



Greater Cambridge Partnership

CAMBOURNE TO CAMBRIDGE

Appendix TR14.1 Coton Orchard Veteran Tree Review





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1 INTRODUCTION

- 1.1.1. This appendix has been prepared to outline the potential veteran status of apple trees at Coton Orchard. The review has been undertaken with the benefit of existing records from the Ancient Tree Inventory (“ATI”) (Woodland Trust 2024) and on site evaluations. The trees recorded on the ATI are reputed to be surviving Bramley’s Seedling apples from the original 1922 orchard planting. This note informs ES Technical Report 14 Arboriculture for the TWA Order application made for the Cambourne to Cambridge (CtoC) Scheme.
- 1.1.2. There is no single definition for a veteran and/or ancient tree. The National Planning Policy Framework (“NPPF”) sets out Government policy on considerations relevant to the grant of planning permission and the circumstances where planning permission should be refused. Paragraph 186 advises on the protection of veteran trees. A veteran tree is defined as “a tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value”. This appendix to TR14 sets out the approach to the identification of veteran trees for the purposes of the NPPF, informed by the Brislington Meadows case¹.
- 1.1.3. In England, Biodiversity Net Gain (BNG) is mandatory under Schedule 7A of the Town and Country Planning Act 1990 (TCPA 1990) (as inserted by Schedule 14 of the Environment Act 2021) for all applications for planning permission made under the TCPA 1990. The provisions of Schedule 7A that would apply to planning permission deemed to be granted pursuant to section 90 TCPA 1990 have not been brought into effect and so Schedule 7A does not apply to the CtoC Scheme. In February 2024 the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024 (“the 2024 Regulations”) came into force for the purposes of paragraph 18 of Schedule 7A to the Town and Country Planning Act 1990 (“TCPA 1990”). The purpose of the 2024 Regulations is to require a different approach to be taken in respect of applications made under the TCPA 1990 in calculating the provision of biodiversity net gain (BNG) when dealing with irreplaceable habitats. As the CtoC Scheme is not subject to the provisions of Schedule 7A of the TCPA 1990, the definition of veteran trees in the 2024 Regulations is not required to be applied in the calculation of the voluntary BNG that GCP are proposing to provide. However, in calculating voluntary BNG, as set out in Technical Report 5, Appendix TR5.7: Biodiversity Net Gain Assessment, regard has been had by GCP to the definition of veteran tree as defined in the 2024 Regulations.
- 1.1.4. The Woodland Trust is a woodland conservation charity in the UK and is concerned with the creation, protection and restoration of native woodland heritage. One of its charitable activities is the setting up and development of an Ancient Tree Inventory so that the location of ancient and old trees can be mapped. The Woodland Trust encourages members of the public to notify the charity of any ancient or old trees in order to add them to the inventory. This can be done by plotting the location of a tree and entering basic information about the tree such as species, girth size and access, and providing photographs. This record will then be checked and approved by one of the

¹ In the planning appeal decision reference APP/Z0116/W/22/3308537, for the development of Land at Broomhill/Brislington Meadows, Broomhill Road, Bristol, the Inspector provided a useful assessment of definitions of ancient or veteran tree and concluded that the definitions in the NPPF are the most appropriate definition to use when deciding whether to grant planning permission.

charity's trained volunteer verifiers to determine whether a tree is an ancient, veteran or notable tree. A veteran tree is described as one with some of the features of an ancient tree but without the great age. The ATI has been consulted as a source of information on the location of trees that may meet the definition of a veteran tree

- 1.1.5. The ATI, which uses definitions not aligned with planning. Trees included in the ATI are therefore not necessarily ancient or veteran in the context of planning.
- 1.1.6. Paragraph 186 of NPPF advises on the principles to be applied when planning applications are determined and the definition of veteran trees is considered in this context. In contrast, Schedule 7A of the TCPA 1990 is relevant once a decision has been taken to grant permission pursuant to a planning application made under the TCPA 1990, when the objective is to securing at least 10% BNG for the approved development. The decision relating to loss or deterioration of irreplaceable habitats and therefore veteran trees, is made with NPPF and is not included in calculations for BNG.

Plate TR14.1-1-1 - Coton Orchard surviving original apple tree location plan



2 POTENTIAL NPPF VETERAN TREE ASSESSMENT

2.1 NPPF DEFINITION

- 2.1.1. The NPPF, last updated in December 2023, provides the following definition of an ancient or veteran tree:

‘A tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are old enough to be ancient, but are old relative to other trees of the same species. Very few trees of any species reach the ancient life-stage.’

2.2 NPPF VETERAN ASSESSMENT

- 2.2.1. The NPPF requires a combination of age, size and condition to be exceptional so each element should be assessed to inform classification. The NPPF does not provide guidance in relation to how age, size and condition should be assessed for veteran trees.
- 2.2.2. RAVEN2 (Forbes-Laird, 2023) is a method that systematically assesses potential veteran trees with criteria of age, size and condition assessed with recognised methods and thresholds to categorise candidate trees as notable, veteran or ancient. In summary:
- Step one considers whether the tree is old relative for the species with a minimum 25% of species age required;
 - Step two considers whether the tree is large for the species;
 - Step three considers primary condition features; if two are present the tree should be regarded as veteran;
 - Step four considers secondary condition features; if one primary feature is present, three secondary features are required to be considered veteran; if there are no primary features there should be at least six secondary features; and
 - Step five is a summary confirmation of the outcome notable, veteran or ancient.
- 2.2.3. The five steps of RAVEN2 are designed to be sequential. The steps of RAVEN2 are used in this assessment as a structure although the NPPF requires the combined age, size and condition to be exceptional, therefore they do not need to follow sequentially and are individually assessed. Other methods to assess age, size and condition, not included within RAVEN2, are also included within this assessment and are described where relevant.
- 2.2.4. A summary of the assessment for each tree, undertaken in April 2024, is located in Annex A with locations shown in Annex B. As T1 is dead, this tree has been excluded from the NPPF assessment because it is no longer functioning as a tree.

ASSESSMENT OF AGE

- 2.2.5. It is understood that the apple trees are original trees of the orchard, which was established in 1922. As such the trees would be just over 100 years old. Relative to oak trees that could live for 1,000 years, apple trees are relatively short-lived trees and could grow to 200 years although in an orchard setting this is uncommon as older trees tend to be removed as they can become less economically viable.

- 2.2.6. RAVEN2 uses the Forestry Commission's White Method (White, 1998) which provides an approach for estimating age of large trees. In summary:
- No measurements for apple trees are provided in the White Method as a benchmark to calculate age. Black mulberry, which is included in the White Method, has a similar habit and rate of growth to apple and is the closest to apple in its nature, so is used as a proxy to test whether the trees are original orchard trees of 1922.
 - The White Method uses stem at 1.3m above ground but where this is not a single stem it should be measured below at the narrowest part of the trunk. The stem diameter was measured and this aligned with the girth recorded in the ATI. The girth recorded in the ATI is therefore used as basis for this assessment.
 - Based on an average 3mm radial growth per year, the tree ages range from 75 to 129 years with the mean average 100 years. The smallest tree is shaded by larger nearby trees which is likely to have reduced the rate of growth.
- 2.2.7. The White Method supports the assumption that most, if not all, of the assessed apple trees are likely to be first generation apples in Coton Orchard dating from 1922. Relative for their species, 100 years is old for an apple tree and all of the trees should be regarded as old relative to others of the same species.

ASSESSMENT OF SIZE

- 2.2.8. Figure 1.3 in Lonsdale (2013) is widely used as a reference for assessing veteran trees based on their stem size; it is used by RAVEN2 to establish whether a tree is very large for its species. Apple are not in Figure 1.3 and none of the species listed is suitable to use as proxy for apple based on their habit and growth characteristics. In the absence of directly relevant size thresholds from RAVEN2 and Figure 1.3, two alternative approaches to assess size have been used in this assessment.
- 2.2.9. Figure 1.3 shows girth size in relation to age and developmental classification of trees. The age and developmental stages shown are labelled as Locally notable, Notable/veteran, Ancient, and Late ancient with each shown as a range for 11 different tree species. The smallest size at which the Notable/veteran stage is in the region of a third of the largest size shown for each species.
- The annotated Figure 1.3 at Annex C shows the girth at which trees could be considered Notable/veteran.
 - The largest girth for each species can also be measured from Figure 1.3.
 - Calculating the point at which trees could become Notable/veteran relative to the largest size provides a mean average of 34.9%.
- 2.2.10. The Tree Register (The Tree Register, 2024) holds records of champion trees in the United Kingdom and Ireland; champion trees are recognised as the biggest or tallest trees of their species. The database has records for 1330 *Malus* (apple genus) although entries are not complete for all. Bramley's Seedling is a variety of the species *Malus pumila* (*M. domestica*). The Tree Register only has eight records of Bramley's Seedling which as a dataset is too small to be reliable. Additionally RAVEN2 recommends using species (not variety), therefore records of *Malus pumila* (*M. domestica*) are used to assess relative size in this assessment.
- 2.2.11. The largest apple in The Tree Register is *Malus pumila* (*M. domestica*) with a girth of 635cm. If that tree is regarded as the largest then 43.1% of that would be a 274cm girth. It could be regarded with

relative certainty that an apple over 274cm girth is large enough to qualify as veteran size; none of the trees are larger than this threshold.

- 2.2.12. A second approach to assess the size of a tree is provided by Fay (2007). Fay provides a table ("Table 1") with girth size categories used for age classification when surveying for ancient or veteran trees; this is reproduced here.

Plate TR14.1-2-1 - Fay (2007) Table 1 outlining girth size categories used for age classification when surveying ancient or veteran trees

Table 1: The girth size categories used for age-class classification during both surveys			
Age Class	Field maple, rowan, yew, birch, holly and other smaller tree species	Oaks, ash, Scot's pine, alder	Sycamore, lime, horse chestnut, sweet chestnut, elm species, poplar species, beech, willows, other pines and exotics
Mature	<2.0m	<3.5m	<4.0m
Fully-mature	2.0< & <2.5m	>3.5 & <4.0m	4.0< & <4.5m
Ancient	>2.5m	>4.0m	>4.5m

- 2.2.13. Table 1 (**Plate TR14.1-2-1**) does not include apple but apple would fall within the 'smaller trees species' category. The developmental stages of tree ageing are described in Fay 2007 with the "Juvenile to early maturity" stage followed by the "Full to late maturity stage". Based on the life stages used by Fay 2007 and Table 1 (**Plate TR14.1-2-1**), trees with a girth less than 200cm would not be regarded as mature so would not be veteran. If this 200cm girth threshold were used T3, T5, T9, T10 and T12 would be large enough to be considered veteran.
- 2.2.14. Erring on the side of caution, and therefore most likely to regard trees as large for their species, the lower threshold of the Fay approach is used instead of the method based on The Tree Register. The trees that should be regarded as large for their species and therefore potential veteran trees are T3, T5, T9, T10 and T12.

ASSESSMENT OF CONDITION

- 2.2.15. The definition of a veteran tree provided by Read (2000), like NPPF it is based on age, size and condition and like most definitions is not absolute but states that "the more [features] the tree has, the stronger the indication that it is a veteran". Fay (2007), Lonsdale (2013) and Read (2000) provide veteran tree features; the condition attributes of RAVEN2 reflects these features.
- 2.2.16. The apple trees do not show signs of retrenchment; with regard to veteran trees Lonsdale (2013) states:
- "In order to qualify as a veteran, the tree should show crown retrenchment and signs of decay in the trunk, branches or roots, such as exposed dead wood or fungal fruit bodies."*
- 2.2.17. The primary condition criteria that RAVEN2 use include retrenchment but this is not a pre-requisite to be considered a veteran which Lonsdale (2013) states. As such the absence of retrenchment in this assessment does not preclude the trees from be regarded veteran. Primary features are the most likely to indicate that a tree is veteran but one single feature on its own would not be sufficient to make a tree exceptional. The four primary features are:
- extensive decay;
 - extensive hollowing;

- senescence; and
- retrenchment.

- 2.2.18. Given their relative age and size, T3, T5, T9, T10 and T12 were assessed against the primary condition features of RAVEN2. None of the trees have the two primary condition features to qualify as veteran based on only assessment of primary features. T9 and T12 have one each.
- 2.2.19. For trees that do not have two primary features the secondary features are assessed which are:
- large quantity of deadwood in crown, >150mm diameter;
 - major storm damage, e.g. breakout wounds, broken spars >30cm diameter;
 - habitat spaces: decay holes, and/or crevices/branch splits sheltered from direct rainfall;
 - aerial rooting;
 - sap run/slime flux;
 - water pool;
 - bark loss (exceeding 400cm²) including due to lightning strike;
 - fungi; and
 - other epiphytic plants, including ferns and significant presence of lichens or mosses.
- 2.2.20. Read (2000) does not set out specific counts for characteristics but refers to “*the more a tree has, the stronger the indication that it is veteran*”. In the context of NPPF, veteran trees should have exceptional condition. Based on the RAVEN2 method, for trees to be exceptional they should have most of the nine secondary features present. None of the trees have six secondary condition features to qualify as veteran trees.
- 2.2.21. For trees with one primary feature a lower threshold for secondary features is used. T9 and T12 each with one primary condition feature, also have three secondary condition features which is regarded as sufficient to consider them as exceptional, therefore both T9 and T12 would qualify as veteran trees.

ASSESSMENT CONCLUSIONS

- 2.2.22. T9 and T12 are veteran trees in the context of NPPF. The recognition as ancient tree requires a veteran tree to have an extremely large girth and an age likely to be over 50% of the species maximum. Although T12 is recorded as a champion tree owing to having the largest stem size Bramley’s Seedling in Cambridgeshire, relative to the largest in the United Kingdom and Ireland it does not exceed 50% of the maximum for the species. As such, T12 is not regarded as ancient.
- 2.2.23. Notable trees are those which are approaching veteran status. The classification of notable is not equivalent to veteran and is not in the scope of NPPF policy. All trees that are not veteran are notable although there is no NPPF policy consequence of this.

3 THE BIODIVERSITY GAIN REQUIREMENTS (IRREPLACEABLE HABITAT) REGULATIONS

3.1 2024 REGULATIONS DEFINITION

3.1.1. In February 2024 the 2024 Regulations provides the following definition:

Ancient and veteran trees can be found as individual trees or collections of trees in any setting.

Ancient trees have passed beyond maturity into an ancient life stage or are old in comparison with other trees of the same species which exhibit one or more of the following—

(i) demonstrably great age relative to others of the same species

(ii) changes to their crown and trunk development indicative of the ancient life stage

Veteran trees are mature trees that share physical and other characteristics in common with ancient trees, due to their life or environment, but are neither developmentally nor chronologically ancient. All ancient trees are veteran trees, but not all veteran trees are ancient. Veteran and ancient trees which have died are still recognised as such because they retain significant biodiversity value for many decades.

Veteran trees exhibit one or more of the following—

(i) significant decay features such as deadwood, hollowing or signs of advanced decay in the trunk or major limbs

(ii) a large girth, depending on and relative to species, site and management history

(iii) a high value for nature, especially in hosting rare or specialist fungi, lichens and deadwood invertebrates

3.1.2. The 2024 Regulations were produced to define irreplaceable habitats in the context of BNG. Government guidance in relation to the 2024 Regulations and irreplaceable habitats (DEFRA, 2024a) states:

Developers should record all on-site irreplaceable habitat in the metric calculation tool.

However, the 10% BNG requirement does not apply when irreplaceable habitats are lost. This is because they are so difficult to recreate and have such a high biodiversity value that it would be impossible to achieve the requirement to increase biodiversity on top of no net loss.

BNG does not change the existing protections and compensation requirements for irreplaceable habitat in planning policy. The national planning policy framework on irreplaceable habitat applies. This means that planning permission for development resulting in the loss or deterioration of irreplaceable habitat will only be granted in wholly exceptional circumstances and where a suitable compensation strategy exists.

- 3.1.3. The BNG User Guide (DEFRA, 2024b) reaffirms this approach with impacts on irreplaceable habitat to be considered outside of BNG:

Irreplaceable habitats (as provided for in BNG regulations) are technically very difficult to recreate once destroyed (or re-creation would take a significant amount of time). As such, the BNG requirement is disapplied for these habitats. Any losses or deterioration impacts to irreplaceable habitats cannot be calculated by the biodiversity metric tool and they are removed from the baseline.

Impacts to on-site and off-site irreplaceable habitats should be avoided in line with planning policy. Irreplaceable habitats require consideration outside of biodiversity net gain, which must comply with up-to-date policy, legislation and regulations.

3.2 2024 REGULATIONS VETERAN ASSESSMENT

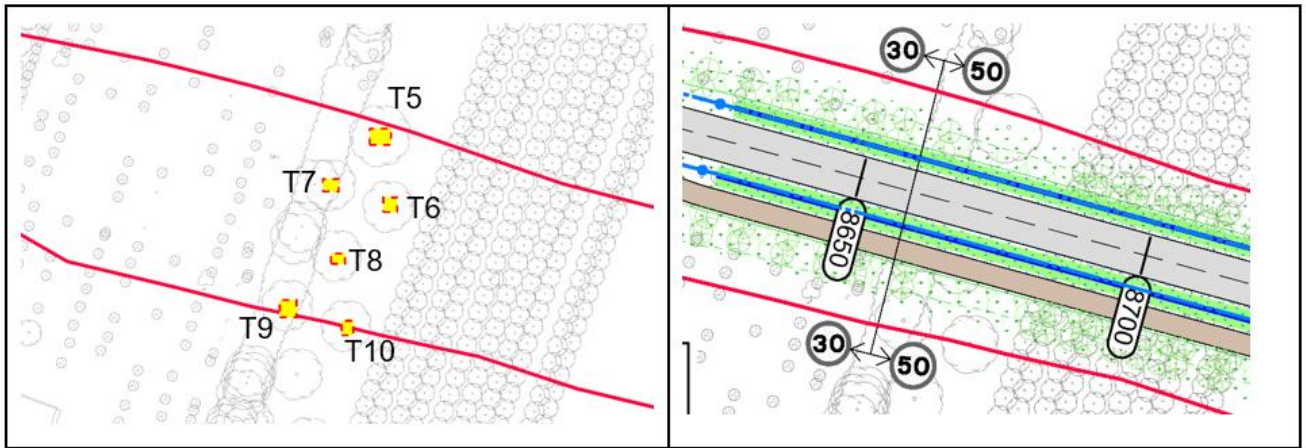
- 3.2.1. All trees had hollowing of branches and several had hollowing of stems. In the context of the 2024 Regulations, all of the trees meet the definition of being veteran due to their extensive decay features. This would include T1, as the 2024 Regulations include dead trees.

4 IMPLICATIONS

4.1 NATIONAL PLANNING POLICY FRAMEWORK

- 4.1.1. With regard to NPPF “Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists”.
- 4.1.2. The assessment of whether there are wholly exceptional reasons for removal of veteran trees is principally a matter for the decision-maker to address and information to assist is provided in the Planning Statement. Should removal of veteran trees be necessary or there is a predicted detrimental impact, a veteran tree compensation strategy should be implemented, a draft of which (as a mitigation and compensation strategy) is presented in TR14.2.

Plate TR14.1-4-1 - Coton Orchard, apple trees in relation in Order Limits



- 4.1.3. The buffer zone for T12 is south of the draft Order limit boundary. Given its distance from the CtoC Scheme proposals, the condition of T12 would not be impacted.
- 4.1.4. T9 is located within and at the southern edge of the draft Order limits. Measures to protect the tree as far as practicable would be implemented, with a particular focus on precise alignment details of the busway and the emergency access and maintenance track and stringent protection during construction. More specific mitigation measures will be developed as part of the detailed design, potentially including use of road designs to protect the root protection area, as have been proposed for the trees north of the Rifle Range section of the CtoC Scheme (see TR14.3).
- 4.1.5. Although the location of T9 should allow for its retention, it is foreseeable that there would be some development activity within the buffer for T9 which has the potential to cause detrimental impact on the tree. On this basis the Veteran tree draft mitigation (including compensation) strategy (TR14.2) sets out the series of measures required to provide compensation in accordance with NPPF.

4.2 BIODIVERSITY NET GAIN REGULATIONS

- 4.2.1. In the context of Biodiversity Net Gain Regulations, the loss of any Irreplaceable Habitat precludes achievement of BNG for that habitat. Veteran trees are deemed Irreplaceable Habitat and so removal would mean that it is technically not possible to achieve net gain in biodiversity of veteran



trees. Instead, a compensation plan should be in place to secure appropriate compensation relative to the baseline habitat type.

5 REFERENCES

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Annex A

ASSESSMENT SUMMARY





Table TR14.1-A-1 – Summary of the assessment for each tree, undertaken in April 2024

Tree	Notes	Step one (Estimate age with White method)	Step Two *	Step Three *	Step Four *	Step Five *
T1	Dead stem/stump 2m tall covered with ivy and elder within Hollow stem. (Estimate diameter 60cm)	100 years	-	-	-	-
T2	Branch hollowing. <i>Inonotus hispidus</i> in crown. Ivy to 3m. Central stem hollowing at crown break.	104 years	196<200cm Not very large	None	4 features	Notable
T3	Branch hollowing. <i>Inonotus hispidus</i> in crown.	108 years	203>200cm, large for species	None	3 features	Notable
T4	Branch hollowing. <i>Inonotus hispidus</i> in crown. Direct stem damage with missing bark. Stem hollowing at crown break. Elder growing within cavity.	103 years	195<200cm Not very large	None	4 features	Notable
T5	Light ivy cover to 2m. <i>Inonotus hispidus</i> in crown. Branch hollowing. Dead snags.	112 years	212>200cm, large for species	None	3 features	Notable

Tree	Notes	Step one (Estimate age with White method)	Step Two *	Step Three *	Step Four *	Step Five *
T6	Hollow stem from 1m to ground. Helical cracking on section with no bark, suggestive of failure. <i>Inonotus hispidus</i> in crown. Branch hollowing.	86 years	162<200cm Not very large	-	-	Notable
T7	Branch hollowing. Light ivy cover to 2m and bramble through crown. West stem dead stub with stem hollowing.	86 years	162<200cm Not very large	-	-	Notable
T8	Branch hollowing. Cavity at crown break and stem hollowing. <i>Inonotus hispidus</i> in crown.	93 years	175<200cm Not very large	-	-	Notable
T9	Ganoderma on stem and in crown at 2m. Branch hollowing. Dead snags including stem to west. Stem hollowing.	110 years	208>200cm, large for species	Extensive decay	3 features	Veteran
T10	Branch hollowing. Saprophite fungi on exposed wood, <i>Trametes</i> in appearance. At crown break decay pocket forming centrally. Elder growing within cavity.	112 years	212>200cm, large for species	None	3 features	Notable

Tree	Notes	Step one (Estimate age with White method)	Step Two *	Step Three *	Step Four *	Step Five *
T11	Failed limb to south. Ivy to 2m. Branch hollowing. Stem hollowing. <i>Inonotus hispidus</i> in crown. Dead snags.	97 years	182<200cm Not very large	-	-	Notable
T12	Branch hollowing. Stem hollowing from limb removed to west at 1m. Dead snag to south appears south half of crown removed. Ivy to 2m. North limb has major hollowing.	129 years	244>200cm, large for species	Extensive hollowing	3 features	Veteran
T13	South limb x2 have failed. Stem hollowing from crown break. Branch hollowing.	82 years	154<200cm Not very large	-	-	Notable
T14	Branch hollowing. <i>Inonotus hispidus</i> in crown. Dead snags.	75 years	Estimate diameter 45cm, 141<200cm Not very large	-	-	Notable

*: Applying the Tree Register would confirm that no trees satisfy Step Two, this column records stem girth sizes based on Table 1 (Fay 2007).

*: Steps Three and Four refer to the primary and secondary condition features using RAVEN2 (Forbes-Laird, 2023).



*: Step Five is confirmation of the outcome notable or veteran.

All trees had mosses and lichens on the stem and many on twiggy branch growth.

The extent of decay and hollowing in several trees has contributed to partial tree failure, evidenced by broken limbs on T11 and T13. The extensive hollowing on other trees presents a high risk of further partial or whole tree failure in the absence of proactive maintenance to conserve the trees.

Annex B

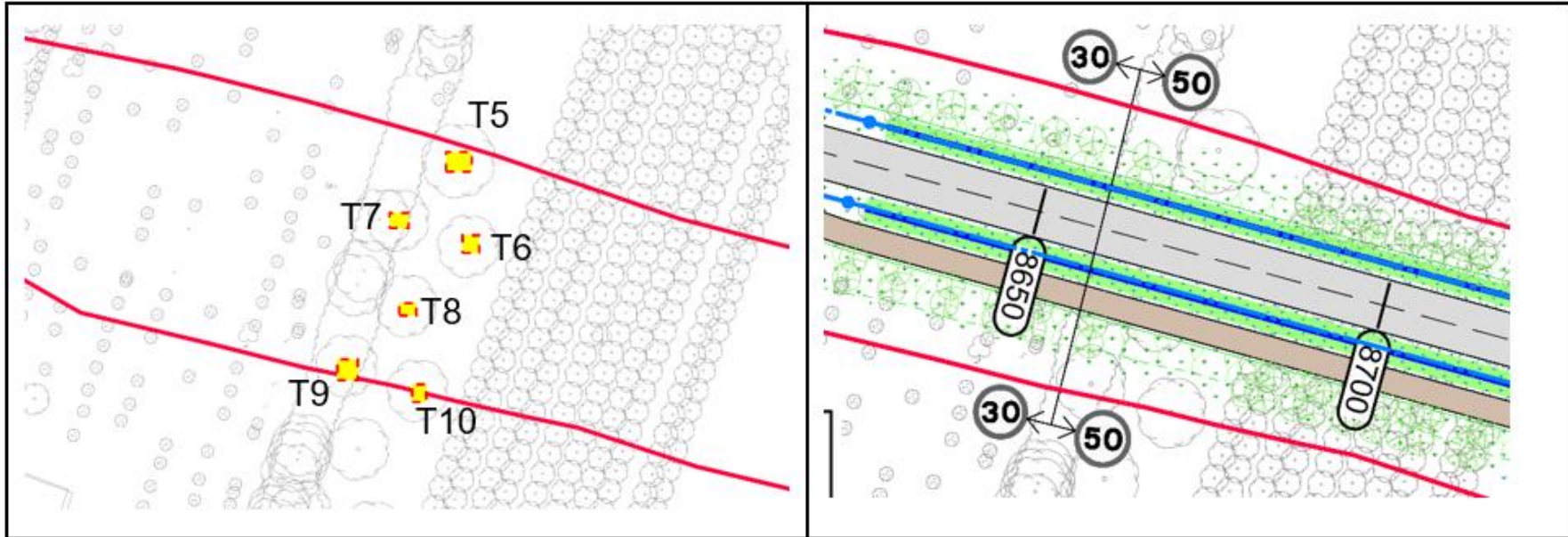
APPLE TREE LOCATIONS



Plate TR14.1-B-1 - Coton Orcahrd, apple trees location plan



Plate TR14.1-B-2 - Coton Orchard, apple trees in relation in Order Limits

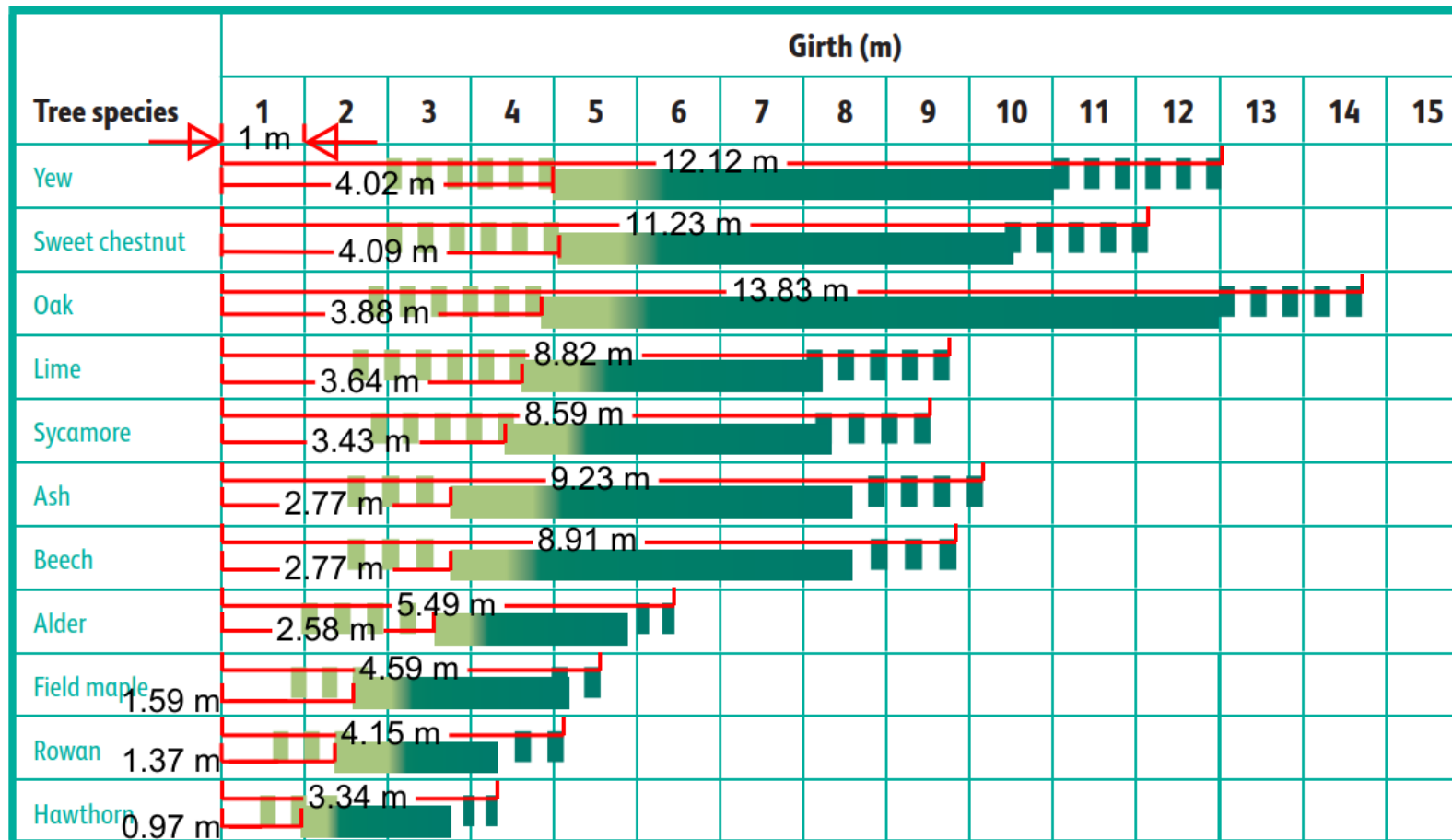


Annex C

FIGURE 1.3 ANOTATED



Plate TR14.1-C-1 - Reproduced from Lonsdale 2013, Figure 1.3 and annotated with measurements for notable/veteran size relation to largest



KEY: ■ Locally notable ■ Veteran/notable ■ Ancient ■ Late ancient

Fig 1.3: Chart of girth in relation to age and developmental classification of trees*

Annotations made to Figure 1.3:

- The bar which covers the Veteran/notable and Ancient classification overlaps some of the Locally notable and Late ancient sections. The bar has been moved down the page to emphasises where Veteran/notable starts. The bar has not been moved to the left right that would change the band size.
- A scaled measure within PDF software is used to establish:
 - Start of the Veteran/notable size band
 - Largest size of trees based on Late ancient

Table TR14.1-C-1 – Summary table of measurements taken from Lonsdale 2013, Figure 1.3

Species	Start of Notable/ veteran (mm)	End of Late ancient (mm)	Veteran as proportion of size range
Yew	402	1212	33%
Sweet chestnut	409	1123	36%
Oak	388	1383	28%
Lime	364	882	41%
Sycamore	343	859	40%
Ash	277	923	30%
Beech	277	891	31%
Alder	258	549	47%
Field maple	159	459	35%
Rowan	137	415	33%
Hawthorn	97	334	29%
Mean average			34.9%



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