Appendix 6-2 Annex I Habitat Plot Results

SDCC Rathcoole Housing Development

Volume 2 of the Environmental Impact Assessment Report

South Dublin County Council

October 2026

Delivering a better world

Quality Information

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1. Introduction

1.1 Background

This Appendix presents the methods and results of habitat condition assessment that were conducted as part of the ecological baseline surveys to inform the Environmental Impact Assessment (EIA) for the proposed SDCC Rathcoole Housing Development (the Proposed Development). Full details of the Proposed Development are presented in Chapter 02 Description of the Development of the EIA Report (EIAR). This Appendix accompanies Chapter 06 Biodiversity of the EIAR and should be read in tandem. Note that this Appendix only relates to Annex I habitats[1]; Fossitt habitat survey results are not presented in this Appendix and are presented in Chapter 06 Biodiversity.

For ease and clarity of reference, all land within the proposed application boundary is referred to as the Site. The Site location is shown in Figure 1-1(EIAR Volume 03). However, it must be noted that the application boundary was reduced after the habitat condition assessment was completed, therefore, some of the Annex I habitats identified lie beyond the Site boundary. This previous application boundary is referred to as the Survey Area, and the Site refers to the application boundary.

Within this Appendix, species are given their common and scientific names when first referred to and their common names only after. Vascular plant scientific names follow Stace (2019). Common names of bryophytes and lichens are not well known, therefore only scientific names have been used for these in all cases, for bryophytes following revisions by the British Bryological Society set out in Blockeel *et al*. (2020). Locations are given as Irish Grid References (IGR), and all distances are cited as the shortest distance as the crow flies, unless otherwise specified. Figure A6-2b, which accompanies Chapter 06 Biodiversity of the EIAR, is relevant to this Appendix.

1.2 Previous Surveys

Previous habitat and botanical surveys and assessments have been previously carried out in the Site and Survey Area, by AECOM and other Ecologists (Wilson and Denyer, 2021). In 2020, two Annex I habitats were identified, comprising 91E0 priority Annex I Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior* to the west of the Site and Survey Area (and contiguous with further alluvial woodland beyond) and 6510 Annex I Lowland Hay Meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*), located within an open grassland in the park area of the Survey Area.

1.3 Quality Assurance

This project has been completed in line with AECOM's Integrated Management System (IMS). The IMS places great emphasis on professionalism, technical excellence, and quality, as well as covering all aspects of environmental and Health and Safety management. All staff members are committed to establishing and maintaining our accreditation to the relevant international standards, including ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018. In addition, the IMS requires careful selection and monitoring of the performance of all subconsultants and contractors.

2. Methods

2.1 Condition Assessment of Annex I Habitat

Habitats that were either previously identified as Annex I habitat or were considered to have affinity with an Annex I habitat (determined during Fossitt habitat surveys, as described in Chapter 06 Biodiversity), a detailed relevé (or plot) survey was carried out. The plot survey had regard for relevant information in *The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessment* (NPWS, 2025) and methods in the following relevant national guidelines:

[1] Annex I habitats are natural habitat types listed in Annex I of the Habitats Directive (Council Directive 92/43/EEC) which are considered of conservation importance at a European level and for which Special Areas of Conservation (SAC) may be designated

- *The Monitoring and Assessment of Three EU Habitats Directive Annex I Grassland Habitats* (Martin *et al.*, 2018) for Lowland Meadows.
- *The Monitoring and Assessment of Four EU Habitats Directive Annex I Woodland Habitats* (Daly *et al*. 2023) and *Results of Monitoring Survey of Old Sessile Oak Woods and Alluvial Forests* (O'Neill *et al*., 2013).

Note that these guidelines are designed for the national monitoring of Annex I habitat condition and extent, and there may be some differences in applying the method between national monitoring surveys and baseline ecological assessment.

For Lowland Meadows, information was collected at the plot level for nine assessment criteria, such as the number of high-quality and positive indicator species, cover of negative indicator species and woody species, forb-graminoid ratio, sward height, and signs of disturbance. A plot fails if even one criterion is not met, however following Martin et al. (2018), professional judgement was applied to override marginal failures, if relevant. Nine 2x2m condition assessments plots were carried out for Lowland Hay Meadows on 17 June 2025 by experienced AECOM Ecologist Jenny Hunter. These comprised four plots in grassland previously identified as Lowland Hay Meadow, with the other five within grassland parcels that were suspected to conform with Lowland Hay Meadow.

For Alluvial Woodland, information was collected at an individual plot level for 11 assessment criteria, such as the presence and proportions of positive/negative indicator species, species regeneration (e.g. the amount of saplings and seedlings of native tree species), canopy and shrub layer cover and height, bryophyte cover, and grazing pressure. Other features such presence of old trees and dead wood were also noted where observed. A pass in at least 9 of the 11 criteria is considered an overall pass at the plot level, indicating Good habitat condition. Three 20x20m condition assessment plots were carried out for Alluvial Woodland condition on 6 August 2025 by experienced AECOM Ecologists Dr Ruth Kelly and Jenny Hunter.

Positive and negative indicator species for both Annex I habitat types are presented in Annex A for reference.

2.2 Data Collection

Habitat condition notes were recorded on a GPS-enabled tablet (Samsung Tab Active2) using Esri Field Maps loaded with current aerial photography. Field data recorded in Esri Field Maps were subsequently imported into QGIS Desktop.

2.3 Survey Personnel

The habitat condition assessment surveys were carried out by Jenny Hunter and Dr Ruth Kelly. This Appendix was prepared by Seánin Munglani, reviewed by Jenny Hunter, and verified by Dr Eleanor Ballard.

Relevant experience for all AECOM ecologists involved in preparation of this Appendix, including all field survey, is presented in Appendix 6-1 Relevant Supporting Information.

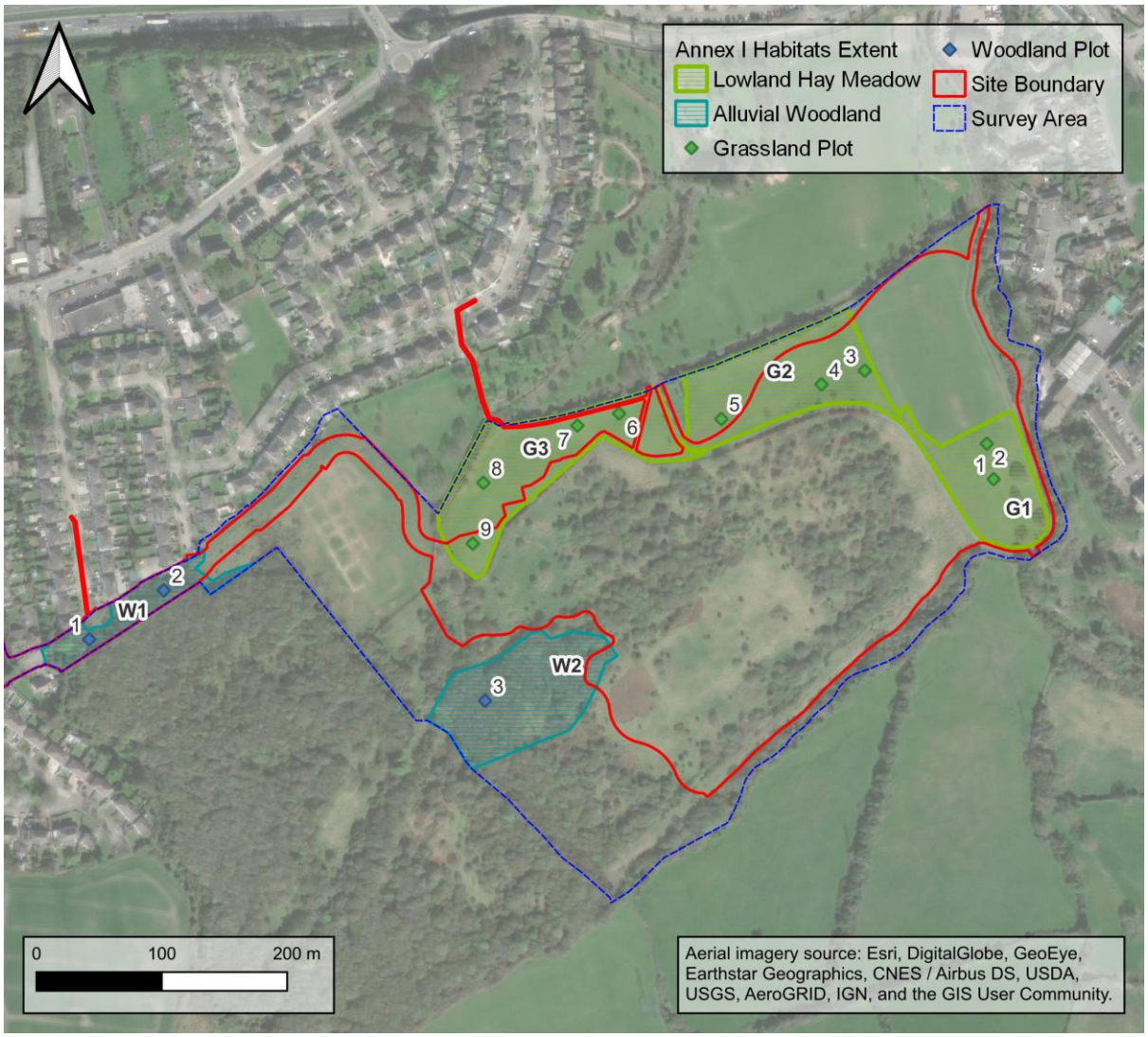
2.4 Limitations

No limitations that constrain the results of the surveys were identified.

3. Results and Discussion

Habitat condition assessments were carried out on 17 June and 6 August 2025 during dry and bright weather conditions. The locations of the condition assessment plots for grasslands and woodlands are shown in Plate 1 and Figure A6-2b.

Plate 1: Habitat Condition Assessment Plots



3.1 Lowland Hay Meadow

The grasslands assessed are present in three relatively discrete parcels, labelled in Plate 1 as G1 (with Plots 1 and 2), G2 (with Plots 3-5), and G3 (with Plots 6-9). Note that Plots 6-9 (in Parcel G3) are within the grassland that was previously identified as Annex I Lowland Hay Meadow (Wilson and Denyer, 2021).

Five plots (Plots 1, and 6-9) passed all nine criteria, which is indicative of Good (or Favourable) habitat condition. Four plots passed eight criteria (Plots 2, 4, 5), each failing in relation to the total number of positive indicator species.

Plot 3 was the only plot to fail more than one criterion, failing in relation to the total number of positive indicator species and forb-to-graminoid ratio. All plots passed the criteria relating to high-quality indicator species, cover of negative indicator species, litter, woody vegetation and bracken, bare soil and disturbance.

Plots within the previously identified Lowland Meadow had a greater diversity of positive indicator species compared with plots in the other two grasslands, with Plots 7-9 supporting 3-4 high-quality indicators and a total of 7-8 positive indicators each, while Plots 1-6 supported 1-2 high-quality indicators and between 4-8 positive indicators each.

The full results of the 6510 Lowland Hay Meadow habitat condition assessment are presented in Table 1.

Table 1: 6510 Annex I Lowland Hay Meadow Condition Assessment

			Criteria (Target for Pass)									
Plot/ Parcel	**Photograph**	**Irish Grid Reference**	**Total No. Positive Indicator Species (≥7 Species in Plot + 20m Surrounding Area)**	**No. High-quality Indicator Species (≥1 Species in Plot + 20m Surrounding Area)**	**Forb to Graminoid Ratio (40-90% Forb Cover)**	**% Cover of Negative Indicator Species (≤10% Individually, ≤20% Collectively)**	**% Cover of Litter (≤25%)**	**% Cover of Scrub, Bracken and Heath (≤5%)**	**Sward Height (10-50 cm ≥50%)**	**% Cover of Bare Soil (≤10%)**	**Grazing and Disturbance (≤20m² Including in Local Vicinity)**	**Total Passes**
1 G1		O0312126632	Pass Eight species recorded: common spotted-orchid *Dactylorhiza fuchsii*, yellow-rattle *Rhinanthus minor*, red clover *Trifolium pratense*, meadow buttercup *Ranunculus acris*, rough hawkbit *Leontodon hispidus*, autumn hawkbit *Leontodon autumnalis*, ribwort plantain *Plantago lanceolata*	Pass Two species recorded: common spotted-orchid, yellow-rattle	Pass 50:50	Pass One species recorded: white clover *Trifolium repens*, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	9
2 G1		O0311626660	Fail Six species recorded in plot: common spotted-orchid, yellow-rattle, red clover, meadow buttercup, ribwort plantain One species recorded within 20m: autumn hawkbit	Pass Two species recorded: common spotted-orchid, yellow-rattle	Pass 40:60	Pass One species recorded: white clover, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	8
3 G2		O0301826719	Fail Four species recorded: yellow-rattle, red clover, meadow buttercup, ribwort plantain	Pass One species recorded: yellow-rattle	Fail 30:70	Pass Two species recorded: white clover, curly dock *Rumex crispus,* <20% collectively	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	7
4 G2		O0298426708	Fail Five species recorded: common spotted-orchid, yellow-rattle, meadow buttercup, ribwort plantain, meadow foxtail *Alopecurus pratensis*	Pass Two species recorded: common spotted-orchid, yellow-rattle	Pass 65:35	Pass One species recorded: curly dock, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	8
5 G2		O0290426680	Fail Five species recorded: common spotted-orchid, yellow-rattle, red clover, meadow buttercup, ribwort plantain	Pass Two species recorded: common spotted-orchid, yellow-rattle	Pass 65:35	Pass One species recorded: white clover, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	8

			Criteria (Target for Pass)										
Plot/ Parcel	Photograph	Irish Grid Reference	Total No. Positive Indicator Species (≥7 Species in Plot + 20m Surrounding Area)	No. High-quality Indicator Species (≥1 Species in Plot + 20m Surrounding Area)	Forb to Graminoid Ratio (40-90% Forb Cover)	% Cover of Negative Indicator Species (≤10% Individually, ≤20% Collectively)	% Cover of Litter (≤25%)	% Cover of Scrub, Bracken and Heath (≤5%)	Sward Height (10-50 cm ≥50%)	% Cover of Bare Soil (≤10%)	Grazing and Disturbance (≤20m² Including in Local Vicinity)	Total Passes
6 G3		O0282226684	Pass Seven species recorded: pyramidal orchid *Anacamptis pyramidalis*, common spotted-orchid, rough hawkbit, red clover, meadow buttercup, ribwort plantain, common hogweed *Heracleum sphondylium*	Pass Two species recorded: pyramidal orchid, common spotted-orchid	Pass 50:50	Pass One species recorded: white clover, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	9
7 G3		O0278926675	Pass Seven species recorded: pyramidal orchid, common spotted-orchid, ox-eye daisy *Leucanthemum vulgare*, rough hawkbit, red clover, meadow buttercup, ribwort plantain	Pass Three species recorded: pyramidal orchid, common spotted-orchid, ox-eye daisy	Pass 60:40	Pass One species recorded: white clover, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	9
8 G3		O0271426629	Pass Eight species recorded: bee orchid *Ophrys apifera*, common spotted-orchid, yellow-rattle, ox-eye daisy, rough hawkbit, red clover, meadow buttercup, ribwort plantain	Pass Four species recorded: bee orchid, common spotted-orchid, yellow-rattle, ox-eye daisy	Pass 75:25	Pass Two species recorded: white clover, ragwort, <20% collectively	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	9
9 G3		O0270626580	Pass Eight species recorded: pyramidal orchid, common spotted-orchid, yellow-rattle, ox-eye daisy, rough hawkbit, red clover, meadow buttercup, ribwort plantain	Pass Four species recorded: pyramidal orchid, common spotted-orchid, yellow-rattle, ox-eye daisy	Pass 75:25	Pass One species recorded: white clover, <10%	Pass Absent	Pass Absent	Pass	Pass Absent	Pass Absent	9

3.2 Alluvial Woodland

The woodlands assessed are present in two discrete parcels, labelled in Plate 1 as W1 which is located in a linear portion at the northwest corner of the Site (with Plots 1 and 2), and W2 (with Plot 3), however in reality both parcels are contiguous with the wider adjacent woodland parcel. W1 is nearly entirely located within the Site, whilst most of W2 is beyond the Site boundary.

Surveys of Plots 1 and 2 were carried out within woodland that was previously identified as Annex I Alluvial Woodland (Wilson and Denyer, 2021), whilst Plot 3 was carried out within a portion of the woodland that was not previously confirmed as Annex I but which was considered to have affinity for the habitat during the Fossitt habitat survey.

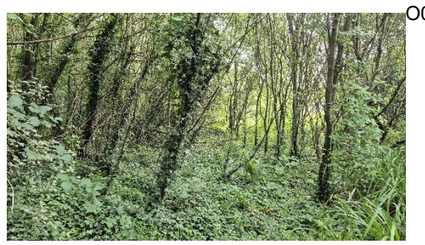
Plot 3 passed all eleven criteria. Plots 1 and 2, each passed ten criteria.

Plot 1 failed one criterion in relation to canopy height and Plot 2 failed in relation to bryophyte cover. All plots passed in relation to number of target and positive indicator species, with eight positive indicators each, although Plot 3 recorded a higher number of target species (two) than Plots 1 and 2 which, had one each. All plots passed the criteria relating to negative indicator cover, although it is worth noting that no negative indicators were recorded at Plot 3, while two negative indicator species were recorded at Plot 1 (sycamore *Acer pseudoplatanus* and cotoneaster *Cotoneaster* sp.) and Plot 2 (cherry laurel *Prunus laurocerasus* and cotoneaster).

All plots passed the criteria for canopy cover of native species, proportion of target canopy species, native shrub cover, dwarf shrub/field layer cover and field layer height, as well as the absence of indicators of grazing pressure.

The full results of the 91E0 Alluvial Woodland habitat condition assessment are presented in Table 2.

Table 2: 91E0 Annex I Alluvial Woodland Condition Assessment

			Criteria (Target for Pass)											
Plot/ Parcel	**Photograph**	**Irish Grid Reference**	**No. of Positive Indicator Species (≥1 Target Species and ≥6 Positive Species)***	**% Cover of Negative Indicator Species (≤10% Cover)**	**Presence of Negative Species Regeneration**	**Median Canopy Height (≥7m)**	**Total Canopy Cover (≥30%)**	**Proportion of Target Species in Canopy (≥50%)**	**% Cover of Native Shrub (10-75%)**	**% Cover of Native Dwarf Shrub/ Field Layer (≥20%)**	**Native Dwarf Shrub/Field Layer Height (≥20cm)**	**Bryophyte Cover (≥4%)**	**Grazing Pressure (All Five Indicators Absent**)**	**Total Passes**
1 W1		O0240026504	Pass Eight species recorded: ash *Fraxinus excelsior*, downy birch *Betula pubescens*, hawthorn *Crataegus monogyna*, remote sedge *Carex remota*, reed canary-grass *Phalaris arundinacea*, creeping buttercup *Ranunculus repens*, common nettle *Urtica dioica*, yellow iris *Iris pseudacorus*, *Thamnobryum alopecurum*	Pass Two species recorded: sycamore, cotoneaster, <1% cover	Pass Absent	Fail 5-6m	Pass 75%	Pass	Pass	Pass	Pass >20cm	Pass 10%	Pass Absent	10
2 W2		O0245926543	Pass Eight species recorded: willow *Salix spp.*, hawthorn, meadowsweet *Filipendula ulmaria*, reed canary-grass, wild angelica *Angelica sylvestris*, common nettle, yellow iris, remote sedge	Pass Two species recorded: cherry laurel, cotoneaster, <1% cover	Pass Absent	Pass 8m	Pass 85%	Pass	Pass	Pass	Pass >20cm	Fail 1%	Pass Absent	10
3 W3		O0271526455	Pass Eight species recorded: ash, willow, downy birch, hawthorn, creeping buttercup, common nettle, creeping bent *Agrostis stolonifera*, *Thamnobryum alopecurum*	Pass Absent	Pass Absent	Pass 8m	Pass 85%	Pass	Pass	Pass	Pass >20cm	Pass 65%	Pass Absent	11

**Target species underlined. **Grazing pressure recorded based on the presence of topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, recent bark stripping, and trampling.*

4. Summary

Previous survey of the Site and Survey Area identified the Annex I priority habitat 91E0 Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior* and the Annex I habitat 6510 Lowland Hay Meadows *(Alopecurus pratensis, Sanguisorba officinalis)* (Wilson and Denyer, 2021).

These habitats were resurveyed by AECOM Ecologists in June and August 2025. Habitat surveys were carried out using Fossitt habitat survey methods and identified Annex I habitats were subsequently subject to condition assessment using published NPWS guidance. Further woodland and grassland parcels were also identified to have affinity with Annex I Alluvial Woodland and Lowland Meadow and were also subject to condition assessments.

Of the two plots within grassland parcel G1, only Plot 1 passed all criteria, with Plot 2 only failing on total number of positive indicators, for which the plot was one species short. However, the Plot 2 did contain two high-quality indicators, so this fail is considered marginal. G1 is considered to be in Good (or Favourable) habitat condition.

At grassland parcel G2, Plot 3 failed two criteria; only four positive indicators were recorded, and the plot had a poor forb to grass ratio. In addition, Plots 4 and 5 also both failed the total number of positive indicators, for which both plots were two species short. It is worth noting that Plot 3 is adjacent to a strip of grassland that was previously disturbed as part of a wayleave for a pipeline (noted by AECOM during a previous site visit in September 2021). Despite this former disturbance, parcel G2 is showing apparent increasing diversity, though overall the parcel is considered to be in Unfavourable condition. However, it is worth noting that with time and continuation of existing management, this parcel is likely to continue to develop into a species-rich sward.

Grassland parcel G3 passed all criteria across all four plots (6-9) and had a greater diversity of positive indicator species compared with the other two grassland parcels, with 3-4 high-quality indicators 7-8 positive indicators in three of the plots. This included three different orchid species; it is worth noting that, whilst high-quality indicator species, pyramidal orchid is generally a coastal species, whilst bee orchid is often found in disturbed areas, though can be found in mesotrophic grasslands. G3 is considered to be in Good (or Favourable) habitat condition.

Information signs noted by AECOM during a previous site visit in September 2021 (though not observed in 2025) indicated that the grasslands were specifically managed to be “pollinator friendly”. A high abundance of yellow-rattle (and to a lesser extent, ox-eye daisy) may indicate that additional sowing has taken place within these grasslands. Whether or not this is the case, it does not necessarily detract from the existing diversity and condition of these grasslands.

Woodland parcels W1 and W2 are both part of a larger parcel of Alluvial Woodland, which extends south and west of the Site boundary.

Of the two plots within woodland parcel W1, Plot 1 failed one criterion in relation to canopy height and Plot 2 failed one criterion in relation to bryophyte cover, however both plots passed all other criteria. In woodland parcel W2, Plot 3 passed all eleven criteria. Both woodland parcels are therefore considered to be in Good (or Favourable) habitat condition.

5. References

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Annex A Indicator Species

Table A.1 contains the list of positive indicator species used in the assessment of Lowland Hay Meadows (6510). Table A.2 contains examples of negative indicators.

Table A.1: List of Positive Indicator Species for 6510 Lowland Hay Meadows

Scientific Name	Common Name
High-quality Indicators	
Bromus racemosus	Smooth brome
Hordeum secalinum	Meadow barley
Knautia arvensis	Field scabious
Leucanthemum vulgare	Ox-eye daisy
Lotus corniculatus	Bird's-foot trefoil
Pimpinella major	Greater burnet saxifrage
Rhinanthus minor	Yellow-rattle
Sanguisorba officinalis	Great burnet
Tragopogon pratensis	Goat's beard
Orchid species	
Positive Indicators:	
Alopecurus pratensis	Meadow foxtail
Centaurea nigra	Knapweed
Crepis capillaris	Smooth hawksbeard
Daucus carota	Wild carrot
Filipendula ulmaria	Meadowsweet
Heracleum sphondylium	Common hogweed
Hypochaeris radicata	Cat's ear
Lathyrus pratensis	Meadow vetchling
Leontodon autumnalis	Autumn hawkbit
Leontodon hispidus	Rough hawkbit
Plantago lanceolata	Ribwort plantain
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow buttercup
Trifolium pratense	Red clover
Trisetum flavescens	Yellow oat-grass
Viccia cracca	Tufted vetch

Source: Martin et al. (2018)

Table A.2: List of Negative Indicator Species for 6510 Lowland Hay Meadows

Scientific Name	Common Name
Arrhenatherum elatius	False oatgrass
Cirsium arvense	Creeping thistle
Cirsium vulgare	Spear thistle
Dactylis glomerata	Cock's-foot
Lolium perenne	Perennial ryegrass
Rumex crispus	Curly dock
Rumex obtusifolius	Broadleaved dock
Senecio jacobaea	Ragwort
Trifolium repens	White clover
Urtica dioica	Nettle

Source: Martin et al. (2018)

Table A.3 contains the list of positive indicator species used in the assessment of Alluvial Woodlands (91E0). Table A.4 contains examples of negative indicators recorded at a national level in Alluvial Woodlands (91E0).

Table A.3: List of Positive Indicator Species for 91E0 Woodlands

Scientific Name	Common Name
Target Species:	
Alnus glutinosa	Alder
Fraxinus excelsior	Ash
Salix cinerea	Grey Willow
Salix spp.	Other willow species
Other Woody Species:	
Betula pubescens	Downy birch
Crataegus monogyna	Hawthorn
Solanum dulcamara	Bittersweet
Viburnum opulus	Guelder-rose
Herbs, Ferns, and Graminoids:	
Agrostis stolonifera	Creeping bent grass
Angelica sylvestris	Wild angelica
Carex remota	Remote sedge
Filipendula ulmaria	Meadowsweet
Galium palustre	Marsh bedstraw
Iris pseudacorus	Yellow Iris
Lycopus europaeus	Gypsywort
Mentha aquatica	Water mint
Phalaris arundinacea	Reed canary-grass
Ranunculus repens	Creeping buttercup
Rumex sanguineus	Wood dock
Urtica dioica	Common nettle
Mosses:	
Calliergonella cuspidata	
Climacium dendroides	
Thamnobryum alopecurum	

Source: Daly et al. (2023).

Table A.4: Negative indicator examples from national 91E0 woodlands

Scientific Name	Common Name
Trees:	
Acer pseudoplatanus	Sycamore
Fagus sylvatica	Beech
Aesculus hippocastanum	Horse-chestnut
Picea spp.	Spruce species
Abies spp.	Fir species
Larix decidua	Larch
Alnus incana	Grey alder
Populus spp.	Poplar species
Tsuga heterophylla	Western hemlock
Pterocarya fraxinifolia	Caucasian wingnut
Shrubs/Herbs:	
Ribes spp.	Currant species
Impatiens glandulifera	Himalayan balsam
Rhododendron ponticum	Pontic rhododendron
Cornus sericea	Red-osier dogwood
Prunus laurocerasus	Cherry laurel
Cotoneaster spp.	Cotoneaster
Symphoricarpos albus	Snowberry
Escallonia spp.	Escallonia
Reynoutria japonica	Japanese knotweed
Leucojum aestivum	Summer snowflake
Ligustrum spp.	Privet species
Luma apiculata	Chilean myrtle
Lysichiton americanus	American skunk-cabbage
Selaginella kraussiana	Krauss's clubmoss
Crocosmia × *crocosmiiflora*	Montbretia

Source: Daly et al., 2023.