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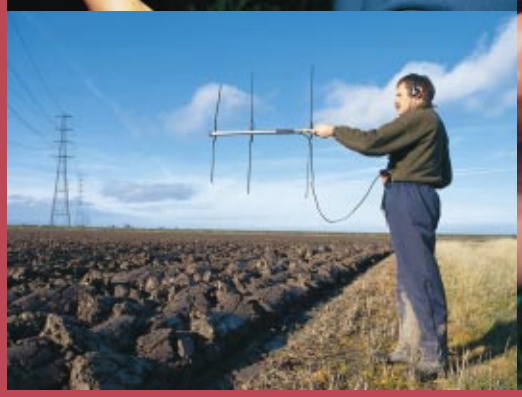

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Evaluation of the Specialist Survey Method for Veteran Tree Recording

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Preface

A specialist survey method was developed as part of English Nature's Veteran Tree Initiative in 1997. It was designed to cater for three levels of complexity to accommodate differences in user expertise and survey detail. This review explores how it has been used since 1997 and might be developed further. The views expressed are those of the contractors but English Nature will take them into account in deciding how in future to promote the recording of veteran trees.

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Summary

This assessment is derived from questionnaire responses received from a wide sample of users of the Specialist Survey Method (SSM). The results show that during the six years since its inception the SSM has been used to record over 45,500 veteran trees. The review process revealed that awareness of its existence and potential use varies considerably in nature conservation circles. A few independent consultancies (representing 12.5% of total respondees) make extensive use of the system accounting for 63% of total recordings.

The majority of surveys cover a relatively small number of trees (less than 500 trees) and have been undertaken by Wildlife Trusts and Local Government departments. The maintenance of records is seldom afforded a high priority and is often inconsistent and poorly accessible. All respondees identified the need for a centralised interactive data management and reference resource. The review identifies that surveys using the SSM, at the least complex stage, engaged a high level of volunteer public involvement and have served to raise awareness of biodiversity issues.

Responses to the review questionnaire showed that while there is a wide range of benefits from this method of veteran tree recording, a number of shortcomings and areas of confusion have been identified. The review attempts to record and analyse in detail the positive and negative aspects of the SSM and proposes a comprehensive set of recommendations for its enhancement.

Recommendations refer to the refinement of the SSM explanatory booklet and in particular cover improvements to survey content and presentation; method and scope of data collection and storage, and survey format, in terms of modular adaptability and digital/hard copy versions. Respondees emphasised the importance of training and promotion in the understanding and application of the SSM.

The review demonstrates that the SSM is perceived as an accessible and adaptable means for qualifying and quantifying saproxylic habitat components in parklands, wood-pasture and wooded landscapes. These features have the potential to assist in defining and monitoring targets for Habitat Action Plans to underpin and support national biodiversity objectives for the UK Lowland Wood Pasture and Parkland Habitat Action Plan.

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We would also thank Ellen Fay for co-ordinating the questionnaire responses.

Contents

1. Introduction

1.1 Context

Tranche 2 Habitat Plans, Terrestrial and Freshwater Habitats (1998), include lowland wood-pasture and parklands as priority habitats. The Habitat Action Plan (HAP) recognises that various factors are responsible for the decline and poor condition in saproxylic habitat and dependent species associated with veteran trees. Impacts that have contributed to a decline in veteran tree populations include neglect, poor management, abiotic and biotic factors that affect tree health and condition. Another significant impact is the isolation and fragmentation of habitats associated with veteran trees. This HAP recognises that various uncoordinated surveys have been carried out relating to different aspect of this habitat-type and specifically refers to the Veteran Trees Initiative's (1996-2000) intention to develop a database for recording veteran trees. Further the HAP identifies a broad strategy for improving survey data quality and methodology with particular reference to standardising recording, carrying out targeted biological surveys and assessing and monitoring key factors that may affect population dynamics of veteran trees.

English Nature and the other conservation agencies are concerned to enhance knowledge of the veteran tree biological resource, both in the UK and beyond to improve measures for veteran tree protection in the context of the statutory framework. There is a current English Nature initiative to establish a UK parkland and wood-pasture database as a means to identify concentrations of veteran tree populations (a trial version is currently available at www.wapis.org.uk). The Specialist Survey Method (Appendix IV) produced as part of the Veteran Tree Initiative has already made a major contribution to veteran tree recording and there is the potential to establish a designated veteran tree database to add value to the current parkland and wood-pasture database, under the aegis of the NBN through the facility of Recorder 2000.

Since the inception of the Habitat Action Plan, a considerable body of data has been accumulated concerning the status of veteran trees and their associated habitats. In 2002 a small number of key research projects were identified to help take the HAP further. One such project is a review of the Veteran Trees Initiative Specialist Survey Method (see 1.2 below), the major instrument for veteran tree surveying to date.

The review into the use and effectiveness of the Specialist Survey Method was carried out through a process of consultation with a number of users and the collation of information received from respondees. The evaluation includes identification of shortcomings experienced by users and a critical assessment of the SSM field guidance notes.

The review includes recommendations for the future improvement and development of the Specialist Survey Method, to provide improvements to practical guidance for the user in the field and to clarify standard requirements for population analyses. Any future structural and methodological revisions that may result from this review should be sufficiently robust and durable to ensure the continued use of the Specialist Survey Method for the reasonably foreseeable future.

The SSM has provided the means to collect a vast amount of data about veteran tree habitat. Currently, this resource is unavailable for integrated analysis, being randomly stored and widely dispersed. It would be desirable that at some point in the second stage application of

the SSM, all accumulated data will be integrated and stored in a shared provision. The most likely vehicle for this facility will be web-based database widely accessible for analysis and expansion.

The current review identified recommendations intended to address modifications to Stage-one use of the SSM (1997 – 2002) and formulate adaptations and improvements so that the future SSM (Stage-two) application will be fully compatible and that both sets of data will be appropriate to easy incorporation in database format.

The review of the SSM complements other current UK projects examining the distribution of veteran trees, in both the national and European contexts.

1.2 Evolution of a co-ordinated and consistent approach to surveying veteran trees:

While developments have taken place at an institutional level through the formulation of Action Plans, the recent history of professional and non-specialist interest in veteran trees has been heavily influenced by the Pollard and Veteran Tree Management meetings organised by the Corporation of London (Read, 1991, 1996), the Ancient Tree Forum (ATF) with some input from English Nature. During the 1990s, there was a growing interest to compare information gathered about veteran trees. Prior to the development of the SSM, the shortcomings inherent in survey and recording practices had become increasingly apparent. Depending on the specific requirements of surveying (whether for tree management, population analysis, associate species recording or site value) each individual site manager or specialist with specific ecological objectives tended to adopt personalised approaches, often with idiosyncratic recording methods and categorisation of data.

A great number of trees had been recorded in terms of their geographical position and basic dimensions, but often this data relied heavily on approximate, impermanent recording methods. Tree positions were collected on to paper plans of variable quality and accuracy. Identification tags were non-standardised and temporary and record sheets were varied and erratically stored. Vast quantities of hard copy records are personalised archive property, much of which is either non-traceable or lost (a not uncommon state with much other ecological data).

Due to the wide range of ecological properties that are intrinsic to the nature of ancient trees, different specialists naturally tended to focus on their particular field of interest when observing relevant features of the tree. Thus lichenologists would study the nature of tree bark, degree of shade and microclimate, while entomologists focused on the rot sites and microhabitats about the body of the tree.

The creation of a unified survey methodology arose as a direct consequence of ATF field meetings and discussions. The first initiative arose from one such meeting at Ashton Court, Bristol, to look at a survey of the veteran tree population carried out by Treework Environmental Practice (TEP) to inform a management programme. The ATF participants who were present agreed to explore the feasibility of developing a standardised survey methodology for veteran trees and a series of meetings were held during 1995. These were attended by a multidisciplinary group of participants together with a number of veteran tree site managers.

One of the prime tasks identified was to formulate a unified survey approach to record the components of the tree that provide substrate for colonising species: a multidisciplinary approach to the development of the survey method was needed.

Without this consensus over the requirements for collecting data, the potential benefits from sharing and comparing findings were eroded. The aim should be that the quantity and quality of ecological data at sites with veteran trees adds value to such sites and provide the means for their conservation and improved condition. Where information is constructively used, this may help secure the case for attracting resources to help meet conservation objectives.

1.3 The Veteran Trees Initiative and development of the Specialist Survey Method

In March 1996, English Nature launched the Veteran Trees Initiative (VTI) to promote the importance, conservation, good management and continuity of veteran trees. The VTI Steering Group identified a need to develop a comprehensive and consistent method of survey for recording veteran trees as an agreed national standard via a continuing process of consultation. A background assumption was that data acquired through an agreed national veteran tree recording system would eventually be collated and that at some future date the information held would be publicly accessible on a national database, although views on national recording schemes have subsequently evolved as part of the National Biodiversity Network.

The results of the consultation process were realised in the VTI publication of the Specialist Survey Method, (Fay & de Berker, 1997). Because survey requirements ranged from very low levels of data recording, to highly specialised levels needing considerable detail, the SSM was developed at three levels of detail.

2. Background to the Specialist Survey Method

2.1 The concept of multiple-level survey

The original design of the survey was conceived as a fully comprehensive approach to underpin biological base-line data recording. This was intended to provide sufficient accuracy and survey depth to allow for meaningful analysis and to provide a basis for subsequent return survey work and monitoring. More detailed and specialised biological surveys could be added as an accessible reference for future research.

In order to address the needs of the enthusiast, non-specialist recorder, whilst providing the means for internal consistency and a serviceable tool for the specialist, the method was initially evolved at its most complex level. The most complex (Specialist Level 3) incorporates all the necessary features and fields that the lower (Levels 2 and 1) also require. Thus there is a hierarchical relationship between the simplest and most complex survey levels and the lower-order levels are subsets of the higher. All levels draw upon a common store of fields and codes.

2.2 A summary of survey levels

The following paragraphs summarise the SSM survey levels from the most complex Level 3 to the simplest Level 1. Level 3 is termed the 'Specialist Level' and contains all the general and detailed information fields sufficient for a full survey and from which data can be selected for inclusion in the lower-order levels (1 & 2). All levels record information from a range of fields that relate to two major survey components, namely, the site (recorded as Site Details) and the tree (recorded as Tree Details).

The Level 3 'Site Details' component comprises fourteen fields for completion, including title, location and grid reference details as well as identifying information concerning the existence of past records about the site and legal or biological status.

The Level 3 'Tree Details' component covers five main information categories, each requiring data entry for a range of fields. These areas comprise the following: *Tree Data* (5 main fields and 2 supplementary fields); *Tree Form/ Vigour* (5 main fields); *Tree Habitat* (11 main fields and 3 supplementary fields); *Tree Associates* (4 main fields) and *Tree Management* (5 main fields)

Level 2 is termed the 'Generic Level' and is aimed at arborists, foresters and other generally informed surveyors. It is designed as a cut-down version of Level 3 and comprises a reduced number of fields that cover all five broad information categories as follows: *Tree Data* (4 out of 5 main fields and no supplementary fields); *Tree Form/ Vigour* (3 out of 5 main fields); *Tree Habitat* (6 out of 11 main fields and 3 supplementary fields); *Tree Associates* (all 4 main fields) and *Tree Management* (2 out of 5 main fields). Furthermore, the generic level requires a lower level of site information input; of the 15 possible fields for entry in respect of site data, only eight are required for completion at this level.

Level 1 is developed as a popular 'Introductory Level'. It uses similar categories to Levels 1 and 2. The explanatory booklet covers the few fields that may be required at this level. It is presented as a folded A5 two-sided card. One card is used per tree. Level 1 requires very simple information to be recorded by means of tick-boxes and is illustrated with self-explanatory line drawings as an aid. There are a maximum of 22 fields available for completion. These include species, location, girth (banded), basic types of tree form, standing/fallen, alive/dead and the presence ('yes/no') of rot, hollowing, deadwood and birds, bats or insects.

A key component of the survey method was to include explanatory notes sufficient to guide the surveyor through the process of inspecting the veteran tree on site. This had to be clear and unambiguous to provide consistency and reduce the potential for subjectivity when recording habitat features. An explanatory booklet accompanies Level 2 and 3 survey forms as an integral field guide to surveying veteran trees. The booklet is illustrated with line drawings and offers guidance for recording tree features. The guide clarifies the advised method for measurements where required. It includes a system for morphological classification of veteran attributes and features, in order to reduce the level of subjectivity involved in a descriptive process. This provides the means to analyse and interrogate data of a morphological content.

The SSM provides a practical aid to the surveyor with a data collecting method. The booklet includes annexed detachable recording cards presented as spreadsheet for site use. Each

booklet contains twenty recording cards, providing the means to survey up to six hundred trees. One booklet is sufficient for most veteran tree sites. Each recording card is designed for either Level 2 or 3 surveys. The distinction between levels is indicated by the use of shaded column headings.

Due to the allocation of survey codes to different features, the system permits the development of a related electronic version and has been designed to be compatible with its use in spreadsheet or database form. At the time of the original project, the brief did not include formulation of a standard electronic version. As a consequence, over the five years of its use, there are many ways in which data has been stored electronically. The absence of an official standard electronic version for data collection and collation is promoting erratic data storage, with a considerable risk of data loss and potential inefficiency in survey investment.

2.3 The use of the SSM

Surveys have been carried out using the SSM at its various levels, often by in-house staff at veteran tree sites or by specialists, who have developed expertise in its application. At the lowest level of recording, both prior to the SSM and indeed since its development, veteran tree surveying has often taken the form of tagging and plotting trees or tagging, girthing and plotting. This might be considered as a sub-Level 1 survey. At the other end of the survey spectrum, there is considerable demand for Level 3-type surveys, often with additional requirements, which may include an arboricultural component. Clearly, the higher the level of detail, the greater the survey time and therefore the higher the costs. In spite of this, the demand for higher-level surveys is increasing. A detailed assessment can add value to the site, by providing complex analysable data about the biological resource. The increased use of Level 3 surveys is likely to be due to the potential for information derived from such survey data to attract future management funding.

Resources allocated for detailed veteran tree surveys may be seen to be a sound investment in nature conservation. Landscape restoration projects often seek funding from Heritage Lottery Fund (HLF). Where sites contain veteran trees, legislation requires that wildlife habitats be protected (Countryside and Rights of Way Act (2000)). Therefore, funding will depend on an understanding of the habitat resource in order to identify its value and extent, the factors that may threaten habitats and to inform future management. As part of preliminary assessments for such funding, it may be necessary to record the veteran tree resource in sufficient detail to gain an understanding of the population dynamics of the site. Where sites of wildlife interest are found to be in unfavourable condition, funding provides the means for restoration; and even for sites in good condition, to maintain them as such may require considerable resources for the management of trees. Thus HLF funding has created an additional impetus for carrying out more detailed (higher level) surveys on veteran tree populations. Often the surveys may generate interesting and unforeseen results. For example, comprehensive data may provide evidence of the age classes of trees in parkland sites when an accredited system for ageing trees is applied (White, 1998). In other cases the rate of historic decline and loss may be shown to be far more extensive than previously thought, revealing a high risk to the population through attrition (Fay 2000; Fay & de Berker 2002; Fay, N. & Fay, L. (2001); Read, 2000).

Planning legislation (Town & Country Planning Acts 1990 (as amended)), within the context of the broader nature conservation regulatory framework (Countryside and Rights of Way Act (2000), requires the evaluation of sites of potentially valuable habitat when considering

applications for land development or change of use. Where veteran trees are present the SSM provides a standard for carrying out an assessment of the habitat status to inform planning decisions. The SSM has formed a significant component of the pre-planning site evaluation (eg Brockworth, Glos). Additionally, the SSM has been used to provide evidence and to aid the evaluation of compensation in cases where damage to veteran trees and associated habitat is claimed.

In the light of the current high levels of specialist input required to establish thresholds of species value in site assessments for potential SSSIs, the importance of veteran tree habitat features has been identified as a relatively accessible alternative and reliable means to inform notification status. As such the SSM could contribute to the evaluation of biological importance based on structural and habitat features of the veteran tree.

The Habitat Action Plan (HAP) for Lowland Wood-Pasture and Parkland (Webb & Bowler 1999) has generated surveys of parkland areas that focus on the biodiversity value as indicated primarily by the status and extent of veteran tree populations present. Such national HAP objectives translate the UK and regional targets at a local level in the form of stated objectives and projects. Typically, the veteran tree surveys that have been carried out (or that are planned), use the SSM (or a derivative application) as a focus for accumulating data in order to set benchmarks for establishing site status and monitoring condition (eg Staffordshire (Webb & Bowler 2001). In other cases the use of the SSM at Level 1 (or a derivative application) has been employed as a technique both for accumulating fundamental veteran tree data and for engaging the public (eg Bristol City Council (2000); Hampshire Wildlife Trust (1997)). The principles underpinning the SSM categorisation of information have been used in data collection for surveys undertaken in the European context (Smith & Bunce 2003) and in wood-pasture surveys in Scotland (Holl & Smith 2002)

3. The review of the use of the SSM

3.1 Methodology

Provision of the SSM booklet is free, although a condition of its use is that English Nature should be notified of progress and completion of recording. However there is not a comprehensive database of the survey users established to date. The first step was therefore to prepare a directory of current and potential SSM users through an initial telephone survey of Wildlife Trusts (WLTs), Environmental/Biological Record Centres (ERCs), recommended County Councils, English Nature officers and other specialist independent consultants. The telephone survey involved 124 participants from which an active list of likely respondees was drawn up. (A list of participants is held by English Nature and the Ancient Tree Forum).

A questionnaire was designed in consultation with a core group of Ancient Tree Forum survey users (Appendix I). The questionnaire was sent to the survey users together with a letter providing the background to the current SSM review to 75 potential respondees. The entire process, apart from a few exceptions, was carried out by email initially between August and October 2002. A second approach was undertaken during November to January with improved results. A total of 28 valid replies were received, including some 23 organisations. Another 10 replies were received from individuals who had surveyed veteran trees without the use of the SSM or whose questionnaire response was insufficiently complete to provide useful or reliable information. A further 5 responses were received beyond the closure date

for inclusion in this review. The questionnaire responses are presented in summarised form in Appendix II (Summary of Questionnaire Response).

The survey review invites responses to a range of questions. There are three sections for completion. Section 'A' refers to background organisation and purpose of survey. Section 'B' requests commentary on the application of the SSM and Section 'C' addresses the perceived value and benefits of the SSM. Also included with the questionnaire is a spreadsheet for completion including columnar analysis of different types of survey undertaken (ranging from sub-SSM Level 1 to higher order than SSM Level 3).

The questionnaire is categorised and coded in the following way: (A1) Individual responsible for survey; (A2a) Organisation; (A2b) Use and nature of SSM; (A3) Purpose of survey; (A4) Survey Level; (A5) Number of trees surveyed; (A6) Survey personnel; (A7) Report production; (A8) Cost of survey; (B1) Omissions in SSM; (B2) Explanatory notes (clarity/ potential improvements); (B3) Strengths and weaknesses of SSM; (B4) Recommendations for improvement and proposed developments and (B5) Data: how stored and whether shared; (C1) key benefits; (C2) Limitations of survey and recommendations for future development.

The responses were collated and analysed following telephone contact with some respondees to clarify their questionnaire return.

4. The findings of the Review

4.1 General

This is not a comprehensive account of the use of the Specialist Survey Method to date; however it is probably a reliable sample of a significant proportion of its users. A small number of individuals who have developed expertise in its application account for the majority of trees surveyed by this method and have tended to provide more detailed information based on their experience.

Apart from its development under the aegis of the Veteran Trees Initiative, the SSM has not been the subject of any specific launch or of any promotional literature. The first telephone survey revealed that a significant proportion (some 35%) of potential users were not aware of its existence or of its possible value in their field. This review has therefore helped to trace other potential respondees and also to promote interest in the SSM.

Recorded respondees had surveyed an estimated 45,500 trees using the SSM at Levels 1, 2 and 3 together with local adaptations to the SSM. 9,129 at Level 1, 4,834 at Level 2 and 13,532 at Level 3 (see Appendix III).

Another 16,500 veteran trees have been surveyed using a Sub-Level1 or modified low-level version of Level 1. Of these some 2,400 trees have been assessed to a higher-level resolution employing Level 3 plus an arboricultural and/or management methodology.

The current survey sample of respondees indicates the application of the SSM represents a total investment of some £291,000. If it is assumed that this took place over the period of six years the average estimated expenditure per year over this period is £48,500. However, as it is expected that some 70% of the expenditure has occurred over the last two years, this would represent a yearly expenditure of some £102,000. The recent level of investment appears to

be acquiring an increased momentum. A number of respondees refer to surveys that are planned in the near future. These calculations do not include work carried out in Scotland and only account for organisational overhead costs where these have been stated. As such these calculations are likely to be an underestimate of the total investment in veteran tree surveys.

Some 20% – 25% of the review sample reflects data collected just prior to or concurrent with the inception of the SSM development (1996/7). This survey work was mainly carried out by Ted Green (pers comm.), as a valuable pioneer initiative, but much of the material derived from this work is in hard copy form with very few components that are directly compatible with SSM fields. Other early veteran tree surveys, (Hampshire Wildlife Trust 1997) similarly recorded findings on paper and many such records are currently untraceable.

The figures included voluntary inputs by the surveyors. As a consequence the expenditure figures are distorted. Estimates of per-tree survey costs vary considerably according to the level, scale and professionalism of survey employed. Survey unit costs typically range between £3.00 and £55.00 per tree. Other factors that influence survey project costs include on-site conditions, accuracy of plotting and GIS data management, the use of photographic records, analysis of data, presentation requirements and the overall complexity of project application.

4.2 Analysis of review responses with reference to omissions, weaknesses and improvements to Explanatory Booklet

The user-survey objectives recorded in the review indicated that many were well suited to the SSM. However, in certain cases while recording tree position and basic dimensions the survey objectives have exceeded the primary recording objectives of the SSM by extending into areas of amenity (Centre Parks per comm.) or arboricultural condition and management (Richmond Park Survey, Fay & deBerker, 2002). The current levels (1 to 3) do not cater for all these applications. In such instances the survey method has been extended to include data fields that are tailored to meet these needs. To date such extensions and adaptations to the SSM have occurred on an individual project basis and have not been standardised for common use. Such developments have not been subject to an overview with the potential for sharing the benefits of survey experience and thereby improving the methodology.

The brief for the SSM review included an evaluation of its use and the submission of proposals for modifications to the clarity and detail of the guidance notes (as contained in the Explanatory Booklet) and improvements to the survey methodology (Appendix IV). The questionnaire responses identify omissions and weaknesses attributable to the survey method and shortcomings in the Explanatory Booklet. Part of the questionnaire (see Appendix I) allows respondees to identify specific strengths and benefits of the SSM as experienced by users. This provides insight for continuing with confidence in areas where the methodology appears robust and serviceable.

A key area of concern is the absence of an active level of promotion and ongoing support for the survey method.

The users lack a point of reference for consultation. Any support that has been available has operated outside the endorsement of an official Agency and has relied on the good will and random availability of a few volunteer consultants. Therefore such support has often been

inconsistent and inefficient. The Veteran Trees Initiative funded the development of the SSM but when the VTI ended the SSM was neither effectively launched nor subsequently actively promoted or managed. There appears to have been little coherent strategy underlying the continued use of the SSM and guidance for a unified approach for collection and storage of data has been limited. This was a significant concern amongst respondees. Some potential users reported difficulty in acquiring SSM Explanatory Booklets and there were cases where electronic application to English Nature for SSM material failed. Additionally, the SSM is not readily found through a web search engine.

4.2.1 Recommendation 1

As a matter of urgency a strategy to support the future development and use of veteran tree surveying should be formulated. This needs to be sufficiently robust to account for developments that may be forecast within a period of up to ten years.

4.2.2 Recommendation 2

The establishment of an interactive database for storage and collation of data should accompany the development strategy.

4.2.3 Recommendation 3

The success of managing survey information will depend on adequate resourcing both in terms of funding and personnel. Therefore the resource implications need to be considered in order to identify a funding programme over a ten-year period to adequately support and promote the use and application of the SSM.

4.2.4 Recommendation 4

Following the revisions and updating of the SSM, and appropriate resourcing the SSM should be re-launched and actively promoted.

Explanatory Booklet: General aspects regarding the guidance notes in the Explanatory Booklet.

Users have shown confusion in determining the level of survey suitable to their requirements. This appears to stem from the fact that the booklet does not set out clearly the logic, that underpins the methodology. In particular, though the three operational survey levels are subsets of one another, the explanation of the relationship between them appears to be unclear.

Users have tended to be attracted to the simpler version and so many surveys using public volunteer involvement have relied on the Level 1 card (often with minor modifications). This has the advantage of simplicity and ease of use with the card used as a self-explanatory survey form. However it was originally intended that the full guidance notes would be available to inform the rationale and practical application of the method even with Level 1. As such Level 1 has broken free from the Explanatory Booklet and users have commonly reported confusion when attempting to apply the method. This is a failing of this aspect of the SSM.

Explanatory Booklet: Structure and layout of the Explanatory Booklet.

Comments received from respondees fall in to two main categories for revision of the Explanatory Booklet. These relate to specific revisions and modifications to the survey fields and to ambiguities that may arise from the translation of guidance notes and its application in the course of surveying. Other aspects are the way the booklet is presented and potential extensions to the application of the survey method. Such improvements are outlined in the recommendations proposed in this section.

4.2.5 Recommendation 5

The structure of the Explanatory Booklet should be revised to include an Introductory Section that more thoroughly sets the scene for surveying veteran trees and explains clearly the logic behind the methodology, in particular offering guidance on selection of the appropriate survey level. To reflect these concerns it is recommended that the Introductory Section should also cover more fully the following items:

a. *Veteran status:*

i. Clearer guidance on the definition of veteran status.

ii. Clarification of indicators for recognition of veteran trees.

b. *Tree age:*

i. Explanation of the ageing process and distinction between mature, veteran and ancient age classes.

ii. Guidance on translating species girth to estimated age (White, 1998).

c. *Tree safety:*

i. The text should continue to emphasize that the SSM is not a safety assessment and should have clearer signposting to 'Veteran Trees: A Guide to Risk and Responsibility' (English Nature 2000). This will become more important as the Specialist Survey Method is refined in the future, eg to include condition assessments and/or tree management components.

d. *Plotting and tagging:*

i. Instructions on preferred methods for accurate tree plotting (including GIS standards).

ii. Guidance providing specification for tagging of veteran trees.

e. *Filing and documenting:*

i. The Explanatory Booklet should provide a full explanation of the importance of collecting data on veteran trees and the contribution that this may make for their conservation and study.

ii. This section should clarify the importance of high quality data and should emphasize the need for consistent and objective surveying and recording.

iii. The booklet should guide the recommended method for inputting data. Subject to the timely establishment of a national database, the guidance should provide specific details for interacting with the database. In the event of the national database not being fully prepared by the time of the Booklet revision, it is recommended that the introduction should incorporate a facility (eg back cover envelope) for attaching the database details when available.

4.2.6 Recommendation 6

The Booklet does not need to include a large number of Level 2 and 3 survey spreadsheet cards (as at present). Rather it is proposed that the booklet contains improved versions of the survey card, a maximum of five cards for each level of survey. These cards should be contained in a separate section of the Explanatory Booklet, clearly differentiated, detachable and suitable for photocopying by the user.

4.2.7 Recommendation 7

The Explanatory Booklet and survey cards should all be readily available on-line.

*There are a number of **specific** aspects regarding the Explanatory Booklet that raised concern.*

Proposed improvements relate to the quality of data collection to provide an appropriate level of reliability when the need arises for re-inspection or monitoring. Respondees have identified ways in which the SSM could be strengthened through the inclusion of additional fields or refinement of existing fields.

4.2.8 Recommendation 8

The following amendments to the text are proposed to provide contextual information relating to the site as distinct from the immediate setting of the individual tree. Recommendations refer to revisions to instructions for recording Site Details following the introductory Section of the Specialist Survey Method Explanatory Booklet

Currently, this section identifies site name, location, legal, formal designations and history of past records of the site. This could be amplified to include broad information regarding the natural history and character of the site.

Location (see Site Details item [E])

i. The Site Details section should be expanded to include categories such as ancient woodland, field boundary and wood pasture incorporated into a table of site context compiled in association with a review of Tree Details [26] (see 4.2.7, Recommendation 9, below).

ii. Previous Specialist inputs regarding the site should be noted, eg RDB species. The Saproxylic Quality Index (Fowles, A. P. *et al* (1999)) where available should be referenced in Site Details (G/H).

4.2.9 Recommendation 9

Proposals that relate to the tree are dealt with in the order that fields are presented in the Specialist Survey Method Explanatory Booklet for amendments to the component of the SSM that relates to the tree.

The sequence of fields may also be seen in the Level 3 survey card spreadsheet and the fields are numerically referenced to correspond with their designations in the booklet (eg Tree Number = Field ***[1]***; Grid Reference = Field ***[2]*** etc).

a. *Tree number[1]*

Proposals have been made to provide a unique identification method, which might combine the survey site and the tree number. The revision to the current SSM should consider the merits of this proposal.

b. *Grid Reference [2]*

The current requirement should be upgraded to mandatory eight-figure grid reference for all levels of SSM use.

c. *Species [3]*

The status on non-native veteran trees has been raised as an issue for clarification. Non-native species should continue to be included although through database analysis their relative significance may be studied. The revised booklet should explain the basis for their inclusion

d. *Dimensions [4]*

Currently Levels 1 and 2 require accurate measurement, while Level 1 is banded according to categories of measurement. The measurement of girth should be consistent for all survey levels. This requires that Level 1 be upgraded to Level 2 and 3 as an accurate measurement.

e. *Tree Form[6]*

i. The range of tree form categories should be expanded to include *Stub High Coppice* to describe circumstances that are often found.

ii. Ancient coppice remnants should be recorded according to percentage of live tissue expressed as a proportion of the outer basal circumference of a projected optimum outline (see also ***Hollowing [16]*** in current SSM).

f. *Live growth [8] and crown loss[9*]

i. These fields are significant; particularly as combined they provided the means for non-specialists (if suitably informed and trained) to record information that a specialist (eg arboriculturist) may subsequently analyse. These fields were developed as key elements to guide assessment of tree condition and to monitor changes in condition.

ii. This section of the Booklet requires improved explanation to describe the reasons for the use of these fields and their importance as indicators of tree conditions and trends.

iii. The Explanatory Booklet should identify the relevance of the sub-grouping of Fields [6] to [10] as combined they contribute to a record of tree form and condition offering considerable data for subsequent analysis.

iv. The field of Crown Loss requires further refinement to assist with the definition of 'Former Peak Crown Outline' in order to undertake this element of the SSM to an adequate standard.

g. *Bark condition[11]*

i. In the light of sites that have suffered catastrophic damage (eg Ashtead Common) Bark Condition should include the additional field of 'fire damage'.

ii. Bark loss or damage should be described in terms of degree or extent.

iii. Bark loss should be distinguished from dead attached bark.

h. *Stubs[15]*

i. Clarification of live stubs is required to inform recording to include the location about the trunk or crown framework.

ii. Live stubs with extensive shattered ends offering key habitats should be separately recorded.

i. *Small holes[17]*

Surveys of veteran tree populations have recorded over 4.5 small holes per tree (Fay & de Berker 2002) providing data for comparison between and within sites.

i. Explanatory notes should clarify the importance of recording small holes about the trunk and crown.

ii. The guidance given in the Explanatory notes on methods of observation and recording of small holes should be improved.

j. Rot[19]

Rot and wood decay are inextricably linked to fungal colonisation [22]. There is a high degree of uncertainty with regard to observation and recording. Although this is a specialist area, it warrants revision and representation due to the importance of this habitat. These fields would benefit from colour and/or photographic illustration.

i. The section describing rot and decay should be expanded and consideration given to presentation such that the complexity of the Rot Characteristics Table is designed to vary according to the survey level.

ii. Rot types should be illustrated.

k. *Dead wood [20]-[21]*

There was little comment regarding the presentation and recording of dead wood. There is concern however that the Specialist Survey Method records only linear units of dead wood which currently cannot be converted into units of volume. Such calculations are important to enable the SSM to contribute and cross-reference with other methodologies for assessing and recording saproxylic quality and condition (Kirby *et al* 1998; Hodge & Peterken 1998; Butler, Currie & Kirby 2002)

i. Survey and recording of dead wood should be refined to provide an user-friendly method for estimating dead wood volume.

ii. Dead wood volume estimates should be expressed in terms of size classifications.

l. *Tree associates[22]-[25]*

The Specialist Survey Method is not intended to provide detailed identification of tree associates but rather suggests potential significance to be followed up by more detailed survey work. SSM surveys undertaken on large populations of veteran trees have provided indications of saproxylic quality with regard to tree associates. Additionally techniques have been developed to quantify associate values recorded through the SSM, which can add value to site assessments (Fay & Fay 2001; Fay & de Berker 2002).

i. The methods used to quantify associate values should be explored for development and inclusion in the improved Specialist Survey Method.

ii. These fields would benefit from colour and/or photographic illustration.

iii. The table of fungal types should make express reference to myccorhizal fungi and illustrate this.

iv. Guidance on identification needs to address the phenological implications of surveying in the interests of recommending appropriate survey timing and also to limit disturbance to wildlife and habitat.

v. The presentation of these categories should be designed to vary according to the survey level.

m *Context [26]*

Some issues arose from recording of the immediate context surrounding the tree, including ambiguities between factors relating to the overall site and the immediate setting of the tree. The scope of contextual descriptions and inferences insofar as these might bear on the site and its condition could be expanded to better describe the tree's growing conditions and to place it within its historic context. Such improvements are intended to enhance understanding and inform future management.

The Site Details are referred to separately in the Specialist Survey Method and appropriate revisions have been considered elsewhere (see 4.2.7 Recommendation 8 (i) above).

i. The table for the context (the area immediately surrounding the tree) should be revised in conjunction with the Site Details table (Recommendation 8). The contextual table should be extended and subdivided to include historic context and natural history context.

ii. Sub-categories of the Context field should be expanded to include characteristics of tree cover, which may indicate to historic management (ancient woodland, parkland, wooded common, wood pasture, pasture woodland, riparian feature, bog carr, field boundary, etc) and general descriptive context (roadside, garden, churchyard, orchard etc).

iii. Background information about local site condition and factors that may influence veteran tree viability should be noted and considered in association with Fields 27-29. These may range from topographical references (slope, inclination, drainage, exposure, improved grassland etc), phytosociological/biological influences (bracken, nectar sources, allelopaths etc) to recent changes of use to the site locality (recent development, land use, ownership, drainage) within the Context zone.

n. *Management [27]*

There was a degree of fundamental misunderstanding of the purpose and scope of this section. The intention of this element of the SSM survey requirement was to describe the evidence of recent management in the immediate vicinity of the tree to inform future management requirements.

The primary emphasis of the SSM should be on observed factors and features of the veteran tree and associated habitat and context. Future adaptations might provide indications to guide management but the overall strategy should be to focus on the accumulation of valid and reliable baseline data.

The recording of management factors should continue to relate to events that have occurred over the past decade.

i. The management table should be refined to include factors that may indicate potential effects on the tree and habitat condition. This would include management influences upon tree longevity and the continuity of veteran tree population.

ii. There should be scope to record tree management practice and the nature of tree hazard management (eg whether tree management practices have been carried pre-BS3998: 1989, post BS3998: 1989 or in accordance with environmental arboricultural techniques, including monolith conversion).

o. *Damage [28]*

There was some confusion in interpreting this field. While 'Damage' assessment is regarded to be crucial in influencing the conclusions that may be drawn from survey material, its current presentation and use does not adequately support this objective. Collation of information derived from fields 26-29 on relevant factors (particularly those that may effect the rooting environment) should allow the identification of site condition, indicate remediation significance and guide future monitoring.

i. The concept of damage should be interpreted in terms of both historic adverse influences (Damage) and potentially damaging operations and events (Threats). Therefore this field should be extended into two separate fields.

ii. The damage table should include an expanded list of factors suggested by respondees (eg phytopathological factors, historical information of tree loss, excavation, disturbed hydrology, catastrophic storm damage, and significant root disturbance from stock or other means).

p. *Photographs [30]*

i. The Explanatory Booklet should provide instructions for the optimum use of photographic material to establish a simple standard for digital photographs. This should be up-datable as technology develops and changes.

ii. This guidance should include methods for collecting photographic data, organising photographic records and how best to maintain archives and monitoring.

Recommendations for conceptual development, improvement and better use of the Specialist Survey Method

The following section refers to the further development, extension and scope of the Specialist Survey Method, to achieve a robust and enduring veteran tree survey system over the next decade. The proposals for consideration as strategic developments to the Specialist Survey Method have been considered in the light of the current use and the nature of applications of the SSM. The proposals fall into six main categories. These are Structure Facilitating Specialist Modules; Analysis package; Data management; Management; Presentation & promotion and Training

4.2.10 Recommendation 10

a. *SSM structure to facilitate specialist modules*

The existing arrangement, while being detailed does not encompass the full range of potential specialist user requirements. For some users level 1 is beyond their immediate requirements, whilst others need a level of resolution beyond level 3. Therefore the SSM should provide a modular framework as at present for those who require a fixed-menu of survey components eg Levels 1,2 & 3, but the following additional should be considered.

Additional tailored (fixed-menu) levels of the Specialist Survey Method.

- Find & Protect Module (minimum level survey sufficient to identify veteran trees guide tree protection also adequate for farm-type veteran tree survey)
- Provide off-the-shelf data collection menu for survey applications to meet core requirements for HLF bids for to inform and accompany landscape and/or archaeological appraisals.
- Standardised indicators of tree condition and stability assessment

A prescribed survey card would be formatted for each survey module.

A flexible approach should be offered. This would permit an 'a la carte' selection facility, which would enable surveys to be constructed from all the survey modules and could draw from other specialist areas for additional fields according to the project objectives. Such a system would be particularly well adapted to database use.

Where, particular statements of significance need to be highlighted prior to or in the course of a survey (eg recording target conservation species, significant habitats or remarkable trees), a facility is should be incorporated in the recording and analysis procedure with guidance provided for consistent application.

b. *Analysis package*

Consistent methodology should be developed to evaluate and compare habitat data derived from the Specialist Survey Method. These might include the following:

i. An extension module to provide habitat valuation, population dynamics and standard format analysis.

ii. Standardised spreadsheets for analysis of data, eg tree population and habitat characteristics (with standardised charts for inclusion in reports).

iii. Standardised module for analysis of tree condition and stability to provide individual viability assessment and population analysis. This should identify attrition rates and vulnerability.

c. *Management programmes informed by surveys*

Guidance is needed in the formulation of management programmes following survey and analysis, to help with the following:

i. Identification of key management signposts that result from data collected (eg threats; low levels of dead wood).

ii. Establishment of method for prioritisation of remedial management & proactive intervention

iii. Development of an arboricultural management module to provide guidelines for a long-term phased tree management schedule of operations that comply with current best practice. This should incorporate costed analysis for budget guidance and funding applications.

iv. Development of management programme format to address concerns relating to potentially damaging operations, continuity and implications derived from the assessment of Site & Tree Context and Previous Management.

d. *Presentation & promotion*

The explanatory booklet should be presented as a CD ROM with photographic illustrations.

i. The booklet should also be freestanding as a separate publication comprehensively illustrated and should encompass all proposed variations in the application of the Specialist Survey Method.

e. *Training*

Respondees frequently raised the issue of the need for training. This emphasised that the lack of an accompanying induction and training package in many ways served to undermine the efficiency, reliability and cost effectiveness of the investment in data collection. Therefore there should be a strong and dedicated commitment to the provision of training to underpin the Specialist Survey Method.

i. An accessible training programme should be established initially over a three-year period. This should cover areas of ambiguity as well as more complex aspects of surveying (eg assessing crown loss, dead wood and rot) and be carried out by individuals who are approved as competent and experienced in the comprehensive use of the SSM.

ii. The training programme should accompany the launch of the revised and extended Specialist Survey Method and involve stakeholder organisations (eg English Nature, Ancient Tree Forum, Woodland Trust, National Trust and Corporation of London).

iii. The primary instrument for training should be the CD ROM, as amended in the future through potential interactive web links.

iv. The schedule of training should cover all aspects of survey requirements and take surveyors through the survey methodology at a level appropriate to their expertise.

v. A facility for user group interaction should be developed at an early stage.

vi. Training should incorporate correct and appropriate data management, guidelines for standardised spreadsheet and database recording and reporting, methods of data collection (paper/card forms; pen-notebook; palm top etc) and data transferral.

5. Conclusions of the review of the Specialist Survey Method

5.1 General benefits of the SSM

Since the publication of the Specialist Survey Method in1997, a great number of veteran trees have been the subject of surveys using this approach. The SSM has stimulated great involvement. Some 1,000 people have been involved either professionally or as volunteers in carrying out surveys, ranging from a solitary tree to populations of several thousand veterans.

The Specialist Survey Method has offered the following key advantages:

- Potential to involve local people and raise awareness of biodiversity through a charismatic subject and support for the accumulation of historical records.
- National consistency providing a framework for objective recording and for long-term research.
- Level 3 provides a sound baseline data for monitoring.
- The methodology is adaptable to requirements and expertise; it is a user-friendly system with well-explained and illustrated guidance.
- The SSM is supported by a thorough, well-structured checklist, which provides quick, clear and replicable results capable of quantification and comparison.
- The approach is holistic and comprehensive supporting integrated biodiversity conservation.
- The accumulation of data offers a potentially important national resource for informing and directing nature conservation policy.
- Data provide indications of condition vital to formulating a conservation strategy for veteran trees and guidance for managers of veteran trees and planners.
- A project-based approach to veteran tree surveying would provide the basis for a national database. This would identify important and threatened veteran tree sites and provide a framework for targeting of resources to their protection. This would also support BAP restoration targets.

The method has stimulated considerable debate and raised a high level of interest in veteran trees and associated issues between enthusiasts and stakeholders. The review demonstrated that all respondents found the Specialist Survey Method to be an important and valuable tool for veteran tree and saproxylic habitat conservation. There is considerable evidence that the method has an as yet unexplored potential. Respondees often indicated that if the Specialist Survey Method were bolstered by targeted funding and adequate professional guidance there would be considerable scope for attracting added value and further resources. The system offers a facility for achieving baseline data on important veteran tree sites and for informing site condition assessments. This has a positive multi-purpose function when judiciously applied for supporting appraisals of historic parklands and landscapes.

5.2 Conclusion

The responses received from users of the Specialist Survey Method indicated that the system has provided an unexpectedly strong impetus for professional and voluntary engagement with veteran tree conservation. It is a tool for organisations at local and national levels to define targets for Habitat Action Plans and to arrive at indicators of site condition, provide measures for improvement and meeting targets. It is recommended that the process be started as soon as possible to enhance the Specialist Survey Method to its second stage of development. This should help to underpin and support national biodiversity objectives for the UK Lowland Wood Pasture and Parkland Habitat Action Plan (UK Biodiversity Group 1998).

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Appendix I. The Review Questionnaire

Veteran Tree Specialist Survey Method

Evaluation Survey on behalf of English nature

Name of organization & Individual Responsible

Section A

1. Have you carried out a veteran tree survey?

Yes ☐ No ☐

If 'No': Are you proposing to carry one out and could you give brief details

2a. If you have carried out a survey, did you use the Specialist Survey Method?

Yes ☐ No ☐

2b. If you did not use the Specialist Survey Method, what survey type did you carry out & how many trees did you record?

3. What was the purpose of your survey?

4. If you used the Specialist Survey Method, to what level was the survey carried out?

Level 1 ☐ Level 2 ☐ Level 3 ☐

5. How many trees did the survey cover at:

Level 1 ☐ Level 2 ☐ Level 3 ☐

6. Who did you use to carry out the survey?

Consultants ☐ Volunteers ☐ Other

7. Did you formulate a report based on the survey?

Yes ☐ No ☐ If yes, can you give any details

8. What was the approximate cost of the survey? £

Section B

The Use of the SSM

(Please expand on answers to Section A)

1. Are there important aspects of a veteran tree survey that, in your opinion, the SSM has omitted?

Yes ☐ **No** ☐

I think that the SSM should cover the following

2. Did you find the SSM explanatory notes?

Clear throughout ☐ Mostly clear ☐ Unclear throughout ☐

I think that the SSM explanatory notes should also cover the following:

3. Could you identify the strengths and weaknesses of the SSM?

Strengths

Weaknesses

4. Could you recommend three practical improvements to the SSM?

5. How have you managed/stored data?

6. Have you shared or kept your data with other surveys, organisations or record centres?

Yes ☐ No ☐

If so, which:

Section C

The Value of the SSM

1. What would you consider to be the key important benefits of the SSM survey?

2. Do you consider the current levels 1, 2, 3 to be appropriate?

Yes ☐ **No** ☐

a) Could you comment on the value / usefulness of having different levels of the

b) What other levels (or purpose) of survey would you consider should be developed or applied to the Specialist Survey Method for veteran tree surveying?

Appendix II. Summary of questionnaire response

Specialist Survey Method Review Response Summary Part 1 Questionnaire Sections 1A – B2 (Level; Survey Purpose; Improvements)

Individual	Organisation	A1	A2	A3		A5	A6		A7	B1				Clarity	B2	B2	B2
		SSM [Y / N]	Level	Purpose		No of trees	Report [Y / N]		Cost (£)	Omissions				[Y / N]	Explanatory Improvements		
			1-3 &/or V=variation	1	2				Estimated	1	2	3	4		1	2	3
Bob Warnock/ Adam Curtis	Ashtead Common NNR	Y	2 +	Condition and failure assessment following fire.	GPS mapping	2302	N	Planned	10000	How to photograph for monitoring	Bark condition to include fire damage			Y	Record absence and loss		
Gavin Hageman	Berks, Bucks & Oxon WLT	Y	1 (304 trees) + 3 (60 trees)	Locate and record VTs	Implement HAP	364	N		2000					Y	Identify types of rot	More info on types of fungi	
Paul Stephans	Birmingham, Blackcountry WLT	N	V			-											
Helen Read	Burnham Beaches	Y	V	Establish number of old pollards		555	Y		3000								
Pete Stroh	Cambs, Beds & Northants	Y	3	Survey VTs in 12 Cambs parklands		219	Y		1500	More detail on fungi and bryophytes	Nectar source location			Y	Explanation of rot type		
Ray Steele	Centre Parks, Sherwood, Notts	Y	3	management		155	Y		1200	Management issues should be referenced	Factors influencing management for longevity	preferential management (Native v non-native)		Y			
Brian Beasley	Dartmoor National Parks Agency	Y	1	Identify VT resource		-		planned									
Naomi Brooks	Derbyshire WLT	Y	1	Black poplar survey		450	Y	In progress	1000					Y			
Dave Clayden	English Nature	Y	V	Recording and conserving VTs		2500	Y		16000								
Debbie Wicks	Hampshire WLT	Y	V	Identification of VT resource for wildlife conservation		600	Y		5000					Y			
Liz Anderson	Herts BRC	Y	1- 3	County conservation of VTs and habitat	Guidance for management and land use	2000	Y		10000					Y			
Clive Faulkner	Montgomeryshire WLT	Y	3	Inventorise parkland areas		250	N		1000					Y	Clarification of stubs (trunk and crown)		

Specialist Survey Method Review Response Summary Part 1 Questionnaire Sections 1A – B2 (Level; Survey Purpose; Improvements)

Individual	Organisation	A1	A2	A3		A5	A6		A7	B1				Clarity	B2	B2	B2
		SSM [Y / N]	Level	Purpose		No of trees	Report [Y / N]		Cost (£)	Omissions				[Y / N]	Explanatory Improvements		
			1-3 &/or V=variation	1	2				Estimated	1	2	3	4		1	2	3
Steve Hull John Smith	Mosaic Mapping	Y	2 + 3	VT inventories for habitat condition assessment, management plan and grants	Sustainable management	4189	Y		60000	Coppice stools. Percentage live tissue in circumference (>20%; 20.40%; $=-60%, 80-100%)				Y	Subjectivity (eg: crown loss)	Inconsistency (eg: small holes)	Lack of clarity (eg: rot table)
			1 + (V)			4110											
Garry Barnes	Norfolk	Y	2	Dissertation		345	Y		2500	Historic context (ancient woodland; field boundary; wood pasture)	Tree age estimate (cf John White)			Y	Identify historic landscape	How to estimate tree age	Tree type to include "stub; high coppice)
Mark Crick	Peterborough CC	Y	3	Camb/Peterb BAP	Peterborough Nat Env audit	415	Y	Received copy	5000								
Phillip Precey (currently @ Derbyshire WLT)	Beds, Cambs, Northants & P'borough WLTs	Y	3	Collect info on P'brogh's VTs to meet BAP target	Part of P'borogh Countryside protection audit												
Ted Green	Ecologist Consultant			Record and locate veteran trees	Initiate fuller surveys at various sites	9797	N		30000					Y	Photographic illustrations	CD Rom	Further development of condition assessment
Fiona Luckhurst	Radnorshire Wild Life trust	Y	3	Management plan	Tree age estimation	14	Y	-	0					Y			
Martin Baker	Cambridgeshire CC	Y	3	Recording VTs in parklands		410	Y		3300								

Specialist Survey Method Review Response Summary Part 2 Questionnaire Sections B3– B5/

Organisation	B3 Strengths & Weaknesses						B4 Recommendations			B5/8		
	Strengths			Weaknesses						DATA STORAGE Hard copy =C; Drawing=CAD; DB; GIS;	Shared Data [Y/N]	
	1	2	3	1	2	3	1	2	3			
Ashtead Common NNR	National consistency	Provides objective framework		Absence of photographic guidance			Training			Map info/ data/ hard copy	Y (CoL website)	
Berks, Bucks & Oxon WLT	Level 3 has good detail			Level 3 very time consuming			Tagging: more information			Excel	EN	
Birmingham, Blackcountry WLT												
Burnham Beaches				Appears complicated	Time consuming		Database needed	Guidelines on identification o VT		HC	N	
Cambs, Beds & Northants	Methodology is adaptable to level of expertise	User friendly	Sound baseline data for monitoring	Further levels required for specialisms			Include recording method of fungi and bryophytes	Guide to ageing identification	Include nearby nectar source species	Excel layered onto GIS (Mapinfo)	Y	(EN, EA, Cambs CC)
Centre Parks, Sherwood, Notts	3 Levels	Adaptable to level of competence		V time consuming			Advertising	Training		HC; CAD (1:2500)[?]	N	
Dartmoor National Parks Agency												
Derbyshire WLT	Detailed	Thorough	Good diagrams	Complicated for volunteers	Time consuming		Training provision			MS Access and Excel: GIS (Mapinfo)	Y	National Black Poplar Working Group
English Nature												
Hampshire WLT										HC	Y	EN; EA; Inverforth Trust; ESSO

Specialist Survey Method Review Response Summary Part 2 Questionnaire Sections B3– B5/

Organisation	B3 Strengths & Weaknesses						B4 Recommendations			B5/8		
	Strengths			Weaknesses						DATA STORAGE Hard copy =C; Drawing=CAD; DB; GIS;	Shared Data [Y/N]	
	1	2	3	1	2	3	1	2	3			
Herts BRC	Well structured check list			Sheer volume of data needed			National database needed			MS Access; HC; CDs of photos; GIS refs	N	
Montgomeryshire WLT	Quick	Clear	Replicable	Needs guidance for analysis			Survey sheet on 1 side only				Y	(CCW, Newtown)
Mosaic Mapping							Regular training courses	Monitoring of implementation for standardised and consistent working		MS Excel (Mapinfo); GIS	Y	Client (E.G.; EN/FC)
							L1 explanatory codes linked to SSM spreadsheet.	GIS specification required. Reference polygon layers for groups.	Formulation of web-based protocols required			
Norfolk	Clear	Concise	Thorough	Management recommendations needed			Introduce historic landscape context	Guidance for landowners (generic ref. fencing; compaction; crown stabilisation)		MS Access; photo database	Y	Shared with ATF; EN; Norfolk CC & WLT; Suffolk CC
Peterborough CC	Clear/straight forward	Quantifiable results	Enables comparison				Identification of mosses	Code for more than 1 spp suspected but needing more info		WLT; ERC	N	

Specialist Survey Method Review Response Summary Part 2 Questionnaire Sections B3– B5/

Organisation	B3 Strengths & Weaknesses						B4 Recommendations			B5/8		
	Strengths			Weaknesses						DATA STORAGE Hard copy =C; Drawing=CAD; DB; GIS;	Shared Data [Y/N]	
	1	2	3	1	2	3	1	2	3			
Ted Green	Well structured	Encouragement to increase surveying of VTs	Systematic	Extent of detail requires careful introduction & training	More information required on types of rot & fungi	Guidance required for optimising & planning surveys phonological-ly	Develop non-specialist guidance for condition assessment	Clarify identification methods of veteran/ancient status	Guidance notes for rot definitions & types of fungi	HC	EN	
Beds, Cambs, Northants & P'borough WLTs		Detailed		Needs guidance for identifying what is a veteran tree	Subjectivity (Bark fluxes)	Subjectivity (Crown deadwood)	Standard for Data Storage			MS Excel SS: MapInfo; GIS table	N	P'borough CC; landowners (where confidential);
Radnorshire Wild Life trust	Detailed	Useful for age & condition assessment	Informs management	Girth measurement on sloping ground difficult.	Bole height ambiguous		Develop, produce & include tree age calculator	Develop standard for data storage		C; Excel	N	
Cambridgeshire CC										HC; GIS mapinfo layer	Y	EN; Cambs CC; Peterborough CC

Specialist Survey Method Review Response Summary Part 3 Questionnaire Sections C1 – C4 (Strengths/Weaknesses; Recommendations; Data Storage)

Organisation	C1 Benefits					C2	C3 Proposed Developments				C4 Comments			
	1	2	3	4	5	Survey Levels Appropriate? [Y/N]	1	2	3	4	1	2	3	4
Ashtead Common NNR	See strengths					Y	National database of SSM records				Included nice eg of mapping			
Berks, Bucks & Oxon WLT	Systematic recording of VTs	Enables monitoring				Y					Included nice eg of mapping			
Birmingham, Blackcountry WLT											Concern about vulnerability of VTs	Tree loss following Birmingham case	Heightened need for recording VTs	Training and R&R
Burnham Beaches	VT conservation	Location and monitoring of VTs	Integrates and supports biodiversity issues				Requires additional level for management and monitoring							
Cambs, Beds & Northants	National biodiversity resource	Awareness raising of VTs	Baseline data for add-on surveys	Historical record		Y	More in depth flora and fauna recording							
Centre Parks, Sherwood, Notts	National Common Resource	VT promotion	Different level for diff skills/use			Y	Level to inc myccorhizal fungi				Objective: maintenance requirements for VTs			Aesthetics & management of veteran avenues
Dartmoor National Parks Agency											Early stages. Will use voluntary labour.	Level 1 survey. To carry out level 3 based on Level 1 findings.	Plan to photograph and link to GIS	Plan to cover whole of National Park
Derbyshire WLT	Different levels for different expertise	Provides baseline data	Indications of condition				Management advice for landowners							
English Nature														

Specialist Survey Method Review Response Summary Part 3 Questionnaire Sections C1 – C4 (Strengths/Weaknesses; Recommendations; Data Storage)

Organisation	C1 Benefits					C2	C3 Proposed Developments				C4 Comments			
	1	2	3	4	5	Survey Levels Appropriate? [Y/N]	1	2	3	4	1	2	3	4
Hampshire WLT														
Herts BRC	Provides direction for comprehensive survey practice	Data compatibility				Y	Further customisation of levels							
Montgomeryshire WLT	Assists with formulation of national resource					Y					Public involvement using simple level. Specialists use complex version.			
Mosaic Mapping	Vital to conservation strategy for VTs	Can be undertaken by people with differing expertise				Y	Development of variable level method	Develop methodology to be adaptable to needs of site and means of client			Redesign categories for database search facility.	Need for full electronic online version	CD Rom based explanatory photographic manual	
Norfolk	SSM fundamental to planners; managers of VTs	SSM promotes VT importance	Benefit to landscape conservation	Establishes baseline survey method for in depth additions		Y	Add L4 for fungi; invert; flora etc. Targeted to specific trees							
Peterborough CC	Standardisation	Replicable	Easy to use	3 Levels adaptable to resources	Allows systematic approach	Y	Invertebrate survey	lower plant survey						
Beds, Cambs, Northants & P'borough WLTs	-	-	-	-	-	Y					Saproxylic invertebrate survey followed for important trees			

Specialist Survey Method Review Response Summary Part 3 Questionnaire Sections C1 – C4 (Strengths/Weaknesses; Recommendations; Data Storage)

Organisation	C1 Benefits					C2	C3 Proposed Developments				C4 Comments			
	1	2	3	4	5	Survey Levels Appropriate? [Y/N]	1	2	3	4	1	2	3	4
Ted Green	Changed the entire basis for scientific exchange on VTs	Public relations: involves wide popular & spacialist interest	Potential for establishment of durable records and tree protection	Potential for influencing policy and directing resources at national level			Extend levels sub L1 and beyond L3	Launch survey method and invest.	Incorporate SSM into SSI validation & use as means for individual ancient tree SSSI					
Radnorshire Wild Life trust	Detail benificial to determining individual tree management					Y								
Borders														
Cambridgeshire CC	Standardisation	Enables comparison	Different level for diff skills/use			-								
Staffordshire WLT	Identification of VTs	Databasing of records	Identification of important sites	Guidance for site management		Y	Develop similar methodology for complete parkland surveys							
	Level of detail	Understanding extent and distribution of veterans in area	Supports BAP targets for restoration			N	Identify means to ensure and clarity at each level							

Specialist Survey Method Review Response Summary Part 3 Questionnaire Sections C1 – C4 (Strengths/Weaknesses; Recommendations; Data Storage)

Organisation	C1 Benefits					C2	C3 Proposed Developments				C4 Comments			
	1	2	3	4	5	Survey Levels Appropriate? [Y/N]	1	2	3	4	1	2	3	4
Treework Environmental Practice	Provides potential inventory of ancient trees	Extensive saproxylic data	Resource for nature conservation management	Potential for quantifying value and for intra/inter-site comparison		Y	Clarification of aims surveying at different levels. Introduce a level of survey as a standard suitable for farm surveys sufficient to guide tree protection	Creation of intermediate survey levels appropriate to varying requirements	Extension of survey to provide: habitat valuation; tree viability assessment; population dynamics analysis; management Introduction to SSM booklet to be revised with explanation for usefulness of data appropriate to recording of each feature	Creation of national database sufficient to collect/collate all levels of current and proposed recording Simple / generic guidelines on typical damage to VTs and management implications. Guidance cross-referenced to Guide to Good Management and Risk & Responsibility				
Somerset Environmental Record Centre Somerset WLT							Propose to use SSM in future				Very early survey, carried out at time of formulating SSM	Early consultation over Somerset's methodology.		

Specialist Survey Method Review Response Summary Part 3 Questionnaire Sections C1 – C4 (Strengths/Weaknesses; Recommendations; Data Storage)

Organisation	C1 Benefits					C2	C3 Proposed Developments				C4 Comments			
	1	2	3	4	5	Survey Levels Appropriate? [Y/N]	1	2	3	4	1	2	3	4
Surrey WLT											VT survey early stage	Proposed 2 year project. Budget of 43000		

Appendix III. Summary of review responses

Key Sites
Survey Levels
Number of Trees

Summary of Review Sample responses: Key Sites, Survey Levels & Number of Trees

Surveyor: SSM Levels Sub-Level 1 to Level 3 Other Survey Types

SITE:	Sub-Level1	Level 1	Level 2	Level 3	Total Level 2 - Level3	Total Sub level 1 to Level3	Treework Level 4 -7	Other type of VT survey	Not surveyed but No of VTs estimated	Total other Types of Survey	Total Trees Surveyed
Castle Hill	700				0	700				0	700
Epsom	50				0	50				0	50
Dixton			460	30	490	490				0	490
Windsor	200				0	200				0	200
Blenheim				900	900	900				0	900
Harridge	200				0	200				0	200
Richmond					0	0		500		500	500
Weston	200				0	200				0	200
Radbourne	200				0	200				0	200
Thame	200				0	200				0	200
Moccas					0	0		300	500	800	800
Brampton	300				0	300				0	300
Croft					0	0		400		400	400
Bredon	200				0	200				0	200
Hatch				1600	1600	1600				0	1600
Pipershill			240		240	240		20		20	260
Kedleston			10	280	290	290				0	290
Picket	40			*	0	40				0	40
Hardwick				90	90	90		100		100	190
Others				5579	5579	5579		100		100	5679
Richmond Park				1380	1380	1380	825			825	1380
Hatfield forest				884	884	884	884			884	884
Slindon Estate				100	100	100	100			100	100
Ashton Court				444	444	444	444			444	444
Turville Heath				200	200	200	119			119	200
Brockworth				20	20	20	20			20	20
Nettlecombe					0	0		280		280	280
Blaise Estate				225	225	225				0	225
Dinefwr Park		2000			2000	2000				0	2000
Herts BRC	550	1275	91	84	175	2000				0	2000
Staffordshire WLT			339	193	532	532		250		250	782
Shugborough Hall SWLT			47		47	47				0	47
Centre Parks, Sherwood				155	155	155				0	155
Windsor					0	0		5500		5500	5500
Staveton					0	0		2500		2500	2500
Bredon					0	0		800		800	800
Yardley Chase					0	0		357		357	357
Whittlebury Park					0	0		540		540	540
Ashtead Common NNR			2302			2302				0	2302
Berks/Buck/OxonWLT		304		60	364	364				0	364
Burnham	555				0	555				0	555
Cambs/Beds/N'hant				219	219	219				0	219
Derbyshire WLT		450			450	450				0	450
EN North Yorks					0	0		2500		2500	2500
Hants WLT		600			600	600				0	600
Montgomeryshire WLT				250	250	250				0	250
Norfolk CC			345		345	345				0	345
P'brogh/Cambs WLT				415	415	415				0	415
Radnorshire WLT				14	14	14				0	14
Cambs CC				410	410	410				0	410
Suffolk CC			1000		1000	1000				0	1000
Somerset WLT		4500				4500				0	4500
TOTAL	**2840**	**9129**	**4834**	**13532**	**19418**	**30890**	**2392**	**13647**	**500**	**16539**	**45537**

Appendix IV. The Specialist Survey Method

TREEWORK

Veteran Trees Initiative

Specialist Survey Form

Contents

Introduction

English Nature launched the Veteran Trees Initiative in March 1996 to promote the management and continuity of England's veteran tree heritage. A key element of the Veteran Trees Initiative is to develop a comprehensive and consistent method of survey as an agreed standard for the recording of veteran trees. Survey information gathered through the *Veteran Tree Recording System* is to be entered onto a national database of veteran trees which will form a register of recorded sites. It is intended that the database will contribute to a greater understanding of the distribution, biology and ecology of veteran trees. The database should subsequently enable recorders to trace individual trees and assess changes associated with particular veteran specimens.

Properties of Veteran Trees

Woody plants have the unique ability to remain healthy and structurally sound by laying down new increments of wood and bark over older wood which may have been weakened through injury, disease or decay. The growth rate of the new wood is influenced by mechanical stress, so that relatively wide increments are laid down over areas where decay of the old wood has led to reduced strength. This adaptive growth sometimes enables trees to attain great mass and longevity, even though they may shed individual limbs.

Tree wounds remove the protective covering of bark, exposing the underlying wood to the atmosphere and to colonisation by decay fungi and other micro-organisms. Partial drying of the wood allows some of these organisms, together with others which are present internally before wounding, to make use of the wood as a food source, thereby degrading it in a variety of ways. As a tree ages, the structure of its bark and wood becomes increasingly complex due to a combination of continued wounding, new growth and the progression of decay through many stages, culminating in cavity formation.

The ability of a tree to continue laying down new annual increments over a partially degraded and complex core is important for biodiversity as well as for its own attainment of great size and age. The resulting structural complexity provides a wide range of internal and external environments which may host many specialised fungi, plants and animals. It is the appreciation of these diverse characteristics which is the focus of the recording process, so that the veteran tree is perceived as a living habitat, rather than as an isolated antique organism.

The Recognition of Veteran Trees

Veteran status is associated with late maturity. However, trees of different species approach late maturity at different ages. Although there is no precise definition of veteran status for the purposes of field work, knowledge of species longevity, size typically associated with old age and local conditions affecting tree growth contributes to the recognition of veteran trees in the field. Their special quality in the landscape is reflected in the view that these trees "are of interest biologically, aesthetically, or culturally because of their age" (see 'Guide to the care of ancient trees', Veteran Trees Initiative, English Nature 1996).

Apart from obvious veteran candidates of massive scale and known antiquity, the surveyor is often likely to encounter uncertainty in the field as to the veteran status of certain trees. In such instances, reference should be made to the range of veteran attributes indicating habitat and associated flora and fauna addressed on the recording form, rather than tree size alone. If in doubt record the tree.

Tree Safety

It should be noted that whilst veteran trees may pose a safety risk, this survey is essentially a habitat assessment. *This is not a safety assessment.* Where there is suspected safety concern further specialist advice should be sought.

The Veteran Tree Recording System

English Nature hopes that the *Veteran Tree Recording System* will appeal to a wide range of people and will involve many who will not be expert. In order to take account of the different levels of specialist knowledge held by those who want to take part, three levels of survey have been devised.

A SITE
This is the name or address of the estate, farm or wood etc eg 'Ashton Court Estate'.
A site may contain one or several identifiable *locations* (see E) where veteran trees may be found.

B COUNTY
Identify the *postal county* in which the site is located. Where a site spans more than one county, the county is taken to be the area where the majority of veteran tree locations may be found.

C POST CODE
Enter the post code of the site address if appropriate.

eg 'Ashton Court Estate'.
The entry for this item will be B | S | 4 | 1 | 9 | J | N.

D GRID REFERENCE
This is the conventional six-figure grid reference derived from reading a current Ordnance Survey map at 1:50,000 scale.

Where feasible, the reference should be prefixed with the relevant two letter identifying code which indicates the 100 km square in which the site is found. The grid reference should identify the approximate *central point* of the site.

eg 'Ashton Court Estate'
Enter grid reference of approximate centre of site - (eg ST 555 722)

E LOCATION
Identify the designated area within the SITE wherein the veteran trees may be found.

E LOCATION *cont.*
This may be a vernacular title of local historic relevance, eg 'Hanging Wood', 'Clarkencombe' or 'Waterley'. This may also be a sub-compartment within a woodland.

Where no location title is known a simple description of tree location can be entered under Section 'J' (Site Notes).

WHEREVER A LOCATION CHANGES,
A NEW SURVEY FORM SHOULD BE USED.

F OWNERSHIP
This is the name of current owners of the land upon which the trees are standing.

eg Sir John Smith, Bristol City Council, National Trust, MOD.

G SITE RECORDS
Do you know of any surveys and/or records which may have a bearing on the veteran trees on the site?

If so which of the following categories of survey and/ or records are applicable?

Ecological
[1] Habitat
[2] Botanical
[3] Mycological
[4] Invertebrate
[5] Lichen
[6] Fauna
[7] Arboricultural
[8] Other ecological

G SITE RECORDS *cont.*
Environmental
[9] Soil
[10] Geological
[11] Hydrological
[12] Atmospheric
[13] Other environmental

Historical Records
[14] Land use
[15] Estate records
[16] Other historical records
[X] Other relevant records
[0] None known

For ecological and environmental surveys only:
If date of survey is known suffix the survey category as follows:-

[A]	Survey/record undertaken within past		5 years
[B]	"	"	5-10yr
[C]	"	"	10-20yr
[D]	"	"	20-50yr
[E]	"	"	over 50

eg Mycological survey undertaken 1923 and 1996, estate records during start nineteenth century, enter **[3AE, 15]**.

H SITE STATUS
This is a planning or other legal designation indicating the constraints which may apply to the site and therefore affecting the trees which are present.

Enter the appropriate two letter code.
One or more designations may apply.

[AO] Area of Outstanding Natural Beauty
[CA] Local Authority Conservation Area

continued

Level 1 is a simple, introductory level to veteran tree recording, using the *Veteran Trees Introduction to surveying ancient trees* Recording Card. Each card is used to survey a single tree. These Recording Cards are intended for use by schools and the non-specialist enthusiast. The Recording Cards are not contained within the Specialist Survey Booklet but may be obtained separately from English Nature.

Level 2 is an intermediate *Generic Survey* of veteran trees, using this Specialist Survey Booklet and completing *only* the essential data sections which are *unshaded* on the Specialist Survey Forms. These are found at the back of the booklet.

Level 3 is a comprehensive, *Specialist Survey* of veteran trees, using this Specialist Survey Booklet and completing *all* the sections of the specialist Survey Forms which are found at the back of the booklet.

Survey Instructions for Levels 2 and 3

Use of the recording system

The *Veteran Tree Recording System* employs a survey method using the forms, which are contained in this booklet together with guidance notes.

Each Survey Form is individually numbered and double sided (Side 1 & 2).
Side 1 contains Site Details and Tree Details [Sections 1-21].
Side 2 contains Tree Details and Notes [Sections 22 - 31].
Site details are entered in sections A to M at the top of side 1.

***Site Details (A-M)** are to be completed for each new site or distinct location upon a site. Guidance notes and instruction for completion of this section are found on pages 5 and 6 of this booklet.*

Tree Details

Tree Details Side 1:		*Tree Details Side 2:*	
Tree Data	Sections 1 - 5	Tree Associates	Sections 22 - 25
Tree Form/Vigour	Sections 6 - 10	Tree Management	Sections 26 - 30
Tree Habitat	Sections 11 - 21	Notes	Section 31

Guidance notes and instructions for the completion of these sections are found on pages 7 - 17 of this booklet.

Veteran trees are extremely variable in form and condition. It is important that the method of survey, explained through the Guidance Notes, should be followed as far as possible to ensure reasonable consistency.

Plotting and Tagging of Trees

Plotting and tagging of trees may be necessary on larger sites. Where trees are identified with an individual tag-number affixed to the tree, a method should be adopted which causes minimal damage to the tree and allows for tree growth (see 'Pollard and Veteran Tree Management II' Corporation of London 1996). In addition to tagging, *wherever feasible all tree positions should be plotted on a plan* and a copy of the plan kept with the recording forms.

Filing and Documenting

Upon completion of a survey the recorder or responsible organisation should keep the original documentation and file a separate copy for safe keeping.

English Nature should be kept informed of progress and completion of recording and should be informed where documents are to be held. English Nature will be responsible for the overall co-ordination of survey results and their collation within a national database of veteran trees.

Survey Precautions

Surveyors should ensure that:

- Any necessary permissions are obtained from land owners or other relevant bodies prior to surveying.
- Surveyors should take all reasonable precautions to avoid risk of personal injury and if possible should not work alone.
- The survey is to be undertaken from ground level only.
- No damage to the tree or its surroundings should occur in the course of surveying.
- Conventions approved by English Nature associated with collection of sample material should be strictly observed.

English Nature do not accept liability for any injury or loss sustained in the course of surveying.

Site Details

H SITE STATUS *cont.*

[ES] Environmentally Sensitive Area
[HC] Heritage Coast
[NN] National Nature Reserve
[NP] National Park
[OA] Other Ancient Monument or historic site
[SA] Scheduled Ancient Monument
[SL] Special Landscape Area
[SS] Site of Special Scientific Interest
[TP] Tree Preservation Order
[WH] World Heritage Site
[X] Other/unknown
[O] None

I ACCESS AND VISIBILITY

Is the site accessible to the public?

[Y] Yes
[N] No
[X] Don't know

Is/are the tree/s visible from a public route or place?

[0] Not visible
[1] Visible but not prominent
[2] Prominent

J SITE NOTES

Briefly describe site location (eg In open field 200m W of Ashton Court House) and any special features of landscape interest about the site.

K DATE

This is the date of inspection entered as D | M | Y.

L RECORDER

Name of person who is inspecting the trees.

M ORGANISATION

Where relevant enter the names of the organisation on whose behalf the survey is being undertaken.

N MAP

Does a map exist of the site?

[Y] Yes
[N] No
[X] Don't know

If so, are the trees inspected plotted on the map?

[Y] Yes
[N] No
[X] Don't know

Tree Details

1 TREE NUMBER

This is a numerical designation identifying individual trees by means of a number tag fixed to the trunk (see 'Pollard & Veteran Tree Management II' Corporation of London 1996). This is optional.

Number identification should be undertaken to guarantee that no duplication occurs for any site, by plotting numbers on the plan.

2 GRID REFERENCE

Insert grid reference for individual tree. Minimum six figure grid reference as (D) omitting 100km letter code.

3 SPECIES

Identify the type of tree (see TABLE below). If species unknown, collect sample of shoot or foliage and label with tree number for identification and insert code **[XB]** or **[XC]** as appropriate.

SPECIES TABLE (Native and pre 1800 introductions)

BROADLEAVES

[CAR]	Common alder	(Alnus glutinosa)
[CAP]	Crab apple	(Malus sylvestris)
[AH]	Ash	(Fraxinus excelsior)
[BE]	Beech	(Fagus sylvatica)
[BEC]	Beech cultivar	(Fagus sylvatica cv.)
[PBI]	Downy birch	(Betula pubescens)
[SBI]	Silver birch	(Betula pendula)
[BCH]	Bird cherry	(Prunus padus)
[WCH]	Wild cherry, gean	(Prunus avium)
[HCH]	Horse chestnut	(Aesculus hippocastanum)
[SC]	Sweet chestnut	(Castanea sativa)
[EM]	*Elm species*	*(Ulmus sp.)*
[EEM]	English elm	(Ulmus procera)
[WEM]	Wych elm	(Ulmus glabra)
[HAZ]	Hazel	(Corylus avellana)
[HAW]	Hawthorn	(Crataegus monogyna)
[HOL]	Holly	(Ilex aquifolium)
[HBM]	Hornbeam	(Carpinus betulus)
[LI]	*Lime species*	*(Tilia sp.)*
[CLI]	Common lime	(Tilia x europaea)
[LLI]	Large leafed lime	(Tilia platyphyllos)
[SLI]	Small leafed lime	(Tilia cordata)
[MA]	*Maple species*	*(Acer sp.)*
[FM]	Field maple	(Acer campestre)
[SY]	Sycamore	(Acer pseudoplatanus)
[OK]	*Oak species*	*(Quercus sp.)*
[EOK]	Evergreen oak	(Quercus ilex)
[POK]	Pedunculate oak	(Quercus robur)
[TOK]	Turkey oak	(Quercus cerris)
[SOK]	Sessile oak	(Quercus petraea)
[PO]	*Poplar species*	*(Populus sp.)*
[ASP]	Aspen	(Populus tremula)
[BPO]	Black poplar	(Populus nigra)
[GPO]	Grey poplar	(Populus x canescens)
[WPO]	White poplar	(Populus alba)
[LPL]	London plane	(Platanus x hispanica)
[ROW]	Rowan	(Sorbus aucuparia)
[WHI]	Whitebeam	(Sorbus aria)
[WST]	Wild service tree	(Sorbus torminalis)
[WAL]	Walnut	(Juglans regia)
[WL]	*Willow species*	*(Salix sp.)*
[CWL]	Crack willow	(Salix fragilis)
[WWL]	White willow	(Salix alba)
[XB]	**Other broadleaves**	(-)

CONIFERS

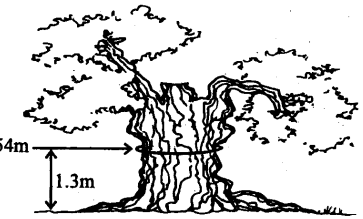
[CE]	Cedar of Lebanon	(Cedrus libani)
[JU]	Native juniper	(Juniperus communis)
[EL]	European larch	(Larix decidua)
[SP]	Scots pine	(Pinus sylvestris)
[NS]	Norway spruce	(Picea abies)
[YEW]	Common yew	(Taxus baccata)
[XC]	**Other conifers**	(-)

4 DIMENSIONS

4.1 GIRTH

The girth (circumference) of the tree is measured at 1.3m height above ground level, and is entered as an accurate measurement in metres to two decimal places, eg 10.54m. Where this is possible enter girth in column 4.1 and enter **[1.3]** in column 4.2.

4.1

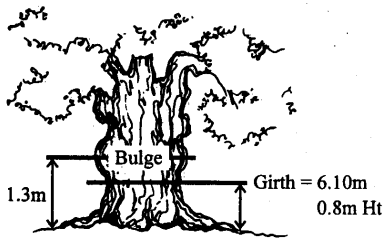


4.2 MEASUREMENT HEIGHT - *IRREGULARITIES*

If there are swellings, burrs, branches or other irregular features which occur at 1.3m height, then measure at the nearest point *below*, where the trunk is more regular.

Where the height of the girth measurement is *not taken at 1.3m*, this should be noted by recording the measurement in column 4.2, eg if girth is 6.10 metres at a height above ground level of 0.8m, the entry would be: Column 4.1 = **[6.10]** Column 4.2 = **[0.8]**

4.2 Example

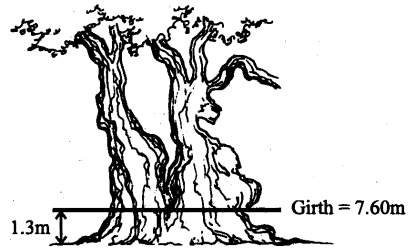


Tree Details

4.2.1 *MULTI-STEMMED above 1.3m*

If the specimen is multi-stemmed, and the multi-stem formation occurs *above* 1.3m height, observe conventions as for 4.1 or 4.2.

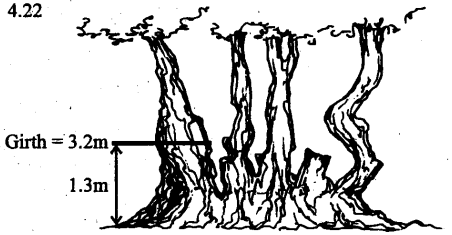
4.2.1



4.2.2 *MULTI-STEMMED below 1.3m*

Measure the largest stem at 1.3 metres, where a specimen is multi-stemmed from below 1.3m height.

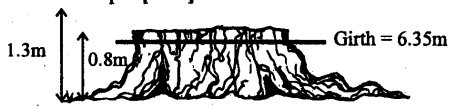
4.22



4.2.3 *STUMPS*

If a stump is below 1.3m height, record girth at the nearest opportunity below 1.3m height and the height of this measurement as for irregular swellings (4.2).

4.2.3 Example **[6.35]** at 0.8m ht.



4.2.4 *If for any reason accurate girthing is still impossible, bracket measurement* **[(6.35)].**

4.3 BOLE HEIGHT

Refers to *pollard trees only,* see 6 'Tree Form'. The bole is the trunk length from ground level to region where *main pollard limbs originate.*

5 NUMBER OF TRUNKS

Trees may contain more than one trunk. (See Tree Forms 6.3, 6.4, 6.6 and 6.11). Count the number of stems *over 0.3m diameter* and arising from *below 1.3m height.*

6 TREE FORM

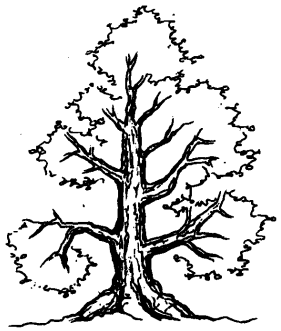
There are many forms a veteran tree may have, depending on its growing conditions, past damage and management. The following describe a range of possible tree forms. *What does the tree look like?*

Select from those below. Enter appropriate bracketed number **[-]** eg for a maiden tree (see 6.1) enter **[1]**.

Note: More than one description may be applicable to a single tree.

TREES

6.[1] Maiden Tree



[1] Free grown with unmodified natural crown.

6.[2] Shredded Tree

[2] Maiden tree with side branches cut close to main stem throughout crown.

6.[3] Multi-stemmed

[3] Trunk *naturally* divided into two or more principal stems giving the appearance of an integral crown.

6.[4] Coppice

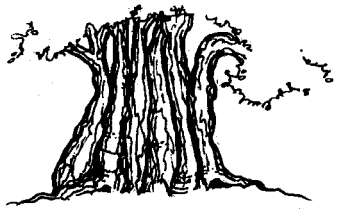
[4] Multi-stemmed from near ground level arising from past cutting of a maiden tree.

Tree Details

6.[5] Stored Stem

[5] Re-grown coppice subsequently recut, singling out a single stem to develop in maiden form.

6.[6] Bundle Planting



[6] Multiple seed/seedling planting of single species developing in maturity with multi-stemmed trunk or crown form, partially or totally fused about areas of stem contact.

6.[7] Natural Pollard

[7] Maiden type tree with major crown regrowth arising from natural catastrophic damage.

6.[8] Managed Pollard / Re-pollard

[8] A maiden or previously pollarded tree subjected to truncation of crown framework or of main stem. Crown regrowth selectively cyclically managed for produce.

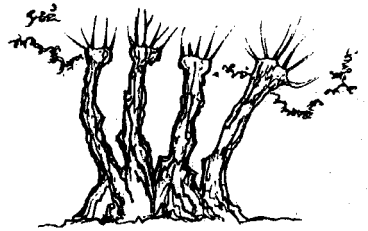
6.[9] Lapsed Pollard

[9] Formerly managed pollard subsequently neglected, typically multi-stemmed heavy limbed, originating at similar crown level.

6.[10] Tiered Lapsed Pollard

[10] Lapsed pollard variably developing multi-level, multiple, limb structure as a result of major limb removal or natural loss at various levels about the crown.

6.[11] Coppard



[11] Single tree previously managed as coppice, subsequently cut to form multi-stemmed pollards.

6.[12] Phoenix Regeneration

Either

Or

[12] Tree-form regrowth, possibly of layered origin arising from collapse of parent trunk or crown.

Tree Details

6 STUMPS

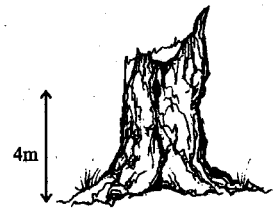
6.[13]

[13] Felled Stump (< 1m height)

6.[14]

[14] Shattered/fractured Stump (< 4m height)

6.[15]



[15] Shattered/fractured Stump (> 4m height)

[X] OTHER (refers to trees or stumps)

7 STANDING / FALLEN

How upright is the tree? What is the position of the main trunk?

7.[1]

[1] More or less upright?

7.[2]

[2] Leaning at a strong angle though apparently firmly rooted.

7.[3]

[3] Leaning with a loosened rootplate.

7.[4]

[4] Collapsed, supported by an adjacent tree.

7.[5]

[5] Collapsed. Main trunk propped clear of ground.

7.[6]

[6] Collapsed, main trunk lying on ground (rootplate intact - partially attached to ground).

7.[7]

[7] Collapsed, main trunk lying on ground (root plate intact - entirely detached from ground).

7.[8] Either

Or

[8] Fractured, collapsed trunk or main crown still attached to parent tree.

7.[9]

[9] Fractured, collapsed and separated, rootplate attached to ground.

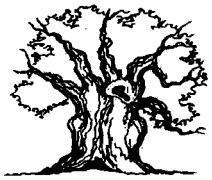
[X] OTHER

Tree Details

8 LIVE GROWTH

This assesses the current proportion of live growth about the tree (this does *not* take account of the shape of the tree, *nor* past crown collapse).

8.[1] Live, Mostly Full Canopy



[1] The crown is mostly covered with live growth. (Live growth occupies over 50% of current canopy outline.)

8.[2] Live Partial Canopy

[2] The crown is fairly well covered with live growth. (Live growth occupies 25%-50% of actual crown outline.)

8.[3] Live Residual Canopy

[3] The crown has some/little live growth. (Less than 25% live crown occupies actual crown outline.)

8.[4] Crown is dead.

[4] The trunk has some live growth.

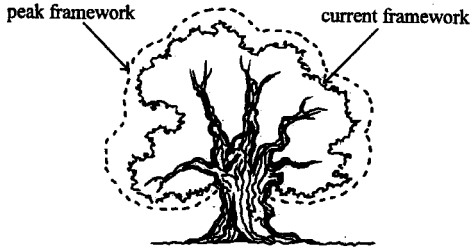
8.[5] Entire Tree Dead

[5] No live growth.

9 CROWN LOSS

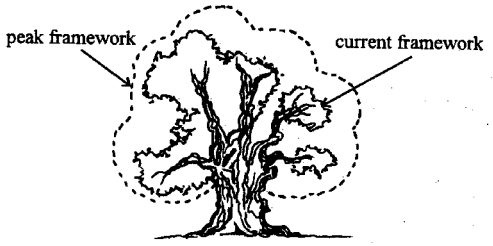
How much of the original crown of the tree has been shed? Crown loss is a comparison between its *current* veteran scale and shape and its likely *former peak crown outline.*

9.[1] Full Crown Outline



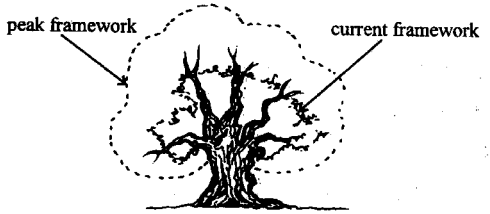
[1] The tree has shed less than 25% of its likely peak crown framework.

9.[2] Nearly Full Crown Outline



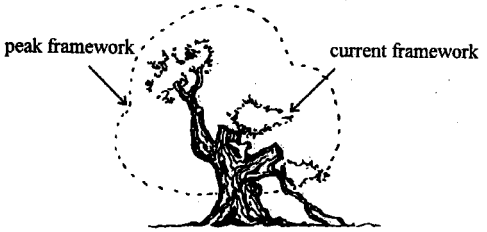
[2] The tree has shed 25%-50% of likely peak crown framework.

9.[3] Partial Crown Outline



[3] The tree has shed 50%-75% of likely peak crown framework.

9.[4] Remnant Crown Outline



[4] The tree has shed over 75% of likely peak crown framework.

10 EPICORMIC GROWTH

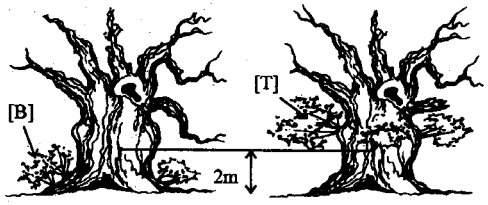
This is twiggy growth apparently developing from the bark surface as a response to stress or environmental changes. In veteran trees strong epicormic presence may indicate vitality about different regions of the tree.

Is there strong, vigorous epicormic growth (twiggy shoots) present about the tree?

If present where is this found? Enter the appropriate number code.

[1] Base (B)	**[5]** BC
[2] Trunk (T)	**[6]** TC
[3] Crown (C)	**[7]** BTC
[4] BT	**[0]** None present

10.1

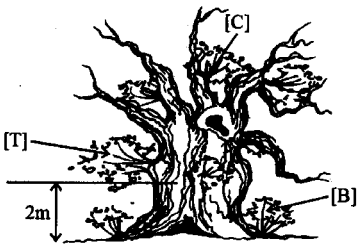


[1] Base

10.2

[2] Trunk

10.3



[7] Base, Trunk and Crown

11 BARK CONDITION

Are there large areas greater than 30cm x 30cm (12" x 12") of dead, loosely attached, missing or flaking bark about the tree?

If present where is this found?

B Base (up to 2m height)
T Trunk (above 2m height to base of crown)
C Crown

Enter the appropriate number code

[1] B	**[5]** BC
[2] T	**[6]** TC
[3] C	**[7]** BTC
[4] BT	**[0]** None present

12 BARK FLUXES (SAP RUNS)

Emissions from within the tree leaking to the bark surface. Exudates include fluxing of liquid often under gas pressure within the tree resulting from bacterial and fungal activity. It may also include the bleeding of wounds and localised reactions to surface colonisation.

These may be seen as wet surface discolourations of varying consistencies or areas of dry and encrusted deposits. Exudations may smell unpleasant or may have a pleasantly fermented smell.

Fluxes may emerge from wounds, cracks or fissures without obvious signs of decay.

This substrate provides a specialised habitat for insects and fungi.

Assess the type of bark flux from the following table. Assess the number of fluxes. Prefix the type with the number.

eg **[2B]** = 2 wet fluxes
[3A] = 3 dry fluxes
[0] = No fluxes apparent

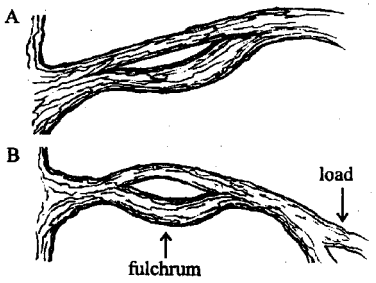
12.1 Bark Flux Table

Type of bark flux					
Dry	Wet	Sticky	Bubbly	Other	None
[A]	**[B]**	**[C]**	**[D]**	**[X]**	**[O]**

13 SPLIT LIMBS

The process of gradual limb loss starts typically in a small proportion of upward curving limbs when the end weight transmits stress along the longitudinal axis causing fibres to part, buckle and tear (delamination).

13.1



13.1 The limb may not be shed and the condition may remain stable for many years (termed Hazard Beam).

13.2

13.2 The limb may be supported within the crown or along the ground or it may further subside, rupturing tissue about the upper surface leaving a torn live limb suspended by the lower fibres.

3 SPLIT LIMBS *cont.*

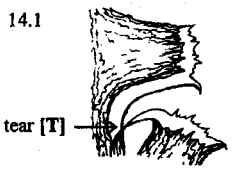
Count the total number of split limbs (13.1 & 13.2) of greater than 15cm (6") diameter at point of fracture. Enter this total on the recording card. If none present enter **[0]**.

Note:
At stage (13.2) the split limb has also resulted in a parent stub (see 15 below). When the suspended limb eventually separates it will result in both a live stub and a tear wound (see 14, Tears/Scars).

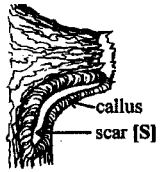
4 TEARS / SCARS / LIGHTNING STRIKES

14.1 TEARS **[T]**: exposed woody tissue wounds usually elongated in shape, principally torn along (not across) the grain.

14.1



14.2



Tears are associated with the *recent* shedding of live limb parts and result when attached fibres on the underside resist fracture from the parent stem.

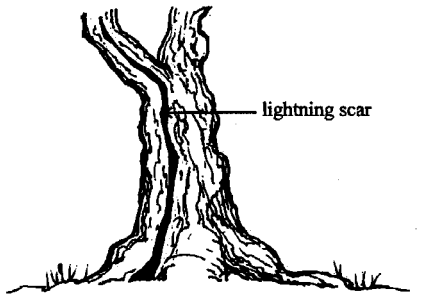
14.2 SCAR **[S]**: an *aged* tear with exposed tissue surrounded with roll of callus.

Record the number of tear and scar wounds in excess of 30cm (12") ie 2 hand lengths.
eg 3 Tears and 2 Scars = **[3T, 2S]**

Enter tallies in column. If none present enter **[0]**.

14.3 LIGHTNING SCAR: an aggravated and extensive wound from a direct lightning strike to tree. This results in a longitudinal surface trunk wound with internal tissue fragmentation.

14.3



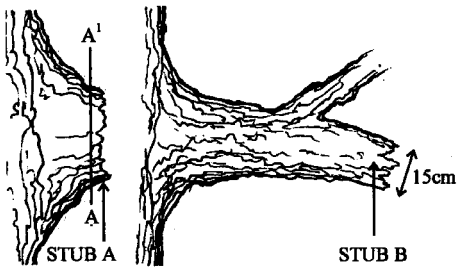
Lightning scars should be recorded by suffixing the entry tally for scars with **[*]**.

15 LIVE STUBS

Stubs are naturally fractured and truncated *ends* of *live* stems or branches. A stub is a result of a natural fracture and may follow the process described under splitting (see 13). It is measured near the point of fracture.

Stubs greater than 15cm (6") diameter are counted and entered on the recording card.

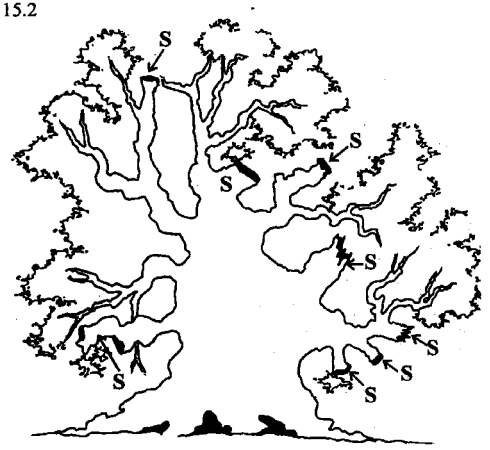
15.1



Stubs are measured from beyond the branch collar (A^1-A) and are over 15cm (6" diameter).

A and B are measured from close to point of fracture.

15.2



(S) = Stub Total number of stubs = **[8]**

Note:
A *stub,* may also be subtended by a *tear* or *scar* wound (see 14). If so *stub, tear and scar wounds* should be recorded separately.

16 HOLLOWING: TRUNK & MATURE CROWN

Hollowing occurs through a combination of wounding and progressive decay which may develop into enlarged cavities. Hollowing may become continuous, leading to an entirely hollow stem or partial shell, providing a wide range of habitat. Hollowing may be readily visible or may be concealed within an apparently intact trunk or limb.

Assess hollowing according to its character and location about the trunk and crown.

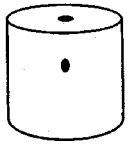
This assessment addresses *only clearly visible* hollows and *DOES NOT REQUIRE THE USE OF BORING IMPLEMENTS.*

Tree Details

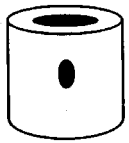
15 HOLLOWING *cont.*

Inspect the Base, Mid Section and Top Section of the main trunk. Identify which of the following schematic diagrams best defines the state of each trunk section **[1]-[5]**.

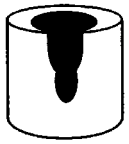
[1] Apparently solid trunk
With minor cavities (less than 15cm / 6" diameter).



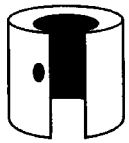
[2] Hollow trunk
Entire circumference.
Minor holes may be present on one or more sides.



[3] Partially solid trunk
Partial circumference with major cavities, large openings (>15cm) or merging apertures.



[4] Remnant trunk
With incomplete shell up to 30% of outer circumference missing.



[5] Remnant trunk
with more than 30% of outer circumference missing.

THE TRUNK
Locate the hollows about the trunk (16.1-16.3) and record its character as **[1]-[5]**.
Combinations may apply.

16 HOLLOWING *cont.*

16.1 **Base of trunk**
Lowest third of trunk from ground level.

16.2 **Middle section of trunk**
Occupies mid third of length of bole.

16.3 **Top section of trunk**
Occupies upper third of length of bole where it loses its discernible continuity with the crown framework.

THE CROWN
16.4 **Mature crown hollowing**
Identify the *number* of hollows greater than 15cm (6") diameter about the mature branches.

17 HOLES: TRUNK & MATURE CROWN
These are small apertures which may be round or irregular in shape and form entry points to hollows which themselves may be hidden.

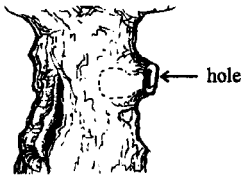
Holes may originate through small limb loss or bark wounds. Aperture expansion is facilitated principally by the activity of micro-organisms and invertebrates.

Apertures between 5cm (2", thumb length) to 15cm (6" hand length) are *counted.*

Count the number of holes about the trunk and crown *separately* and enter the tally in appropriate column.

Holes may be occupied by bats or birds. Signs of use are indicated by imported mud or twigs, droppings and urine stains below the aperture (see 25 Birds/Mammals).

17.1



18 WATER POCKETS
Water pockets accumulate about the tree where there are hollows or natural depressions with an orientation which allows the collection of organic debris and the retention of water to form localised reservoirs at various heights.

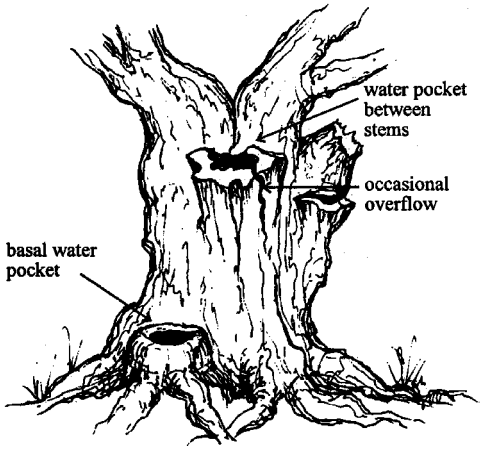
Typically water pockets are found at the union of major stems, at buttress depressions of major stems and may have intact bark.

Internal decay may provide conduits between water pockets within the heart of the tree affording gradual prolonged flow after rainfall. This provides specialised habitats for fungi and insects.

A water pocket containing settled rain water is distinct from a hollow with wet disintegrating rot (see 19 Rot).

Count the number of water pockets and insert the tally in the recording card. If none present enter **[0]**.

18.1



19 ROT

Following wounding and fungal activity wood may be digested to form rot. The broad characteristics of wood degradation may be described by reference to its colour, texture and moisture content. These are presented in Table 19.1 'Rot Characteristics'.

19.1 Rot Characteristics Table

Colour	Cubical Dry	Fibrous Dry	Fibrous Moist	Soft / Moist	Wet / Disintegrating	Other	None
White	[A]	[B]	[C]	[D]	[E]	[X]	[O]
Red / Brown	[F]	[G]	[H]	[K]	[M]		
Black	[N]	[P]	[R]	[S]	[T]		

Assess the presence of *predominant major* rots about the trunk or main limbs. Rot areas up to 2 hand spans 30cm (12") x 15cm (6").

Qualify the predominant characteristics of each identifiable, major rot by reference to Table 19.1.

Identify the number of major rots by prefixing the type designations with the appropriate numbers.

eg 2 sites of red/brown, dry cubical rot = **[2F]**
3 sites of white, dry fibrous rot = **[3B]**

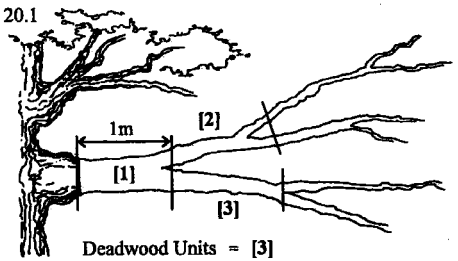
Where a site of rot is considered to be extensive ie greater than 2 hand spans, suffix Rot Characteristic entry with **[*]**.

20 DEADWOOD (ATTACHED TO TREE)

Are there any *dead* branches or trunk sections attached to the tree greater than the thickness of your leg (15cm / 6" or over)?

Each identified 1m (39") length (over 6" diameter) is measured as a *single unit of deadwood*. The number of *deadwood units* attached to the tree is measured and the tally entered in the recording card.

20.1



Deadwood Units = [3]

Note: • Diameter is taken *beyond* collar swelling.
• Treat moribund branch as dead limb.

21 DEADWOOD (FALLEN)

Are there any detached fallen *deadwood units* ie major branches or parts of trunk at least 1m (39") long and over 15cm (6") diameter, *lying near the tree* within its natural height scope?

Each length of 1m = 1 unit of fallen deadwood. Assess the number of fallen deadwood units and enter the tally in the recording card.

22 FUNGI

Assess the type/s of fungi present upon the tree *and* beneath the drip line of the crown on the ground.

Identify the number of *different* fungal types and their location from Table 22.1.

22.1 Fungal Type / Location Table

Fungi	Tree	Fallen Wood	Ground Under Crown	Other	None
Bracket	[A]	[B]	[C]	[X]	[O]
Skin-like Covering	[D]	[E]	[F]		
Cap and Stalk	[G]	[H]	[K]		
Slime Mould	[M]	[N]	[P]		

22 FUNGI *cont.*

eg 2 types of bracket on tree + 1 type of bracket on fallen deadwood + 3 types of cap/stalk fungi on ground = **[2A | 1B | 3K]**.

23 EPIPHYTES AND HEMIPARASITES

Note the presence of epiphytes and hemiparasites upon the tree identified by the following codes.

TYPE
[A] Lichens
[B] Moss
[C] Polypody / Fern
[D] Ivy
[E] Mistletoe
[X] Other - trees / shrubs / climber
[0] None present

If more than one type is present enter appropriate multiple code.

Where more than one species is identified within a category, prefix category with species count.

eg 3 Lichen species + 2 Moss + Ivy = **[3A | 2B | D]**

Where epiphytic growth is exceptional, covering more than 30% of the main trunk, suffix the appropriate category entry/ies with **[*]** eg **[3A*]**.

24 INVERTEBRATES

Evidence of invertebrate activity is indicated by the presence of bore/exit holes and frass (dry, powdery residue from tunnelling) about the wood, bark and sites of decay - such species are adapted to the deadwood habitat (ie saproxylic). Many are only found on veteran trees.

Record indications of invertebrate activity by identifying the presence of burrows/exit holes and frass associated with the following substrates:-

Tree Details

24 INVERTEBRATES *cont.*

[1] Rot Site: Enter appropriate category from Table 19.1 Rot Characteristic Table.
[2] Deadwood
[3] Bark
[4] Fungi
[X] Other
[0] None

Enter the appropriate code/s on the recording card.

25 BIRDS AND MAMMALS

Veteran trees present particularly valuable sites for bat roosts and bird nests.

Indications of habitation may include modification to apertures of holes or fissures, feeding debris, distinctive droppings and bark urine streaks (dark staining).

Feeding activity may also be observed from the chiselling of bark and wood about the tree.

Observe the following:
Identify signs of occupancy associated in holes about the tree.
Record additional signs associated with feeding.
Refer to the list below, record appropriate code/s.

[1] Opening adapted with mud or twigs
[2] Opening with smoothed lower lip
[3] Bark streaks with *blackish* staining leading down from aperture or fissure.

Additional signs

[4] Chiselling of wood and bark.
[5] Droppings, pellets or other distinctive debris.
[6] Other nests or occupancy sites about the crown.
[X] Other significant signs of bird and mammalian activity.
[0] None observed.

26 CONTEXT

This describes the landscape context *within 2x height of the tree* and is indicative of the setting and historic land use about the tree:

[AR] Arable Field
[AT] Ancient Track
[AV] Avenue
[BU] Old Buildings
[BX] Recent Development (within 20 years)
[CH] Churchyard
[CL] Common Land
[DP] Deer Park
[FP] Footpath / bridleway
[GD] Garden, small (domestic)
[GO] Grounds, large (ornamental)
[HE] Heathland
[HR] Hedgerow
[HW] Highway
[MO] Moorland
[OR] Orchard
[PB] Parish Boundary
[PL] Parkland
[PO] Pondside
[PS] Pasture unimproved (low intensity grazing)
[PX] High intensity grazing
[RV] Riverside
[UP] Urban Park
[UT] Urban Tree
[VG] Village Green
[WL] Woodland (internal)
[WE] Woodland Edge
[X] Other

The recorder will need to consult the context table for this and *enter a code.*
One or more designations may apply.

27 MANAGEMENT

This indicates a recent history of *tree management* over the *past ten years.*

[1] Pollarding
[2] Other arboricultural work
[3] Weed control (within crown spread)
[4] Management of competitive tree growth
[5] Protective fencing (effective)
[6] Protective fencing (ineffective)
[7] Controlled public access
[8] Planting: for veteran continuity
[9] Planting: potentially competitive
[X] Other
[0] None known

One or more designations may apply.

28 DAMAGE

Record major damage and/or debilitation which has occurred to the tree or its associated flora and fauna. Only *known* causal agencies should be recorded.

Select from the following:

[1] Excessive browsing from stock/pests
[2] Inappropriate tree surgery
[3] Vandalism
[4] Plant/machinery (impact/abrasion)
[5] Lightning
[6] Fire damage
[7] Storm
[8] Compaction
[9] Ploughing ditching/trenching
[10] Chemical toxicity: herbicide or fertiliser application or identifiable pollution.
[11] Virulent disease: arising from identified pathogen (eg DED, Honey Fungus).
[X] Other MAJOR damage
[0] None
[*] *Imminent fatal or structural debilitation threat*

29 SHADE

Is the tree shaded by other trees? Assess the extent of the shade and record from the list below.

[0] Unshaded
Unshaded, at present.

[1] Light Shade
Shaded on one or two sides but not from above.

[2] Close Shade
Shaded on three or four sides, *not* from above.

[3] Heavy Shade
Shaded from above and one or two sides.

[4] Extensive Shade
Shaded from above and all aspects.

30 PHOTOGRAPHIC NUMBER

Where possible relate photographic identification number to tree number.

eg	If tree no.	=	00176				
	Photo. no.	=	00176A				
Where	A	=	1990	B	=	1991
	C	=	1992	D	=	1993
	E	=	1994	F	=	1995
	G	=	1996	H	=	1997
	I	=	1998	J	=	1999
	K	=	2000	etc		
	Z	=	2015	AA	=	2016

If this system is adopted enter appropriate letter code. If there is no systematic photographic record of the tree/s and none proposed enter:

[0] None

[X] If another record system is being used.

31 NOTES

Where the recorder requires to make additional comments or to register a need for further assessment, limited scope is presented in the Notes Section on the recording card.

FURTHER INFORMATION

For advice, copies of Veteran Tree Survey Forms and Guidance Notes:

ENGLISH NATURE

The Veteran Trees Initiative (VTI/SVY2/3)
English Nature
Northminster House
PETERBOROUGH
PE1 1UA

Enquiry line: 01733 455100
Fax line: 01733 455103

For technical comments regarding survey methods and data collection communicate in writing to:

TREEWORK

Treework *Environmental Consultancy*
Treework Services Ltd
Cheston Combe
Church Town
Backwell
BRISTOL
BS48 3JQ

Fax number: 01275 463087

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Front cover photographs:
Top left: Using a home-made moth trap.
Peter Wakely / English Nature 17,396
Middle left: English Nature bat warden with a whiskered bat near Holme, Devon.
Paul Glendell / English Nature 24,795
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
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

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