



Norfolk County Council

Norwich Western Link Road

Ancient Hedgerow Report





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1 Introduction

1.1 Project background

- 1.1.1. The Norwich Western Link Road (NWL) is a highway scheme linking the A1270 Broadland Northway from its junction with the A1067 Fakenham Road to the A47 trunk road near Honingham.
- The NWL, hereafter referred to as the Scheme, will comprise:
 - Dualling the A1067 Fakenham Road westwards from its existing junction with the A1270 to a new roundabout located approximately 400m to the north west.
 - Construction of a new roundabout.
 - Constructing a dual carriageway link from the new roundabout to a new junction with the A47 near Honingham.
- 1.1.2. As part of a separate planned scheme, National Highways proposes to realign and dual the A47 from the existing roundabout at Easton to join the existing dual carriageway section at North Tuddenham. If that scheme proceeds, it is expected that National Highways will construct the Honingham junction and the Norwich Western Link will connect to the north-eastern side of that junction.
- 1.1.3. The Scheme will cross the River Wensum and its flood plain by means of a viaduct. In addition, six other structures are proposed to cross minor roads and to provide habitat connectivity. The Scheme will include ancillary works such as provision for non-motorised users, necessary realignment of the local road network, including the stopping up of some minor roads, and the provision of environmental mitigation measures.

1.2 Purpose

- 1.2.1. Hedgerows were recognised as being impacted by the Scheme. Information on hedgerows has been gathered from:
- Phase 1 Habitat Survey (WSP, 2021);
 - Hedgerow Survey (WSP, 2022);
 - Protected species surveys (summary data, WSP, 2021);
 - Arboricultural surveys to BS5837:2012 (WSP, 2020); and
 - Heritage reviews of maps and records (*pers comm*).
- 1.2.2. These recognised methodologies typically capture enough information to identify potential significant impacts, and opportunities for mitigation, required of an environmental impact assessment. However, the baseline arboricultural survey and report suggested that some hedgerows contained veteran plants, based on characteristics analogous to features of veteran trees. The field survey followed BS5837:2012 but this standard method does not address recording individual hedgerow plants (except those that qualify as trees within the hedgerow). Hence, a precautionary approach was followed, taking field notes and pictures of attributes for subsequent consideration and verification.

- 1.2.3. Whilst the analogy with veteran trees is pertinent, there is no recognised methodology or approach to apply to veteran components of hedgerows, particularly if subject to continuing agricultural management.
- 1.2.4. This technical note establishes a methodology for a comprehensive and consistent field survey of hedgerows to identify physical features that might elevate the importance of hedgerows containing veteran plants.

1.3 Background

- 1.3.1. Hedgerows are an important habitat and landscape feature, afforded protection under The Hedgerow Regulations 1997 (The Hedgerow Regulations 1997. Available online at: <https://www.legislation.gov.uk/uksi/1997/1160/contents/made> [Last accessed 18/01/2021]). Hedgerows are surveyed as a feature within habitat assessment, are identified within arboriculture survey and reviewed for their cultural or heritage significance, but the standard methodologies do not assess the individual hedgerow plants with the detail applied to larger trees. An initial arboricultural survey, identified that the approach potentially missed important information. A proposal for a more detailed survey of hedgerows, adopting a methodology adapted from assessment of ancient and veteran arboricultural features, was proposed to provide an exemplar approach to environmental safeguarding.
- 1.3.2. Ancient woodlands (in England and Wales) are those that are mapped since 1600 and the habitat (particularly soils and associated flora) is sufficient to value the habitat even in the absence of mature trees. The definition is based on longevity of habitat (Forestry Commission and Natural England (2014). Ancient woodland, ancient trees and veteran trees: protecting them from development. Available online at: [Ancient Woodland and Veteran Trees Protection Surveys Licences](#). [Last accessed 18/01/2021]).
- 1.3.3. In contrast, ancient and veteran trees are inherently important arboricultural features and the individual tree represents irreplaceable habitat because of the physical, biological and chemical diversity that supports an assemblage of other species, including (but not limited to) fungi, lichens, invertebrates, bats and birds. The tree may be present in woodland, pasture, or marking a property boundary. Forest Research observes that “the term veteran tree is not precisely defined, as various criteria may determine the veteran status of an individual tree when compared to others. For example, a tree may be regarded as a veteran due to great age; great age relative to others of the same species, existing in an ancient stage of life or due to its biological, aesthetic or cultural interest, (Forest Research (n.d.) Veteran Trees (Available online at: [Historic Environment Resources - veteran trees](#). [Last accessed 18/01/2021]).
- 1.3.4. Hedgerows may be considered both through consideration of longevity provided in mapping (analogous to ancient woodlands), or the display of veteran features in individual hedgerow plants and by applying further field-derived data, the presence of ancient or veteran hedges will be determined.

- 1.3.5. Government guidance makes clear that planning permission should be refused if development will result in the loss or deterioration of ancient woodland, ancient trees and veteran trees unless there are wholly exceptional reasons or there's a suitable compensation strategy in place.

1.4 Terminology

- 1.4.1. **Ancient tree:** a tree that has reached a great age in comparison with others of the same species. Ancient trees are characterised by a low, fat and squat shape, because the crown has retrenched (reduced in size) through age, a wide trunk compared with others of the same species and hollowing of the trunk.
- 1.4.2. **Veteran tree:** a veteran tree is not defined by its age but shows characteristics of ancient trees (that could result from natural damage, management, or the tree's environment). Ancient trees are veteran trees, but not all veterans are ancient. However, ancient and veteran trees are afforded the same level of statutory protection and hence differentiation between ancient and veteran arboricultural features is not critical to legal constraints.
- 1.4.3. **Ancient woodland:** a habitat designation based on mapped records. The area has been wooded since at least 1600. The importance of the habitat is derived particularly from soils, and the protection conferred to these sites from development (as noted in the introductory background section of this note applies to the habitat and is not governed by the age or quality of the trees.
- 1.4.4. **Historic hedgerow;** a habitat/boundary feature of archaeological or historic value, identified according to criteria established in the Hedgerow Regulation Act¹. Subject to certain exceptions, the removal of a hedgerow to which the regulations apply is prohibited.
- 1.4.5. **Hedgerow plants:** woody vegetation within the hedgerow itself. The expression is used to differentiate from larger trees within the hedgerow. Hedgerow trees refers to those that have grown up beyond the height of the hedge. The expression hedgerow plants is not applied (in the context of this report) to the ground flora at the foot of the hedgerow.

2 Application of tree surveying methodology to component plants of the hedgerow

- 2.1.1. The method of qualifying a tree as veteran is established around the presence of certain features (identified in the Method section below). But there is no scoring system and a high degree of professional judgement is applied to observations.
- 2.1.2. The combination of the tree’s genetic material, interacting with the environmental conditions, over many generations makes each veteran tree unique. It cannot be replicated (at least not over a timescale over which land use and development is typically considered). This leads to them being recognised by UK Government as irreplaceable habitat². Recognition as irreplaceable habitat therefore sets a further marker for consideration. It implies that the tree has attained a maturity and size that presents opportunity for physical diversity, through decay and hollowing and cannot be substituted. The same constraint is required of hedgerows.
- 2.1.3. Coppicing and pollarding trees (providing cyclical cutting of stem growth at ground level or above browsing animal height respectively) rejuvenates growth, but such trees may be veteran, particularly if unique habitats develop at an unusually large stool or pollard. Similar criteria may be applied to long established hedgerows. However, the same constraint applies, if the hedgerow is managed by coppicing, laying and regular cutting - whilst veteran features may develop, the arboricultural feature is rejuvenated through the encouragement of healthy new growth and the criterion of physical size is difficult to achieve.
- 2.1.4. A methodology for the determination of ancient or veteran hedgerows has been developed that combines the approach to determining ancient woodland with that of ancient and veteran trees. Namely, historical records were assessed for the existence of very long-established hedgerows and a field survey of the hedgerow was undertaken for individual features that present irreplaceable physical, biological or chemical conditions for other species. The field survey examines individual plants, whether growing as single stems, or from coppice stools or layered stems and these are assessed for veteran features. The collective importance of a length of hedgerow is a purely ecological consideration.
- 2.1.5. The field survey evidence has been assessed alongside historical records. The Hedgerow Regulations Act presents criteria for determining archaeologically and historically important hedgerows. Of particular relevance to the Scheme is documentation demonstrating the hedgerow was an integral part of a field system pre-dating the Inclosure Acts, which created legal property rights to land previously held in common.
- 2.1.6. Arboricultural surveys were carried out to BS5837:2012 that requires “*shrub masses, hedges, hedgerows and stumps should be checked by the arboriculturist for inclusion in the tree survey. it will normally be sufficient to record their height and species*” [which represents a lesser degree of detail than is applied to trees]. The arboricultural survey (WSP, 2020) indicated that a section of hedgerow (coded H189) contained veteran plants. From this finding it was determined that all hedgerows, within the site extents, should receive a more detailed appraisal than is provided by the method of BS5837.

3 Methods

3.1 Overview

- 3.1.1. Across the Scheme, 25 hedgerows have been identified. The study boundary and locations are shown in Appendix A. Data from the ecological surveys established that hedgerows 1, 2 and 25 were of recent planting and were scoped out.
- 3.1.2. On 18 November 2020, 13 hedgerows (number 3, 4, 5, 6, 7, 8, 9, 10, 11, 21, 22, 23, 24) were examined to assess the presence of individual veteran plants within the arboricultural feature, by applying a consistent methodology adapted from techniques to assess veteran trees.
- 3.1.3. Access to hedgerows 12-20 were deferred at the request of the landowner. Assessment took place on 23 February 2021.
- 3.1.4. The field survey of hedgerows looked for the following characteristics:
- foliose lichens;
 - bryophytes (non-vascular plants made up of mosses, liverworts and hornworts) and ferns;
 - presence of a coppice stool that is large for the species in question;
 - natural water pools held in the coppice base;
 - degree of bark fissuring (species dependent);
 - suckers (Suckers are new growth often at the base of the tree and can be an indicator that a tree is under stress. Suckers can be more prevalent in older trees);
 - stem and branch cavities;
 - hollowing of principal stems;
 - wood decaying fungal fruiting bodies;
 - decayed areas of wood;
 - sap runs/bark fluxes (Sap runs/bark fluxes are excretions of liquid sap which may be due to infection, which usually occurs from natural growth cracks, wounds, bacteria etc.); and
 - aerial roots growing into decayed wood or branches.
- 3.1.5. There is no scoring system or threshold number of features for recognition as a veteran arboricultural feature because the evidence base is too small to apply scientific methods. Instead, professional judgement is applied. Quantification around tree size for both ancient and veteran trees has been offered by some commentators and size-based attributes are important (Ancient Tree Forum (2013). Ancient and Other Veteran Trees: Further Guidance on Management. Available online at: ancienttreeforum.co.uk/wp-content/uploads/2015/02/ATF_book.pdf. Last accessed 18/01/2021). This is because the physical material of the veteran specimen is relevant in presenting volume and surface area for gradual age-related progression of the above natural processes. This limits application to hedgerow plants.
- 3.1.6. The method is led by the identification of characteristic features, but it has been noted that classification as ancient or veteran specimens secures recognition as irreplaceable habitat (UK Government Standing Advice). Hence, the method may be quality assured against the question of replaceability/ irreplaceability.



- 3.1.7. The method considered only the hedgerow plants maintained by hedgerow management, such as cutting or laying. Hedgerow trees, that have grown up beyond the height of the hedge have been previously, as part of an arboricultural survey, and were not resurveyed.

4 Results

- 4.1.1. None of the hedgerows were considered to present enough features to be classed as veteran. This conclusion, therefore, revises an earlier consideration of veteran potential relating to a linear group of plants (referenced H189, in the arboricultural survey, WSP (2020)) within hedgerow 4, judged to be individually veteran.

4.2 Hedgerow 4

- 4.2.1. The revision of a veteran classification of plants within hedgerow 4 is based on the specimens' sizes and the assessment that the form and function of the plants could be replicated in a limited number of generations or by successfully translocating equivalent living specimens, which is a timescale or approach not available in respect of veteran trees. The surveyor did not find that the merit of the individual plants was wholly analogous to ancient and veteran trees, when seeking to apply the characteristics of the method reported here.
- 4.2.2. This did not necessarily discount the possibility that the hedgerow was ancient based on mapped records but WSP cultural heritage specialists reviewed the evidence and concluded that this hedgerow clearly marks a field boundary that was created as a part of the process of enclosure and does not, therefore, qualify as an historic hedgerow.
- 4.2.3. Similarly, the fact that individual elements of the hedgerow are not veteran does not diminish the collective ecological value of the feature, but the information is assessed elsewhere (WSP, 2020).
- 4.2.4. It is acknowledged that the specimens are aged and of arboricultural interest, but the upper growth of the plants contains young growth as a result of hedgerow cutting. The trunks support abundant lichen growth, but this is principally crustose lichens not foliose lichens (the surveyor did not identify the species of lichen). The limited size of hedgerow plants presents opportunity for only shallow cavities and no decay was evident.
- 4.2.5. Photographs of representative plants are provided in Appendix B.
- 4.2.6. A tree (T178) recorded as an individual element within hedgerow 4 is a veteran tree and that identification still applies.

4.3 Other hedgerows

- 4.3.1. None of the remaining hedgerows surveyed were found to contain veteran hedgerow plants. This finding does not disregard the presence of individual veteran trees within hedgerows, but this summary report does not replicate information previously reported. Identification of individual hedgerow trees, as veterans, remains applicable.

5 Conclusion

- 5.1.1. The potential for identifying individual hedgerow plants as ancient or veteran arboricultural features (through a process that is analogous to identifying ancient and veteran trees) was investigated widely across the proposed scheme. This followed a previous suggestion that a length of hedge within hedgerow 4 (H189 in the arboricultural survey) contained veteran plants. In this appraisal, the surveyor observed some relevant features of aged hedgerow plants but could not conclude that they were veteran, in the way the term is recognised as applied to trees.
- 5.1.2. This report re-evaluated the assessment of H189, concluding that it does not feature veteran hedgerow plants.
- 5.1.3. There is recognition that professional judgement is applied in such cases, but this survey reflected qualifying criteria that were not explicit when conducting earlier surveys. However, the difficulty in defining veteran trees is professionally recognised by national authorities and this is amplified when attempting to apply similar criteria to hedgerow plants.
- 5.1.4. The more recent survey was undertaken by a consultant with on-going engagement with the proposed scheme. At this stage of advice, it was appropriate to re-appraise and present an assessment in which the surveyor could be personally confident. The expression irreplaceable habitat should not be applied to the hedgerows surveyed.



6 References

WSP UK Ltd (2020) *Arboricultural Report*. Cambridge

WSP UK Ltd (2021) *Phase 1 Habitat Survey*. Cambridge

WSP UK Ltd (2022) *Hedgerow Report*. Cambridge

Appendix A – Hedgerow Map



Appendix B - Photographs



Photographs of representative plants within Hedgerow 4



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