans = high value; 11-100 veterans = medium value; 10 veterans or less = low value.

Of the sites visited, 16 sites fell into the medium value category and 14 fell into the high value category. No sites with fewer than 10 veteran trees were surveyed. Sites with fewer than 10 veterans would probably not be considered a high priority for further survey or assessment except in regions where veteran trees are very scarce.

Region	Number of sites		
	High value (>100 veterans)	**Medium value (11-100 veterans)**	**Low value (10 veterans or less)**
Dorset	7	8	0
Thames Basin	2	4	0
N. Yorkshire	5	4	0
Total	14	16	0

Recommendation

The size of the veteran tree population should be a primary criterion. Guidelines to assist with identification of veteran trees and shrubs require some clarification.

The following thresholds appear appropriate:
>100 veterans = high value; 11-100 veterans = medium value; 10 veterans or less = low value.

4.2.2 Presence, and number, of ancient trees

The term 'veteran' encompasses a wide range of trees which display attributes associated with late maturity such as large trunk girth and trunk hollowing. The term 'ancient' refers specifically to the age class of a tree, describing the stage of development in the ageing process beyond full maturity. Veteran features can develop prior to the ancient stage in a tree's life, for example as a result of environmental stress. Therefore trees which meet the

guidelines discussed in section 3.1 and which are recorded as veterans, though usually mature, are not necessarily 'ancient'.

Whilst all veteran trees are potentially of cultural and ecological value, ancient individuals are especially valued. They are considered likely to be of particular cultural and ecological significance and are a key indication that there is likely to have been a continuity of veteran tree/deadwood habitat and management at a site. Sites which harbour concentrations of ancient trees are more likely to offer a robust and sustainable ecosystem for the species assemblages associated with this habitat (Fay, *pers. comm*.).

The majority of veterans recorded during the field trials were included on the basis of their dbh rather than features typical of antiquity and most (even many of the 1.5m dbh individuals) appeared unlikely to be beyond late maturity. However, a number of ancient trees were also encountered, for example oaks likely to be in excess of 400 years old (some perhaps up to 1000 years old).

The initial guidelines did not distinguish between 'veteran' and 'ancient' trees. However, it is recommended that the significance of ancient trees is recognised by the addition of a measure for the presence, and number, of ancient trees. This is a much more subjective judgement than the recording of veteran trees (which follow more objective guidelines as discussed in section 3.1) and records need to be treated with caution depending on surveyor experience.

Practical measurement

Accurate measurement of the age of individual trees is difficult to assess in the field but the following may assist with the identification of ancient trees:

- dbh > 2m (Read 2000), though this only applies to certain species (eg oak);
- significant trunk hollowing;
- significant crown die back (as a result of natural retrenchment through ageing), often accompanied by re-iterative epicormic growth, though this will not apply to working pollards;
- historical records of individual trees or sites, though these will not be consistently available.

Thresholds

The presence of even small numbers of ancient trees is of significance and indicates an important continuity of habitat at a site.

Therefore the following thresholds are suggested:

>15 ancient trees = high value; 1-15 ancient trees = medium value; ancient trees absent = low value.

The trial sites fall into the following categories:

Region	Number of sites		
	High value (>15 ancient trees)	**Medium value (1-15 ancient trees)**	**Low value (ancient trees absent)**
Dorset	2	11	2
Thames Basin	1	4	1
N. Yorkshire	3	4	2
Total	6	19	5

Recommendation

Presence, and number, of ancient trees (and shrubs) at a site should be a primary criterion. Guidelines are needed to assist with identification of ancient individuals in the field.

The following thresholds are suggested:
>15 ancient trees = high value; 1-15 ancient trees = medium value; ancient trees absent = low value.

4.2.3 Trees >1.5m dbh

Trees >1.5m dbh are valuable in terms of conservation (Read 2000). Large trees are likely to support a greater number veteran attributes such as dead wood in the crown, decay holes and fungal fruiting bodies than smaller individuals.

There is likely to be some overlap between this criterion and that relating to ancient trees (see 4.2.2 above). However many large veterans would not yet be considered ancient and, conversely, many ancient trees/shrubs are not >1.5m dbh. This measure may be important in differentiating between sites which support a good population of notably large (but possibly not yet ancient) veteran trees and those which support populations of 'borderline' veterans. It also provides an additional indicator for overall volume of the resource which was suggested as a valuable assessment measure by some contributors.

If tree size were considered important only as an indicator of antiquity then:

- this measure might be considered to be adequately covered by the criterion relating to ancient trees;
- the two criteria might be combined into one ('the presence, and number of, ancient and/or large trees and shrubs'); or
- presence, and number, of trees >1.5m dbh might be considered a secondary criteria (see below).

However, the inclusion of a distinct criterion relating to large trees has the advantage that it can be recorded more consistently than "ancientness". Since this measure relates directly to the veteran tree resource it is considered a primary criterion.

Practical measurement

It is relatively easy to note individuals which have a dbh greater than 1.5m, although the accuracy of estimates should be checked by occasional girth measurements (>1.5m dbh approximating to >4.7m girth).

Thresholds

The initial guidance suggests the following thresholds:
>15 individuals = high value; 5-15 individuals = medium value; <5 individuals = low value.

Region	Number of sites		
	High value (>15)	**Medium (5-15)**	**Low (<5)**
Dorset	7	6	2
Thames Basin	2	3	1
N. Yorkshire	6	0	3
Total	15	9	6

Recommendation

The presence of, and number of, large veterans should be a primary criterion with the following thresholds:
>15 individuals = high value; 5-15 individuals = medium value; <5 individuals = low value.

4.3 Secondary criteria

4.3.1 Extent of site

On its own this measurement is not considered key to the evaluation of a site's veteran tree interest. A small site could be just as valuable, or more valuable, than a large site, depending on the characteristics of the veteran tree population present (numbers and quality of veteran trees).

However, the measure is of value in some respects, for example:

- a large site has the potential to support a larger veteran tree population with greater space to accommodate younger cohorts and open-grown trees;
- a large site may support a greater diversity of habitats and/or be of greater ecological value in other respects (eg viability of habitats and species).

Practical measurement

The site extent is easily measured using GIS once the site boundaries have been identified (see sections 2.2 and 3.2 above).

Thresholds

The initial guidance suggested the following thresholds:

>50ha = high value; 11-50ha = medium value; 10ha or less = low value.

Region	Number of sites		
	High value (>50ha)	**Medium value (11-50ha)**	**Low value (10ha or less)**
Dorset	5	7	3
Thames Basin	3	2	1
N. Yorkshire	5	2	2
Total	13	11	6

Recommendation

The extent of the site should be a secondary assessment criterion with the following thresholds: >50ha = high value; 11-50ha = medium value; 10ha or less = low value.

4.3.2 Tree cohort continuity (assessed by tree size)

The initial guidance notes stated: "Cohort continuity is a critical component, providing a measure of the potential for future habitat continuity at a site. A cohort of trees every 100 years is probably a reasonable level of continuity. Each cohort should consist of at least as many trees as are in the veteran/near-veteran category."

There appears to be a general consensus that cohort continuity is an important measure of the condition of the veteran tree resource and its potential to retain its value in the long-term but that the current value of the veteran tree resource at a site is not dependent on the presence of future cohorts.

The initial guidelines referred only to the presence of equal numbers of trees in 100 year age groups. This does not take into account tree species or distribution. For example:

- If the current veteran tree interest comprises mainly oaks, the presence of future cohorts comprising mainly other species might not be of equal value to future cohorts of oaks;
- If young trees are concentrated in one part of the site, some distance from current veterans, will associated species be able to disperse to the new veterans in the future?
- Trees growing in a wooded situation (ie not open-grown) may not develop into veterans of equal value to open-grown individuals.

A more useful field measure might attempt to assess not only the numbers of trees in 100 year age groups (with an aspiration that future cohorts outnumber current veterans) but also include an assessment of whether the species composition and distribution of these reflects those of the current veteran tree population.

Practical measurement

Measurement of cohort continuity, especially taking into account species, distribution and situation, is complex, particularly at large sites. Although a brief assessment could be made during the field trials, accurate or detailed assessment would not be possible at many sites within a single brief field visit.

Thresholds

The initial guidance suggests the following thresholds:

- at least 1 cohort of trees per 100 yrs = high value;
- aAt least 1 cohort over 100 yrs as well as veterans = medium value;
- largely veterans & trees under 150 yrs = low value.

However, taking into account species, distribution and situation the thresholds might be amended as follows:

- at least 1 cohort of trees per 100 yrs comprising similar species composition, distribution and situation to the current veteran tree population = high value;
- cohorts not considered to adequately reflect the numbers, species, distribution or situation of current veteran tree population = medium value;
- veteran trees only = low value.

Using these modified thresholds cohort continuity at many sites was not assessed as favourably as taking into account numbers of trees alone.

Region	Number of sites		
	High	Medium	Low
Dorset	3	12	0
Thames Basin	1	5	0
N. Yorkshire	4	4	1
Total	8	19	1

Recommendation

Tree cohort continuity should be a secondary assessment criterion with species, distribution and situation (open-grown versus shaded) taken into consideration as well as total tree numbers when considering the value of tree cohorts (thresholds as described above).

4.3.3 Dead and decaying wood

Dead and decaying wood is a feature upon which many species associated with veteran trees depend. For example, the value of a site in terms of its saproxylic invertebrate species is likely to be directly related to the abundance/characteristics of the deadwood habitat present.

Deadwood associated with veteran trees is often clearly visible as large dead branches or trunk sections, either attached to the trees or fallen. However, less obvious decaying wood present within the trees, for example associated with hollowing trunks may be of equal, or

greater, importance and actively pollarded trees will have little visible deadwood. Therefore, the quantity of obvious deadwood at a site is not necessarily the sole indicator of the quantity or quality of deadwood habitat present. Additionally, even at sites where deadwood has largely been removed in the past, deadwood management policies can be changed in the future.

Nevertheless, the presence of visible deadwood will indicate that there has been a tradition of deadwood retention at the site, a practice which is generally accepted as good management for species which are often associated with veteran tree populations and deadwood habitat. The presence of significant quantities of large and long-standing deadwood is also likely to indicate a continuity of this habitat in the past.

Therefore the presence and quantity of dead and decaying wood are considered to be relevant measures of one aspect of the condition of a site, particularly if this reflects the management policy relating to retention or removal of deadwood at a site. However, the likely presence of 'invisible' deadwood should not be overlooked, especially at sites with little visible deadwood.

Practical measurement

The general abundance/characteristics of (visible) dead wood could be assessed relatively easily in the field, especially during winter months. Assigning assessment thresholds was relatively straightforward despite the subjective nature of the assessment.

Whole/near-whole standing and fallen dead trees should be recorded as veteran trees (see 3.1.3 above).

Thresholds

The initial guidance suggests the following thresholds:

- trees with much dead wood in crowns, large limbs and stems left in situ = high;
- some dead wood left on trees and ground, but evidence for removal = medium;
- little dead wood either in the trees or on the ground of any size = low.

Using these thresholds, the 30 sites surveyed during the field trials can be categorised as follows:

Region	Number of sites		
	High	**Medium**	**Low**
Dorset	5	9	1
Thames Basin	2	0	4
N. Yorkshire	3	4	2
Total	10	13	7

More complex methods for deadwood measurement exist (for example, Cox and Sanderson 2001). However, a relatively rapid assessment is required by the current protocol.

Recommendation

The presence and quantity of visible deadwood should be a secondary criterion with thresholds as suggested by the initial guidance.

4.3.4 Ground vegetation

The quality and status of the ground vegetation is of relevance to the overall condition of both the site and the veteran tree resource, providing an indication of:

- past, and current, site management including the level of agricultural intensification and other impacts on the soils, which are believed likely to have a direct impact upon the health of the veteran trees;
- the availability of nectar sources within the site.

A veteran tree population occurring within a matrix of semi-natural habitats is likely to be of greater value in terms of its associated species and in better health than a population occurring within significantly modified or intensively managed habitat.

Practical measurement

The general quality of ground (field layer) vegetation could be assessed relatively easily in the field although the quality of grassland (unimproved, semi-improved, improved) was not always possible to assess accurately during winter months. Many sites are diverse, supporting a number of different field layer vegetation types. In such cases it can be difficult to assign a site to a single assessment category and the predominant vegetation type was used to evaluate the site although this will result in the overlooking of small (but possibly significant) areas of high or low quality vegetation. Where both high quality and low quality vegetation are present over significant areas a "medium" assessment was assigned.

Thresholds

The initial guidance suggested the following thresholds:

- good quality, unimproved = high value;
- semi-improved or significantly disturbed = medium value;
- mainly arable or improved = low value.

The above thresholds appear to relate mainly to open habitat rather than more densely shaded or wooded habitats. Therefore the following additions are suggested:

- semi-natural vegetation = high value;
- disturbed/modified vegetation = medium value;
- significantly suppressed vegetation/bare ground (as a result of dense shade) = low value.

Using these combine thresholds the field trial sites were spread fairly evenly across the three categories.

Region	Number of sites		
	High	Medium	Low
Dorset	8	4	3
Thames Basin	1	2	3
N. Yorkshire	2	5	2
Total	11	11	8

Recommendation

Ground (field layer) vegetation should be an important secondary criterion. Thresholds should relate to a variety of habitats including both open and wooded habitat as follows:

- predominantly unimproved/semi-natural = high value;
- predominantly semi-improved/disturbed/partly modified = medium value;
- predominantly improved/arable/significantly modified or suppressed = low value.
- sites supporting ground vegetation of varying quality in roughly equal proportions are best assessed as of medium value.

4.3.5 Other veteran trees in the surrounding landscape

The presence of veteran trees in the surrounding landscape may allow dispersal of species and connect veteran tree populations which might otherwise be isolated. A site with additional veteran trees in the vicinity may have a greater potential to support viable populations of species associated with veteran tree or deadwood habitat. Such veterans could be concentrated on another neighbouring 'site' or occur as more widely spaced individuals scattered in the landscape, for example in hedgerows.

Practical measurement

The ease with which this is measured depends on local knowledge. During the field trial, sites were assessed mainly on the basis of whether other veteran tree sites were known from the locality or whether veteran trees were observed in the local landscape during survey.

Thresholds

The initial guidance thresholds referred primarily to the presence of other 'veteran trees sites' in the locality. However, taking into account scattered veterans in the landscape as well as more concentrated populations, the following thresholds are suggested:

- veteran trees frequent throughout the surrounding landscape (within 1km) or concentrated adjacent to the site (ie an adjacent veteran tree site) = high value;
- veteran trees present but infrequent in the landscape (within 1km) or concentrated within 1km of the site (ie near-by veteran tree site) = medium value;
- few or no veteran trees present within 1km (no other veteran tree sites) = low value.

Using these thresholds, the 30 sites surveyed during the field trials can be categorised as follows:

Region	Number of sites			
	High (adjacent)	Medium (within 1km)	Low (>1km away)	Unknown
Berkshire	1	2	1	2
Dorset	0	8	1	6
Yorkshire	0	5	3	1
Total	1	15	5	9

Recommendation

The presence of other adjacent/near-by veteran trees, either concentrated on 'sites' or scattered in the landscape, should be a secondary criterion with thresholds as discussed above.

4.3.6 Diversity within the veteran tree population

The suggested methodology did not take into account the diversity within the veteran tree population. However, the value of veteran tree populations over isolated individuals lies, at least in part, in the presence of alternative/abundant niches and micro-climates which are likely to be greater in a diverse veteran tree population than in a uniform one.

Factors which contribute to diversity within a veteran tree population include:

- the range of tree/shrub species present;
- the range of forms represented, for example open-grown or close-grown maidens, pollards, coppice stools, phoenix regeneration, layered individuals etc;
- the age structure - veterans can range from less than 200 years up to 1000 years or more;
- the range of situations/habitats represented such as open and unshaded, grouped, open-canopy woodland or closed-canopy woodland.

A field measure relating to the diversity of veteran trees on a site could assist with both site assessment and provide useful information to guide future management of the veteran population.

Practical measurement

It has been suggested that each of the above factors requires separate assessment but splitting this criterion into four would result in it receiving too great a weighting. However, each of the four characteristics should be recorded separately on the survey form.

Thresholds

The following thresholds are suggested:

- Diversity in at least three factors (species, form, age and/or situation) = high;
- Diversity in at least two of the factors, or high diversity in one = medium;
- Little diversity = low.

Region	Number of sites		
	High	**Medium**	**Low**
Dorset	7	6	2
Thames Basin	2	3	1
N. Yorkshire	4	4	1
Total	13	13	4

Recommendation

Veteran tree diversity (taking into account species, form, age and/or situation) should be a secondary criterion with the thresholds as described above.

4.3.7 Interest for associated species (lichens, saproxylic invertebrates etc)

The inclusion of existing species information in the evaluation of sites for their veteran tree interest is considered of value where the species interest is directly associated with the site's veteran tree population and/or its associated deadwood habitat.

Practical measurement

This criterion relates purely to existing information (which was not generally available during the field trials).

At some sites, species data may be known prior to survey. New information may also come to light as a result of discussions with the site owner, Local Records Centre or other local contacts.

Thresholds

Prior to the field survey it was agreed that a site should only be considered of low value for this feature where a specialist survey had been undertaken but little or no interest had been recorded. Where no information is available the site should not be assigned to a value category.

The initial guidance suggests the following thresholds:

- Significant interest confirmed = high value;
- Moderate interest confirmed = medium value;
- Surveyed but no interest found = low value.

Region	Number of sites			
	High (high species interest)	**Medium (some species interest)**	**Low (no significant species interest)**	**Unknown (no information) ***
Dorset	1	0	0	14
Thames Basin	0	0	0	6
N. Yorkshire	2	0	0	7
Total	3	0	0	27

* Additional species information is available for some of these sites but was not incorporated into the results presented in this report.

Recommendation

Associated species interest should be included as a secondary criterion at sites where information is available.

4.3.8 Documented habitat continuity

The initial guidelines did not include a field measure or assessment criterion specifically relating to habitat continuity. However continuity (of veteran tree and deadwood habitat) was added for consideration as an assessment criterion during the project. A site which has a continuous history of traditional management and of veteran tree and deadwood habitat is likely to be considered to be of particular value since:

- it is likely to support ancient trees and long-standing deadwood;
- it is likely to support a greater diversity of associated species, particularly given the poor dispersal rates of many species associated with veteran trees. Periods during which veteran trees and/or deadwood have not been present at a site may have lead to extinctions;
- the associated habitats (eg grassland) are likely to contribute significantly to the site's overall nature conservation value and its value to species associated with veteran trees;
- the soils are likely to be relatively undisturbed which may contribute to the long-term survival of veterans;
- it is also likely to be of particular cultural and historical interest.

Factors which may indicate a long-term continuity of veteran tree/dead wood habitat at a site include:

- a well documented history of traditional habitat management (eg long-established parks and hunting forests);
- presence of a wide age range amongst veteran trees including ancient trees;
- presence of long-standing and large diameter standing and fallen decaying wood;
- evidence of traditional habitat management on site (eg unimproved/semi-improved field layer vegetation, continued low intensity grazing, deer park management, continuous pollard management).

Habitat continuity is difficult to assess in the field, particularly during a brief field visit. Moreover, consultation indicated that indicators of habitat continuity in the field are adequately covered by other assessment criteria, notably the presence of ancient trees, dead wood and ground vegetation criteria. However, where historical records documenting habitat continuity exist, these should also be taken into consideration. Historical information could also be used prior to field survey to identify sites likely to be suitable for further assessment (ie as an initial filtering system).

Note that historical records were not used in the field trials, though information was subsequently made available for a few of the trial sites.

Recommendation

Documentary evidence of habitat continuity (in relation to veteran tree/deadwood habitat) should be used as a secondary criterion where available. Where long-term habitat continuity is well documented (for example evidence that a site is derived from a pre-1800 deer-park/hunting forest or pre-dissolution monastic land), a site should score highly for this criterion. However, absence of such documentation should not affect the assessment since this may be as a result of poor records rather than poor continuity.

4.3.9 Potential

At some sites the veteran tree interest will be naturally increasing or there may be high potential to enhance this interest through appropriate management. Conversely, at other sites the veteran tree interest may be naturally declining or there may be little potential to ensure its continuity.

Factors which affect the site's potential with regard to its veteran tree interest include:

- historical and current management including threats to veterans (crown shading, disturbance of soils, agricultural drift, removal of old trees);
- presence/absence of near veterans and future cohorts (cohort continuity);
- management objectives (public access, landscape, commercial, nature conservation);
- potential for planting/developing new generations of veterans;
- deadwood management (safety issues, possible conflicts with other management objectives);
- site extent (interest may always be limited on small sites);
- site ownership (sympathetic to veteran trees/deadwood or not).

Some of these factors contribute to other assessment criteria (particularly retention of deadwood, tree cohort continuity, site extent) and some factors could change in the future (site ownership, objectives, site management). Nevertheless, although an evaluation should primarily be based on the current value of a site, whether it is likely to be possible to sustain (or enhance) a site's veteran tree interest or whether thus interest is likely to be lost (or decline) is of relevance.

Practical measurement

A subjective assessment is possible taking into account each of the factors listed above.

Thresholds

The following thresholds are suggested:

- veteran tree interest likely to remain high or increase in the short- to medium-term = high value;

- veteran tree interest likely to be remain moderate in the short- to medium-term = medium value;
- veteran tree interest likely to remain low or decline in the short- to medium-term = low value.

Region	Number of sites		
	High	**Medium**	**Low**
Dorset	8	7	0
Thames Basin	2	3	1
N. Yorkshire	4	3	2
Total	14	13	3

Recommendation

Potential should be a secondary criterion to give some measure of the likely future dynamics with regard to the site's veteran tree interest.

4.4 Other useful field measures

4.4.1 Density of veteran trees

Density gives a measure of the relationship between site extent and number of veteran trees.

The initial guidance stated: 'density should be assessed based on the numbers in the 'tree-ed' area' but given the difficulties in defining and measuring the 'tree-ed' area (see discussion in section 4.5.1 below), density was measured for the site overall (the estimated total number of veteran trees divided by the site area).

Although easily measured, there are two significant problems associated with the use of density as an assessment criterion.

i) The difficulty in assigning thresholds:

The relationship between veteran tree density and associated species interest is not yet well understood. The initial guidance suggested that sites with more than five veterans per hectare would be regarded as of high value and sites with less than two veterans per hectare would be regarded as of low value. However, desirable densities are likely to vary between sites (for example they may be different for parkland habitat and wood pasture habitat), high densities may not be the optimum where this results in competition or shading between veterans or a lack of opportunities for future open-grown veterans and low densities may not affect more mobile species.

Assigning appropriate thresholds appears to need further consideration. Consequently it has been suggested that this measure should not be used as an assessment criterion until the relationship between density and veteran tree interest are better understood.

ii) The influence of site boundaries/site extent on density:

Extensive sites supporting large veteran tree populations may have a lower density of veterans than a small site supporting few veteran trees although the former would generally be considered to be of greater value, other factors being equal.

This is well illustrated at Castle Hill, North Yorkshire. Part of this site (*c* 5ha) is an SSSI comprising remnant wood pasture dominated by veteran trees. Although veteran trees are concentrated within this area, a large number of very large and ancient trees occur scattered through the adjacent plantation woodland. Castle Hill SSSI supports over 20 veteran trees per hectare. However, when the site boundaries are extended beyond the SSSI, despite the fact that the veteran tree population is more than doubled (from 120 to 250), the density of veterans falls to less than five per hectare.

Recommendation

Veteran tree density should not be used as an assessment criteria until the relationship between density and veteran tree interest is better understood and meaningful assessment thresholds can be established. However, a minimum veteran tree density threshold may be useful in defining a 'veteran tree site' (see section 3.2 above).

4.4.2 Presence of non-site-native veterans

During the field trials, species were recorded during the rough mapping of veterans so the numbers of veterans of individual species could be calculated along with the proportion of which were non-site-native species. Limes were generally assumed to be non-site-native where they were obviously planted.

The initial guidance suggested that sites with more than 25% non-site native veterans should be viewed as of low value for this criterion. However, at many sites there has been a long tradition of planting non-site native trees (for example sweet chestnut in deer parks) and many epiphytic and saproxylic species can be associated with these. There appears to be general agreement that certain non-site-native broadleaved species can be of importance within a veteran population, particularly where they are long-established (ie there has been a long history of the species at the site).

Therefore, the presence of non-site-native trees within a veteran tree population is not necessarily detrimental to the site's interest.

Recommendation

The proportion of non-site-native species is not considered a useful assessment criterion since long-established species such as sweet chestnut can be considered to be of significant value as veterans and may be of significant cultural/amenity value at some sites.

All species which might be considered of value in a veteran tree population, regardless of origin, should be included in the guidelines for recording veterans but other species considered to be of limited value (for example non-native conifer species) should not be recorded.

Nevertheless, species composition of the veteran tree population is a valuable field measure which can be gathered (or estimated) during a rapid site assessment and will be of relevance to future site management (for example in guiding the composition of future cohorts) and will influence associated species (for example epiphytes).

4.4.3 Scrub

Scrub species (for example hawthorn, blackthorn and bramble) can act as a nectar source for a number of invertebrate species associated with veteran tree and deadwood habitat. The presence of some scrub could also indicate appropriate grazing levels and a lack of agricultural intensification.

However, the value of scrub in association with veteran trees depends on:

- the scrub species;
- the cover (cover of scrub needs to be balanced with the traditionally/historically open nature of parkland and wood pasture habitats).

Although the presence and moderate cover of certain species of scrub is accepted as of value, setting thresholds for high, medium and low categories would be complex (depending on the species, habitat, distribution in relation to veteran trees etc) and a site with an absence of scrub should not necessarily be devalued, particularly since a change in management can result in an increase in scrub cover in a relatively short timescale.

Recommendation

The presence/cover of scrub should not be used as an assessment criterion. However, notes on the presence, abundance and species of scrub present at a site can be made during a rapid field assessment and this information may be of value in providing additional information about the site and guiding future management.

4.4.4 Water-bodies or other wet habitats

This measure was included in the initial guidance since some species associated with veteran trees at some sites also utilise or require wetland habitat. The presence of water bodies may be of particular value to bats. However, although the presence of wetland habitat might add to the overall ecological value of a site, it is of only minor importance in relation to the veteran tree interest of a site and a site with an absence of wetland habitat should not be regarded as of lesser value.

Recommendation

The presence/absence of water bodies or wetland habitat should not be used as an assessment criterion. However, the presence, abundance and type of wetland habitat at a site can be noted during a rapid field assessment and this information may be of value in providing additional information about the site and guiding future management.

4.4.5 Site management

Current management was considered as a field measure and assessment criterion. The management of a site will not only affect the current interest but is likely to be significant in determining the value of the veteran tree interest at a site in the short to medium term. For example the existing and future veteran tree interest of a site may be significantly affected by:

- crown competition or shading;
- overgrazing or poaching;
- pruning and deadwood/dead tree removal;
- replanting of wood-pasture or parkland.

However, most of these features are well covered by other assessment criteria such as ground vegetation, dead and decaying wood, tree cohort continuity and potential.

Recommendation

Site management is unlikely to be of value as an additional assessment criterion. However, it will be worth noting positive and negative aspects of current management (including threats to the veteran tree and deadwood resource) during field survey to inform decisions relating to future management priorities.

4.4.6 Site shape

For many habitats, shape can be an important consideration, particularly where edge effects can significantly influence the habitat. Nevertheless, there are a variety of views concerning the significance of edge effects on the veteran tree interest of a site including:

- veteran trees can be affected by local pollution such as agricultural spray drift;
- on some sites veteran trees near the site margins may benefit from increased light levels;
- the impact of edge effects will depend on the quality and management of the adjacent habitat;
- the impact of edge effects will depend on the extent of the site as well as the shape.

In summary, the potential impacts of edge effects are not yet fully understood and will vary from site to site depending on the terrain, adjacent habitat type and management as well as site shape.

Recommendation

Site shape should not be used as an assessment criterion. However, the general shape of a site is easily assessed and the information may assist in identifying threats and management priorities for a site.

4.4.7 Surrounding landuse

As for site shape above, the impact of adjacent landuse is likely to vary from site to site depending on a number of factors including:

- management regime of the surrounding land;
- site extent;
- location of veteran trees within the site;
- the number of veteran trees in the surrounding landscape (which is taken into account separately, see section 4.3.5 above).

Recommendation

Extent of adjacent semi-natural habitat alone is not considered to be a valuable assessment criterion. However, notes on surrounding landuse can be made during a rapid field assessment and may assist in identifying threats and opportunities as well as management priorities for a site.

4.4.8 Local pollution load

Pollution is likely to affect the overall species diversity associated with the veteran tree interest at a site (particularly lichens) and also tree health. However, at any one site it is difficult to assess the actual pollution loads since these will be affected by local conditions such as shelter and adjacent landuse. Pollution loads cannot be assessed during a rapid site assessment and available critical load maps do not take into account local conditions or agricultural spray drift.

Recommendation

Local pollution load is considered to be of limited value as an assessment criterion. However, available information (including critical load maps) may be of value in identifying threats at individual sites and guiding management priorities.

4.5 Other field measures/criteria which were considered

4.5.1 % 'tree-ed land'

This measurement was not found to be useful, or relevant, to the veteran tree interest of a site for the following reasons:

- 'tree-ed land' is difficult to define; for example, whether it refers solely to veteran trees or trees of any age;
- 'tree-ed' area is difficult to measure; for example where trees (especially young trees) are widely spaced;
- % 'tree-ed land' is of limited value (if any) as an indication of veteran tree interest; for example, the 'tree-ed' area may be high but the number of veteran trees can still be low;

- setting of thresholds is not straightforward since both high and low proportions of 'tree-ed land' could be viewed as desirable/undesirable in different situations; for example parkland habitat might be expected to be less-treed than wood pasture.

4.5.2 Proportion of known veteran tree resource in an 'Area of Search' (AoS)

The value of this criterion is doubtful given:

- it is unlikely that good estimates of the veteran tree resource exist for most AoS so this measure may not be feasible for the majority of sites. It is likely that only sites with a small proportion of the resource (ie low value sites) could be identified with any confidence;
- this measure is directly linked to the number of veteran trees. The number of trees on a site can be compared within any one AoS and sites with a large number of veteran trees would have already be identified as of high value for that primary criterion;
- given the number of veteran trees scattered through the countryside in most areas, it is unlikely that any site would support >20% of the AoS veteran tree resource. Indeed, even sites with significant numbers of veteran trees might support no more than 5% of the AoS veteran tree resource;
- it does not take into account quality of the resource;
- sites which lie within AoS rich in veteran trees would be disadvantaged by this criterion.

Table 3. Summary of recommendations relating to assessment criteria and field survey

Assessment criterion/ field measure	Suggested thresholds	Notes
Primary criteria:		
Number of veteran trees	>100 = high value 10-100 = medium value <10 = low value	Record all veterans including dead whole standing and fallen trees; shrubs; coppiced/laid/boundary shrubs/trees; naturally layered individuals and phoenix regeneration. Guidelines for recording veterans need clarification.
Presence and number of ancient trees/shrubs	>15 = high value 1-15 = medium value absent = low value	Guidance is required for identifying and recording ancient trees and shrubs in the field.
Trees >1.5m dbh	>15 = high value 5-15 = medium value < 5 = low value	Inclusion of this as a separate criterion assumes that large trees are considered of interest in their own right (ecological and cultural value) rather than solely as an indicator for age.
Secondary criteria:		
Site extent	>50ha = High 11-50ha = Medium <11ha = Low	A minimum threshold density might be useful in defining sites and delineating appropriate boundaries. Designation should extend beyond boundary veterans to include root area.

Assessment criterion/ field measure	Suggested thresholds	Notes
Cohort continuity	1 cohort/100 yrs with similar spp/distribution to veterans = high value Incomplete cohorts/different spp/distribution to veterans = medium value Veterans only = low value	A detailed assessment of cohorts is difficult during a brief field visit, particularly at large or complex sites but it should be possible to assign a value.
Visible dead and decaying wood	Abundant, left in situ = high value Some present, evidence of removal = medium value Little = low value	Assessment relates to management/retention of deadwood as well as quantities present.
Ground vegetation	Good quality/unimproved/semi-natural = high value Semi-improved/disturbed/modified = medium value Arable/improved/significantly suppressed = low value	Ground vegetation will reflect past and current site management and the level of soil disturbance which is likely to influence tree health. Ground vegetation characteristics will also affect available nectar sources
Veteran trees in the surrounding landscape	Adjacent veteran tree site or veterans frequent in landscape = high value Veteran tree site within 1km or veterans infrequent in the landscape = medium value; Few or no veterans within 1km = low value	Include near-by 'veteran tree sites' and veterans scattered in the landscape (eg in hedgerows).
Diversity within veteran tree population (species, age, form, situation)	Diversity in at least 3 characteristics = high value Diversity in at least 2 characteristics (or significant diversity in 1) = medium value Little diversity = low value	Make notes concerning each of the four features: species, age, form and situation.
Associated species interest	High interest = high value Some interest = medium value Specialist survey undertaken but no interest found = low value	Where no information is available no category should be allocated.
Documentary evidence of habitat continuity	Documentary evidence of centuries of habitat continuity = high value.	Use where available. May also be valuable to identify sites as a desk study for further assessment.
Potential	Interest likely to remain high or increase = high value Interest likely to be remain moderate to high = medium value Interest likely to remain low or decline = low value	Add as a criterion with a subjective assessment reflecting the potential to sustain or enhance the site's veteran tree interest in the short-medium term.
Other useful field measures (used to guide future management but not to assess sites)		
Density of veteran trees		Appropriate minimum threshold level to identify 'veteran tree sites' needs to be considered further.

Assessment criterion/ field measure	Suggested thresholds	Notes
Species composition of veterans		Record veteran species composition rather than just the proportion of non-site natives.
Scrub		Record presence/cover/distribution/ species of scrub on site and whether this is impacting on veterans (eg significantly shading trunks).
Water-bodies/ wetland habitat		Record presence/absence and characteristics.
Site management/ threats		Record current management regime and note positive and negative impacts (threats) to the veteran tree/deadwood resource.
Shape		Record as compact, elongated, irregular, fragmented, linear.
Surrounding landuse		Record adjacent landuse and approximate proportions of semi-natural habitat (>75%, 25-50%, <25%). Identify any obvious impacts (eg agricultural spray drift).
Local pollution load		Refer to critical load maps and take into account local conditions where possible.
Other suggested criteria/measures not considered of value		
% 'tree-ed' land		
Proportion of known veteran tree resource in AoS		

5. Results of site assessment

5.1 Overview

Results of the field trials are presented in the following sections, with further detail provided in the appendices. As the guidelines and assessment protocol were evolving during the progress of the field trials the results may not represent a definitive assessment of these sites. For example, at the outset of the project, there was no criterion relating to ancient trees and these may not have been recorded well at some of the sites visited early on in the project. Even after ancient trees were added to the methodology, no definitive guidance was available as to what to record and therefore ancient trees may not have been recorded objectively and systematically at all sites.

The results presented here should therefore be viewed as an illustration of the assessment protocol. Assessment of individual sites may require amendment as a result of further survey or availability of additional information (for example relating to documented history).

5.2 Presentation of results of field trials

Examples of completed assessment sheets and maps for a selection of high scoring and low scoring sites are included in Appendix 2.

A table summarising the assessment results of each site against the assessment criteria is included in Appendix 3.

The results of the assessment can be used to evaluate individual sites. For example, any site which scores highly for all three primary criteria is likely to support an important veteran tree population and, conversely, a site which scores moderately for one primary criterion and low for the other primary criteria is unlikely to support significant veteran tree interest. The secondary criteria add information and may be of particular relevance at some sites. For example, a site which scores moderately for primary criterion (perhaps due to its small size) may be especially notable in terms of its documented history or associated species.

The assessment results can also be used to compare sites, in local, regional or national contexts. There are several ways in which the results could be used to compile 'ranking' tables but the method which appears to produce the most meaningful results is to rank sites first on their scores for the primary criteria (the number of high scores being taken into account first, followed by number of medium scores and then number of low scores). Secondary criteria scores are then used to distinguish between sites which scores equally for the primary criteria. Alternative systems of awarding points for assessment scores (for example, 3 points for a high score, 1 point for a medium score, 0 points for a low score) were considered to be too complex and did not appear to provide enhanced ranking. Other approaches (eg multi-variate analyses) are being considered but have not yet been carried out.

Tables 4 and 5 present a summary of the results of the assessment for each site, ranked as described above.

Note that Castle Hill was evaluated in two ways:

i) taking only the SSSI area into account;
ii) taking a larger area into account including both the SSSI and much of the surrounding plantation which supports scattered veteran trees.

In fact, although the scores for some of the criteria are different, the overall assessment is the same for both Castle Hill SSSI and the wider site even though the latter includes significantly more veteran and ancient trees. This is mainly due to the fact that the smaller SSSI area is already of highly significant value in terms of its veteran tree interest in its own right.

Table 4 Summary of results of field trials

Sites ranked by region.
Sites which appear to be of notable value are shown in bold.
Sites which appear to be of low value are shown in italics.

Site name	Assessment for primary criteria			Assessment for secondary criteria			Rank on primary criteria alone	Rank taking into account all criteria
	H	M	L	H	M	L		
DORSET								
The Oaks	**3**	**0**	**0**	**5**	**3**	**1**	**1**	**1**
Holt Forest	**3**	**0**	**0**	**4**	**3**	**0**	**1**	**2**
Kingston Lacy	**2**	**1**	**0**	**4**	**1**	**2**	**3**	**3**
Stock Gaylard	**2**	**1**	**0**	**2**	**4**	**1**	**3**	**4**
Minterne Park	**2**	**1**	**0**	**1**	**5**	**1**	**3**	**5**
Langton West & Talbots Woods	1	2	0	5	2	0	6	6
Minterne Seat Coppice	1	2	0	4	4	0	6	7
Melcombe Park/Hill Wood	1	2	0	2	4	0	6	8
Sutton Common/Boys Wood	1	2	0	1	5	0	6	9
Herringston House	1	2	0	1	4	2	6	10
Holt Wood	0	3	0	3	4	0	11	11
Turnworth Common (part)	0	3	0	3	3	0	11	12
Goathorn Plantation (parts)	0	3	0	1	5	1	11	13
Kings Wood	*0*	*1*	*2*	*2*	*3*	*1*	*11*	*14*
Game Copse	*0*	*1*	*2*	*1*	*4*	*2*	*11*	*15*
THAMES BASIN								
Aldermaston Park	**3**	**0**	**0**	**6**	**1**	**0**	**1**	**1**
Silwood Park	**2**	**1**	**0**	**5**	**2**	**0**	**2**	**2**
Easthampstead Park *	0	3	0	1	3	3	3	3
Sunningdale Park	0	3	0	0	6	1	3	4
Caversham Park *	0	3	0	0	4	3	3	5
Baylis House	*0*	*1*	*2*	*0*	*1*	*6*	*6*	*6*
NORTH YORKSHIRE								
Duncombe Park	**3**	**0**	**0**	**7**	**2**	**0**	**1**	**1**
Castle Hill (SSSI only)	**3**	**0**	**0**	**5**	**2**	**1**	**2**	**2**
Castle Hill (incl. surrounds)	**3**	**0**	**0**	**5**	**2**	**1**	**2**	**2**
High Wood	**3**	**0**	**0**	**4**	**3**	**0**	**4**	**4**
Studley Royal	**2**	**1**	**0**	**4**	**3**	**0**	**5**	**5**
Ripley Park	**2**	**1**	**0**	**3**	**3**	**2**	**6**	**6**
Beningborough Hall *	1	1	1	2	3	2	7	7
Yorkshire site A	0	2	1	1	5	2	8	8
Yorkshire site B	0	2	1	0	4	3	9	9
Freeholders Wood	*0*	*1*	*2*	*2*	*2*	*3*	*10*	*10*

* Sites where the veteran tree density is less than 1 tree/hectare (and might therefore not be considered appropriate for a site-based assessment).

Table 5 Summary of results of field trials

Sites ranked overall.
Sites which appear to be of notable value are shown in bold.
Sites which appear to be of low value are shown in italics.

Site name	Assessment for primary criteria			Assessment for secondary criteria			Rank on primary criteria alone	Rank taking into account all criteria
	H	M	L	H	M	L		
Duncombe Park	**3**	**0**	**0**	**7**	**2**	**0**	**1**	**1**
Aldermaston Park	**3**	**0**	**0**	**6**	**1**	**0**	**1**	**2**
The Oaks	**3**	**0**	**0**	**5**	**3**	**1**	**1**	**3**
Castle Hill (SSSI only)	**3**	**0**	**0**	**5**	**2**	**1**	**1**	**4**
Castle Hill (incl. surrounds)	**3**	**0**	**0**	**5**	**2**	**1**	**1**	**4**
Holt Forest	**3**	**0**	**0**	**4**	**3**	**0**	**1**	**6**
High Wood	**3**	**0**	**0**	**4**	**3**	**0**	**1**	**7**
Silwood Park	**2**	**1**	**0**	**5**	**2**	**0**	**8**	**8**
Studley Royal	**2**	**1**	**0**	**4**	**3**	**0**	**8**	**9**
Kingston Lacy	**2**	**1**	**0**	**4**	**1**	**2**	**8**	**10**
Ripley Park	**2**	**1**	**0**	**3**	**3**	**2**	**8**	**11**
Stock Gaylard	**2**	**1**	**0**	**2**	**4**	**1**	**8**	**12**
Minterne Park	**2**	**1**	**0**	**1**	**5**	**1**	**8**	**13**
Langton West & Talbots Woods	1	2	0	5	2	0	14	14
Minterne Seat Coppice	1	2	0	4	4	0	14	15
Melcombe Park/Hill Wood	1	2	0	2	4	0	14	16
Sutton Common/Boys Wood	1	2	0	1	5	0	14	17
Herringston House	1	2	0	1	4	2	14	18
Beningborough Hall *	1	1	1	2	3	2	19	19
Holt Wood	0	3	0	3	4	0	20	20
Turnworth Common (part)	0	3	0	3	3	0	20	21
Goathorn Plantation (parts)	0	3	0	1	5	1	20	22
Easthampstead Park *	0	3	0	1	3	3	20	23
Sunningdale Park	0	3	0	0	6	1	20	24
Caversham Park *	0	3	0	0	4	3	20	25
Yorkshire site A	0	2	1	1	5	2	26	26
Yorkshire site B	0	2	1	0	4	3	26	27
Kings Wood	*0*	*1*	*2*	*2*	*3*	*1*	*28*	*28*
Freeholders Wood	*0*	*1*	*2*	*2*	*2*	*3*	*28*	*29*
Game Copse	*0*	*1*	*2*	*1*	*4*	*2*	*28*	*30*
Baylis House	*0*	*1*	*2*	*0*	*1*	*6*	*28*	*31*

* Sites where the veteran tree density is less than 1 tree/hectare (and might therefore not be considered appropriate for a site-based assessment).

5.3 Review of effectiveness of the assessment protocol

Using primary criteria alone it is relatively easy to split the sites into those which appear of particular note (for example, sites with at least two primary criteria scoring highly), those which appear of average interest and those which appear to support little interest (for example, those with most primary criteria scoring low).

However, the precise order of sites in a table should not be viewed as definitive. For any one site, scores for specific criteria and other information gathered during the assessment should be taken into account in addition to the position in a table; simple figures of high medium and low scores should not be viewed in isolation. Particularly for sites which fall into the middle category (moderate or average interest), secondary criteria may be of value in identifying where relatively small veteran tree populations are of note, for example sites with a long documented history and/or notable ground vegetation or associated species.

When considering site designation across a series of sites, details of individual criteria may also be important to ensure that a range of veteran tree features are included in the series, for example representatives of a range of tree species.

Consultation with site owners/managers and other persons familiar with the sites has confirmed that the trial results presented in tables 4 and 5 appear to produce a meaningful evaluation, with sites ranked approximately as expected (with a few exceptions as discussed below). Thus, the assessment method appears to adequately recognise sites which are of known importance for their veteran tree interest and the evaluation thresholds appear to be broadly appropriate.

Of the sites surveyed during the project five are already designated SSSI partly on account of features associated with their veteran trees and decaying wood habitat. These sites are: Castle Hill (SSSI area), Duncombe Park, High Wood and Holt Forest/Holt Wood. With the exception of Holt Wood, these sites are assessed as of notable value for their veteran tree interest. During the field trial, Holt Wood was assessed in isolation from Holt Forest and scored less well since it is a small site with only moderate numbers of veterans and few large trees. However, had it been assessed jointly with Holt Forest (which is within the same SSSI) the combined sites would have scored highly. The other SSSIs included in the trial (Goathorn Plantation, Game Copse and Kings Wood) are not designated on account features associated with veteran trees. These sites did not score highly for their veteran tree interest during the assessment.

Sites which were outstanding for one or more criteria generally scored highly overall as well. For example The Oaks and High Wood which both support notably large numbers of ancient trees are ranked highly in the overall assessment.

Two sites appear to have scored lower than was expected by persons familiar with the sites and their history: Yorkshire site A (North Yorkshire) and Turnworth Common (Dorset). The full assessment for these sites are also included in Appendix 2.

Although Yorkshire site A has apparently been managed continuously as wood pasture for at least 400 years (and is of high historical and cultural interest) it scored medium or low on a number of criteria including number of veterans, number of large and ancient trees, site extent, tree cohort continuity and quantities of visible deadwood. Despite the continuity of management it would appear that there is no more than moderate current veteran tree interest at this site.

In the field trial, Turnworth Common scored moderately for all three primary criteria but local English Nature staff are of the opinion that this does not reflect the value of the veteran tree population at the site. Further investigation revealed that the site boundary provided for the field trial omitted part of the Common and therefore the full veteran population (which includes over 150 individuals) was not included. Additionally there were no guidelines for the recording of veteran holly which is a significant feature at the site. The larger site would have scored highly for at least one of the primary criteria. This example shows the importance of extending site boundaries to include whole concentrations of veterans regardless of traditional boundaries such as ownership or current SSSI boundaries.

5.4 Comparison with assessments using different criteria

During the project, a number of different assessment systems (sets of criteria) were tested, for example using the initial guidelines and thresholds (Table 1) in an unmodified form and using all the criteria and field measures discussed in section 3. These alternative assessments were presented in the initial draft report and at the seminar in September 2004.

All the systems tested resulted in relatively similar results, particularly in terms of ranking of sites. However, the system described and presented in section 5.2 above has the following advantages:

- the initial assessment relates specifically to the veteran tree population. A site which scores highly for many criteria/field measures but which does not support a notable veteran tree population will not rank highly;
- secondary criteria incorporate an assessment of the condition of the veteran tree resource and the potential to sustain this interest at the site;
- the assessment is relatively simply with only three primary criteria and nine secondary criteria;
- the additional information gathered, although not used to evaluate or compare the veteran tree interest of sites, could assist with future management of the site including setting objectives and priorities for management of its veteran trees;
- several criteria have been dropped because they resulted in anomalous assessments. For example, the removal of a criterion relating to density of veterans has resolved the anomaly which previously resulted in Castle Hill SSSI scoring higher than the wider site at Castle Hill despite the latter encompassing a larger veteran tree population.

6. Conclusions and recommendations

The field trials demonstrate that it is possible to undertake a meaningful rapid assessment of sites for their veteran tree interest. The recommended assessment protocol provides a method by which sites of particular value in terms of their veteran tree resource can be identified.

6.1 Summary of recommendations relating to site definition

A threshold density of one veteran tree per hectare is suggested to "define" a veteran tree site. Although individual and more widely scattered veterans may well be of cultural and ecological value, areas which support a very low density of veteran trees are unlikely to be suitable for a site-based veteran tree assessment or site-based designation. A different

approach to conservation of individual and scattered veteran trees may be more appropriate, for example through their recognition in farm environment assessments.

Even where the overall density of veterans exceeds this threshold, veteran trees are unlikely to be distributed evenly throughout a site. Areas with few, or no, veterans can be included within sites, particularly where they occur centrally or provide areas for the development of future cohorts of veterans.

Once a site has been assessed as of significant value, it may be desirable to extend the "site boundary" to ensure it includes:

- root systems of veterans which occur on the boundaries of the site;
- surrounding land where management of this land is key to the survival of the veteran tree resource.

6.2 Summary of recommendations relating to veteran tree identification and recording

Modifications to the initial recording guidelines (Box 1) are required as follows:

- clearer guidance regarding the recognition and recording of veteran trees including all species considered likely to be of value as veterans, dead veterans, shrubs, coppice stools etc);
- guidance regarding the recognition and recording of ancient individuals to encourage a consistent approach. Such guidance has also been recommended in relation to the Specialist Survey Method (Fay & De Berker 2003).

6.3 Summary of recommendations relating to assessment criteria

Recommended modifications to the initial assessment guidelines are detailed in Table 3.

Sites should be assessed first on the size and quality of their veteran tree population with condition and sustainability of the resource given secondary status. A system of primary and secondary criteria is recommended.

A number of further field measures which are relatively easy to record and that provide valuable information are recommended to assist with guiding future management and setting management priorities but are not considered appropriate to assess or compare sites.

Table 6 presents the recommended assessment protocol. The assessment thresholds appeared to provide appropriate results during the current field trials but may require further consideration in the future in the light of further experience of their use.

Table 6 Recommended veteran tree site assessment protocol

Field Measure	Possible thresholds		
	High value	**Medium value**	**Low value**
Primary assessment criteria			
Number of veteran trees	>100	10-100	
Number of ancient trees	>15	<15	0
Number of trees >1.5m dbh	>15	5-15	<5
Secondary assessment criteria			
Extent of site	>50ha	11-50ha	10ha or less
Tree cohort continuity (assessed by tree size)	At least 1 cohort per 100 yrs similar spp and distribution to veterans	Future generations present but gaps in cohorts/new generations do not reflect spp/ distribution of veterans	Large gaps in cohorts/veteran trees only
Visible deadwood (standing and fallen & incl. rot holes, hollow trunks etc)	Abundant	Present but evidence of removal	Little present
Ground vegetation	Unimproved grassland/semi-natural woodland	Semi-improved or significantly disturbed	Arable, improved or suppressed (bare)
Veteran trees near-by (sites and trees in the landscape)	Adjacent	Within 1km	>1km away
Diversity within veteran tree population (species, form, age, situation)	Diversity in at least three characteristics (species, age, form and situation)	Diversity in two characteristics or significant diversity in 1 characteristic	Little diversity
Associated species interest (eg lichens, saproxylic invertebrates)	Known to be high	Some interest known	
Documented habitat continuity - historical continuity	Documentary evidence of habitat continuity (several centuries)		
Potential	Interest likely to remain high or increase in short- to medium-term	Interest likely to remain moderate in short- to medium-term	Interest likely to remain low or decline in short- to medium-term
Other field measures			
Density of veteran trees (over site)			
Species composition of veterans			
Scrub (incl. bramble and hawthorn)			
Site management/threats			
Water-bodies/wetland habitat			
Shape			
Surrounding landuse			
Local pollution load			

6.4 Recommendations relating to assessment methodology

The recommended methodology is detailed in box 4.

Further work will be required to develop a site survey form and associated guidance.

Box 4 Recommended veteran tree site survey methodology

A. Survey preparation:

1. Obtain maps at an appropriate scale. A scale of approximately 1:5000 is considered ideal.
2. Arrange access to the site.

B. Field survey:

1. Identify individual veteran trees (including shrubs etc) using revised guidelines and map these (approximately), including a note of species, trees >1.5m and ancient trees.
2. Note other site features including amounts of visible deadwood present, scrub cover, adjacent landuse and current management.
3. Complete the majority of sections of the survey form in the field.

C. Report completion:

1. Input veteran tree positions into GIS (including information on species and dbh if desired).
2. Identify an appropriate site boundary (excluding areas with few or no veteran trees as appropriate).
3. Calculate measurements which could not be made easily in the field, including site area, number of veteran trees and veteran tree density.
4. Complete additional sections of the survey form.

6.5 The way forward

Taking the assessment protocol forward was discussed at the seminar in September 2004.

Recommendations included:

- further field trials, applying the assessment protocol at further sites and comparing the results to expert opinion;
- testing the assessment protocol and suggested thresholds at sites in Wales, Scotland and Northern Ireland;
- refining the guidelines for identifying and recording veterans and drafting appropriate assessment thresholds to reflect regional and national variation;
- further consideration of the need to compare sites on a national basis as well as an Area of Search (AoS) basis to ensure that the most important sites nationally achieve designation;

- a review of the relative importance of historical research and documented changes in the historic environment;
- consideration of the overlap between nature conservation and historic landscape interests.

Although the assessment protocol is designed to allow non-specialist surveyors to record the appropriate measures, some basic training may be required in identifying and recording veteran and ancient trees and shrubs. The degree of training required is likely to depend on how comprehensive the revised guidelines are for recording and recognising these features.

Finally, the development of alternative approaches, and designations, may be desirable for individual veteran and ancient trees and "treescapes" supporting significant numbers of veteran trees but at very low densities. Agri-environment schemes might have an important role to play in treescapes linking 'core' veteran tree sites.

7. References

COX, J. & SANDERSON, N. 2001. *Livestock grazing in National Trust parklands*. Cirencester: National Trust Estates Department.

FAY, N. & DE BERKER, N. 2003. Evaluation of the specialist survey method for veteran tree recording. *English Nature Research Reports*, No. 529.

NATURE CONSERVANCY COUNCIL. 1989: *Guidelines for selection of biological SSSIs*. Peterborough: NCC.

RATCLIFFE, D.A. 1979: *A Nature Conservation Review*.

READ, H. 2000. *Veteran Trees: A guide to good management*. Peterborough: English Nature.

SMITH, M. & BUNCE, R.G.H. 2004: Veteran trees in the landscape: A methodology for assessing landscape features with special reference to two ancient landscapes. *In*: R. Smithers, ed. *Landscape ecology of trees and forests*, 168-175. Grantham, IALE.

VETERAN TREES INITIATIVE. 1997. *Specialist survey method*. Peterborough: English Nature.

WEBB, J. & BOWLER, J. 2001. County surveys of parkland. The Staffordshire experience. Peterborough: *English Nature Research Reports*, No. 416.

Appendices

Appendix 1 List of seminar attendees and other contributors

Appendix 2 Examples of survey outputs (site assessment forms)

Appendix 3 Table of assessment results for each site against each criteria

Appendix 1 List of those who contributed at the seminar or on drafts of the report

Keith Alexander	Ancient Tree Forum	Louise Hutchby	English Nature
Jill Butler	Ancient Tree Forum	Rebecca Isted	English Nature
Neville Fay	Ancient Tree Forum	Roger Key	English Nature
Vikki Forbes	Ancient Tree Forum	Heather Robertson	English Nature
Ted Green	Ancient Tree Forum	Dave Rogers	English Nature
Dan Abrahams	English Nature	Helen Stace	English Nature
Martyn Ainsworth	English Nature	Paul Stamper	English Heritage
Simon Barker	National Trust	Gordon Wyatt	English Nature
David Clayden	English Nature	Ray Hawes	National Trust
Steve Clifton	English Nature	Mike Smith	Scottish Natural Heritage
Sean Cooch	English Nature	Stuart Warrington	National Trust
Mike Edgington	English Nature		

Appendix 2 Examples of survey outputs (site assessment forms)

Veteran tree site evaluation sheet

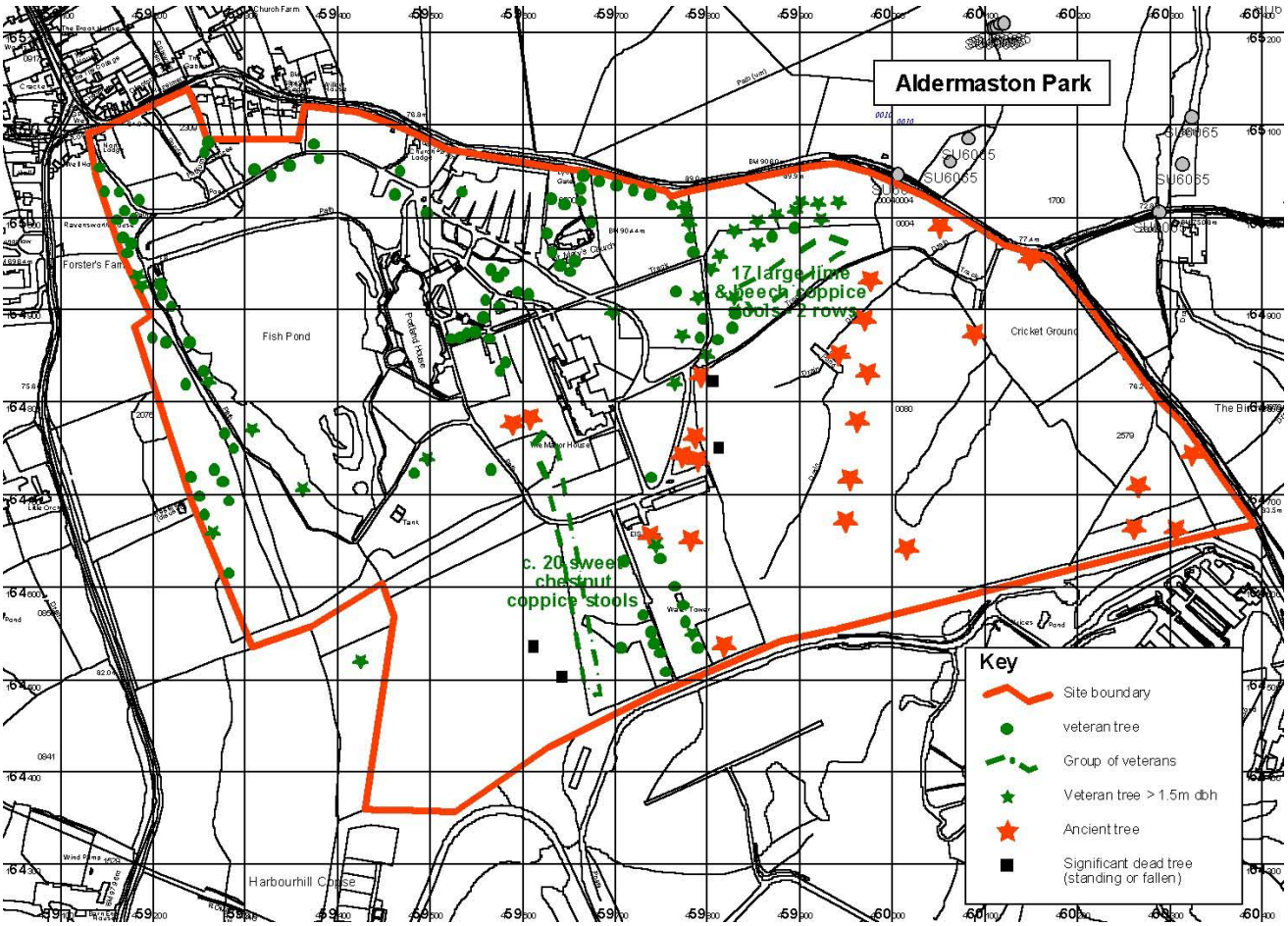
Site:	**ALDERMASTON PARK**
Date:	20 November 2003
Time on site:	7 hours
General description:	Extensive park comprising open habitat (mainly semi-improved and improved grassland) with scattered open grown trees, mature woodland and "wooded" gardens dominated by *c* 150 year old trees and more recently developed woodland which has grown up around scattered ancient open-grown oaks.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	*c* 200 - primarily mature, over-mature and ancient pedunculate oaks, yew and sweet chestnut.	High (>100)
No. of ancient trees	Many (*c* 22) of the oaks are reputed to be 1000 years old. A number of ancient sweet chestnut pollards and coppice stools are also present - possibly several hundred years old?	High (>15)
No. trees > 1.5m dbh	*c* 90	High (>15)
Secondary criteria		
Extent of site	*c* 56ha	High (>50ha)
Tree cohort continuity	Many mature and large (near veteran) trees scattered across the whole site and the veterans are in a variety of stages of anitquity although there appears to be a generation gap in the range 200-1000 years. Young trees are abundant both in young regenerating woodland and as open grown individuals including rows planted in the parkland.	Medium (gap in the 200-1000 year range with few mature oaks in close proximity to the majority of ancient oaks).
Visible dead and decaying wood	Very abundant deadwood and rot holes, especially in the ancient oaks which are mainly hollow. Also several large dead trees and limbs (mainly fallen) retained.	High (much standing and fallen deadwood retained)
Ground vegetation	Mostly semi-improved grassland (presumably mown) or woodland (bramble, bracken).	High (mainly semi-natural)
Other veteran trees in the locality	Other veterans likely to occur within the remainder of Aldermaston Park to the south.	High (adjacent)
Diversity of species, age, form and situation amongst veterans	Most veterans are mature pollards but maidens and coppice are also well-represented. A total of 11 species are represented. The veterans occur in both open and woodland situations, including open-grown oaks now surrounded by younger woodland.	High (diversity of species, form and situation)
Interest for associated species	None known	

Field measure/assessment criteria	Notes	Assessment (value)
Documented historical/habitat continuity	Likely to exist but not available at time of survey.	
Potential	Interest likely to increase as current non-ancient veterans age further, other mature trees become veterans and young trees mature. There is high potential to manage the site to enhance the veteran tree interest (eg retaining deadwood and dead trees in future, perhaps opening up woodland to favour existing veterans and to encourage future veterans, planting appropriate trees to create links in currently untreed areas).	High
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 3.6/ha	
Non-site-native veterans	*c* 28% veterans are non-site-native (mainly sweet chestnut with occasional horse chestnut, limes and sycamore)	
Scrub/bramble	Locally frequent bramble and scrub present even in open areas (bramble around bases of many trees). Rhododendron/laurel are locally abundant in wooded areas increasing the shade.	
Water-bodies or other wet habitat	Large lake plus streams and a number of pools, concentrated to the west of the site but with drains and a wet depression in the woodland to the east.	
Site management/threats	The site's management is relatively low-key with significant areas receiving little intervention away from paths/roads. Currently open areas appear to be kept open but much woodland has developed on previously open habitat to the east of the site. Deadwood appears to be retained wherever it occurs away from major paths/roads.	
Shape	Compact	
Surrounding landuse	Mainly pasture (possibly some semi-improved) plus the AWE base to the south (appears mainly built and improved).	
Local pollution load	No information available	

Score for key features: 3 high; 0 medium; 0 low.
Total score: 9 high; 1 medium; 0 low.

Aldermaston Park (map not to scale)



Veteran tree site evaluation sheet

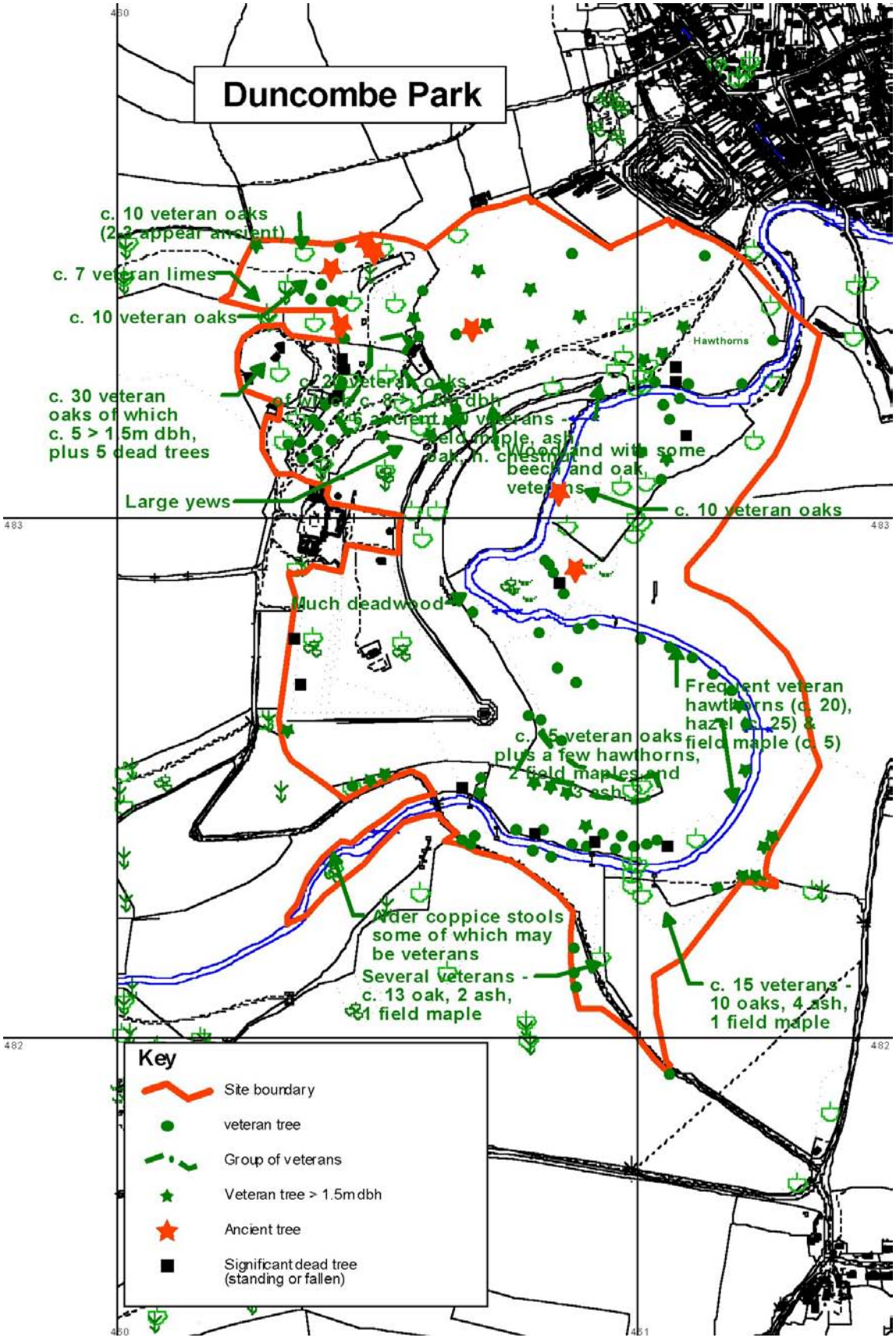
Site:	**DUNCOMBE PARK**
Date:	9 March 2004
Time on site:	8 hours
General description:	Grounds associated with Duncombe House. Pasture with areas of woodland, planted trees (clumps and scattered) and gardens immediately adjacent to the house.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	>300 - mainly mature oaks but also ash, limes, horse chestnuts, beech, field maple, alder, yews etc. Probably a number of veteran hazel and hawthorn too.	High (>100 veterans)
No. of ancient trees	*c*. 18	High (>15)
No. trees > 1.5m dbh	*c* 60	High (>15)
Secondary criteria		
Extent of site	*c* 120ha	High (>50ha)
Tree cohort continuity	Veterans of very varied ages, many mature trees/shrubs, many semi-nature and young plus new plantings and regeneration. Species mix may not be identical in future generations.	High (complete cohorts)
Visible dead and decaying wood	Abundant in canopy and retained large diameter fallen deadwood including in open habitat (though rather infrequent on site overall as the site is so large).	High (much deadwood left in situ)
Ground vegetation	Mix of semi-improved and improved grassland with some areas possibly unimproved and areas of ancient and/or semi-natural woodland flora.	Medium
Other veteran trees in the locality	Castle Hill within 1km	Medium
Diversity of species, age, form and situation amongst veterans	Very diverse species and form (maidens, pollards, coppice) and situation (open, woodland and woodland edge).	High
Interest for associated species	Significant invertebrate interest	High
Documented historical/habitat continuity	Long history of park and wood management - documentation likely to exist?	High?
Potential	Already managed with veteran trees and deadwood as a high priority objective. Interest likely to continue/increase.	High
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 2.5/ha	
Non-site-native veterans	*c* 10% veterans are non-site-native - horse chestnut, beech, lime	
Scrub/bramble	Variable - good amounts of bramble and hawthorn, especially in woodland (little in fields - some of which are overgrazed).	
Water-bodies or other wet habitat	River	

Field measure/assessment criteria	Notes	Assessment (value)
Site management/threats	Maintained as "parkland" (grazed) with deadwood and veterans retained and good cohort continuity - generally excellent though some areas seriously overgrazed and poached.	
Shape	Compact	
Surrounding landuse	Mainly improved grassland, arable plus conifer plantation.	
Local pollution load	Possibly medium (epiphytic bryophytes and lichens not obviously abundant)	

Score for key features: 3 high; 0 medium; 0 low.
Total score: 10 high; 2 medium; 0 low.

Duncombe Park (map not to scale)



Veteran tree site evaluation sheet

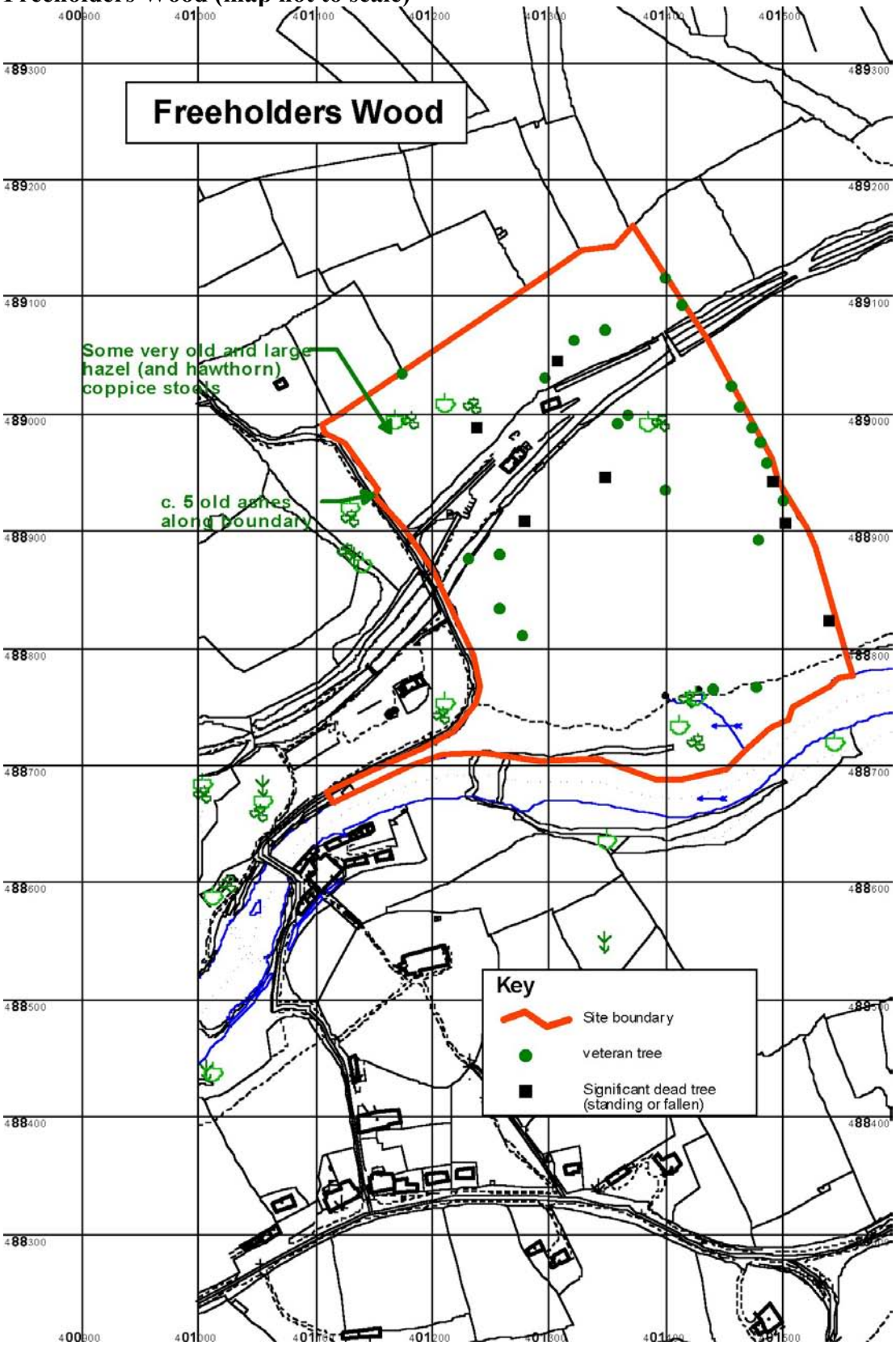
Site:	**FREEHOLDERS WOOD**
Date:	8 March 2004
Time on site:	3 hours
General description:	Largest remnant of hazel coppice (presumably ancient woodland) in Wensleydale. Managed as coppice.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	*c* 20-25 plus an unconfirmed number of coppice stools and several boundary trees/shrubs likely to be of interest	Medium (11-100 veterans)
No. of ancient trees	None appears ancient	Low (absent)
No. trees > 1.5m dbh	1 large boundary ash	Low (<5)
Secondary criteria		
Extent of site	*c* 13ha	Medium (11-50ha)
Tree cohort continuity	Probably equal numbers within each cohort although overall numbers are quite low, with new recruitment possibly affected by deer grazing. New generations wood-grown rather than open-grown.	High (complete cohorts) though not open-grown
Visible dead and decaying wood	The majority of coppiced timber appears to have been removed (other than brash). There is also evidence of pruning of dead branches and all large deadwood appears to have been removed (stumps remain). Occasional standing and fallen dead trees present but rare overall.	Low (little deadwood present, evidence of significant removal)
Ground vegetation	Ancient semi-natural woodland flora including bluebell, dog's mercury and ransoms.	High
Other veteran trees in the locality	None known	Low?
Diversity of species, age, form and situation amongst veterans	Several species represented, maidens and coppice. All within woodland or on woodland boundary.	Medium
Interest for associated species	None known	
Documented historical/habitat continuity	Likely to exist (ancient woodland) but not available during field trails.	
Potential	There are relatively few mature trees present and the site will continue to be managed as coppice. The potential is similar to any ancient woodland site. May be safety issues since the woodland is well-visited.	Low?
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 2/ha (plus coppice stools)	
Non-site-native veterans	None	
Scrub/bramble	No (or very little) bramble. Dense scrub present, particularly hazel coppice, blackthorn and hawthorn.	

Field measure/assessment criteria	Notes	Assessment (value)
Water-bodies or other wet habitat	Adjacent to river, with springs present to south of site.	
Site management/threats	LNR managed traditionally as coppice woodland. However, this does not necessarily favour the veteran tree/deadwood interest.	
Shape	Compact	
Surrounding landuse	River, semi-improved and imrpoved grassland	
Local pollution load	Possibly medium (epiphytic bryophytes and lichens not obviously abundant)	

Score for key features: 0 high; 1 medium; 2 low.
Total score: 2 high; 3 medium; 5 low.

Freeholders Wood (map not to scale)



Veteran tree site evaluation sheet

Site: **BAYLIS HOUSE/PARK, SLOUGH**
Date: 17 November 2003
Time on site: 1.5 hours

General description:	Amenity park and gardens with many relatively young planted trees of various species, approximately 25 mature limes (0.9-1.2m dbh) with abundant mistletoe and a few mature (but probably no more than 200 year old) pedunculate oaks (2 of which are >1.5m dbh).

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	*c*11 - mainly mature pedunculate oaks (some of these "borderline" veterans only just 1m dbh - or smaller but with deadwood), 2 larger oaks, 1 hornbeam pollard and 1 yew.	Medium (11-100 veterans)
No. of ancient trees	None	Low (none present)
No. trees > 1.5m dbh	2	Low (<5)
Secondary criteria		
Extent of site	7.3ha	Low (<10ha)
Tree cohort continuity	A reasonable number of mature trees present (*c* 100 years) and young trees are frequent (10-50 years) but these are different species to the veterans and there are few, if any, non-veterans over 100 years old.	Medium (gaps in cohorts, new generations do not reflect species/distribution of current veterans)
Visible dead and decaying wood	No visible deadwood present - trees carefully pruned to remove damaged or dead branches, no deadwood left on site.	Low (little deadwood of any size left on site)
Ground vegetation	Improved grassland, tightly mown.	Low
Other veteran trees in the locality	None known	Low?
Diversity of species, age, form and situation amongst veterans	Most veterans are mature oaks in an open situation.	Low
Interest for associated species	None known (abundant mistletoe present)	
Documented historical/habitat continuity	None known	
Potential	Interest could increase as limes become larger and over-mature but dead/dying trees and deadwood likely to be removed from site before attaining full interest. Vandalism (fires, broken young trees) a problem at this site.	Low

Field measure/assessment criteria	Notes	Assessment (value)
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 1.5/ha	
Non-site-native veterans	No non-native species amongst the veterans though all these are probably planted and the majority of trees on site are exotic	
Scrub/bramble	Essentially no scrub or bramble present	
Water-bodies or other wet habitat	Pond present but low value for nature conservation	
Site management/threats	Maintained as open habitat but over-tidy with tightly mown improved grassland and deadwood removed.	
Shape	Elongated	
Surrounding landuse	Built up and playing fields	
Local pollution load	No information available	

Score for key features: 0 high; 1 medium; 2 low.
Total score: 0 high; 2 medium; 8 low.

Baylis House (map not to scale)

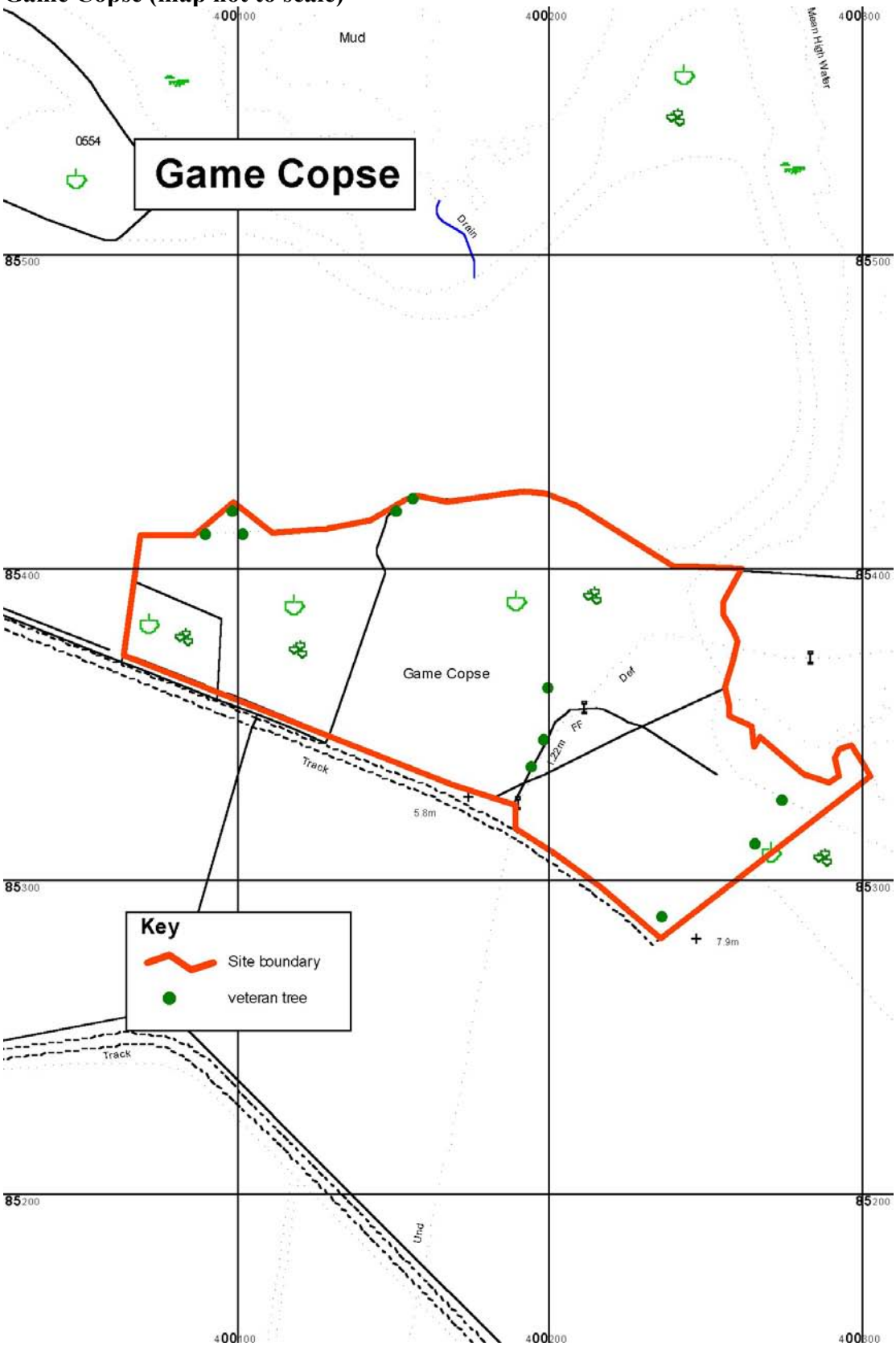
Veteran tree site evaluation sheet

Site:	**GAME COPSE**
Date:	19 February 2004
Time on site:	1 hour
General description:	Small copse dominated by mature and semi-mature oaks (including some pollards and open-grown twisted individuals) and mixed age birch. Wet areas support birch and alder. Bracken dominates the dry areas with purple moor-grass and soft-rush dominating wet areas. Significant boundary banks support some large oak pollards.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	*c*11 - all oaks - most only just 1m diameter.	Medium (10-100 veterans)
No. of ancient trees	None (oldest probably 200-300 years old?).	Low (absent)
No. trees > 1.5m dbh	None.	Low (<5)
Secondary criteria		
Extent of site	*c* 1.8ha	Low (<10ha)
Tree cohort continuity	Several mature/near veteran and semi-mature oaks present but no young oaks (<50 years).	Medium (gaps in cohorts)
Visible dead and decaying wood	Unlikely to be removed but little present as there are few mature/over-mature trees. Some fallen birch present.	Medium (some deadwood present but not abundant)
Ground vegetation	Bracken generally dominant with locally abundant bramble and purple moor-grass/soft-rush in wet woodland.	High (semi-natural)
Other veteran trees in the locality	Goathorn Plantation within 1km	Medium (within 1km)
Diversity of species, age, form and situation amongst veterans	All veterans are oaks of a similar age, form and situation (boundary/woodland).	Low (little diversity)
Interest for associated species	None known	
Documented historical/habitat continuity	Likely to exist but not available during field trials.	
Potential	Potential is limited by the size of site (<2ha).	Medium
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 6.1/ha	
Non-site-native veterans	None	
Scrub/bramble	Some bramble present. Holly locally shading.	
Water-bodies or other wet habitat	Drains and wet woodland.	
Site management/threats	No management apparent though the woodland appears to be open to low intensity grazing.	
Shape	Compact	
Surrounding landuse	Improved, semi-improved and marshy grassland plus salt marsh	
Local pollution load	Probably low but no information available	

Score for key features: 0 high; 1 medium; 2 low.
Total score: 1 high; 5 medium; 4 low.

Game Copse (map not to scale)



Veteran tree site evaluation sheet

Site: **THE OAKS**
Date: 5 December 2003
Time on site: 3 hours

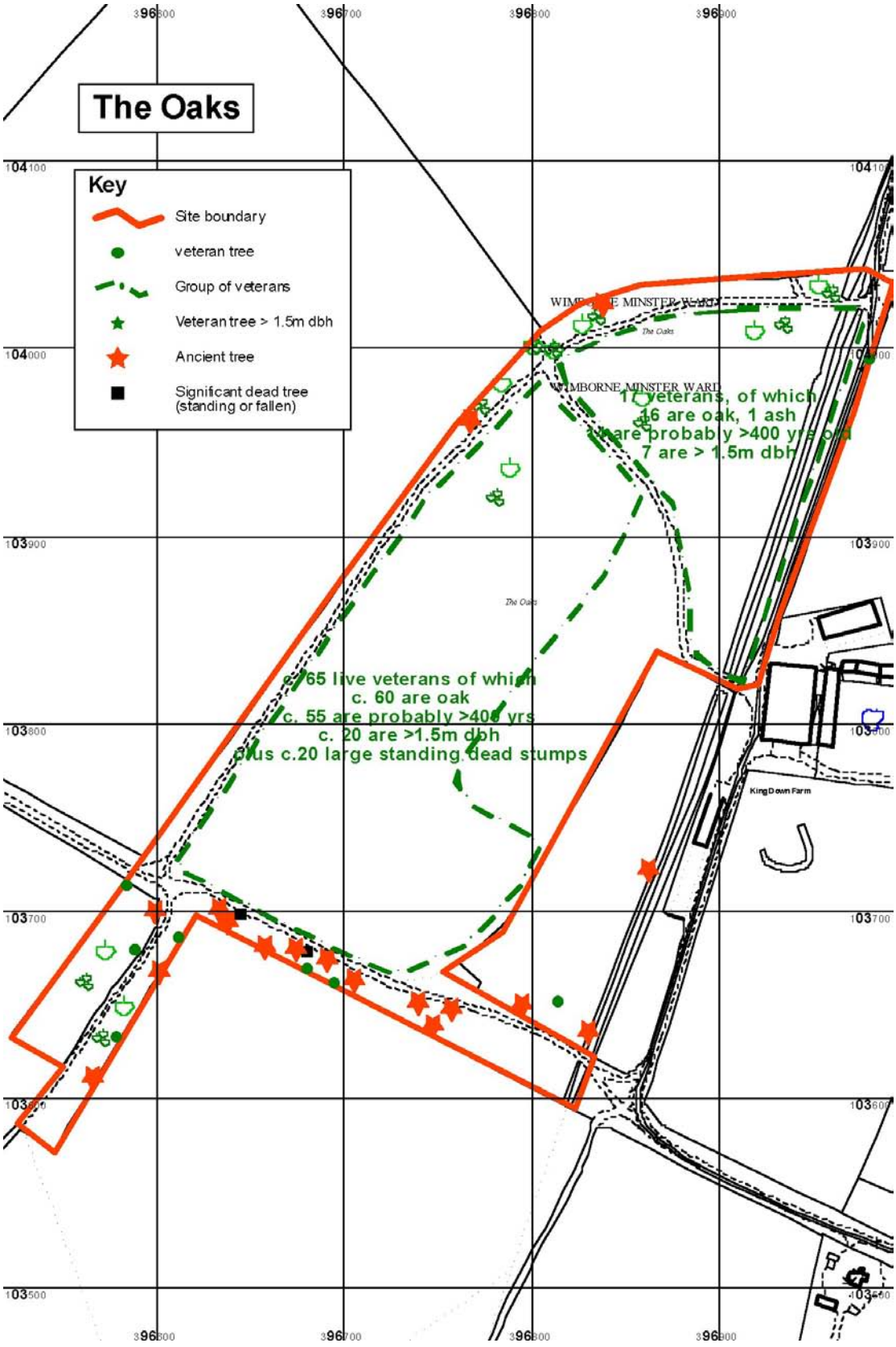
General description:	Former wood pasture dating back at least 700 years. No longer grazed - developed into woodland with grassland areas infilled. Many ancient (>400 years?) oaks present - mostly pollards and/or open-grown. Also mature oaks (<400 years), ash, lime and horse chestnut. Abundant young ash and hazel with dense bramble, dog's mercury and ivy.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	*c*110 - mainly over-mature open grown and/or pollarded pedunculate oaks. Also a few notably large/mature lime, horse chestnut, ash and hazel stools.	High (>100 veterans)
No. of ancient trees	*c* 80 probably between 400 and 600 years old?	High (>15)
No. trees > 1.5m dbh	*c* 30	High (>15)
Secondary criteria		
Extent of site	*c* 8.5ha	Low (<10ha)
Tree cohort continuity	Many mature trees present (>70 years) though these have small crowns (not open-grown) and few young/semi-mature oaks (<70 years) - young trees mainly ash.	Medium (gaps in cohorts, new generations do not reflect species/distribution of current veterans)
Visible dead and decaying wood	Abundant dead wood - dead limbs (standing and fallen), rotting boles and numerous standing dead trunks (>20). Many trees on "last legs".	High (abundant deadwood left in situ)
Ground vegetation	Dense bramble with locally abundant dog's mercury and ivy.	High (semi-natural woodland)
Other veteran trees in the locality	Scattered veteran trees present in adjacent pasture fields and at other sites nearby (Kingston Lacy, Bradbury Rings?).	Medium
Diversity of species, age, form and situation amongst veterans	Almost all veterans are overmature open-grown and/or pollarded oaks (though some variation in age is apparent) in a shaded woodland situation. Some occur at margins and a few other species represented.	Medium (some diversity)
Interest for associated species	Known to be of particular interest for invertebrates and fungi (including notably rare species).	High
Documented historical/habitat continuity	Historical information understood to date back 700 years.	High

Field measure/assessment criteria	Notes	Assessment (value)
Potential	Grazing unlikely to be re-introduced. However, maintenance of site's interest for veteran trees/deadwood a high priority for management plus National Trust ownership - potential to retain current interest high.	High
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 13/ha	
Non-site-native veterans	One lime of unconfirmed species/origin	
Scrub/bramble	Scrub and bramble very dense, shading most lower trunks. Ivy dense and abundant as a climber on many veterans.	
Water-bodies or other wet habitat	Absent	
Site management/threats	Maintained as semi-natural woodland with minimum intervention and priority given to retaining deadwood rather than pruning for safety (public ROW to be diverted). Infilling of grassland/development of scrub encouraged. Many of the veterans are on their "last legs" and crown shading is a problem.	
Shape	Compact	
Surrounding landuse	Improved pasture and arable.	
Local pollution load	No information available	

Score for key features: 3 high; 0 medium; 0 low.
Total score: 8 high; 3 medium; 1 low.

The Oaks (map not to scale)



Veteran tree site evaluation sheet

Site: **TURNWORTH COMMON**
Date: 15 February 2004
Time on site: 4 hours

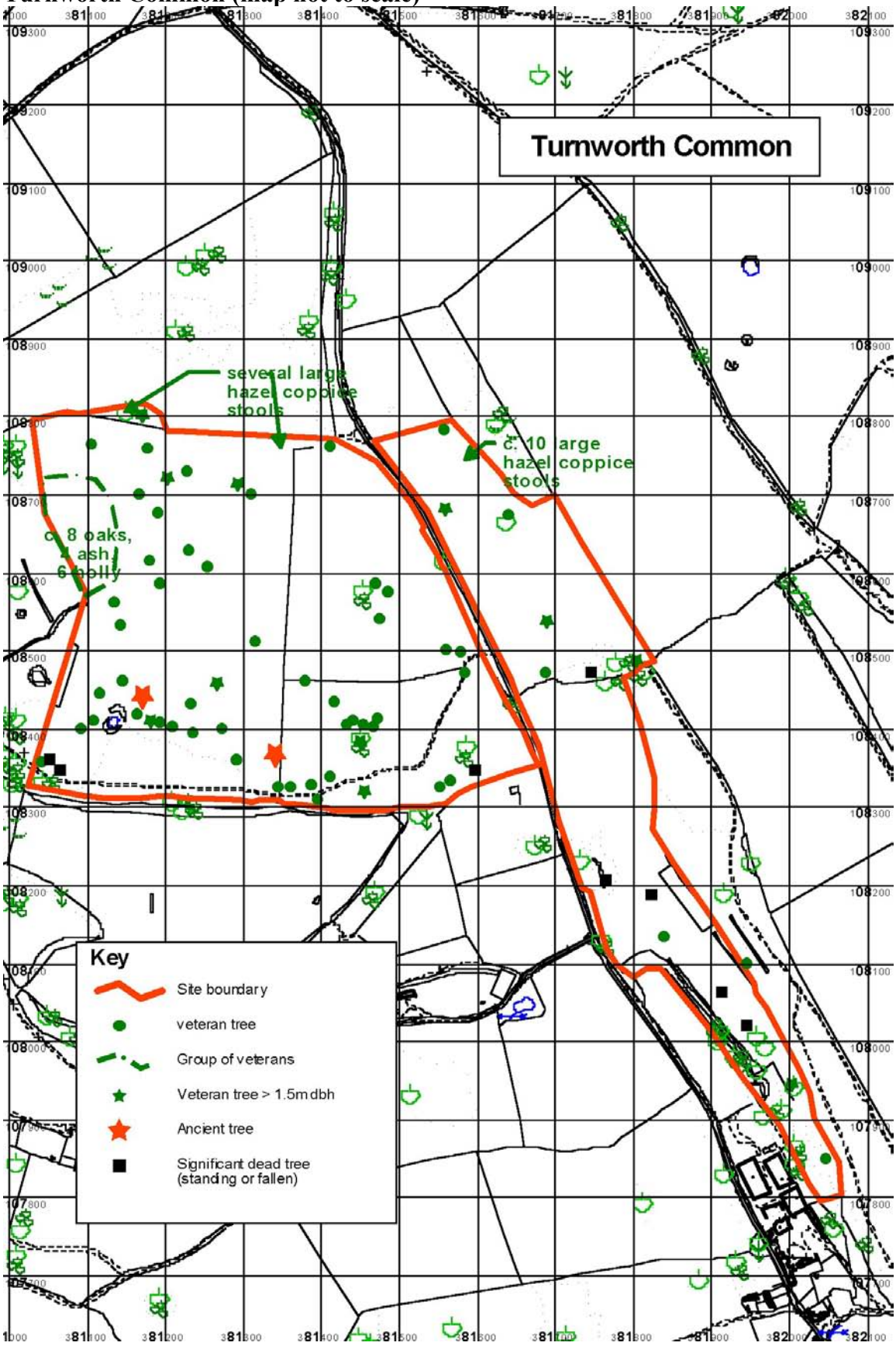
General description:	E of road: Unimproved/semi-improved (?) grassland with scattered mature trees and small patches of scrub/woodland. W of road: Grazed wood pasture comprising a mosaic of open grassland/bramble/scrub and areas of mature ash/oak woodland with hazel coppice.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	Nearly 100 - mainly mature pedunculate oaks with significant numbers of ash and scattered holly and hazel to the W of the road. Mainly beech with some ash, lime and hazel to the E of the road.	Medium (11-100 veterans)
No. of ancient trees	Two individual oaks appear notably old.	Medium (<15)
No. trees > 1.5m dbh	*c* 12	Medium (5-15)
Secondary criteria		
Extent of site	*c* 37 ha	Medium (11-50ha)
Tree cohort continuity	There are numerous mature, semi-mature and young trees on site including planted and naturally regenerating individuals. However, these do not entirely reflect the current species and distribution of veterans, eg there are few young beech.	Medium (gaps in cohorts, new generations do not reflect species/distribution of current veterans)
Visible dead and decaying wood	Reasonably frequent but not hugely abundant - removal isn't apparent but there are simply not very many large or very old trees and/or standing dead trees.	Medium (some deadwood present but not significant amounts)
Ground vegetation	Mostly unimproved and/or semi-improved grassland, scrub and semi-natural woodland.	High (mainly semi-natural and unimproved)
Other veteran trees in the locality	Unknown	?
Diversity of species, age, form and situation amongst veterans	Most veterans are mature oaks (pollards and maidens). However there are a variety of other species represented (beech, ash, field maple, holly, sweet chestnut, lime, hazel). Veterans occur in completely open, part shaded (woodland edge/scrub) and woodland situations.	High (high diversity)
Interest for associated species	None known	
Documented historical/habitat continuity	May exist but not available during field trials.	

Field measure/assessment criteria	Notes	Assessment (value)
Potential	High potential due to continued grazing, numbers and diversity of future veterans and good continuity of cohorts plus sympathetic ownership (National Trust).	High
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 2.7/ha though higher to the W of the road (*c* 3.3/ha).	
Non-site-native veterans	<5% veterans are non-site-native - occasional sweet chestnut and (presumably planted) lime.	
Scrub/bramble	Abundant but patchy, only shading some trunks.	
Water-bodies or other wet habitat	One temporary pool noted.	
Site management/threats	Traditionally managed as parkland and wood pasture though possibly slightly overgrazed to E and undergrazed to W.	
Shape	Irregular/part elongated	
Surrounding landuse	Mainly improved pasture and arable but with similar mosaics of scrub, grassland and woodland to the W.	
Local pollution load	Probably low but no information available	

Score for key features: 0 high; 3 medium; 0 low.
Total score: 3 high; 6 medium; 0 low.

Turnworth Common (map not to scale)



Veteran tree site evaluation sheet

Site:	**Yorkshire site A**
Date:	8 March 2004
Time on site:	0.5 hours (NB: surveyed from adjacent road only)
General description:	Small remnant of wood pasture.

Field measure/assessment criteria	Notes	Assessment (value)
Key criteria		
No. of veteran trees (incl. shrubs etc)	*c* 25 - all oaks	Medium (11-100 veterans)
No. of ancient trees	Possibly 2-3	Low (<5)
No. trees > 1.5m dbh	A couple of individuals appear ancient	Medium (<15)
Secondary criteria		
Extent of site	*c* 0.9ha	Low (<10ha)
Tree cohort continuity	A few (*c* 5) other mature oaks present and veterans are of mixed ages but no young trees present.	Medium (incomplete cohorts)
Visible dead and decaying wood	Some left in crowns but little fallen deadwood present (one sizable branch) and no standing dead trees. Trees pruned and presumably most deadwood removed.	Medium (some present, evidence of some removal)
Ground vegetation	Appears to be semi-improved grassland	Medium
Other veteran trees in the locality	None known but scattered veterans present throughout local landscape	Medium
Diversity of species, age, form and situation amongst veterans	All oaks in a wood pasture situation (well spaced, not too shaded).	Low
Interest for associated species	None known	
Documented historical/habitat continuity	Understood to be well documented - remnant of wood pasture which is likely to have been continuously managed as such for centuries.	High
Potential	Limited due to the size and isolation of the site but the veteran tree interest could be enhanced if deadwood and over-mature/dying trees are retained in future and a new cohort is planted.	Medium
Other field measures (not used in assessment)		
Density of veteran trees on site	*c* 27/ha	
Non-site-native veterans	None	
Scrub/bramble	None present other than occasional hawthorns in boundary hedges.	
Water-bodies or other wet habitat	Ditch along one boundary	
Site management/threats	Actively managed as wood-pasture. However, deadwood appears to be largely removed and there are no young trees.	
Shape	Compact	
Surrounding landuse	Improved grassland and arable	
Local pollution load	Appears low	

Score for key features: 0 high; 2 medium; 1 low.
Total score: 1 high; 7 medium; 3 low.

Appendix 3. Summary of veteran tree site evaluation

	Primary criteria			Secondary criteria								
	1	2	3	4	5	6	7	8	9	10	11	12
Thames Basin												
Aldermaston Park	H	H	H	H	M	H	H	H	H			H
Baylis House	M	L	L	L	M	L	L	L?	L			L
Caversham Park	M	M	M	M	M	L	L	L?	M			M
Easthampstead Park	M	M	M	H	M	L	L	L?	M			M
Silwood Park	H	M	H	H	H	H	M	M	H			H
Sunningdale Park	M	M	M	M	M	L	M	M	M			M
Dorset												
Game Copse	M	L	L	L	M	M	H	M	L			M
Goathorn Plantation (parts)	M	M	M	L	M	M	H	M	M			M
Herringston House	M	M	H	M	M	M	L	L	H			M
Holt Forest	H	H	H	H	M	H	H	M	M			H
Holt Wood	M	M	M	M	H	M	H	M	M			H
Kings Wood	M	L	L	M	M	H	L	?	H			M
Kingston Lacy	H	M	H	H	H	L	L	M	H			H
Langton W. Wd/Talbots Wd	H	M	M	M	H	H	H	?	H			H
Melcombe Park/Hill Wood	M	M	M	H	M	M	M	?	H			M
Minterne Park	H	M	H	M	M	M	L	M	M			H
Minterne Seat Coppice	H	M	M	M	M	H	H	M	H		H	M
Stock Gaylard	H	M	H	H	M	M	M	M	L			H
Sutton Common/Boys Wood	M	M	H	H	M	M	M	?	M			M
The Oaks	H	H	H	L	M	H	H	M	M	H	H	H
Turnworth Common	M	M	M	M	M	M	H	?	H			H
North Yorkshire												
Beningborough Hall	M	L	H	H	H	M	L	L?	M			M
Castle Hill (SSSI only)	H	H	H	L	M	H	H	H	M	H		H
Castle Hill (incl. surrounds)	H	H	H	H	L	H	M	H	M	H		H
Duncombe Park	H	H	H	H	H	H	M	M	H	H	H?	H
Freeholders Wood	M	L	L	M	H	L	H	L?	M			L
High Wood	H	H	H	M	M	H	H	M?	H			H
Ripley Park	H	M	H	H	M	M	L	L?	H		H	M
Studley Royal	H	M	H	H	H	M	M	M?	H			H
Yorkshire site A	M	M	L	L	M	M	M	M	L		H?	M
Yorkshire site B	M	M	L	L	M	L	M	M	M			L?

Key to primary criteria

1 = No veteran trees 2 = No. ancient trees 3 = No. trees > 1.5m dbh

Key to secondary criteria

4 = Extent of site
5 = Tree cohort continuity
6 = Visible dead wood
7 = Ground vegetation characteristics
8 = Presence of other veteran trees near-by
9 = Diversity of form, species, age and situation amongst veterans
10 = Known interest for associated species (NB: mostly unavailable during field trials)
11 = Documented habitat/historical continuity (NB: mostly unavailable during field trials)
12 = Potential

ENGLISH NATURE

English Nature is the Government agency that champions the conservation of wildlife and geology throughout England.

This is one of a range of publications published by:
External Relations Team
English Nature
Northminster House
Peterborough PE1 1UA

www.english-nature.org.uk

Cover printed on Character Express, post consumer waste paper, ECF.

ISSN 0967-876X

Cover designed and printed by Status Design & Advertising, 2M, 5M, 5M.

Front cover photographs:
Top left: Using a home-made moth trap.
Peter Wakely/English Nature 17,396
Middle left: Co_2 experiment at Roudsea Wood and Mosses NNR, Lancashire.
Peter Wakely/English Nature 21,792
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
Paul Glendell/English Nature 23,020
Main: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
Paul Glendell/English Nature 24,888