

MONA OFFSHORE WIND PROJECT

Environmental Statement

Volume 7, Annex 6.6: Tree survey and arboricultural impact assessment Part 1

Reference Number: MOCNS-J3303-RPS-10125

Document Reference: F7.6.6

APFP Regulations: 5(2)(a)

February 2024

F01



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Document status					
Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Application	RPS	Mona Offshore Wind Limited	Mona Offshore Wind Limited	Feb 2024
Prepared by:		Prepared for:			
RPS		Mona Offshore Wind Ltd.			

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Glossary

Term	Meaning
Arboreal	In connection with, or in relation to, trees.
Arboriculturist	Person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees in relation to construction.
Arboricultural Impact (or Implications) Assessment (AIA)	Study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.
Arboriculture Method Statement (AMS)	Methodology for the implementation of any aspect of development that has the potential to result in the loss of or damage to a tree. Note The AMS is likely to include details of an on-site tree protection monitoring regime.
Asymmetric crown	Crowns that have a morphological bias in a particular direction. This can give the tree an aesthetically unfavourable appearance, but can also subject the tree to uneven wind- loading forces and potentially result in failure.
Bodelwyddan National Grid Substation	This is the Point of Interconnection (POI) selected by the National Grid for the Mona Offshore Wind Project.
Competent person	<p>Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached</p> <ul style="list-style-type: none"> Note 1- A competent person understands the hazards and the methods to be implemented to eliminate or reduce the risks that can arise. For example, when on site, a competent person is able to recognise at all times whether it is safe to proceed. Note 2 A competent person is able to advise on the best means by which the recommendations of this British Standard may be implemented.
Condition	Assessment based on a visual and professional view giving consideration to many factors such as tree health, structural integrity and suitability of its position.
Crown spread	Gives distances between extreme limits of the crown and the stem, usually along the four compass points. Helps to show crown symmetry.
Crown Reduction	The removal of branch ends to reduce the extreme limits of a tree's branch spread and height.
Crown Thin	The removal of selected branches within the crown to thin the internal branch structure.
Form	A general assessment of the shape and position of the tree within its environment.
Hazard Beam	After the loss of a distal part, a limb concentrates growth upwards creating adverse end weights that can render the limb susceptible to failure.
Mona Offshore Wind Project	The Mona Offshore Wind Project is comprised of both the generation assets and offshore and onshore transmission assets and associated activities.
Mona Onshore Development Area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction compounds), and the connection to National Grid infrastructure will be located
Pathogen	An agent that causes disease, especially a living microorganism such as a bacterium or fungus.

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Term	Meaning
Root Protection Area (RPA)	Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m ² .
Tree protection plan	Scale drawing prepared by an arboriculturist showing the finalised layout proposals, tree retention and tree and landscape protection measures detailed within the AMS, which can be shown graphically.
Tree Retention Plan	A Development Consent Order (DCO) plan setting out the measures to be put in place to ensure the safety and long term viability of retained trees. This will include site-specific protection measures to be adhered to by the Principle Contractor(s) on site in addition to the physical protection of trees during the construction phase.
ULE	'Useful Life Expectancy' is an estimate based on currently known factors of the possible remaining life of the tree as an asset. AKA 'Estimated remaining contribution'.
Veteran tree	Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Vigour	A general classification, as to the present and future potential growth and development of a tree. A comment regarding the health status of the tree specific to its species.

Acronyms

Acronym	Description
AIA	Arboricultural Impact (or Implications) Assessment
AMS	Arboriculture Method Statement
AWSU	Ancient Woodland Site of Unknown Category
ASNW	Ancient Semi-Natural Woodland
CEZ	Construction Exclusion Zones (where relating to trees and woodlands)
DCO	Development Consent Order
DBH	Diameter at Breast Height
EIA	Environmental Impact Assessment
G	Group (when referring to tree survey groups)
LPA	Local Planning Authority
OLEMP	Outline Landscape & Ecology Management Plan
PAWS	Plantation on Ancient Woodland Site
RAWS	Restored Ancient Woodland Site
RPA	Root Protection Area
SSSI	Site of Special Scientific Interest
T	Tree (when referring to surveyed trees)
TPO	Tree Preservation Order

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Acronym	Description
ULE	Useful Life Expectancy
W	Woodland (when referring to surveyed woodlands)

Units

Unit	Description
%	Percentage
m	Metres
mm	Millimetres
km ²	Square kilometres

1 TREE SURVEY AND ARBORICULTURAL IMPACT ASSESSMENT

1.1 Introduction

- 1.1.1.1 This tree survey and arboricultural impact assessment (AIA) forms part of the DCO application for the Mona Offshore Wind Project. This technical report accompanies Volume 3, Chapter 6: Landscape and visual resources of the Environmental Statement. In addition, it supports Volume 3, Chapter 3: Onshore ecology of the Environmental Statement, the Outline Code of Construction Practice (CoCP) (Document Reference J.26), and the Outline Landscape and Ecology Management Plan (LEMP) (Document Reference J.22). The AIA differs from the Environmental Impact Assessment and is a standalone impact assessment undertaken in accordance with BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations (BSI Publication, 2012).
- 1.1.1.2 Separate tree and hedgerow retention plans are submitted with the DCO application (Document Reference B.14). These plans show Ancient Woodland, veteran trees and trees with preservation orders (TPOs), which are defined further in this document. The plans also show hedgerows which have been subject to condition assessment surveys. Further details on the condition assessment surveys are presented in Volume 7, Annex 3.4: Hedgerow survey technical report of the Environmental Statement.
- 1.1.1.3 From an arboricultural perspective, the Mona Onshore Development Area lies within two administrative authorities:
- Terrestrial works within Conwy County Borough
 - Terrestrial works within the County of Denbighshire.
- 1.1.1.4 The tree survey of the Onshore Cable Corridor and the Onshore Substation was carried out by RPS in June and October 2023 (refer to the tree survey schedules in Appendix A and tree survey plans in Appendix B).
- 1.1.1.5 The purpose of this report is to:
- Provide an assessment of the quality of the surveyed trees with reference to the categories and sub-categories listed within Appendix A
 - Assess and quantify the arboricultural impact of the Mona Offshore Wind Project
 - Informs the baseline and identification of potential impacts within the onshore ecology and landscape chapters (Volume 3, Chapter 3: Onshore ecology and Volume 3, Chapter 6: Landscape and visual resources of the Environmental Statement)
- 1.1.1.6 To minimise the potential for harm to occur to retained trees all works shall be carried out in accordance with the tree protection measures and construction techniques detailed within the Outline Arboriculture Method Statement (Document Reference J26.18). These will be secured via the Outline CoCP (Document Reference J.26). In particular, the establishment of a Construction Exclusion Zone (CEZ) by erection of tree protection fencing, will minimise the potential for harm to occur to retained trees. Where it is not possible to define a CEZ, due to lack of tree survey data, a ‘tree protection protocol’ will be employed.

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1.2 Study area

- 1.2.1.1 This arboricultural study focusses upon the Mona Onshore Development Area. Figure 1.1 shows the Mona Onshore Development Area and summarises where the detailed surveys, aerial mapping and tree protection methodologies have been targeted.
- 1.2.1.2 The permanent onshore infrastructure for the Mona Offshore Wind Project includes the Landfall, Onshore Cable Corridor, Onshore Substation and 400 kV Grid Connection Cable Corridor.
- 1.2.1.3 The permanent onshore infrastructure will be located within the Mona Onshore Development Area together with mitigation areas and temporary construction facilities.
- 1.2.1.4 The location for the Onshore Substation and temporary construction compounds are shown on the tree and hedgerow protection plans within Appendix C.

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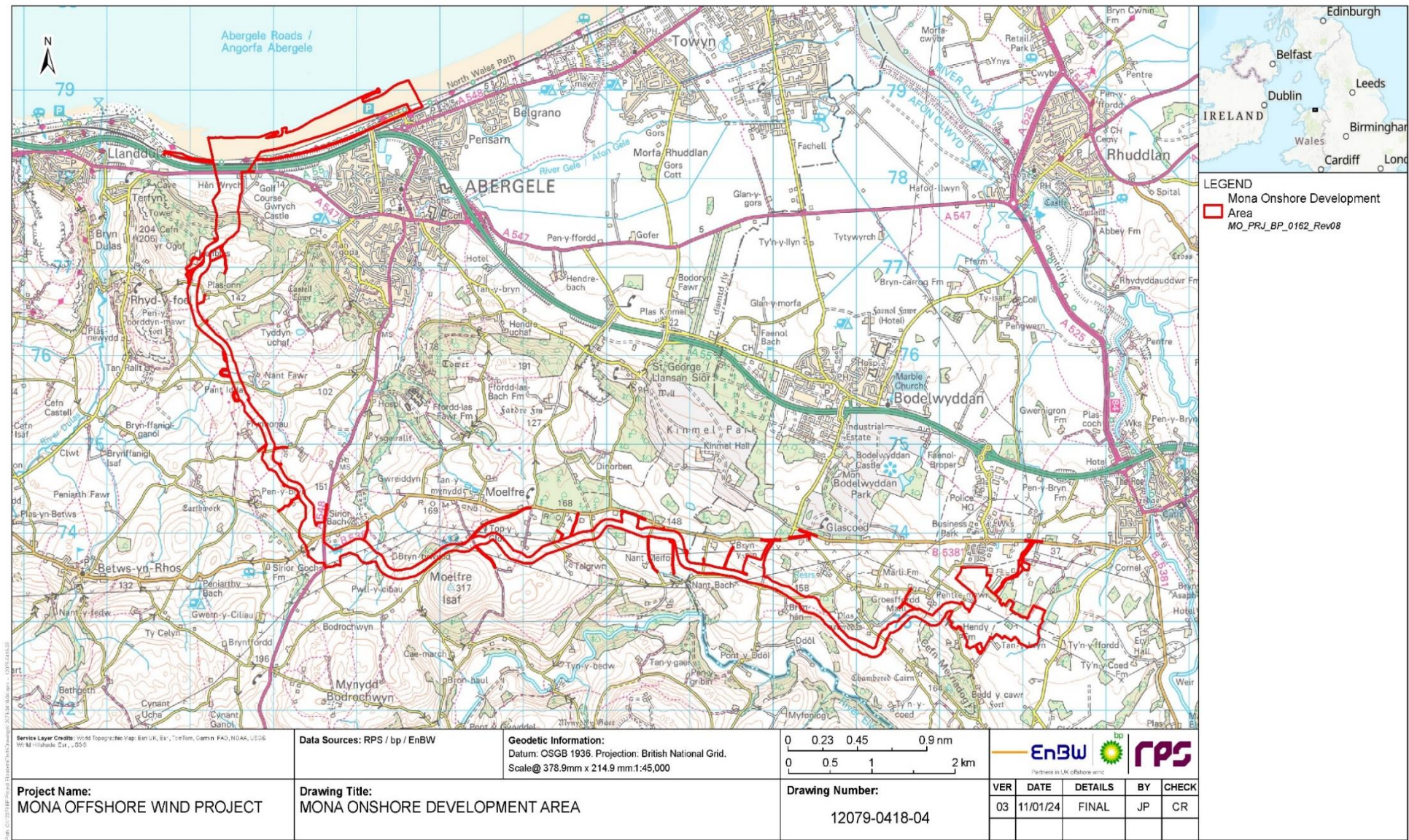


Figure 1.1: Mona Onshore Development Area

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1.3 Consultation

1.3.1.1 A summary of the key issues raised during consultation activities undertaken to date specific to arboricultural matters is presented in Table 1.1

Table 1.1: Summary of key consultation topics raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to arboriculture.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this technical report
June 2023	Woodland Trust (S42)	<p>A number of ancient and veteran trees within the proposed cabling corridor are recorded on the Ancient Tree Inventory. Five areas of ancient woodland are within the proposed corridor boundary, and numerous others are located within the wider work area, or adjacent to the corridor/work area boundaries.</p> <p>The Woodland Trust recommends that any non-ancient woodlands affected by the scheme, are reviewed to ensure any areas of potentially unmapped ancient woodland are accounted for as the scheme progresses.</p> <p>The Trust also highlights the importance of an arboricultural impact assessment to be undertaken early within the design process. Surveys are also recommended for detailing woodland flora and fauna alongside an assessment of historical mapping.</p> <p>The Trust has concerns over root damage due to the proposed route alignment corridor found. The Trust would primarily advocate for the redirection of any cabling through ancient woodland areas. However, if such works are likely to occur, it suggests using non-invasive root investigation, for ancient trees and protection beyond the limit of the usual investigative tools. Further clarification on the technique and any potential impacts are necessary.</p>	<p>Ancient Woodland, veteran trees and their root protection areas (RPA) have been avoided by the direct impacts of the Onshore Cable Corridor and Onshore Substation.</p> <p>The Mona Onshore Cable Corridor passes through Llanddulas Limestone and Gwyrch Castle Wood Site of Special Scientific Interest (SSSI) (using both trenched and trenchless techniques to ensure there are no impacts to the woodland within the SSSI which is also Ancient Woodland (Appendix B). This is detailed in Volume 5, Chapter 4.3: Onshore crossing schedule, of the Environmental Statement</p> <p>Tree RPAs will be clearly marked and fenced off during construction. The operation and maintenance of the Onshore Substation and Onshore Cable Corridor should not necessitate the removal of trees or encroachment on any tree RPAs. In the unlikely event that work near a retained tree is required during the operation and maintenance phase, a method statement for that work would be agreed with the relevant tree officer. These tree protection measures are detailed in the Outline Arboriculture Method Statement (Document Reference J26.18).</p>

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Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this technical report
June 2023	Conwy County Borough Council	In order to determine the impact on trees, the Council request a full BS5837 'Trees in relation to design, demolition and constructions' report. The report should provide details for all trees affected within the development and those on neighbouring properties.	A tree survey and AIA have been undertaken for the Mona Onshore Development Area, to the relevant guidelines and British Standards. They are presented in sections 2 and 3 of this document. An Outline Arboriculture Method Statement has been prepared which sets out measures for the protection of trees during the construction period (Document Reference J26.18).

1.3.1.2 Consultation was also undertaken with Conwy County Borough Council and Denbighshire County Council's online mapping portal was reviewed (Table 1.2).

Table 1.2: Summary of data collection undertaken for the Mona Offshore Wind Project relevant to arboriculture.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this technical report
22/12/2023	Online search using Denbighshire CC website	Details of TPOs and Conservation Areas	Details located using online portal
16/10/2023	Emailed request to Conwy County Borough Council, with emailed reply	Requested details of TPOs and Conservation Areas	Planning Officer replied with details of Tree Officer (name/email etc.)
02/11/2023	Emailed request to Conwy County Borough Council Tree Officer, with emailed reply	Requested details of TPOs	Tree Officer replied with details of TPOs, including location maps and schedules

1.4 Planning considerations

1.4.1.1 Trees can offer many benefits, including the provision of visual amenity, softening or complementing the effect of the built environment, reducing visual impact and by making places more comfortable in tangible ways e.g. contributing screening and shade, reducing wind speed and turbulence, intercepting snow and rainfall, and reducing glare.

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- 1.4.1.2 New tree planting opportunities should be considered as part of any potential redevelopment; this will help to broaden the age diversity of the tree cover within the area. Sufficient space should be provided for species with significant stature to grow out into maturity. Further information relating to tree planting as part of the scheme can be found within the Outline LEMP (Document Reference J.22).
- 1.4.1.3 Under the UK planning system (Town and Country Planning Act 1990), local authorities have a statutory duty to consider the protection and planting of trees with any development consent order. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is considered when dealing with DCO decisions.
- 1.4.1.4 Local Authorities also use guidance found within BS5837:2012 to consider appropriate measures to consider trees impacted by development as it is the recognised industry standard.
- 1.4.1.5 Trees covered by a Tree Preservation Order are protected under the Town and Country Planning (Tree Preservation) (England) Regulations 2012. The DCO allows the developer to carry out works to TPO trees provided it is part of the agreed development works.
- 1.4.1.6 NPS EN-1 (Department for Energy Security & Net Zero, 2024) sets out that applications should include measures to mitigate fully the direct and indirect effects of development on ancient woodland, ancient and veteran trees or other irreplaceable habitats during both construction and the operational phase (Paragraph 5.4.32). As set out in Table 1.1, Ancient Woodland, veteran trees and their RPA have been avoided by the direct impacts of the Onshore Cable Corridor and Onshore Substation.
- 1.4.1.7 NPS EN-1 also states that existing trees and woodlands should be retained wherever possible and the applicant should assess the impacts on, and loss of, all trees and woodlands within the project boundary and develop mitigation measures to minimise adverse impacts (Paragraph 5.11.27). Hedgerow restoration and woodland planting is proposed as part of the Illustrative Landscape and Ecology Strategy Plan in the Outline LEMP (Document Reference J.22). The Design Principles Document (Document Reference J3) also details the landscape proposals for the project.
- 1.4.1.8 Planning Policy Wales (Welsh Government, 2021) makes it clear that '*Trees, woodlands and hedgerows are of great importance, both as wildlife habitats and in terms of their contribution to landscape character and beauty. They also play a role in tackling climate change by trapping carbon and can provide a sustainable energy source. Local planning authorities should seek to protect trees, groups of trees and areas of woodland where they have natural heritage value or contribute to the character or amenity of a particular locality. Ancient and semi-natural woodlands are irreplaceable habitats of high biodiversity value which should be protected from development that would result in significant damage*' (PPW Edition 8, para 5.2.9).
- 1.4.1.9 Conwy County Borough Council has supplementary planning guidance associated with trees and development (LDP40) (Conwy County Borough Council, 2017) which sets out that an AIA should identify and evaluate the direct and indirect impacts on development on trees and advise on subsequent mitigation measures. Denbighshire County Council also has supplementary planning guidance associated with TPOs (Technical Advice Note 10) and protection of trees and landscaping (Policy RD1) (Denbighshire Council, 2016).

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1.5 Methodology

- 1.5.1.1 The surveys were carried out in accordance with the requirements set out in BS 5837: 2012 (BSI Publication, 2012). Trees were identified using georeferenced aerial mapping and OS Explorer digital tiles. Trees greater than 100 mm stem/trunk diameter were surveyed, often as individual trees but also as collection or groups of trees where they form a definable, shared canopy.
- 1.5.1.2 The tree survey of the Mona Onshore Development Area involved a visual inspection from the ground of individual specimens and groups of trees to record their dimensions, amenity value and management recommendations. Where observed, the general condition of all the trees has been noted. The survey assessed individual trees and groups of trees for quality and benefits within the context of Mona Onshore Development Area.
- 1.5.1.3 The locations of the trees were plotted by the surveyor using digital and on site positioning. The survey results are presented in Appendix A. Table 1.3 provides a breakdown of the information recorded during the survey, these categories are in accordance with the guidance contained within Section 4 of BS 5837:2012 (BSI Publication, 2012).
- 1.5.1.4 The methodology presented in this document will be used during construction to identify when and where trees will need to be protected to limit construction impacts and provides detailed instructions on how to set up this protection.
- 1.5.1.5 The Arboriculture Method Statement (Document Reference J26.18) details generic site-wide methods that shall be adopted to ensure tree health is considered and maintained throughout construction. This will be secured within of the CoCP (Document Reference J26).

Table 1.3: Tree characteristics recorded during survey.

Tree characteristics	
Tree ref no	Sequential reference number of trees or groups of trees. Avenues, woodlands and hedgerows were also recorded within the tree survey schedules (Appendix A) # - denotes inaccessible trees (best estimates are made about the location, physical dimensions and characteristics).
Species	Species listed by common name, with scientific names (italic lettering).
Height (m)	Estimated height of canopy to nearest metre.
Branch spread	Branch spread, taken as a minimum at the four cardinal points, to derive an accurate representation of the crown.
Stem diameter at 1.5 m above ground level	Estimated diameter of trunk unless otherwise indicated. Multi-stemmed trees being measured in accordance with BS5837: Annex C.
Existing canopy height above ground level	Estimated average height of canopy to nearest metre.
Stem no.	Number of stems (if necessary) of individual tree.

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Tree characteristics	
Life stage	<p>Apparent age expressed as the following categories, based on size and condition:</p> <p>Y (Young)</p> <p>SM (Semi-mature)</p> <p>EM (Early-mature)</p> <p>M (Mature)</p> <p>OM (Over-mature)</p> <p>V (Veteran)</p> <p>D (Dead)</p>
Physical condition	<p>Apparent condition expressed as the following categories, based upon a brief visual inspection from the ground only:</p> <p>Good</p> <p>Fair</p> <p>Poor</p> <p>Dead</p>
Comments/Management recommendations	General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations and potential for wildlife habitats (not exhaustive).
Estimated remaining contribution (years)	Estimated remaining contribution, in years (<10, 10+,20+,40+)
Tree quality assessment value: <u>category</u>	<p>Criteria grading with regards to BS 5837:2012 (Table 1) expressed as:</p> <p>A (Trees/Vegetation of high quality and value)</p> <p>B (Vegetation of moderate quality and value)</p> <p>C (Trees/Vegetation of low quality and value)</p> <p>U* (Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years)</p> <p>* Category U trees can have existing or potential conservation value which might be desirable to preserve.</p>
Tree quality assessment value: <u>sub-category</u>	<p>Criteria grading with regards to BS 5837:2012 (Table 1) expressed as:</p> <p>1 (Trees with mainly <i>arboricultural</i> value)</p> <p>2 (Trees with mainly <i>landscape</i> value)</p> <p>3 (Trees with mainly <i>cultural/conservation</i> value)</p>

1.6 Limitations

- 1.6.1.1 Due to access constraints, some areas within the Mona Onshore Development Area were not subject to a tree survey in 2023. The areas not subject to survey are labelled on the tree survey plans (Appendix B). For the purposes of this report, tree and woodland positions in these areas have been reviewed using aerial mapping only. Trees and woodlands not surveyed currently will be completed during the pre-construction phase.
- 1.6.1.2 Trees were not climbed or inspected below ground level and inaccessible trees will have best estimates made about the location, physical dimensions and characteristics.

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Where direct access to trees was difficult a '#' denotes this within the tree survey schedule (Appendix A).

1.6.1.3 Trees and woody vegetation were not assessed for their potential impact upon future construction issues such as foundation designs (refer to NHBC Chapter 4.2 (2016)). Whilst this report may assist in assessing likely future impacts, it should not be classed as a comprehensive vegetation survey in relation to impact upon future designs.

1.6.1.4 In some instances, the mapped location of trees protected by TPOs do not correlate with physical location of trees on site.

1.7 Desktop study

1.7.1.1 Information on trees and woodlands within the arboricultural study area was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 1.4 below.

Table 1.4: Summary of key desktop sources.

Title	Source	Year	Author
Ancient Woodlands	Natural Resource Wales (NRW)	2023	NRW
TPO & Conservation Areas	Conwy County Borough Council	2023	Conwy County Borough Council
TPO & Conservation Areas	Denbighshire County Council	2023	Denbighshire County Council

1.7.2 Ancient Woodland

1.7.2.1 Within Wales, Ancient Woodlands have been defined into four categories:

- Ancient semi-natural woodland (ASNW)
- Ancient Woodland site of unknown category
- Plantation on Ancient Woodland site
- Restored Ancient Woodland site.

1.7.2.2 The different categories of ancient woodlands in relation the Mona Onshore Development Area are presented on the tree survey plans and tree and hedgerow protection plans (Appendix B and Appendix C).

1.7.2.3 Current UK guidelines state that ancient woodlands should have a buffer zone of at least 15 m from the boundary of the woodland and any construction activities to avoid root damage.

1.7.3 Tree Preservation Orders

1.7.3.1 Conwy County Borough Council have an online mapping portal which details the locations of TPOs. This information has been added to the tree survey plans (Appendix B) and tree protection plans (Appendix B). As set out previously, in some instances the mapped location of these TPOs do not correlate with physical location of trees on site. The mapped TPO locations shown on the tree survey plans (Appendix B) match

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the locations shown on the Conwy County Borough Council website. No adjustments have been made by the Applicant to correspond to actual tree locations.

1.7.3.2 Denbighshire County Council's TPO details have been plotted on the tree survey and protection plans (Appendix B and Appendix C). All current TPOs lie outside of the Mona Onshore Development Area.

1.7.3.3 Under the Town and Country Planning (Tree Preservation) Regulations 2012, a TPO prohibits the cutting down, topping, lopping (including cutting of roots), uprooting, wilful damage and wilful destruction of trees without the local planning authority's written consent. If consent is given, it can be subject to conditions which must be followed. The DCO allows works without having to submit separate, stand-alone applications with regard to TPO trees, in compliance with the agreed development works and documents. It should be noted that there is currently no impact to TPO trees.

1.8 Tree survey

1.8.1 Tree survey and site access

1.8.1.1 As set out previously, due to access constraints, some areas within the Mona Onshore Development Area were not subject to a tree survey in 2023. The areas not subject to survey are labelled on the tree survey plans (Appendix B). For the purposes of this report, tree and woodland positions in these areas have been reviewed using aerial mapping only. Trees and woodlands not surveyed currently will be completed during the pre-construction phase.

1.8.1.2 Where access was available, it has been possible to offer comprehensive arboricultural protection measures including focused tree and woodland protection methodologies. However, access was not possible for approximately a third of the Mona Onshore Development Area. Where survey data has yet to be obtained, observations were made by utilising aerial mapping to locate trees and woodlands. Where detailed tree surveys have not been possible, a more generic methodology has been used when dealing with construction near trees within the Mona Onshore Development Area (refer to the Outline Arboriculture Method Statement (Document Reference J26.18)).

1.8.2 Results

Overview

1.8.2.1 As noted in section 1.8.1, tree survey work will be completed during the pre-construction stage. During the 2023 survey of the Onshore Cable Corridor, 178 Individual trees were surveyed while 95 Groups, 2 Woodlands, 106 Hedgerows and 1 Scrub areas were recorded.

1.8.2.2 During the 2023 survey of the Onshore Substation, 222 Individual trees were surveyed while, 21 Groups, 5 Woodlands, 41 Hedgerows and 29 Scrub areas were recorded.

1.8.2.3 The species, age and condition diversity is characteristic of this area of Conwy and Denbighshire. In the main, native or naturalised species dominate the rural areas, where the Mona Onshore Development Area is located.

1.8.2.4 Of note were trees, tree groups or woodlands which possessed significant aged and/or habitat qualities. In many cases these features correlate with ASNW designations, but in the case of individual or smaller tree groups these features do not have any

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recognised, wider status; and their value has been highlighted by virtue of this arboricultural assessment.

- 1.8.2.5 Individual trees which possess significant aged and habitat qualities have been afforded 'veteran' tree status. These trees have been conferred larger buffers than the standard BS5837 root protection areas (RPA).

1.8.3 Design and site layout considerations

- 1.8.3.1 The results of the tree survey have been used to provide Tree Survey Plans (Appendix B). These plans define the RPA for each tree. The RPA for each tree is shown as a circle. This area may be adjusted should physical constraints or topographical features that limit root activity in a particular area, however the total area should remain the same. Prior to any adjustment of the trees RPA zones the changes will be assessed by an arboriculturist. During any site planning exercises the current and future growth potential of the trees will be considered.
- 1.8.3.2 The RPA for single stem trees broadly equates to a radius 12 times the stem diameter of the tree at 1.5 m above ground level or the extent of canopy spread, whichever is the greater. For multi-stemmed, low branching trees or those with trunks with an irregular girth the point of stem diameter measurement is adjusted in consideration of these factors and in accordance with the illustrations in BS5837:2012 (Annex C).
- 1.8.3.3 Where an RPA has been identified, it should become an exclusion zone during construction works and for any development. In instances where exclusion zones cannot be avoided, specialist arboricultural measures should be employed. The exclusion zones should be fenced-off where practical and protected in accordance with BS5837:2012. The canopy is likewise susceptible to damage during construction work and requires similar protection. Due to the size and nature of this development it is not practical to fence off all RPAs on site, instead only those in close proximity to works will be fenced off (see also the Outline Arboriculture Method Statement, Document Reference J26.18).
- 1.8.3.4 No activities that result in excavations, changes in level or soil compaction should take place within the RPA of any retained trees, especially older mature trees. This would include the storage of materials, any construction work, trafficking by vehicles or even excessive trafficking by pedestrians.
- 1.8.3.5 If some form of construction must take place within the RPA, then certain measures need to be adopted to avoid disturbance or damage to the roots.
- 1.8.3.6 To minimise the potential for harm to occur to retained trees, all works must be carried out having regard to the RPAs. In general, by adopting appropriate methods of working, precautionary and protective measures, significant harm to retained trees can be avoided. In particular the establishment of a CEZ by erection of tree protection fencing will minimise the potential for harm to occur to retained trees.

1.8.4 Trees and management of health and safety

- 1.8.4.1 It is recommended that suitable arboricultural assessments be undertaken in order to regularly assess the full health and safety of all trees both in full leaf and bare stemmed.
- 1.8.4.2 The assessments should prioritize areas based on levels of access and presence of target (i.e. exposure of people to hazard) and accord with arboricultural advice, taking

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account of relevant factors (where known) that affect safety such as the age class, condition, size and species of the trees.

1.9 Arboricultural impact assessment

1.9.1 Introduction

- 1.9.1.1 Trees have finite energy reserves, developed each year throughout the growing season, which are utilised for biological processes such as growth and defence against pests or diseases throughout the following year.
- 1.9.1.2 Any development in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the proposed development and the retained trees to identify what precautions are necessary, proportionate and appropriate.
- 1.9.1.3 Development has the potential to impact upon the above ground and below ground parts of trees. Whilst some damage that can occur, such as physical damage to the trees stems and branches from machinery movements, is clearly visible, the impact from other aspects of work common on development sites, which can have a significant effect upon the continued health of trees, are not always immediately evident.
- 1.9.1.4 Damage that is not immediately evident, but which can cause long term harm to retained trees, includes things such as damage to the soil structure by compaction causing root damage and levels changes altering the water table and affecting moisture availability.
- 1.9.1.5 The retention and protection of significant trees and vegetation will assist in assimilating the proposed development into the wider landscape and offer long term tree cover.

1.9.2 Brief description of the Mona Offshore Wind Project

- 1.9.2.1 The following, are the main construction activities involved in the Mona Offshore Wind Project, as set out in Volume 1, Chapter 3: Project description of the Environmental Statement:
 - Site clearance, including vegetation clearance, where required
 - Topsoil strip and storage within the easement area
 - Establish and prepare temporary haul road along the Onshore Cable Corridor
 - Excavate trenches for the ducted cable, with subsoil removed from the trench and stored within the Mona Onshore Development Area
 - Trenchless techniques will be used to install ducts under obstacles (as set out in Volume 5, Annex 4.3: Onshore crossing schedule of the Environmental Statement and shown in Appendix C)
 - Excavation of joint bays and link bays (this may also be undertaken after the ducting is laid and the cable trench is reinstated)
 - Cable laying and placement of stabilised backfill material (undertaken as part of the duct install operation)
 - Cable jointing and fibre splicing followed by backfill of joint bays/installation of inspection covers

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- Removal of the temporary haul road and ditch flumes
- Replacement of topsoil
- Reinstatement to previous land use including field drainage
- Removal of temporary compounds and access roads prior to completion of works
- Removal of temporary fencing
- Planting of any sections of replacement hedgerow.

1.9.3 Overview of potential impacts

- 1.9.3.1 Below is a brief overview of the assumed impacts that works may have within the Mona Onshore Development Area.
- 1.9.3.2 This is summary of the potential impacts has been extracted from the tree and hedgerow protection plans in Appendix C.
- 1.9.3.3 The tree and hedgerow protection plans have adopted a hierarchy of significance to the retention values of each tree. These values are reflective of the tree's qualities, and they correlate with the BS5837 tree category criteria (i.e. categories A, B, C & U).
- 1.9.3.4 The hierarchy of significance has been illustrated using a Black-Red-Amber-Green (BRAG) system, using the following criteria: -
- Black – Significant potential to constrain development (including veteran trees or ancient woodlands)
 - Red – High potential to constrain development (including category A trees)
 - Amber – Moderate potential to constrain development (including category B trees)
 - Green – Low potential to constrain development (including category C trees)
- 1.9.3.5 The Mona Offshore Wind Project consists of the following elements which relate to potential harm to trees:
- **Construction of the Onshore Substation:** Depending on proximity to trees, construction of the Onshore Substation may impact upon RPAs. Tree, woodland and hedgerow removal will also take place within this development zone.
 - **Onshore cable installation:** This will require trenching to bury the cable within fields and other areas. If this work passes through the RPA of any retained trees, it will have a significant impact on the tree's roots. There are sections of cabling proposed, which cross existing roads, tracks and other obstacles.
 - **Access roads and compounds:** There are five temporary construction compounds which relate to the Onshore Cable Corridor and one for the Onshore Substation works. These require temporary access routes. These routes will be removed on completion of the construction works.
 - **Site security fencing:** Fencing is required around selected construction areas. However, the small scale of excavation required for fencing makes this a low impact task.

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1.9.4 Assessment of tree removal impact

- 1.9.4.1 The installation of the onshore cables will only result in minimal tree removal, as micro siting will be used within the Mona Onshore Development Area to avoid as many trees as possible. During detailed design, options will be explored to limit conflicts with the RPAs and maximise tree retention.
- 1.9.4.2 Tree loss will however occur within the Onshore Substation works area. The retention of all high-quality trees and woodlands will be targeted, where achievable.

1.9.5 Tree removal summary

- 1.9.5.1 Trees that are likely to require removal to facilitate the construction of the Mona Offshore Wind Farm have been highlighted as such on the tree and hedgerow protection plans.
 - **Construction of the Onshore Substation:**
Less than 50 trees are likely to require removal in order to facilitate the Onshore Substation and its access route, shown on the tree and hedgerow protection plans (Appendix B) with an orange hatch:
 - **Onshore cable installation:** No tree removal is foreseen, however this will be confirmed during detailed design/cable alignment. The loss is likely to be minimal.
 - **Access roads and compounds:** Less than 5 trees are likely to require removal to facilitate the access roads and construction compounds. This would be confirmed during detailed design.
 - **Site security fencing:** No tree removal is required.

1.10 Summary

- 1.10.1.1 An arboricultural survey and assessment have been completed for the Mona Offshore Wind Project covering the Mona Onshore Development Area. This included detailed tree surveys which accords with BS5837:2012, statutory investigations and arboricultural impact assessment.
- 1.10.1.2 To identify statutory tree protections (i.e. Tree Preservation Orders), desktop and direct communication has been completed with Conwy County Borough and Denbighshire County Councils. Online searches with NRW have also been completed to identify designated ancient woodlands within the study area.
- 1.10.1.3 Part of the Mona Onshore Development Area has not yet been surveyed in detail. For the purposes of arboricultural impact assessment, aerial mapping has been used to locate trees, and a tree protection protocol employed to help direct construction and protect trees.
- 1.10.1.4 In order to protect trees during the delivery of the project, specialist construction methods (i.e. trenchless techniques) have been proposed. Alongside these construction methods, tree protection fence and visual barriers have also been proposed. In areas where specific tree protection methods cannot be proposed (due to lack of survey data), a tree protection protocol will be employed.
- 1.10.1.5 Less than 55 trees will require removal to facilitate the access and works area for the Onshore Substation and to facilitate the proposed access to temporary construction compounds. These are shown on the tree and hedgerow protection plans (Appendix C).

1.11 References

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