Appendix H Habitat Surveys

Part 1 - Habitat Surveys 2018

Part 2 - Habitat Surveys 2019

Part 3 - 2023 update of Annex 1 Habitat Results 2019 (Appendix H - Part 2)

Part 4 - Soil Depth measurements of various transects in Polygon 1f (10 March 2020)

H.1 Part 1 Habitat Surveys 2018

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N6 Galway City Ring Road

Habitat mapping and assessment of a section of Lough Corrib cSAC and surrounding areas

2017

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1 Introduction

BEC Consultants Ltd were appointed by Scott Cawley to carry out habitat surveys, assess Annex I habitats and collect relevés from sections of Lough Corrib candidate Special Area of Conservation (cSAC) (site code 000297) and additional adjoining areas (Figure 1) which occur within the study area of the N6 Galway City Ring Road (GCRR). This report presents the findings of these surveys carried out during 2014 and incorporates data collected from the area by BEC Consultants during 2013 (Perrin *et al*., 2013).

The aim of the surveys was to provide a baseline dataset for use during consideration of the development of the GCRR and to inform any potential transport solutions which will traverse the scheme study area. The objectives for the survey were to:

- map habitats within the study area recording a number of common and, where appropriate, characteristic, plant species from each mapped polygon;
- record where habitats conform to those listed in Annex I of the EU Habitats Directive, and make a rapid assessment of the habitat value of these areas;
- assess the Annex I habitats using standard assessment criteria developed by the National Parks & Wildlife Service (NPWS);
- record a number of relevés to support the mapping data collected;
- survey areas of potential priority *6210 Calcareous grassland identified by Perrin *et al.* (2013);
- refine mapping of wooded limestone pavement areas which had been mapped as 'Part 8240' by Perrin *et al.* (2013); and
- where possible, relate habitat mapping to vegetation communities developed by NPWS.

Work was conducted by BEC Consultants Ltd, with some of the wetland areas at Coolagh Lakes and Coolanillaun Bog also surveyed and assessed by Wetland Surveys Ireland (WSI) (Crushell & Foss, 2014a, b). All survey work carried out in 2014 was conducted between May and September 2014. The study area for this work was a sub-set of the scheme study area, being mainly concentrated within the cSAC. A number of outlying areas adjacent to the cSAC (west of the River Corrib, west and northwest of Coolagh Lakes, and north of Menlough Road) were also included within the study area.

The convention of indicating priority Annex I habitats by an asterisk (*) is followed in this report.

2 Methods

2.1 Previous surveys

In 2013, habitat mapping and a number of habitat assessments were conducted within the Lough Corrib cSAC at Menlough (northeast of Coolagh Road), at areas adjacent to the River Corrib at Dangan Lower and Menlough, and at areas of limestone pavement at Ballygarraun to the east of the current survey area. The data from Perrin *et al*. (2013) which were collected within the current study area have been incorporated into the current project. Data pertaining to Ballygarraun have been updated and are presented separately in Perrin (2014).

Some habitat mapping data were available from Wilson & Fernández (2013), who carried out a national survey of limestone pavement habitat for NPWS. The limestone pavement northeast of Menlough Road was sampled during this survey, with four monitoring stops (100 m x 100 m) being established. The habitat polygons created for the National Survey of Limestone Pavement (NSLP) were incorporated into the polygons used by Perrin *et al.* (2013) which were subsequently used

during this project. This report also presented results from four assessments for *8240 exposed Limestone pavement and two from 6210 Calcareous grassland.

In preliminary work for the GCRR, a habitat map was created through aerial photograph interpretation by Forest, Environmental Research and Services Ltd. (FERS, 2013), which covered the study area for most of the current project (except Coolanillaun Bog). Polygons generated by FERS were used as the basis for habitat mapping for the areas around Coolagh Lakes and west of the River Corrib.

A report was prepared by Conaghan (2000) which described and assessed habitats along previously proposed routes for the Galway Outer Bypass. This included habitats at Dangan Lower, Coolagh Lakes and the limestone plateau, many of which were considered by Conaghan (2000) as corresponding to Annex I habitats.

2.2 Initial habitat mapping

A GIS model was created to incorporate the mapping from Perrin *et al*. (2013) with polygons created by FERS (FERS 2013). Some re-digitisation of polygon boundaries was carried out prior to habitat mapping in the field. Coolanillaun Bog had not been covered by either of the 2013 studies, so polygon boundaries were created by WSI. All of the areas represented by polygons within the GIS were then viewed in the field and assigned to Heritage Council habitat codes (Fossitt, 2000) and, where relevant, Annex I habitat types. Waypoints were collected on a GPS unit and field maps were annotated to indicate where re-digitisation of polygons was necessary; this was carried out in the office.

Initial habitat mapping was conducted for the area around Coolagh Lakes and the section of the study area west of River Corrib in May 2014. This comprised mapping to level 3 of the Heritage Council habitat codes (Fossitt, 2000) with areas of Annex I habitat also being identified. Initial habitat mapping of Coolanillaun Bog was conducted by WSI during August 2014. Initial habitat mapping of the area northeast of Coolagh Road had been completed by Perrin *et al*. (2013).

2.3 Stage 2 mapping

Stage 2 mapping comprised all polygons being revisited and notes made on the main plant species (three common species and up to three characteristic species) occurring within the polygon. When applicable a short note was also made to describe the habitat and any impacts were noted. For polygons which represented a mosaic of habitats, an approximate percentage cover for each component habitat was recorded.

In addition, polygons which represented Annex I habitats were considered on a rapid quality assessment scale of 1-3, taking general habitat condition and impacts into account, whereby:

1 = the habitat was a poor example of the Annex I habitat;

2 = the habitat was a good example of the Annex I habitat; and

3 = the habitat was an excellent example of the Annex I habitat.

In general, a rating of 1 was assigned to habitats which barely met the criteria to be considered as the Annex I habitat, or Annex I habitats with significant impacts operating on them, such as heavy encroachment by scrub on exposed *8240 Limestone pavement. All wooded limestone pavement was assigned a rating of 1. It should be noted, however, that the impacts should not be so significant that the integrity of the Annex I habitat has been lost; a rating of 1 means that the habitat is in poor condition, but is still Annex I habitat. A rating of 3 was assigned to habitats which exceeded the criteria to be considered as the Annex I habitat, and which were generally free (or almost free) of negative impacts, and/or which were undergoing appropriate management. A rating of 2 was

assigned to any Annex I habitats that fell between these two extremes. Some correspondence was retrospectively applied between this rapid quality assessment scale and assessment stop results, in that a polygon containing a monitoring stop that failed the structure and functions could not receive a rating of 3.

Stage 2 mapping was conducted between July and September 2014. Additional visits to specific polygons were made in January 2015, May 2017 and June 2017. Data recorded from this stage were added to the attributes table within the GIS. Following Smith *et al.* (2011) a DATA_QUAL column was included in the final attributes file to indicate the survey method used for each polygon based on the following codes:

- S= Field data collected from a walkover survey;
- V= Data have been field validated, where the habitat has been viewed in the field in less detail; and
- DD=Habitat information has been derived from aerial photograph interpretation.

Smith *et al.* (2011) notes further codes to describe data of lesser quality but these are not relevant to this project.

A field, NRA_RATING, was included in the attributes table to contain the National Roads Authority (NRA) ecological rating (NRA, 2009) for each of the polygons. Values were assigned as follows:

- All Annex I polygons within the cSAC were assigned the value “International Importance”.
- Annex I polygons outside the cSAC were assigned ratings of International, National and County Importance, based on the Quality rating assigned to them during the survey (3, 2 and 1 respectively).
- Non-Annex polygons outside the cSAC were mainly evaluated on an overall habitat basis, these largely informed by the vegetation communities and/or Fossitt habitats, using the following criteria:
    - All PF, FS, WN, WD, WS, FW, FL habitats assigned to High Local Importance except WS3, WS5 and WD5 assigned to Low Local Importance (see Fossitt 2000 for further details of the codes given).
    - WL1/WL2 assigned to High Local Importance if they add significantly to connectivity or are relatively undisturbed, otherwise assigned to Low Local Importance.
    - HD1 assigned to either High or Low Local Importance on a case-by-case basis, depending on context and other habitats within the polygon (if any).
    - GS communities: All assigned to High Local Importance except communities 3b and 2c, which are assigned to Low Local Importance (more semi-improved community types).
    - ER2: Low Local Importance
    - ED3 assigned to either High or Low Local Importance on a case-by-case basis, depending on species, context and other habitats within the polygon (if any).
    - BL3, GA1, GA2, ED2: No Ecological Importance.
- For non-Annex polygons inside the cSAC, a qualifier “located in SAC” was added. Note that, while all habitats within a cSAC should, according to the NRA guidelines (NRA, 2009), automatically receive a rating of International Importance, the methodology followed here was deemed to be more useful for the overall decision-making process.

Finally, a field, ECO_VALUE, was included in the attributes table to contain a modified version of the NRA ecological rating for each of the polygons. For this field, all Annex I polygons, regardless of whether they were in the cSAC or not, were assigned the value “International Importance”. The values for all non-Annex polygons were the same as the NRA_RATING field.

2.4 Relevés

Representative relevés were collected across the survey area to support the habitat classification given during the mapping exercise and to provide additional data on the conservation value of habitats. Survey time was not spent collecting relevés from habitats within the cSAC which were not of conservation interest (e.g. BL3 Buildings and artificial surfaces), and habitats which are difficult to access (e.g. certain types of WS1 scrub) are under-represented within the relevé data.

Cover of all vascular plants and bryophytes in vertical projection was recorded as a percentage of each plot. Bryophyte samples were collected where necessary and identified later in the lab. Data were entered onto a handheld computer in the field using TurbovegCE.

2.5 Conservation assessment of Annex I habitats

The conservation status of each Annex I habitat was assessed following the guidelines available from NPWS. The purpose of this assessment was to determine the current quality and condition of the Annex I habitats within the study area, highlighting areas which were in particularly good condition and those which might be experiencing management pressures. As the study area did not cover the full extent of the cSAC the results of the assessment can only be considered representative of the study area and not the whole of the cSAC. The results presented here represent baseline data for these habitats and thus (with the exception of the Area assessment) there are no previous data that can be used to draw conclusions on trends in habitat condition (i.e., improvement, stability or decline).

The guidelines, which have been developed specifically for habitats occurring within Ireland, are based on the approach used for the national conservation assessment of Annex I habitats, which is carried out according to guidelines published by the EU (Evans & Arvela, 2011). It utilises four main parameters to assess the habitats at a national level: range, area (extent), structure and functions, and future prospects. This approach has been applied to the conservation assessment of Annex I habitats within individual sites for a number of different national habitat studies such as the Limestone Pavement Monitoring Project (Wilson & Fernández, 2013), Coastal Monitoring Project (Ryle *et al*., 2009), Woodland Monitoring Survey (O'Neill & Barron, 2012) and the Irish Semi-natural Grasslands Survey (ISGS) (O'Neill *et al*., 2013). These assessments adopted a "traffic light" system of assessment for the four criteria, as shown in Table 1.

Table 1. Summary matrix of the parameters and conditions required to assess the conservation status of Annex I habitats. Modified from Ryle *et al*. (2009).

	Favourable	***Unfavourable – Inadequate***	***Unfavourable – Bad***
Range	Stable	>0 - <1% decline per year	≥1% decline per year
Area	Stable	>0 - <1% decline per year	≥1% decline per year
Structure & functions	Stable	1 – 25% of area is unfavourable	> 25% of area is unfavourable
Future prospects	Prospects excellent or good, long-term viability of habitat assured	Intermediate between *Favourable* and *Unfavourable – Bad*	Severe impact from threats, habitat declining rapidly
Overall	*All parameters green*	*Combination of green and amber*	*One or more parameters red*

Range considers the national range (distribution) of a habitat, so it is omitted from assessments carried out on an individual site.

Assessment of area is concerned with detecting changes in the extent of the Annex I habitat over time, particularly habitat losses. The actual parameter measured is percent annual change for the period over which the change is being assessed. Habitat loss or gain at a site can be assessed by reviewing aerial photographs or satellite imagery *in lieu* of baseline habitat mapping though this technique is limited by the availability and quality of historic images and in general only gross habitat changes can be detected with any degree of certainty.

The structure and functions assessment examines a number of criteria that measure the health and overall functioning of the Annex I habitat. These criteria vary, depending on the habitat being assessed. For terrestrial habitats such as those considered for this project, a range of criteria, such as vegetation height, plant species cover and disturbance, are considered to gauge the condition of the habitat and thus to derive their conservation status. The structure and functions of the habitat was assessed by recording monitoring stops which examine the condition of the habitat in addition to providing relevé data for the location. Structure and functions criteria are assessed at each stop based on habitat-specific criteria, with each criterion having a target value which must be reached for it to pass. A failure of one or more criteria to meet a required target causes the stop to fail, except for *8240 Limestone pavement (exposed and wooded types) and *91E0 Alluvial forests, where a single criterion failure may be allowed. The percentage of assessment stops that pass or fail the structure and functions assessment is used as a proxy for the percentage of the area that passes. This assumes that all assessment stops represent and assess a similar area of habitat. It should be noted that failure of an assessment stop, or an assessment result of *Unfavourable*, does not necessarily mean that the habitat is non-Annex or of low conservation value, but rather that it is in need of improved management.

The future prospects parameter assesses how likely the Annex I habitat is to continue to move towards, or remain at, favourable conservation status. According to Evans & Arvela (2011), the future prospects parameter is partly dependent on the area and structure and functions parameters, with impacts, threats and pressures operating on the Annex I habitat also taken into account to determine the likely future trend and status of the habitat. Pressures and threats on Annex I habitats were recorded during fieldwork and adapted to the codes of Ssymank (2011). The nature of each impact (positive, negative or neutral), its intensity (high, medium or low), and the percentage of the Annex I habitat affected were recorded.

Assessment criteria were available from NPWS for the majority of the Annex I habitats recorded (Table 2). The criteria by which habitats were assessed are available in the publications referenced in Table 2 below, together with more complete descriptions of the assessment methodology for each Annex I habitat.

The assessment criteria developed through the National Survey of Upland Habitats (NSUH) have been based primarily on data from upland situations and may not be directly relevant to the lowland examples of these habitats as recorded during the current project. However, as part of this project WSI reviewed the NSUH criteria for 7230 Alkaline fens and 7140 Transition mires and quaking bogs, and considered them appropriate for use on lowland examples of the habitat (Crushell & Foss, 2014a). Criteria for *7120 *Cladium mariscus* fens were developed for this project by WSI (Crushell & Foss, 2014a) as there has been no comprehensive study of the habitat and it has not been described previously in an Irish context. Criteria for 6430 Hydrophilous tall-herb communities were based on data collected during the Irish Semi-natural Grasslands Survey (ISGS) (O'Neill *et al*., 2013) and in general these were considered suitable for assessing unmanaged swamp communities; however, an adjustment was introduced in allowing a higher cover (70%) of the reed species *Phragmites australis*

(common reed) and *Phalaris arundinacea* (reed canary grass) to be present in the relevé before the stop would fail.

Table 2. Annex I habitats recorded, the reference for assessment criteria used, and the size of relevé.

Annex I habitat code	Habitat name†	Reference	Relevé size (metres)
4010	Wet heaths	Perrin *et al.* (2014)	2 x 2
4030	Dry heaths	Wilson & Fernández (2013)	1 x 1 / 2 x 2
4060	Alpine and Boreal heaths	Wilson & Fernández (2013)	1 x 1 / 2 x 2
(*)6210	Calcareous grassland (* important orchid sites)	O'Neill *et al.* (2013)	1 x 1 / 2 x 2
6410	*Molinia* meadows	O'Neill *et al.* (2013)	2 x 2
6430	Hydrophilous tall-herb communities	O'Neill *et al.* (2013)	2 x 2
(*)7130	Blanket bogs (* active)	Perrin *et al*. (2014)	2 x 2
7140	Transition mires and quaking bogs	Perrin *et al.* (2014)	2 x 2
*7210	*Cladium* fens	Crushell & Foss (2014a); criteria developed for GCRR project	2 x 2
7230	Alkaline fens	Perrin *et al.* (2014)	2 x 2
*8240	Limestone pavement	Wilson & Fernández (2013)	5 x 5
*91E0	Alluvial forests	O'Neill & Barron (2013)	10 x 10

† Abbreviated Annex I habitat names are used throughout this report; full Annex I habitat titles are available in CEC (2013)

2.6 Definition of Annex I habitats

Of the 15 Annex I habitats surveyed during this study, the majority are well defined by recent national studies co-ordinated by NPWS (listed in Table 2). Some further definition was required for wooded *8240 Limestone pavement, and this is described below. For *7210 *Cladium mariscus* fens there has been no comprehensive study of the habitat and it has not been described previously in an Irish context. WSI reviewed the available literature and developed assessment criteria for this habitat for use during this project, as there were no existing criteria by which to assess the habitat; these are presented in Appendix 1. Following this review, the species-poor *Cladium mariscus*-dominated swamp community was included within the Annex I habitat type. Some published sources have not included this variant within the Annex I habitat type (Fossitt, 2000; NPWS, 2013) but it equates to the British NVC Community "S2 *Cladium mariscus* swamp and sedge-beds *Cladietum marisci*" (Rodwell *et al*., 1995), which is listed in the Interpretation Manual of EU Habitats (CEC, 2013) as corresponding to the Annex I habitat. The interpretation for this Annex I habitat that is presented in this report is consistent with that used in other countries, e.g. the UK (www.jncc.defra.gov.uk) and Germany (www.bfn.de).

Though the Interpretation Manual does not specifically mention woodland being a component of the Annex I definition for *8240 Limestone pavement, its inclusion appears widely accepted (JNCC, 2009, 2014; Wilson & Fernández, 2013). The Interpretation Manual does include "scrub... (e.g. *Corylo-Fraxinetum*)", and the two corresponding categories from the UK National Vegetation Classification which relate to *8240 Limestone pavement are both woodland types. It is, however, stated by Rodwell *et al.* (2000) that limestone pavement habitats do not fit well in the NVC system, with there being nothing encountered that cannot be described in terms of fragments, or complexes of a variety of vegetation types, already represented elsewhere within the classification.

The National Survey of Limestone Pavement (NSLP) (Wilson & Fernández, 2013) describes two pavement types based on their morphology:

- blocky, characterised by a well-defined structure of clints and grikes; and
- shattered areas of loose rubble which generally lack a well-defined structure of clints and grikes.

Wooded limestone pavement is described in the NSLP as a habitat which "includes low woodland formations dominated by Hazel and/or Ash with typical blocky pavement under the canopy". No justification is provided as to why hazel/ash woodland which has developed over shattered pavement is not included within the Annex I type. The EU Interpretation Manual does include 'shattered pavements' within its definition of the Annex I habitat. Recognising areas of blocky pavement as opposed to shattered pavement under woodland, when the ground is carpeted in a cover of bryophytes, can be difficult. Indeed, both blocky and shattered pavement types frequently occur together, which further complicates the distinction. The species occurring in woodland over blocky pavement and shattered pavement would be similar and can indeed be found in calcareous woodland on deeper soils, so the species do not assist in defining the habitat. As such, it was decided for this project to define wooded *8240 Limestone pavement as having a closed canopy of trees at least 3 m tall with at least 50% of the surface comprising bedrock at the surface (the bedrock was normally covered by mosses) and retaining some evidence of limestone pavement structure. In the wooded limestone pavement habitats encountered during this survey, soil was generally present but was thin (< 2 cm), though could be deeper in places – for example, in old grikes – due to a build-up of humus.

2.7 Vegetation community mapping

Relevés were referred *post hoc* to vegetation communities from the relevant NPWS habitat surveys (Table 2). The limitations of these community descriptions should be recognised, as the vegetation communities have been developed on a project-specific basis rather than as part of an Irish Vegetation Classification, and as such they may have been analysed following different methodologies and at different scales. Some of the communities have been developed based on hundreds of relevés from across the country, while others are based on fewer than 10 representative samples. There is also some overlap between the projects, e.g. both the NSLP and the ISGS have sampled and described calcareous grassland communities. Expert judgment was therefore applied in deciding which vegetation communities to use.

Irish vegetation communities have not been published recently for some of the communities which were recorded, including *Cladium mariscus* fen, reed swamp, scrub and improved grassland. During this study a detailed community definition was developed and applied for *Cladium mariscus* fen and *Cladium mariscus* swamp. For other communities, where recently published vegetation data were not available, either the Fossitt habitat, the Fossitt habitat in combination with the Annex I habitat, or the Fossitt habitat in combination with abundant characteristic species were utilised (Table 3).

A total of 333 relevés recorded during this study were classified to a vegetation community, and these communities were then utilised as a reference to assist in the classification of the most frequent vegetation community within each surveyed polygon. *8240 relevés were classified to the more detailed communities listed in Wilson & Fernández (2013), whereas *8240 polygons were classified using the broader vegetation types of limestone pavement exposed (LPE) and limestone pavement wooded (LPW); limestone pavement grassland/heath was never recorded as the most frequent vegetation community within a polygon.

It should be noted that for a few polygons it was not possible to confidently assign a vegetation community based on the available data. On the maps (Figures 6a-d), these instances are indicated as 'Not assigned'. In the GIS shapefile, a number of different descriptors were used, as follows: 'Intermediate' was utilised to indicate the intermediate nature of the community; 'None' was used to denote polygons of built land and other man-made habitats where there was no recognisable

vegetation community; 'Not walked' was used in cases where polygons could not be accessed for a walkover survey; a limited number of habitats were assigned only to Fossitt (2000) category, and were not broken down further into separate communities, with the Fossitt (2000) code serving as the vegetation community in these cases.

Table 3. Novel vegetation communities. All alphanumeric abbreviations, such as FS1, refer to Fossitt (2000).

Vegetation community	Description
FS1_*7210	*Cladium mariscus* swamp as described in Crushell & Foss (2014a)
FS1_6430	FS1 swamp community with indicator species for the 6430 Annex I habitat
FS1_7140	FS1 swamp community with indicator species for the 7140 Annex I habitat
FS1_Phragmites	FS1 swamp community with *Phragmites australis* dominant, often >70% cover
FS1_Scirpus	FS1 swamp community with *Scirpus lacustris* dominant
FS1_Sparganium	FS1 swamp community with *Sparganium erectum* dominant
FS2_*7210	*Cladium mariscus* swamp as described in Crushell & Foss (2014a), with a higher broadleaf herb component and/or lower *Phragmites australis* cover than FS1_*7210
FS2_6430	FS2 swamp community with indicator species for the 6430 Annex I habitat
FS2_Sparganium	FS2 swamp community with *Sparganium erectum* abundant
GM1_6430	GM1 community with indicator species for the 6430 Annex I habitat. This community is a subset of the grassland community 1b (O'Neill *et al.,* 2013)
HH4_4060_Dryas	HH4 heath community with a population of *Dryas octopetala*
PF1_*7210	*Cladium mariscus* fen as described in Crushell & Foss (2014a)
PF1_6430	Tall herb fen community with indicator species for the 6430 Annex I habitat
PF1_Juncus subnodulosus	Fen community with abundant *Juncus subnodulosus* that could not be classified using Perrin *et al.* (2014)
PF1_Molinia	Fen meadow community with abundant *Molinia caerulea* that could not be classified using O'Neill *et al.* (2013) or Perrin *et al.* (2014)
WS1_Myrica	Scrub community with abundant *Myrica gale* that could not be classified using Perrin *et al*. (2008)
WS1_Prunus, WL1_Prunus	Scrub or tree line community with abundant *Prunus spinosa* that could not be classified using Perrin *et al.* (2008)
WS1_Rubus, WL1_Rubus	Scrub or tree line community with abundant *Rubus fruticosus* agg. that could not be classified using Perrin *et al*. (2008)
WS1_Ulex	Scrub community with abundant *Ulex europaeus* that could not be classified using Perrin *et al*. (2008)
WD1_Alnus incana, WD1_Ulmus sp., WS3_Fallopia	Communities with a significant % of non-native trees or shrubs, with the most abundant non-native species noted

2.8 Potential priority habitat *6210 Calcareous grassland

Perrin *et al*. (2013) identified a number of polygons as the Annex I grassland habitat 6210 Semi-natural grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). At the time of survey in late summer 2013, it was not possible to determine if these corresponded to the priority habitat version of this habitat (*important orchid sites) due to the early flowering period of many orchids. In order to qualify as the orchid-rich priority habitat, *6210 calcareous grassland should

support a population of any orchid species other than the relatively common *Dactylorhiza fuchsii* and *Dactylorhiza maculata* (O'Neill *et al*., 2013).

Each of the polygons identified as having 6210 Calcareous grassland within the area northeast of the Menlough Road were revisited in June 2014 with a view to determining whether they qualified as the priority habitat type, and representative photographs were taken. Where polygons were considered to support suitable orchids, then the habitat map was updated from 6210 Calcareous grassland to *6210 Calcareous grassland (important orchid site), the priority habitat version of this habitat.

3 Results

3.1 Habitat mapping

The extent of the survey area, which covers 478.2 ha, is shown in Figure 1. Excluding the area covered by rivers and lakes, the area surveyed and mapped for this project in 2013 and 2014 is 388.8 ha. The habitat maps presented in Figures 2a-d were created in ArcMap and show the habitats according to the Fossitt (2000) classification scheme. A total of 41 Fossitt (2000) habitats were recorded during the survey. It should be noted that, where a mosaic of habitats was recorded, only the primary habitat (i.e., the one with the highest percentage cover) is represented. A summary of the area of the Fossitt habitats surveyed is presented in Table 4, and further data are available in the associated GIS shapefile.

Table 4. Extent of Fossitt habitats within the survey area.

Fossitt code	Habitat	Area (ha)
BL1	Stone walls and other stonework	0.22
BL3	Buildings and artificial surfaces	6.70
ED1	Exposed sand, gravel or till	<0.01
ED2	Spoil and bare ground	2.33
ED3	Recolonising bare ground	2.92
ED4	Active quarries and mines	0.30
ER2	Exposed calcareous rock	26.95
ER4	Calcareous scree and loose rock	0.01
FL1	Dystrophic lakes	0.13
FL3	Limestone/marl lakes	7.28
FL4	Mesotrophic lakes	0.04
FS1	Reed and large sedge swamps	28.76
FS2	Tall-herb swamps	4.06
FW2	Depositing/lowland rivers	81.99
FW4	Drainage ditches	0.50
GA1	Improved agricultural grassland	4.49
GA2	Amenity grassland (improved)	15.17
GM1	Marsh	3.61
GS1	Dry calcareous and neutral grassland	61.30
GS2	Dry meadows and grassy verges	7.34
GS4	Wet grassland	40.65
HD1	Dense bracken	1.24
HH2	Dry calcareous heath	0.42
HH3	Wet heath	8.00
HH4	Montane heath	0.08
PB3	Lowland blanket bog	6.19
PF1	Rich fen and flush	8.95
PF2	Poor fen and flush	0.10
PF3	Transition mire and quaking bog	4.11

Table 4 (ctd.)

Fossitt code	Habitat	Area (ha)
WD1	(Mixed) broadleaved woodland	12.78
WD2	Mixed broadleaved/conifer woodland	0.07
WD4	Conifer plantation	0.40
WD5	Scattered trees and parkland	1.55
WL1	Hedgerows	1.02
WL2	Treelines	2.31
WN2	Oak-ash-hazel woodland	59.99
WN6	Wet willow-alder-ash woodland	9.64
WS1	Scrub	66.10
WS2	Immature woodland	0.30
WS3	Ornamental / non-native shrubs	0.08
WS5	Recently-felled woodland	0.15
	Total site area	478.22

A total of 16 Annex I habitats, covering 155.2 ha, were recorded during the survey, counting all variants of habitats (i.e., priority, non-priority, wooded, exposed) separately. The aquatic Annex I habitat 3160 Dystrophic lakes was recorded but was not assessed as part of this project, which was focused on terrestrial habitats. The locations of all Annex I habitats are shown in Figures 3a-d. Mosaics of Annex I habitat are represented separately on the map. A summary of the area of the Annex I habitats surveyed is presented in Table 5.

Table 5. Extent of Annex I habitats within the survey area. *denotes priority habitat

Annex I code	Habitat	Area (ha)
3160	Dystrophic lakes	0.13
4010	Wet heaths	7.99
4030	Dry heaths	0.41
4060	Alpine and Boreal heaths	0.08
6210	Calcareous grasslands	6.98
*6210	Orchid-rich calcareous grasslands	12.08
6410	*Molinia* meadows	4.20
6430	Hydrophilous tall-herb communities	5.88
*7120	*Cladium* fens	10.61
7130	Blanket bog (inactive)	3.54
*7130	Blanket bog (active)	2.65
7140	Transition mires and quaking bogs	4.19
7230	Alkaline fens	3.11
*8240	Limestone pavement (exposed)	58.27
*8240	Limestone pavement (wooded)	26.74
*91E0	Alluvial forests	8.89
	Total area of Annex I habitats	**155.74**

The Annex I habitat that covered the greatest area was *8240 Limestone pavement, with both the exposed and wooded variants far exceeding the other Annex I habitats in extent. The two variants of *8240 together covered 85.0 ha, and therefore constituted over half of the Annex I habitat in the survey area.

The distribution of Annex I habitats with respect to the rapid quality assessment carried out during the field survey are represented in Figures 4a-d. Where two Annex I habitats occurring in mosaic within a polygon were ranked differently, the whole polygon was assigned according to the higher score. While taking the form of a rapid assessment of the overall quality of the Annex I habitat within the

polygon, these data complemented the assessment data and permitted some extrapolation in relation to where the best quality examples of the different Annex I habitats are to be found within the study area. Overall, just 32 Annex I polygons were assigned the highest quality rating of 3, covering an area of 7.1 ha. A total of 275 polygons received the middle quality rating covering 74.6 ha, and 378 Annex I polygons covering an area of 75.0 ha were given the lowest quality rating.

A total of 478.2 ha of habitat were surveyed, across both Annex I and non-Annex I habitats. A brief description of each mapped habitat follows below. Habitats which correspond to Annex I habitats are presented first (section 3.2), with non-Annex I habitats described subsequently (section 3.3).

Juniperus communis plants were located within the survey area on the limestone plateau, with up to 35 plants being recorded in one discrete location and a small number of additional isolated plants including some on limestone pavement east of Menlough Village and in one location at Coolanillaun Bog. Cooper *et al.* (2012) define the Annex I habitat 5130 *Juniper communis* formations as being formed from discrete clusters of 50 or more plants. A sufficient number of plants was not recorded to correspond to this Annex I habitat.

3.2 Annex I habitats

***8240 Limestone pavement (exposed)**

Corresponding Fossitt (2000) habitats: ER2 Exposed calcareous rock, WS1 Scrub

Limestone pavement is located on the eastern side of the River Corrib, with the main area occurring as a limestone pavement plateau to the northeast of Coolagh Road. There are additional pockets of *8240 Limestone pavement to the southeast of Coolagh Road between the Coolagh Lakes and Menlough Village, and also in Terryland to the east of Coolagh Lakes. This habitat consists of both the 'block' and 'shattered' variants of limestone pavement, with the shattered type being most frequent. The exposed variant also includes areas of limestone pavement being invaded by scrub (almost invariably *Corylus avellana*) that is not yet forming a continuous canopy and is less than 3 m in height. The main vascular species include scattered low-growing woody species (e.g. *Rubus fruticosus*, *Rosa spinosissima*, *Hedera helix* or immature *Corylus avellana* or *Ilex aquifolium*) and herbaceous species such as *Sesleria caerulea, Teucrium scorodonia, Mycelis muralis, Geranium robertianum, Senecio jacobaea, Carlina vulgaris* and *Carex flacca*. A suite of calcicole ferns is usually found, comprising *Asplenium ruta-muraria, Ceterach officinarum* and, in the deeper clefts (grikes), the shade-loving *Phyllitis scolopendrium*. Characteristic bryophytes are *Ctenidium molluscum*, *Tortella tortuosa* and *Neckera crispa.*

***8240 Limestone pavement (wooded)**

Corresponding Fossitt (2000) habitat: WN2 Oak-ash-hazel woodland

The wooded variant of *8240 Limestone pavement was recorded in areas of hazel woodland with a canopy of at least 3 m and minimal soil depth over at least 50% of the habitat. Soil depth and areas of exposed limestone pavement and boulders differentiate these rocky Annex I variants from non-Annex versions of WN2 Oak-ash-hazel woodland. Typical woody species include *Corylus avellana, Fraxinus excelsior, Crataegus monogyna, Sorbus aria* agg., *Euonymus europaeus, Ilex aquifolium, Prunus spinosa, Rubus fruticosus* agg., *Rosa spinosissima* and *Hedera helix.* The field layer contains species including *Fragaria vesca, Geum urbanum, Potentilla sterilis* and *Sesleria caerulea*. Rocks are sometimes completely covered by bryophytes such as *Eurhynchium striatum, Neckera crispa* and *Thamnobryum alopecurum*, but soil is typically lacking underneath the moss growth. These areas often occur in mosaic with non-Annex I scrub or woodland. Within the study area, wooded *8240 Limestone pavement is confined to the eastern side of the River Corrib and was recorded primarily to

the northeast of the Coolagh Road, but it was also found to occur southeast of Coolagh Road between Coolagh Lakes and Menlough Village, and in Terryland east of Coolagh Lakes.

6210 Calcareous grassland and *6210 Orchid-rich calcareous grassland

Corresponding Fossitt (2000) habitat: GS1 Dry calcareous and neutral grassland

The main areas of species-rich calcareous grassland were found to the northeast of Coolagh Road. Additional examples were recorded between Coolagh Lakes and Menlough Village, at Terryland to the east and south of Coolagh Lakes, on Jordan's Island, and west of the River Corrib to the north of Corrib Village. The thin soils support a highly diverse sward typically containing *Briza media, Carex flacca, Sesleria caerulea, Potentilla erecta, Succisa pratensis, Centaurea nigra, Galium verum* and *Leucanthemum vulgare.* Bryophytes include *Scleropodium purum* and *Ctenidium molluscum.* Some of these habitats are very species-rich, with over 40 species recorded from some 2 m x 2 m relevés. The orchid-rich variant of this habitat was recorded in a number of polygons northeast of Coolagh Road and also in the area west of the River Corrib to the north of the Corrib Village Student Accommodation complex. To be considered the orchid-rich priority habitat (*6210) the 6210 grassland should have a population of any orchid species other than the relatively common species *Dactylorhiza fuchsii* or *Dactylorhiza maculata* (O'Neill *et al*., 2013). It should be noted, however, that orchid populations are ephemeral, and the fact that no orchids were seen in a particular polygon during the survey does not preclude the possibility of them occurring in subsequent years. O'Neill *et al.* (2013) suggest the precautionary approach of considering all 6210 sites as potential priority orchid-rich *6210.

6410 *Molinia* meadows

Corresponding Fossitt (2000) habitats: GS4 Wet grassland, PF1 Rich fen and flush

This Annex I habitat type was quite limited in extent in the area surveyed, being recorded from eleven polygons. These were distributed through the study area, being found at Dangan Lower, Coolanillaun Bog, to the east and south of Coolagh Lakes and with a further single example at Ballindooley in the northeast of the study area. The sward is composed of *Molinia caerulea*, *Cirsium dissectum*, *Anthoxanthum odoratum*, *Carex flacca*, *Cynosurus cristatus* and *Juncus conglomeratus,* with *Centaurea nigra, Succisa pratensis* and *Trifolium pratense* also found. *Calliergonella cuspidata* is the main bryophyte.

4010 Wet heaths

Corresponding Fossitt (2000) habitat: HH3 Wet heath

4010 Wet heaths were recorded at Coolanillaun Bog, with additional small areas towards the north of Coolagh Lakes, at Kentfield in the west of the study area, and with a further area near Dangan Lower. The habitat was primarily classified here on the presence of *Myrica gale* as a dwarf or low shrub together with *Molinia caerulea*. Indicator species such as *Erica tetralix* and *Calluna vulgaris* were sometimes absent.

4030 Dry heaths

Corresponding Fossitt (2000) habitat: HH2 Dry calcareous heath

This habitat was found in mosaic with other calcareous habitats on the limestone plateau to the northeast of Coolagh Road, with an additional area occurring northeast of Coolagh Lakes, again in association with calcareous grassland and limestone pavement. In addition, the habitat was noted as a point feature within other areas on the limestone pavement plateau where it was too small to consider as a mappable area. *Calluna vulgaris* is usually the main species. Where *C. vulgaris* is less

abundant it occurs with species typical of calcareous grassland. Where it is more abundant, diversity is lower and it occurs alongside other woody species such as *Hedera helix* and *Rosa spinosissima*, or *Pteridium aquilinum*.

4060 Alpine and Boreal heaths

Corresponding Fossitt (2000) habitat: HH4 Montane heath

Three adjoining polygons containing this habitat were recorded on the limestone plateau at Ballindooley. The habitat is essentially a diverse calcareous grassland sward in which *Dryas octopetala* is a significant component. *Calluna vulgaris* is also usually present in small amounts. *D. octopetala* was recorded in a number of other polygons but not with sufficient cover to indicate the presence of HH4 Montane heath.

7130 Blanket bog and *7130 Blanket bog (active)

Corresponding Fossitt (2000) habitat: PB3 Lowland blanket bog

PB3 Lowland blanket bog was recorded at Coolanillaun Bog and Dangan Lower. The habitat at Coolanillaun is dominated by *Molinia caerulea,* with typical bog species present throughout including *Calluna vulgaris*, *Erica tetralix* and *Eriophorum angustifolium*, but a notable absence of *Sphagnum* spp. and low overall bryophyte cover. The blanket bog at Coolanillaun is not typical lowland blanket bog, being influenced by flooding from the River Corrib and supporting a range of species more typical of soligenous conditions. This area was considered non-priority 7130 Blanket bog as it was not regarded as 'active' blanket bog. The blanket bog habitat at Dangan Lower occurs in an area of cattle-grazed commonage and is again an atypical example of the habitat. The vegetation is dominated by *Schoenus nigricans* and *Myrica gale*, as in the alkaline fen to the west (see below). Here, however, the bryophyte layer is composed of *Sphagnum* spp. (including *S. denticulatum, S. palustre, S. tenellum* and *S. subnitens*), *Erica tetralix* is much more frequent and *Narthecium ossifragum* is abundant. The peat in the area of the bog is over 1.6 m deep. Due to the presence of peat-forming *Sphagnum* species this habitat was considered *7130 Blanket bog, the priority active version of the habitat.

7230 Alkaline fens

Corresponding Fossitt (2000) habitat: PF1 Rich fen and flush

7230 Alkaline fens were recorded at Coolanillaun Bog, to the east and south of Coolagh Lakes, and at Dangan Lower. A further small area was recorded to the northwest of Menlough Castle near the River Corrib. The presence of brown mosses is key to these areas being considered Annex I habitat. Other species present include the sedges *Carex rostrata,* C. *echinata, C. panicea, C. viridula* and *C. hostiana, Menyanthes trifoliata, Schoenus nigricans*, *Juncus subnodulosus, Mentha aquatica* and *Eriophorum angustifolium.* The Flora (Protection) Order 1999 species *Eriophorum gracile* was found within 7230 Alkaline fens at Coolanillaun Bog.

***91E0 Alluvial forests**

Corresponding Fossitt (2000) habitat: WN6 Wet willow-alder-ash woodland

Examples of this Annex I habitat were found through the wetland areas associated with Coolagh Lakes, Coolanillaun Bog, both sides of the River Corrib, and Jordan's Island. Areas of the habitat are generally small and fragmented within the study area, the largest being just 1.4 ha in size. In the wetter locations the canopy is dominated by *Salix cinerea* with *Phalaris arundinacea, Filipendula*

ulmaria, Calystegia sepium, Iris pseudacorus, Lysimachia vulgaris and *Angelica sylvestris* in the field layer.

7140 Transition mires and quaking bogs

Corresponding Fossitt (2000) habitat: PF3 Transition mire and quaking bog

The largest areas of transition mire were recorded from Coolanillaun Bog and at Terryland to the northeast of Jordan's Island. Additional small examples were recorded from the channel to the east of Jordan's Island, from Dangan Lower, and from a drainage channel northwest of the NUIG Sports Pavilion. The largest complex of this habitat occurs at Coolanillaun Bog in conjunction with a valley depression running north-south through the central part of the bog and around the margin of a small dystrophic lake in the south. In this area there is an abundance of sedges, including *Carex diandra, C. lasiocarpa* and *C. rostrata,* occurring together with herbs such as *Potentilla palustris*, *Epilobium palustre*, *Galium palustre*, *Menyanthes trifoliata*, *Mentha aquatica* and *Valeriana officinalis*. The ground layer is dominated by *Calliergonella cuspidata*. The presence of *Eriophorum gracile*, a species listed on the Flora (Protection) Order 1999, in transition mire at Coolanillaun Bog is notable. Species within the large area of this habitat to the northeast of Jordan's Island include *Carex diandra, C. rostrata* and *C. lasiocarpa,* which were present together with *Equisetum fluviatile*, *Juncus acutiflorus / subnodulosus* and *M. trifoliata*.

***7210 *Cladium* swamps**

Corresponding Fossitt (2000) habitats: FS1 Reed and large sedge swamps, FS2 Tall-herb swamps, PF1 Rich fen and flush

The most widespread variant of this habitat to occur within the site is species-poor *Cladium mariscus*-dominated swamp (recorded as FS1 Reed and large sedge swamps or occasionally FS2 Tall-herb swamp). The habitat occurs through the central sections of Coolanillaun Bog, around the margins of the waterbodies at Coolagh Lakes, along the channel to the east of Jordan's Island, and scattered along the western bank of the River Corrib. *Cladium mariscus* is usually dominant, with *Phragmites australis* often occasional. A more open, species-rich variant of the habitat (recorded as PF1 Rich fen and flush) was also recorded with species including *Schoenus nigricans*, *Juncus subnodulosus, Carex lasiocarpa* and *Molinia caerulea*.

6430 Hydrophilous tall-herb communities

Corresponding Fossitt (2000) habitats: FS1 Reed and large sedge swamps, FS2 Tall-herb swamps, GM1 Marsh, PF1 Rich fen and flush

This habitat occurs throughout the wetland sections of the survey area. It was recorded to the north, east and south of Coolagh Lakes, from Coolanillaun Bog, to the east and south of Jordan's Island, and at various locations along the western side of the River Corrib. Frequently recorded species from this habitat include *Filipendula ulmaria*, *Epilobium hirsutum*, *Iris pseudacorus*, *Lysimachia vulgaris*, *Mentha aquatica* and *Phragmites australis*.

3.3 Non-Annex I and freshwater habitats

Non-Annex I Grassland and marsh

GS1 Dry calcareous and neutral grassland was found throughout almost the entire study area except Coolanillaun Bog and Jordan's Island. Significant areas occur between Menlough Castle and Coolagh Lakes, and east of Monument Road in Menlough. Species recorded from this habitat include *Cynosurus cristatus, Centaurea nigra*, *Trifolium repens*, *Plantago lanceolata* and *Ranunculus repens.*

Examples of *GS2 Dry meadows and grassy verges* were recorded throughout the study area, but were generally limited in extent and often represented by rank, unmanaged grassland. Characteristic species recorded include *Dactylis glomerata, Holcus lanatus, Arrhenatherum elatius* and *Plantago lanceolata.*

GS4 Wet grassland was found throughout the wetter sections of the study area: Coolanillaun Bog, west, south and east of Coolagh Lakes, on Jordan's Island, and along the west bank of the River Corrib. *Filipendula ulmaria, Juncus* spp.*, Molinia caerulea, Holcus lanatus* and *Agrostis stolonifera* were all recorded frequently from this habitat.

GM1 Marsh was infrequently found, with small examples from Coolanillaun Bog, north of the National University of Ireland, Galway (NUIG) Sports Pavilion and at Terryland. Species such as *Iris pseudacorus, Valeriana officinalis, Calystegia sepium* and *Filipendula ulmaria* were recorded.

GA1 Improved agricultural grassland is generally confined to the margins of the site e.g. Kiloughter, Terryland and near Quincentennial Bridge. *GA2 Amenity grassland* was recorded at the sports pitches near NUIG Sports Pavilion.

Freshwater

A number of different lake habitats were noted during the survey, but these were not surveyed comprehensively or assigned to Annex I habitat as part of this survey. They were surveyed in a separate Aquatic Habitats survey, the results of which are presented in the Constraints Report. A small area of *FL1 Dystrophic lakes* habitat was found at Coolanillaun Bog, where the acidic surroundings influenced the pH of the waterbody. Coolagh Lakes are classified as *FL3 Limestone / marl lakes.* A small example of *FL4 Mesotrophic lakes* was recorded to the east of one of the Coolagh Lakes.

FW4 Drainage ditches were occasionally recorded within the survey area, with the most extensive draining into the western side of one of the Coolagh Lakes.

The main River Corrib was assigned to the category *FW2 Lowland depositing river*. A small river at Terryland in the southeast of the survey area was also recorded as *FW2 Lowland depositing river*, along with other sections of the River Corrib at Menlough Pier and Glenlo Abbey Hotel.

There are extensive stands of *Phragmites australis* along the banks of the River Corrib on both sides, fringing Jordan's Island, and also Coolagh Lakes classified as non-Annex I *FS1 Reed and large sedge swamps*.

Non-Annex I *FS2 Tall-herb swamps* are less frequent, being recorded around Jordan's Island, and to the north of the island near the outflow of Coolagh Lakes to the River Corrib, northwest of Menlough Castle and on the west bank of the River Corrib near Corrib Village.

Non-Annex I Peatlands

PF1 Rich fen and flush was recorded quite frequently at Dangan Lower and around Coolagh Lakes, with small patches also occurring west of the River Corrib near Corrib Village and north of NUIG Sports Pavilion. Frequently recorded species include *Carex panicea, C. viridula, C. nigra, Juncus subnodulosus* and *Hydrocotyle vulgaris*.

Non-Annex I Heath and dense bracken

Patches of dense bracken, *HD1 Dense bracken,* were recorded frequently across the study area and was often in mosaic with other habitats, particularly WS1 scrub.

Non-Annex I Woodland and scrub

The largest areas of non-Annex I *WN2 Oak-ash-hazel woodland* occur at Menlough to the southwest of Coolagh Road. Additional areas occur though the dry sections of the study area. The habitat is often found in a complex with polygons of wooded *8240 Limestone pavement in areas where the soil was found to be too deep to be considered the Annex I habitat.

WN6 Wet willow-alder-ash woodland generally correlates with the Annex I habitat *91E0 Alluvial forest but a non-Annex I version of the habitat was recorded in a few instances where the ground flora was of particularly poor quality.

Areas of *WD1 (Mixed) broadleaved woodland* were concentrated in the centre of the study area between Menlough Pier and Coolagh Lakes, and on the west bank of the River Corrib around the lands at the NUIG Sports Pavilion. Stands of *Fagus sylvatica* were noted between Menlough Castle and Coolagh Lakes, while otherwise native hazel woodland northeast of Menlough Castle was found to have sufficient abundance of *Acer pseudoplatanus* to classify the habitat as WD1. A small block of *WD4 Conifer plantation*, consisting of *Pinus contorta*, occurs northeast of Jordan's Island adjacent to Annex I 7230 Alkaline fens habitat.

The majority of examples of *WS Scrub/transitional woodland* habitats (WS1-5) were *WS1 Scrub*. The areas of WS1 are dominated by spinose species such as *Rubus fruticosus*, *Prunus spinosa* and *Ulex europaeus.* In addition, areas of low *Corylus avellana* (<3 m) were recorded under this category, as were damp peaty areas dominated by tall *Myrica gale*. *WS2 Immature woodland* was recorded in one location at Terryland, *WS3 Ornamental/non-native shrub* was used to record ornamental planting near Quincentennial Bridge and a *Fallopia japonica* infestation near the NUIG Sports Pavilion. A small area of *WS5 Recently-felled woodland* was recorded southeast of Menlough Castle.

The two *WL Linear woodland/scrub habitats, WL1 Hedgerows and WL2 Treelines,* were recorded only when they formed a significant habitat area and were broad enough (> 4 m) to map as a polygon. They occur throughout the survey area.

Non-Annex I Cultivated and built land

BL3 Buildings and artificial surfaces were recorded at instances through the survey site, corresponding with roads, tracks, car parks and buildings. For ease of mapping, houses, driveways and residential gardens were generally mapped within this category (thus on occasion incorporating *GA2 Amenity grassland* and *BC4 Flower beds and borders* within BL3). Stone walls (*BL1 Stone walls and other stonework*) are a frequent feature of the study area but were not systematically recorded as they were generally less than 4 m wide.

Non-Annex I Exposed rock and disturbed ground

Disturbed ground was recorded as *ED2 Spoil and bare ground* or *ED3 Recolonising bare ground*, depending on the percentage of vegetation cover (habitats with greater than 50% vegetation cover in this context were assigned to ED3). These habitats were found scattered throughout the study area, often in association with path and tracks, and also where recent disturbance of grassland and limestone pavement had occurred, such as on the limestone plateau at Ballindooley, and at Terryland. An active quarry (*ED4 Active quarries and mines*) was recorded for the western strip of Coolagh quarry that lies within the study area.

3.4 Annex I habitat assessments

3.4.1 Area change

Changes in extent of all 15 habitats assessed were recorded for the period 1995 to 2014 through a combination of observations in the field and analysis of historic aerial photographs (www.osi.ie) and online satellite imagery (www.google.ie/maps). The EU Habitats Directive came into force in 1994 and the 1995 aerial photographs provide the baseline imagery closest to this date. Areas of change were viewed and comparisons were made with surrounding Annex I habitat to assess the likelihood of Annex I habitat having occurred previously within the area of change. When it was considered likely that Annex I habitat had occurred, the area was digitised such that area calculations could be determined. This method is relatively subjective and detection of changes is restricted to obvious changes in habitat; subtle changes from one habitat type to another cannot be reliably identified by this process. The results of area change investigations are given in Tables 6-9. Only losses in habitat were found, with no gains in habitat area recorded. Five habitats were found to have suffered area loss: *8240 Limestone pavement (exposed), *8240 Limestone pavement (wooded) (results for these two habitats are presented together in Table 6), 6210 Calcareous grassland (losses of 6210 and *6210 are considered together in Table 7), *91E0 Alluvial forests (Table 8) and 7230 Alkaline fens (Table 9). The overall change in habitat area represented a loss of less than 1% per year for each of these habitats giving them an assessment result of *Unfavourable – Inadequate*. No loss in area was noted for the remaining habitats, which thus received an assessment result of *Favourable* for the area change parameter. The impact codes given in Tables 6-8 are the approved EU impact codes in use for National Conservation Assessment reporting, as given in Ssymank (2011).

Table 6. Impacts causing obvious losses in *8240 Limestone pavement (exposed and wooded), 1995-2014.

Impact code	Impact	Area (ha) 1995-2014
A02.01	Agricultural intensification	0.9
A10.01	Removal of hedges and copses or scrub	0.6
C01	Mining and quarrying	1.5
D01.01	Paths, tracks, cycling tracks	0.6
E01.03	Dispersed habitation	1.1
All impacts		*5.0*
% of *8240 lost	Based on current habitat area (84.47 ha) and area lost (5.0 ha)	5.59%
% loss per year	Period of loss = 19 years	0.29% p.a.

Table 7. Impacts causing obvious losses in *6210/6210 Calcareous grassland, 1995-2014.

Impact code	Impact	Area (ha) 1995-2014
A02.01	Agricultural intensification	1.8
E01.03	Dispersed habitation	0.1
E04.01	Agricultural structures	0.06
All impacts		*2.0*
% of 6210 lost	Based on current habitat area (19.06 ha) and area lost (2.0 ha)	9.5%
% loss per year	Period of loss = 19 years	0.5% p.a.

Table 8. Impacts causing obvious losses in *91E0 Alluvial forests, 1995-2014.

Impact code	Impact	Area (ha) 1995-2014
B02.02	Forestry clearance	0.3
All impacts		*0.3*
% of *91E0 lost	Based on current habitat area (8.89 ha) and area lost (0.3 ha)	3.26%
% loss per year	Period of loss = 19 years	0.17% p.a.

Table 9. Impacts causing obvious losses in 7230 Alkaline fens, 1995-2014.

Impact code	Impact	Area (ha) 1995-2014
B01.02	Artificial planting on open ground (non-native trees)	0.4
All impacts		*0.4*
% of 7230 lost	Based on current habitat area (3.11 ha) and area lost (0.4 ha)	11.40%
% loss per year	Period of loss = 19 years	0.6% p.a.

3.4.2 Structure and functions

A total of 278 relevés were recorded by BEC Consultants in the study area, 232 in 2014 and 46 in 2013. A further 55 relevés were recorded by Wetland Surveys Ireland (WSI) in 2014 in the Coolagh Lakes and Coolanillaun Bog areas. The locations of these 333 relevés are presented in Figures 5a-d, and the species recorded in each relevé are provided as a separate Excel spreadsheet file submitted with this report. In all, 221 of the relevés were recorded in an Annex I habitat, the remaining 112 relevés recorded to characterise the non-Annex I habitats for mapping to community level.

Results of the structure and functions assessment of the Annex I habitats is presented below.

Following Wilson & Fernández (2013), the exposed and wooded variants of *8240 Limestone pavement were assessed under different criteria. For the purposes of this analysis, and following discussion with F. Fernández (pers. comm.) and NPWS (D. Lynn, pers. comm.), scrub-encroached exposed *8240 habitat (*WS1 Scrub*) was distinguished from wooded *8240 habitat (*WN2 Oak-ash-hazel woodland*) partly on canopy characteristics, with the latter having a canopy of 3 m or more. While this canopy height is lower than the 5 m threshold for woodland stipulated in Fossitt (2000), it was considered appropriate for this project to distinguish between the two habitat types. In addition, those areas classified as WN2 woodland invariably had an open canopy which it was possible to walk under, and all the general characteristics of WN2 woodland described in Fossitt (2000). Those areas classified as scrub did not have a differentiated canopy structure, and it was generally not possible to walk easily through the habitat. The assessment results below are presented by Annex I habitat in descending order of their extent within the study area.

Tables 10 and 11 summarise the results by assessment criterion for the two *8240 limestone pavement habitats. The main criteria that failed in exposed *8240 limestone pavement habitats were negative indicator species cover and scrub cover, including *Rubus fruticosus* agg. (brambles), *Prunus spinosa* (blackthorn) and *Corylus avellana* (hazel), with failure due to excessive cover by these species.

Using the methodology of Wilson & Fernández (2013), each *8240 assessment stop is allowed to fail one criterion but still pass overall. Based on the assessment parameters shown in Table 1, failure of 32% of stops equates to a conservation status of *Unfavourable – Bad* for exposed *8240 limestone pavement, while a failure rate of 13% corresponds to a conservation status of *Unfavourable – Inadequate* for wooded *8240 limestone pavement.

Table 10. Summary of Structure and functions assessment results for exposed *8240 Limestone pavement. *n* = 50. U-B = *Unfavourable – Bad*.

Assessment criteria	Target	Failure rate
No. positive indicator species	≥7	10%
% cover negative indicator species	≤1	44%
% cover bracken	≤10	6%
% cover non-native species	≤1	0%
% cover scrub	≤25	44%
Stop failure rate		*32%*
Overall assessment result		*U-B*

Table 11. Structure and functions assessment results for wooded *8240 Limestone pavement. *n* = 32. U-I = *Unfavourable – Inadequate*.

Assessment criteria	Target	Failure rate
No. positive indicator species	≥7	0%
% cover negative indicator species	≤10	0%
% canopy	≥30	0%
% bryophytes	≥50	34%
Grazing pressure [overgrazing]	None	3%
Dead wood	Present	13%
Non-native regeneration	Absent	3%
Stop failure rate		*13%*
Overall assessment result		*U-I*

The Annex I habitat 6210 Calcareous grasslands, and its priority orchid-rich variant, *6210, were assessed according to the criteria outlined in O'Neill *et al.* (2013). Table 12 summarises the results for these two habitats by criterion. The priority habitat *6210 was found to pass more criteria than the non-priority habitat, the latter failing to achieve favourable results for high quality indicator species, negative indicator species and grazing/disturbance at several assessment stops. Overall, 14% of *6210 stops failed their assessments, resulting in a conservation rating of *Unfavourable – Inadequate*, while 67% of 6210 stops failed, a rating of *Unfavourable – Bad*.

Table 12. Structure and functions assessment results for *6210/6210 Calcareous grassland.
*6210 (orchid-rich): *n* = 14. 6210 (non-priority): *n* = 15
U-I = Unfavourable – Inadequate; U-B = Unfavourable – Bad.

Assessment criteria	Target	Failure rate (*6210)	Failure rate (6210)
No. positive indicator species	≥7	7%	20%
No. high quality indicator species	≥2	0%	20%
% cover non-native species	≤1	0%	0%
% cover negative indicator species: maximum individual cover	≤10	0%	20%
% cover negative indicator species: maximum collective cover	≤20	0%	20%
% cover scrub/bracken/heath	≤10	7%	13%
% forb:graminoid	40-90	7%	33%
Median sward height (cm)	5-40	14%	20%
% cover litter	≤25	14%	7%
% disturbed ground	≤10	0%	0%
Grazing/disturbance	No overgrazing/ No disturbance	0%	13%
Stop failure rate		*14%*	*67%*
Overall assessment result		*U-I*	*U-B*

*7210 *Cladium* swamps is a priority habitat which occurs along the River Corrib and Coolagh Lakes. Assessment criteria for this habitat were devised by Crushell & Foss (2014a), and the results of the 34 assessments are presented in Table 13. The main causes of failure for this habitat were excessive cover of woody species such as brambles and *Salix cinerea* (grey willow), as well as negative herbs such as *Epilobium hirsutum* (great willowherb) and *Typha latifolia* (bulrush). Overall, 15% of stops failed, to give a conservation rating of *Unfavourable – Inadequate*.

Table 13. Structure and functions assessment results for *7210 *Cladium* swamps.
n = 34. U-B = *Unfavourable – Bad.*

Assessment criteria	Target	Failure rate
Cladium mariscus present	Yes	0%
No. positive indicator species	≥2	3%
% cover *Cladium* + indicator species	≥75%	0%
% cover negative herbs	<5%	6%
% cover non-native species	<1%	0%
% cover woody species (local vicinity)	<10%	9%
% of live shoots > 1 m	≥50%	0%
% disturbed ground (relevé)	<10%	0%
% disturbed ground (local vicinity)	<10%	0%
Area showing signs of drainage by ditches / heavy trampling / tracking	<10%	0%
Disturbed vegetation (if tufa present)	<1%	n/a
Stop failure rate		*15%*
Overall assessment result		*U-I*

*91E0 Alluvial forests occur scattered throughout the survey area, and are generally fragmented in nature. Using the assessment criteria described in O'Neill & Barron (2013), a minimum of four individual assessment plots are normally recorded for the habitat at a site, with a further assessment

carried out across all four of these plots for functional characteristics such as native tree regeneration, presence of dead wood at the site, and assessment of the age profile of the woodland by means of diameter at breast height (DBH) measurement. The results presented in Table 14 show that the main issues with this habitat in the study area are insufficient height of the canopy, insufficient shrub layer cover and lack of positive indicator species. Across the four plots in which functional parameters were measured, the habitat was found to lack diversity in terms of its age profile (i.e. the stand was even-aged), and large-diameter dead wood was absent. The overall assessment result for *91E0 was therefore *Unfavourable – Bad*.

Table 14: Structure and functions assessment results for *91E0 Alluvial forests. *n* = 7. U-B = *Unfavourable – Bad*.

Assessment criteria	**Target**	**Failure rate**
1-plot assessment criteria		
Positive species (target)	Present	0%
Positive species (non-target)	≥6	14%
Negative species cover	≤10	0%
Negative species regeneration	Absent	0%
Median canopy ht.	≥7m	43%
Total canopy cover	≥30%	0%
Proportion of target species in canopy	≥50%	0%
Native shrub layer cover (10-75%)	10-50%	29%
Native field layer cover	≥20%	0%
Native field layer height	≥20cm	0%
Bryophyte cover	≥4%	29%
Grazing pressure	No overgrazing	0%
Assessment result: 1-plot level	*Passes in ≥8 criteria*	*2 plots failed*

4-plot assessment criteria	*Target*	*Result*
Target species size class distribution	≥1 of each size class present over 4 plots	Fail
Target species regeneration	≥1 sapling ≥2 m tall over all 4 plots	Pass
Other native tree regeneration	≥1 sapling ≥2 m tall in 2 or more plots	Pass
Old trees & dead wood	≥3 from any category (DBH ≥20 cm)	Fail
Assessment result: 4-plot level	*3 of 4 criteria to pass*	*Fail*
Overall assessment result		*U-B*

4010 Wet heaths habitat was assessed according to the criteria in Perrin *et al*. (2014). This habitat failed across the extent of the site on multiple criteria (Table 15), failing comprehensively on cover of indicator mosses and lichens. All stops failed, giving a conservation rating of *Unfavourable – Bad*.

Table 15: Structure and functions assessment results for 4010 Wet Heaths. *n* = 8. U-B = *Unfavourable – Bad*.

Assessment criteria	Target	Failure rate
Erica tetralix (20m vicinity)	Present	38%
% cover positive species	≥50%	50%
% cover *Cladonia* and indicator mosses	≥10%	100%
% cover ericoids and *Empetrum nigrum*	≥15%	88%
% cover dwarf shrub species	<75%	0%
% cover negative species	<1%	0%
% cover non-native species (relevé)	<1%	13%
% cover non-native species (local vicinity)	<1%	0%
% cover scattered native trees/scrub	<20%	25%
% cover bracken	<10%	0%
% cover *Juncus effusus*	<10%	0%
Damaged *Sphagnum*	<10%	0%
Signs of browsing on selected dwarf shrub species	*Sphagnum* cover <33% of shoots	14%
Signs of burning (local vicinity)	Absent	0%
Signs of burning inside sensitive areas (local vicinity)	Absent	0%
Cover disturbed bare ground (relevé)	<10%	0%
Cover disturbed bare ground (local vicinity)	<10%	0%
Area showing signs of drainage by ditches / heavy trampling / tracking	<10%	0%
Stop failure rate		*100%*
Overall assessment result		*U-B*

*7130 Blanket bogs (active) and the non-priority 7130 Blanket bogs (inactive) were assessed according to the criteria in Perrin *et al.* (2014). The majority of the habitat in the study area was the priority habitat, where five assessment stops were recorded, with a further small area of non-priority 7130 found at Coolanillaun Bog, in which one assessment stop was recorded. Table 16 shows the results for these two habitats. Failures in three separate criteria were noted in the priority habitat: lack of positive indicator species, damaged sphagnum, and excessive browsing to dwarf shrub species. The individual stop in the non-priority area suffered from burning, as well as excessive cover of negative species, dominance by one or more species, insufficient cover of characteristic bryophytes and lichens, and insufficient positive indicator species. The failure rates of 60% and 100% for the priority and non-priority habitats respectively both result in an assessment result of *Unfavourable – Bad*.

Table 16. Structure and functions assessment results for *7130/7130 Blanket bogs. *7130 (active): *n* = 5. 7130 (inactive): *n* = 1. U-B = *Unfavourable – Bad*.

Assessment criteria	Target	Failure rate (*7130)	Failure rate (7130)
No. of positive indicator species	≥7	20	100
% cover of bryophyte or lichen species, excluding *Sphagnum fallax*	≥10%	0	100
% cover of each of the following species: *Calluna vulgaris, Eleocharis multicaulis, Eriophorum vaginatum, Molinia caerulea, Schoenus nigricans, Trichophorum germanicum*	Individually <75%	0	100
% cover of negative species	Collectively <1%	0	100
% cover of non-native species (relevé)	<1%	0	0
% cover of non-native species (local vicinity)	<1%	0	0
% cover of scattered native trees and scrub	<10%	0	0
% crushed, broken and/or pulled up *Sphagnum* species	<10% of *Sphagnum* cover	20	0
Shoots of ericoids, *Empetrum nigrum* and *Myrica gale* showing signs of browsing	Collectively <33%	20	0
Burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Not evident	0	100
Burning inside boundaries of sensitive areas	Not evident	0	100
Cover of disturbed bare ground (relevé)	< 10%	0	0
Cover of disturbed bare ground (local vicinity)	< 10%	0	0
Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting	< 10%	0	0
Cover of erosion gullies and eroded areas within the greater bog mosaic	< 5%	0	0
Stop failure rate		*60%*	*100%*
Overall assessment result		*U-B*	*U-B*

6430 Hydrophilous tall-herb communities are found interspersed throughout the wetlands of the study area. A total of 14 relevés were recorded and assessed (Table 17) according to the criteria of O'Neill *et al.* (2013) (criteria were modified to allow a higher cover of common reed in these swamp situations). Scrub invasion by brambles was found to be a problem at two of the stops, while excessive cover (>70%) of common reed was also an issue at one of these. The failure of these two stops means that the habitat receives an overall assessment rating of *Unfavourable – Inadequate*.

Table 17. Structure and functions assessment results for 6430 Hydrophilous tall-herb communities. *n* = 14. U-I = *Unfavourable – Inadequate*.

Assessment criteria	Target	Failure rate
No. of positive indicator species	≥3	0%
% cover non-native species	≤1	0%
% cover negative indicator species	Collectively ≤33%	7%
% cover scrub	≤5%	14%
% cover indicator species	≥40%	0%
Mode herb height	≥50 cm	0%
Cover of bare soil	≤10%	0%
Area showing signs of serious grazing pressure / disturbance	<20m^2	0%
Stop failure rate		*14%*
Overall assessment result		*U-I*

7230 Alkaline fens habitat was assessed according to the criteria of Perrin *et al.* (2014). Table 18 presents the results of the individual criteria. This habitat failed the assessment across a range of criteria, including number and cover of positive indicator species, cover of negative species, and cover of non-native species. The overall assessment was *Unfavourable – Bad*, based on a failure rate of 78% of stops.

Table 18. Structure and functions assessment results for 7230 Alkaline fens. *n* = 9. U-B = *Unfavourable – Bad*.

Assessment criteria	Target	Failure rate
No. of brown moss species	≥1	0%
No. of positive vascular indicator species	≥ 2 (RFLU1a/RFLU2) ≥3 (RFLU4/RFEN1a)	33%
Cover of brown mosses and vascular indicator species	≥ 20% (RFLU1a/RFLU2) ≥75% (Rflu4/RFEN1a)	56%
Total cover of negative species	< 1%	33%
Cover of non-native species	< 1%	0%
Cover of scattered native trees and scrub	< 10%	0%
Total cover of *Juncus effusus* and *Phragmites australis*	< 10%	22%
At least 50% of the live leaves/flowering shoots are more than 5 cm above ground surface	≥50%	0%
Cover of disturbed, bare ground	< 10%	22%
Cover of disturbed, bare ground	< 10%	22%
Area showing signs of drainage resulting from ditches or heavy trampling or tracking	< 10%	33%
Where tufa is present, disturbed proportion of vegetation cover	< 1%	n/a
Stop failure rate		*78%*
Overall assessment result		*U-B*

6410 *Molinia* meadows habitat was assessed according to the criteria detailed in O'Neill *et al.* (2013). The results of the assessment are presented in Table 19. Five of the ten assessments failed, the main reason for failure of the individual assessments being insufficient forbs (broadleaved herbs) in the sward. Expert judgement was exercised in one case where a relevé's failure on 38% forb cover

was considered marginal, so this assessment was allowed to pass overall, as all other criteria were favourable within the stop. The overall failure rate for the habitat was 50%, giving an overall assessment result of *Unfavourable – Bad*.

Table 19. Structure and functions assessment results for 6410 *Molinia* meadows. *n* = 10. U-B = *Unfavourable – Bad*.

Assessment criteria	Target	Failure rate
Total number positives	≥7	0%
Total number HQ	≥1	0%
Cover non-natives	≤1%	0%
Cover negatives individually	≤10%	10%
Cover negatives collectively	≤20%	0%
Cover Polytrichum species	≤25%	0%
Cover scrub/bracken/heath	≤5%	0%
Forb component 40-90%	40-90%	60%
Sward height, proportion 10-80 cm	≥30%	0%
Litter cover	≤25%	40%
Cover bare soil	≤10%	0%
Area showing signs of severe grazing / disturbance	<20m	0%
Stop failure rate		*50%*
Overall assessment result		*U-B*

7140 Transition mires and quaking bogs habitat was assessed according to the criteria in Perrin *et al*. (2014). All assessment relevés were recorded in the RFEN1b community type and assessed according to the criteria relevant for this community (Table 20). Most of the assessments passed, with one stop failing on insufficient species, and another failing on disturbance to the habitat. Overall, these two stop failures (18% of stops) resulted in an overall assessment result of *Unfavourable – Inadequate*.

Table 20. Structure and functions assessment results for 7140 Transition mires and quaking bogs. *n* = 11. U-I = *Unfavourable – Inadequate*.

Assessment criteria	Target	Failure rate (%)
No. of positive indicator species (Groups i or ii)	≥3 (P01a/PFLU5) ≥6 (RFEN1b)	9%
No. of positive indicator species (Group i)	≥1	0%
Collective cover of selected positive indicator species	≥25%	0%
Collective cover of negative species	< 1%	0%
Cover of non-native species	< 1%	0%
PFLU5/RFEN1b: Proportion of the tips of live leaves and/or flowering shoots of vascular plants should be more than 15 cm above the ground surface	≥50%	
Cover of disturbed bare ground (relevé)	< 10%	9%
Cover of disturbed bare ground (local vicinity)	< 10%	0
Area showing signs of drainage resulting from heavy trampling or tracking or ditches (local vicinity)	< 10%	0
Stop failure rate		*18%*
Overall assessment result		*U-I*

4030 Dry heaths habitat was assessed according to the assessment criteria of Wilson & Fernández (2013), as the examples of the habitat surveyed occurred in the context of limestone pavement. Three of the seven stops (43%) failed overall, with failures due to scrub encroachment and insufficient positive indicators (Table 21). The overall conservation result for this habitat is therefore *Unfavourable – Bad*.

Table 21. Structure and functions assessment results for 4030 Dry heaths.
n = 7. U-B = *Unfavourable – Bad.*

Assessment criteria	Target	Failure rate
No. positive indicator species	≥7	29%
% cover negative species	Collectively ≤10%	0%
% cover non-native species	≤1%	0%
% cover trees/shrubs	≤25%	29%
% cover disturbed ground	<10%	0%
Stop failure rate		*43%*
Overall assessment result		*U-B*

One small area of 4060 Alpine and Boreal heaths habitat was found in the limestone plateau at Ballindooley. Although small, this area was found to pass all of the assessment criteria across all three stops (Table 22), and therefore received an overall conservation rating of *Favourable*.

Table 22. Structure and functions assessment results for 4060 Alpine and Boreal heaths.
n = 3. F = *Favourable*.

Assessment criteria	Target	Failure rate
No. positive indicator species	≥7	0%
% cover negative species	Collectively ≤10%	0%
% cover non-native species	≤1%	0%
% cover trees/shrubs	≤25%	0%
% cover disturbed ground	<10%	0%
Stop failure rate		*0%*
Overall assessment result		*F*

The assessment results for the Annex I habitats detailed above are summarised below in Table 23.

Table 23. Summary of structure and functions (S&F) assessment results for all Annex I habitats recorded in the GCRR study area.

Annex I habitat	No. assessments	Failure rate (%)		Assessment result (S&F)
*8240 (Exposed)	50		32%	Unfavourable – Bad
*8240 (Wooded)	33		12%	Unfavourable – Inadequate
*6210	14		14%	Unfavourable – Inadequate
6210	15		67%	Unfavourable – Bad
*7210	34		15%	Unfavourable – Inadequate
*91E0	5	1-stop assessment: 4-stop assessment:	29% 100%	Unfavourable – Bad
4010	8		100%	Unfavourable – Bad
6430	14		14%	Unfavourable – Inadequate
*7130	5		60%	Unfavourable – Bad
7130	1		100%	Unfavourable – Bad
6410	10		50%	Unfavourable – Bad
7140	11		18%	Unfavourable – Inadequate
7230	9		78%	Unfavourable – Bad
4030	7		43%	Unfavourable – Bad
4060	3		0%	Favourable

3.4.3 Future prospects

Fourteen significant impacts were recorded within the study area across the Annex I habitats surveyed, and 11 of these impacts were considered to be having a negative impact on Annex I habitats. Four of the impacts were considered to be having a beneficial effect where they occurred. Impacts such as grazing may be positive, negative or neutral, depending on the intensity at which they occur and the sensitivity of the habitat to damage by grazing.

The main negative impact recorded across the study area as a whole was succession to scrub and woodland, particularly on exposed limestone pavement. A lack of more open *8240 Limestone pavement habitats with exposed rock reduces the niches the habitat can provide which ultimately reduces its structure and functions. Tables 24 to 38 summarise the negative, neutral and positive impacts for each of the Annex I habitats, with the impact codes corresponding to the EU-approved impact codes given by Ssymank (2011).

It should be noted that impacts identified during the area assessment were not included in these tables as it is not evident that these historic impacts pose a continuing threat to the habitat in the future.

Table 24. Impacts recorded within *8240 exposed limestone pavement.

Impact		Description within study area	Intensity	Influence	% habitat
K02.01	Species composition change (succession)	Succession to scrub, woodland, heath or grassland	High	Negative	76-99%
A10.01	Removal of hedges and copses or scrub	Scrub clearance and associated disturbance	High	Negative	1-25%
A02.01	Agricultural intensification	Damage/removal of habitat for agricultural improvements	High	Negative	<1%
C01	Mining and quarrying	Rock displacement/small-scale quarrying	High	Negative	<1%
A04.03	Abandonment/lack of grazing	Lack of management	Medium	Negative	76-99%
D01.01	Paths, tracks, cycling tracks	Tracks created by machinery	Medium	Negative	<1%
I01	Invasive non-native species	e.g. *Centranthus ruber, Cotoneaster* spp.	Low	Negative	<1%
I02	Problematic native species	Bracken encroachment	Low	Negative	<1%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Positive	76-99%
A04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Positive	76-99%

Table 25. Impacts recorded within *8240 wooded limestone pavement.

	Impact	Description within study area	Intensity	Influence	% habitat
A10.01	Removal of hedges and copses or scrub	Disturbance/woodland clearance	High	Negative	1-25%
D01.01	Paths, tracks, cycling tracks	Paths and tracks created by machinery	High	Negative	<1%
B06	Grazing in forests/woodland	Poaching/dung deposition by cattle and horses	Low	Negative	76-99%
I01	Invasive non-native species	Invasive non-natives, e.g. *Acer pseudoplatanus* (sycamore)	Low	Negative	<1%

Table 26. Impacts recorded within *6210 Calcareous grassland (orchid-rich).

	Impact	Description within study area	Intensity	Influence	% habitat
K02.01	Species composition change (succession)	Scrub encroachment	Medium	Negative	51-75%
A04.03	Abandonment/lack of grazing	Lack of management	Low	Negative	1-25%
I02	Problematic native species	Bracken encroachment	Low	Negative	<1%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Positive	76-99%
A.04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Positive	76-99%

Table 27. Impacts recorded within 6210 Calcareous grassland (non-priority).

	Impact	Description within study area	Intensity	Influence	% habitat
A10.01	Removal of hedges and copses or scrub	Disturbance/scrub clearance	High	Negative	<1%
K02.01	Species composition change (succession)	Succession to scrub (mainly) and some dry heath	Medium	Negative	1-25%
C01	Mining and quarrying	Small-scale quarrying	Medium	Negative	<1%
A04.03	Abandonment/lack of grazing	Lack of management	Low	Negative	26-50%
I02	Problematic native species	Bracken encroachment	Low	Negative	<1%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Positive	76-99%
A.04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Positive	76-99%

Table 28. Impacts recorded within *7210 *Cladium* swamps.

	Impact	Description within study area	Intensity	Influence	% habitat
J2.07.01	Groundwater abstractions for agriculture	Drainage	Medium	Negative	<1%
K02.01	Species composition change (succession)	Scrub encroachment	Low	Negative	1-25%
A.04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Neutral	<1%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Neutral	<1%

Table 29. Impacts recorded within *91E0 Alluvial forests.

	Impact	Description within study area	Intensity	Influence	% habitat
B02.02	Forestry clearance	Woodland clearance	High	Negative	<1%
G01.02	Walking, horse-riding and non-motorised vehicles	Trampled paths through woodland causing fragmentation	Medium	Negative	<1%
I01	Invasive non-native species	*Cornus sericea*	Low	Negative	<1%
J02.07.01	Groundwater abstractions for agriculture	Ditch clearance/drainage	Low	Neutral	<1%
B06	Grazing in forests/woodland	Horse grazing	Low	Positive	<1%

Table 30. Impacts recorded within 4010 Wet heaths.

	Impact	Description within study area	Intensity	Influence	% habitat
A04.03	Abandonment/lack of grazing	Lack of management	Medium	Negative	51-75%
K02.01	Species composition change (succession)	Bramble encroachment	Medium	Negative	1-25%
C01.03	Peat extraction	Past peat cutting	Low	Negative	<1%
A04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Positive	1-25%

Table 31. Impacts recorded within *7130 Blanket bogs (active).

	Impact	Description within study area	Intensity	Influence	% habitat
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Neutral	100%

Table 32. Impacts recorded within 7130 Blanket bogs (inactive).

	Impact	Description within study area	Intensity	Influence	% habitat
C01.03	Peat extraction	Past peat cutting	High	Negative	76-99%

Table 33. Impacts recorded within 6430 Hydrophilous tall-herb communities.

	Impact	Description within study area	Intensity	Influence	% habitat
K02.01	Species composition change (succession)	Scrub encroachment	Low	Negative	26-50%

Table 34. Impacts recorded within 7230 Alkaline fens.

	Impact	Description within study area	Intensity	Influence	% habitat
B01.02	Artificial planting on open ground (non-native trees)	Planting of conifer stand and associated continuing habitat impacts	High	Negative	1-25%
J2.07.01	Groundwater abstractions for agriculture	Drainage	Medium	Negative	1-25%
K02.01	Species composition change (succession)	Scrub encroachment	Low	Negative	<1%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Neutral	1-25%
A04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Neutral	1-25%

Table 35. Impacts recorded within 6410 *Molinia* meadows.

	Impact	Description within study area	Intensity	Influence	% habitat
A04.03	Abandonment/lack of grazing	Lack of management	Medium	Negative	26-50%
K02.01	Species composition change (succession)	Scrub encroachment	Low	Negative	1-25%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Positive	1-25%
A04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Positive	1-25%

Table 36. Impacts recorded within 7140 Transition mires and quaking bogs.

	Impact	Description within study area	Intensity	Influence	% habitat
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Neutral	<1%
A04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Neutral	<1%

Table 37. Impacts recorded within 4030 Dry heaths.

Impact		Description within study area	Intensity	Influence	% habitat
K02.01	Species composition change (succession)	Succession to scrub	Low	Negative	26-50%
I02	Problematic native species	Bracken encroachment	Low	Neutral	<1%
A04.02.03	Non-intensive horse grazing	Grazing (horse)	Low	Neutral	<1%

Table 38. Impacts recorded within 4060 Alpine and Boreal heaths.

Impact		Description within study area	Intensity	Influence	% habitat
K02.01	Species composition change (succession)	Scrub encroachment	Low	Neutral	<1%
A04.02.01	Non-intensive cattle grazing	Grazing (cattle)	Low	Positive	100%

Table 39 summarises the future prospects assessment results for each of the Annex I habitats. Details of quantifying impacts in a scoring system are given in O'Neill *et al.* (2013). Three Annex I habitats – *7130 Blanket bogs (active), 7140 Transition mires and quaking bogs, and 4060 Alpine and Boreal heaths – are seen to have *Favourable* future prospects, having no negative impacts operating on them. Three habitats – the two *8240 habitats and 7130 Blanket bogs (inactive) – have *Unfavourable – Bad* future prospects. For the limestone pavement habitats, this is due to negative impacts such as scrub and woodland encroachment operating over a large area of the habitat. For the blanket bog, it is due to the negative effects of past peat cutting which continue to affect the quality of the habitat after cessation of the activity. All other habitats were scored as *Unfavourable – Inadequate* for future prospects, due to a range of impacts operating at a lower level or over a smaller proportion of the habitat.

Table 39. Summary of Future Prospects (FP) scores for Annex I habitats. Scores calculated according to O'Neill *et al*. (2013).

Annex I habitat	Score	Assessment result (FP)
*8240 (Exposed)	-7.75	Unfavourable – Bad
*8240 (Wooded)	-3.75	Unfavourable – Bad
*6210	-1.25	Unfavourable – Inadequate
6210	-2.75	Unfavourable – Inadequate
*7210	-1	Unfavourable – Inadequate
*91E0	-1.25	Unfavourable – Inadequate
4010	-2.75	Unfavourable – Inadequate
6430	-0.75	Unfavourable – Inadequate
*7130	0	Favourable
7130	-3.75	Unfavourable – Bad
6410	-1	Unfavourable – Inadequate
7140	0	Favourable
7230	-2.75	Unfavourable – Inadequate
4030	-0.75	Unfavourable – Inadequate
4060	1.5	Favourable

Table 40 summarises the overall condition assessment for each of the Annex I habitats assessed. Due to combinations of *Unfavourable* assessments for most of the habitats, only 4060 Alpine and

Boreal heaths was given an assessment of *Favourable* overall, most of the habitats (10 of the 15) being assessed as *Unfavourable – Bad*, and the remaining four as *Unfavourable – Inadequate*.

Table 40. Summary of all assessment data for Annex I habitats.
F = *Favourable*, U-I = *Unfavourable – Inadequate*, U-B = *Unfavourable – Bad*.

Annex I habitat	Area change	Structure & Functions	Future Prospects	Overall condition assessment
*8240 (Exposed)	U-I	U-B	U-B	U-B
*8240 (Wooded)	U-I	U-I	U-B	U-B
*6210	U-I	U-I	U-I	U-I
6210	U-I	U-B	U-I	U-B
*7210	F	U-I	U-I	U-I
*91E0	U-I	U-B	U-I	U-B
4010	F	U-B	U-I	U-B
6430	F	U-I	U-I	U-I
*7130	F	U-B	F	U-B
7130	F	U-B	U-B	U-B
6410	F	U-B	U-I	U-B
7140	F	U-I	F	U-I
7230	U-I	U-B	U-I	U-B
4030	F	U-B	U-I	U-B
4060	F	F	F	F

3.5 Annex I rapid quality assessment ratings

Annex I polygons surveyed and mapped were each assigned a quality assessment rating of 1 (poor) to 3 (excellent) in the field. The only Annex I habitats to receive a quality rating of 3 were exposed *8240 Limestone pavement (3.14 ha), *6210 Orchid-rich calcareous grasslands (2.02 ha), 7140 Transition mires and quaking bogs (0.55 ha), 6430 Hydrophilous tall-herb communities (0.16 ha), 6210 Calcareous grasslands (0.05 ha) and *7210 *Cladium* swamps (0.03 ha). Some areas of mosaic of *8240 and *6210 habitats covering 1.2 ha were also assigned the highest quality rating.

3.6 Vegetation community mapping

Frequencies of the vegetation communities mapped in the study area are shown in Table 41, and the distribution of the communities is shown in Figures 6a-d. The exposed *8240 Limestone pavement (LPE) Annex I habitat was the most frequent vegetation community recorded at the site, followed by the calcareous grassland community 3a, which was often present as either the Annex I habitat *6210 or 6210. The vegetation communities add additional definition to the vegetation recorded during the study and will assist in future monitoring and habitat mapping at the site.

Table 41. Most frequent vegetation communities recorded

Vegetation community	Frequency	Associated Annex I habitat
LPE	247	*8240
GS1_3a	149	*6210/6210
WS1_Prunus	86	None
LPW	71	*8240
WN2_2e	71	None
WS1_Rubus	66	None
FS1_Phragmites	62	None
FS1_*7210	59	*7210
WS1_2e	39	None
WN2_2a	37	None
GA2	36	None
GS2_3c	36	None
GS4_1b	35	None
GS1_3b	33	None
WN6_3c	31	*91E0
GS1_3c	30	None
FS2_6430	28	6430
GS4_1c	28	6410
GS1_3d	26	None
GA1	22	None
PF3_RFEN1b	22	7140
WD1_2f	21	None
PF1_RFLU1b	16	None
WN6_3e	16	*91E0
WS1_Myrica	15	None
GS4_2d	11	None
WN6_3b	11	*91E0
GM1_6430	10	6430
GS1_2c	10	None

4 Discussion

Most of the survey detailed in this report took place within Lough Corrib cSAC. A total of 478.2 ha of habitat were mapped, with almost 90 ha of this area mapped as rivers or lakes. The remaining 388.8 ha of habitat were comprehensively surveyed and assessed. Of this, 155.74 ha were classified as Annex I habitat. This represents 40% of the surveyed area.

A small proportion of this Annex I habitat was rated by field surveyors as being in excellent condition, with the remainder equally split between good and poor condition. Annex I habitat assessment results, following examination of recent area changes, current structure and functions, and future prospects, indicate that many of the habitats are in *Unfavourable* condition. However, poor quality ratings and unfavourable condition assessments probably indicate that these habitats are suffering from impacts that may be linked to poor or lack of management, but they do not diminish the overall importance of the habitats in a regional or national context. Many deficiencies could be rectified with

the application of suitable management, restoring the habitat to a more favourable conservation status, and rigorous monitoring of Annex I habitats to identify habitat deterioration before it becomes irremediable. In addition, it should be noted that conservation assessment criteria have been developed with assessment of the national Annex I habitat resource in mind; regional variants (e.g. naturally species-poor examples) may fail when assessed against these national criteria, when in fact they represent excellent examples of the habitat in the regional context.

*8240 Limestone pavement, including both exposed and wooded variants, is the Annex I habitat that covers the greatest extent within the area surveyed. Significant areas of (*)6210 (Orchid-rich) Calcareous grasslands also occur, both in association with the limestone pavement and separately from it, the calcareous soil and underlying bedrock of the area being conducive to the formation of this particular Annex I habitat.

Many of the Annex I habitats exist in mosaic with non-Annex I habitats. In particular, the wetland areas around the River Corrib floodplain, Coolagh Lakes and Coolanillaun Bog are a complex of interconnected habitats that form a continuous hydrological system. Therefore, even those areas of habitat that do not correspond to an Annex I habitat contribute to the conservation objectives of the whole of the cSAC. For hydrologically linked systems in particular, impacts that occur in non-Annex I habitats, even at some distance from Annex I habitats, may have repercussions for the Annex I habitats. The Annex I habitats do not exist in isolation and non-Annex I habitats such as *Phragmites australis* swamp are integral to the functioning of the local ecosystem and to ensuring that the structure and functions of associated Annex I habitats are maintained.

It should be noted that all activities taking place within the cSAC that have the potential to affect the Annex I habitats found within the cSAC can only be carried out in accordance with the Conservation Objectives for cSACs developed by NPWS. It should also be noted that the species *Eriophorum gracile* (slender cottongrass) was recorded in two of the Annex I habitats at Coolanillaun Bog. In addition to the protection afforded by the cSAC designation, this species is further protected under Irish law by the Flora (Protection) Order 1999.

In summary, the majority of the surveyed area was found to be comprised of Annex I habitats, or non-Annex I habitats functionally linked with Annex I habitats. Any impacts or activities with the potential to affect the Annex I habitats within Lough Corrib cSAC must take cognisance of the Conservation Objectives for the cSAC.

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Figure 1. Survey area

Figure 2a. Primary Fossitt habitats within the survey area

526200 526400 526600 526800 527000 527200 527400 527600 527800 528000 528200 528400 528600

730000 729800 729600 729400 729200 729000 728800 728600 728400

PRIMARY FOSSITT HABITATS

- BL3. Buildings and artificial surfaces
- ED2. Spoil and bare ground
- ED3. Recolonising bare ground
- ED4. Active quarries and mines
- ER2. Exposed calcareous rock
- FL3. Limestone/ marl lakes
- FL4. Mesotrophic lakes
- FS1. Reed and large sedge swamps
- FS2. Tall-herb swamps
- FW2. Depositing/ lowland rivers
- FW4. Drainage ditches
- GA1. Improved agricultural grassland
- GA2. Amenity grassland (improved)
- GM1. Marsh
- GS1. Dry calcareous and neutral grassland
- GS2. Dry meadows and grassy verges
- GS4. Wet grassland
- HD1. Dense bracken
- HH2. Dry calcareous heath
- HH3. Wet heath
- HH4. Montane heath
- PB3. Lowland blanket bog
- PF1. Rich fen and flush
- PF3. Transition mire and quaking bog
- WD1. (Mixed) broadleaved woodland
- WD4. Conifer plantation
- WD5. Scattered trees and parkland
- WL1. Hedgerows
- WL2. Treelines
- WN2. Oak-ash-hazel woodland
- WN6. Wet willow-alder-ash woodland
- WS1. Scrub
- WS2. Immature woodland
- WS3. Ornamental/ non-native shrub
- WS5. Recently-felled woodland

a b c d

N E S W

0 0.1 0.2 0.4 Kilometers 1:7,000

Figure 2b. Primary Fossitt habitats within the survey area

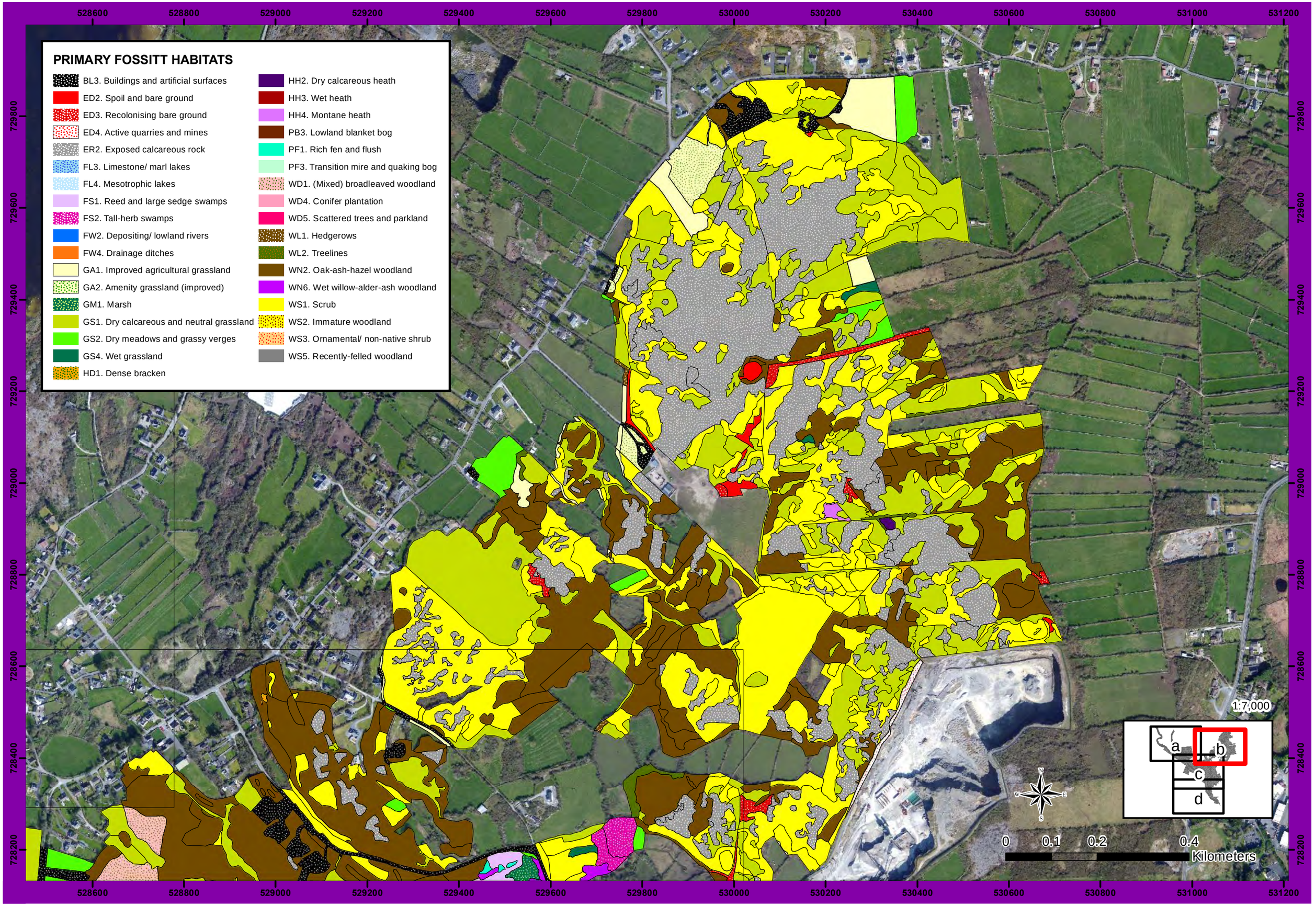

Figure 2c. Primary Fossitt habitats within the survey area

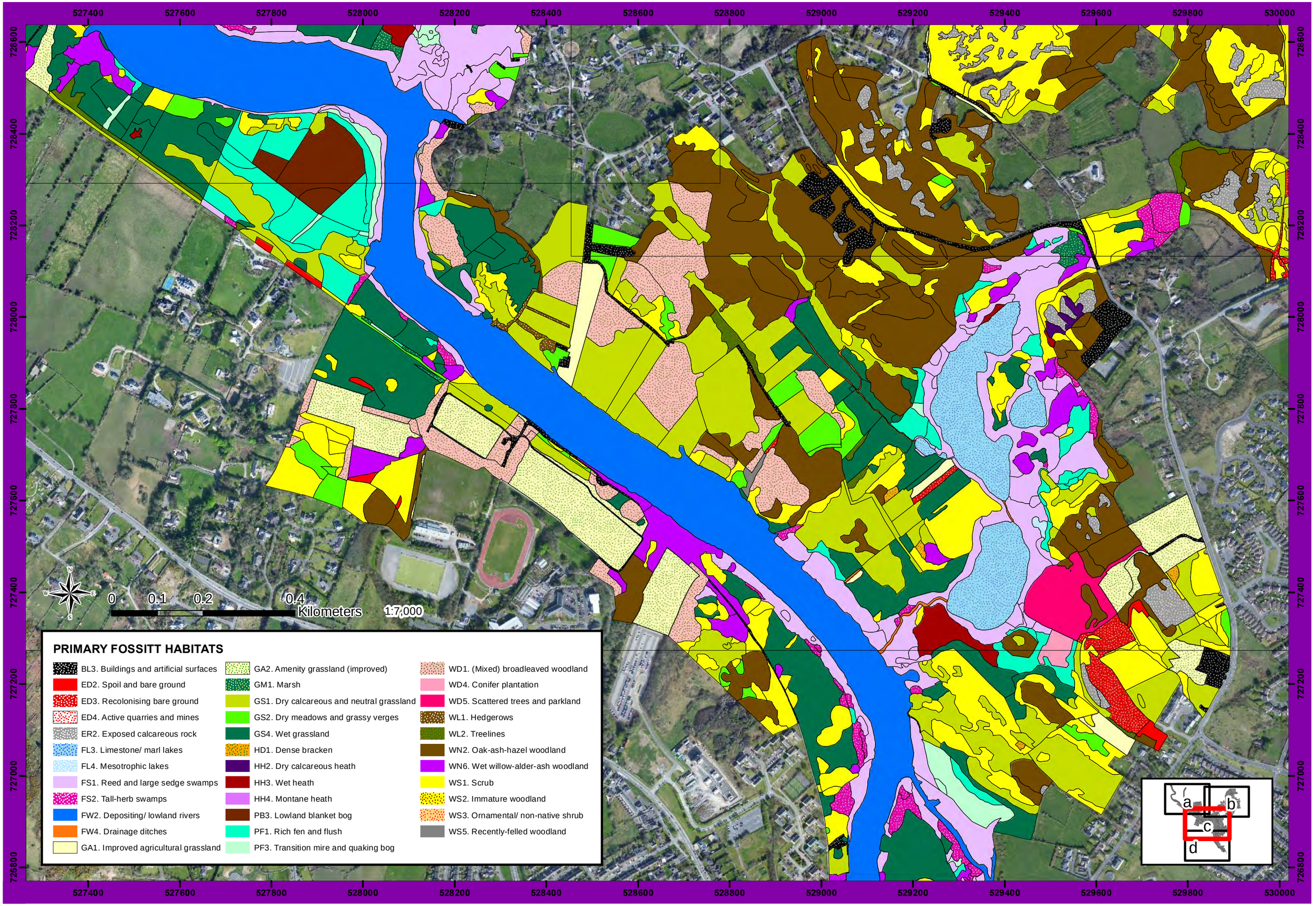

Figure 2d. Primary Fossitt habitats within the survey area

527400 527600 527800 528000 528200 528400 528600 528800 529000 529200 529400 529600 529800 530000

727200 727000 726800 726600 726400 726200 726000 725800 725600

PRIMARY FOSSITT HABITATS

- BL3. Buildings and artificial surfaces
- ED2. Spoil and bare ground
- ED3. Recolonising bare ground
- ED4. Active quarries and mines
- ER2. Exposed calcareous rock
- FL3. Limestone/ marl lakes
- FL4. Mesotrophic lakes
- FS1. Reed and large sedge swamps
- FS2. Tall-herb swamps
- FW2. Depositing/ lowland rivers
- FW4. Drainage ditches
- GA1. Improved agricultural grassland
- GA2. Amenity grassland (improved)
- GM1. Marsh
- GS1. Dry calcareous and neutral grassland
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- GS4. Wet grassland
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- HH4. Montane heath
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- WD4. Conifer plantation
- WD5. Scattered trees and parkland
- WL1. Hedgerows
- WL2. Treelines
- WN2. Oak-ash-hazel woodland
- WN6. Wet willow-alder-ash woodland
- WS1. Scrub
- WS2. Immature woodland
- WS3. Ornamental/ non-native shrub
- WS5. Recently-felled woodland

a b c d

N W E S

0 0.1 0.2 0.4 Kilometers 1:7,000

Figure 3a. Primary Annex I habitats within the survey area

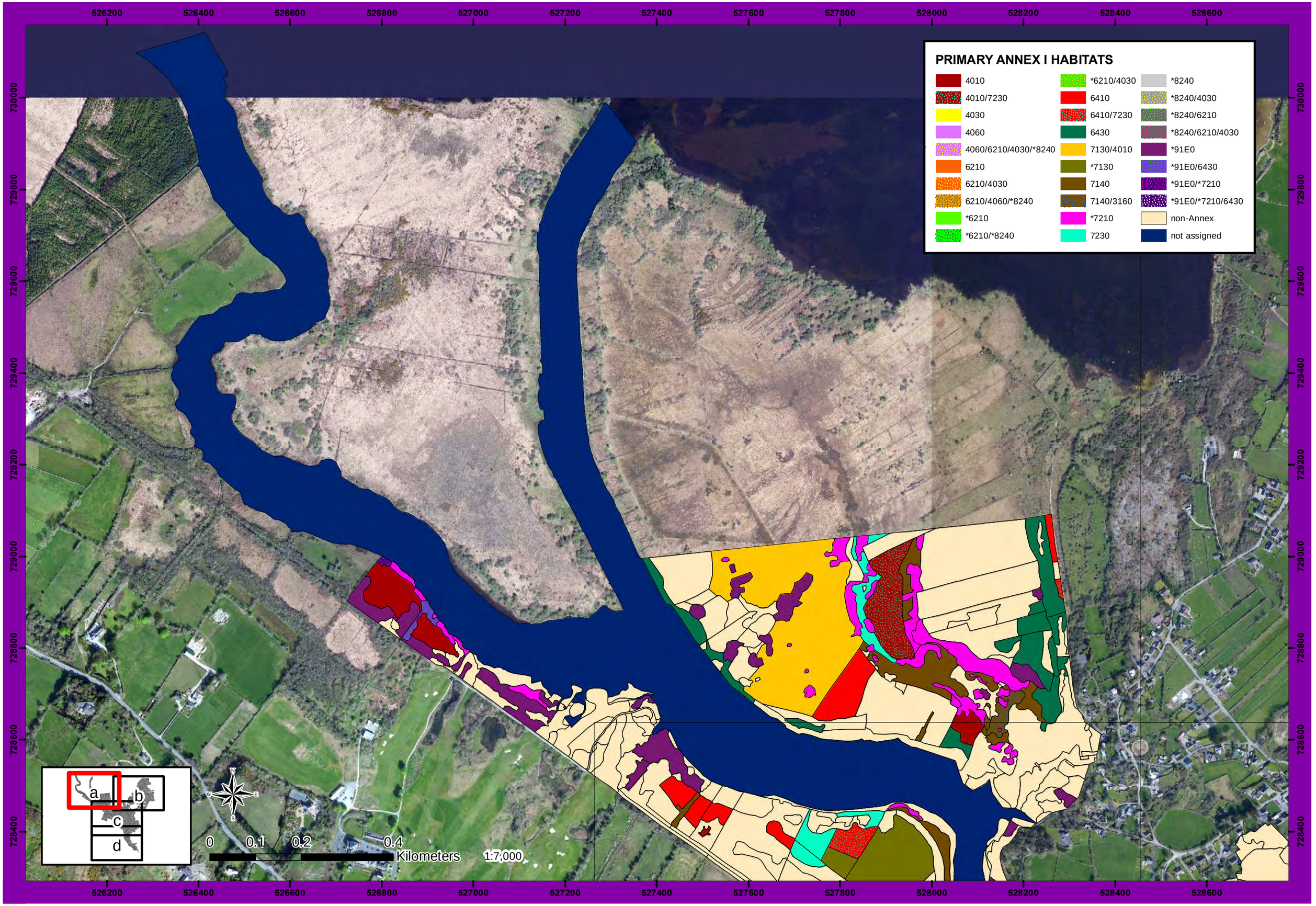


Figure 3b. Primary Annex I habitats within the survey area

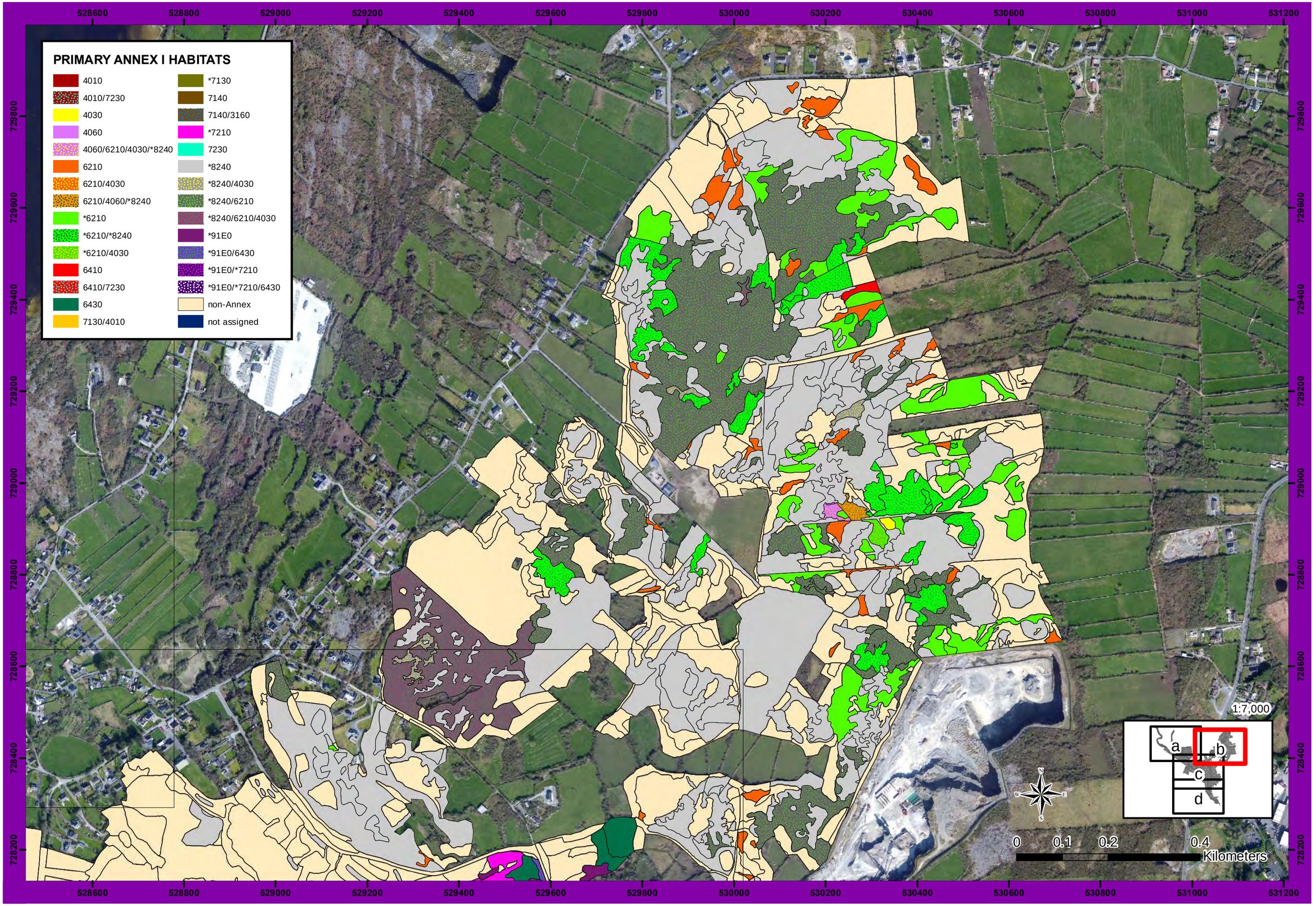


Figure 3c. Primary Annex I habitats within the survey area

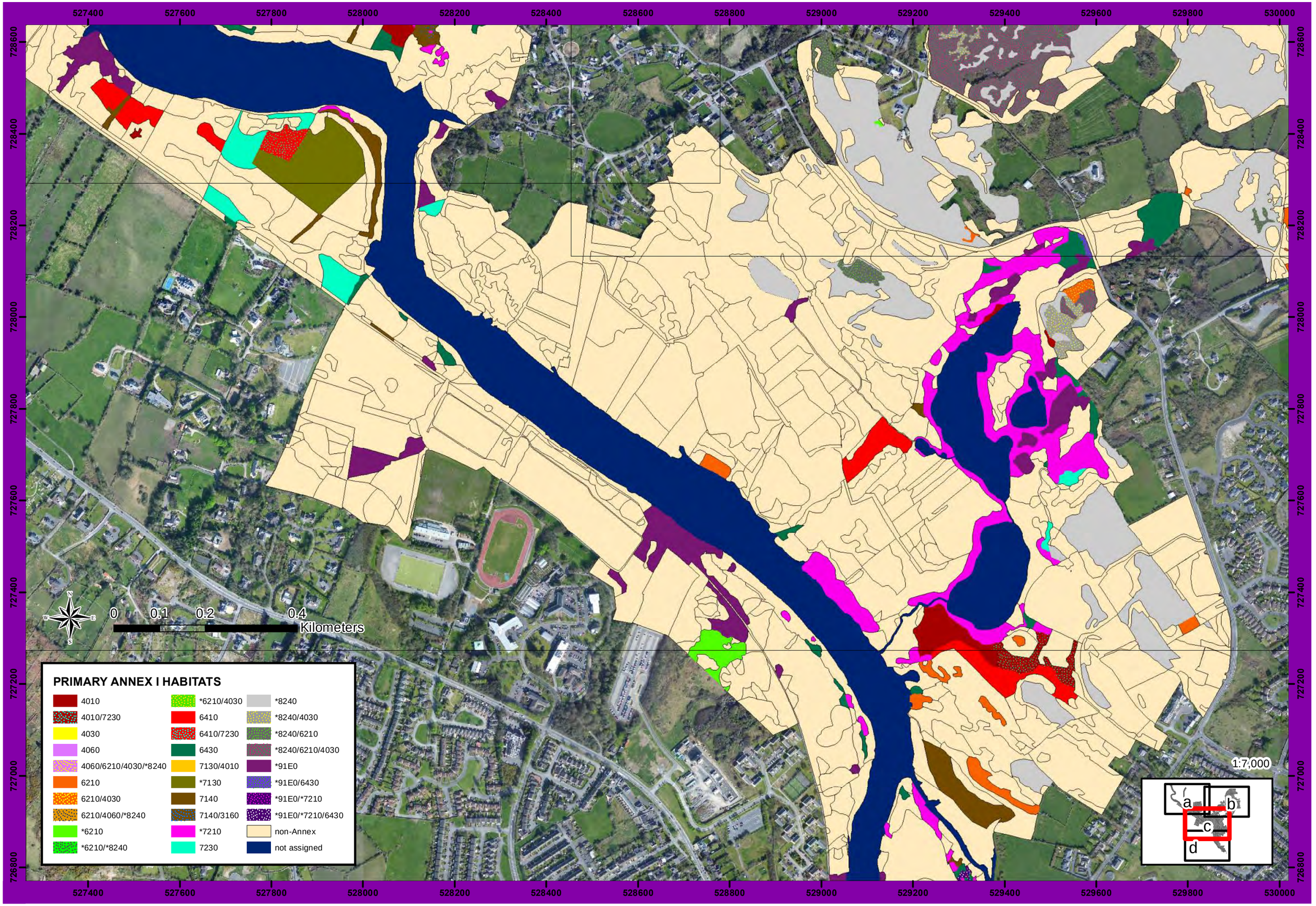


Figure 3d. Primary Annex I habitats within the survey area

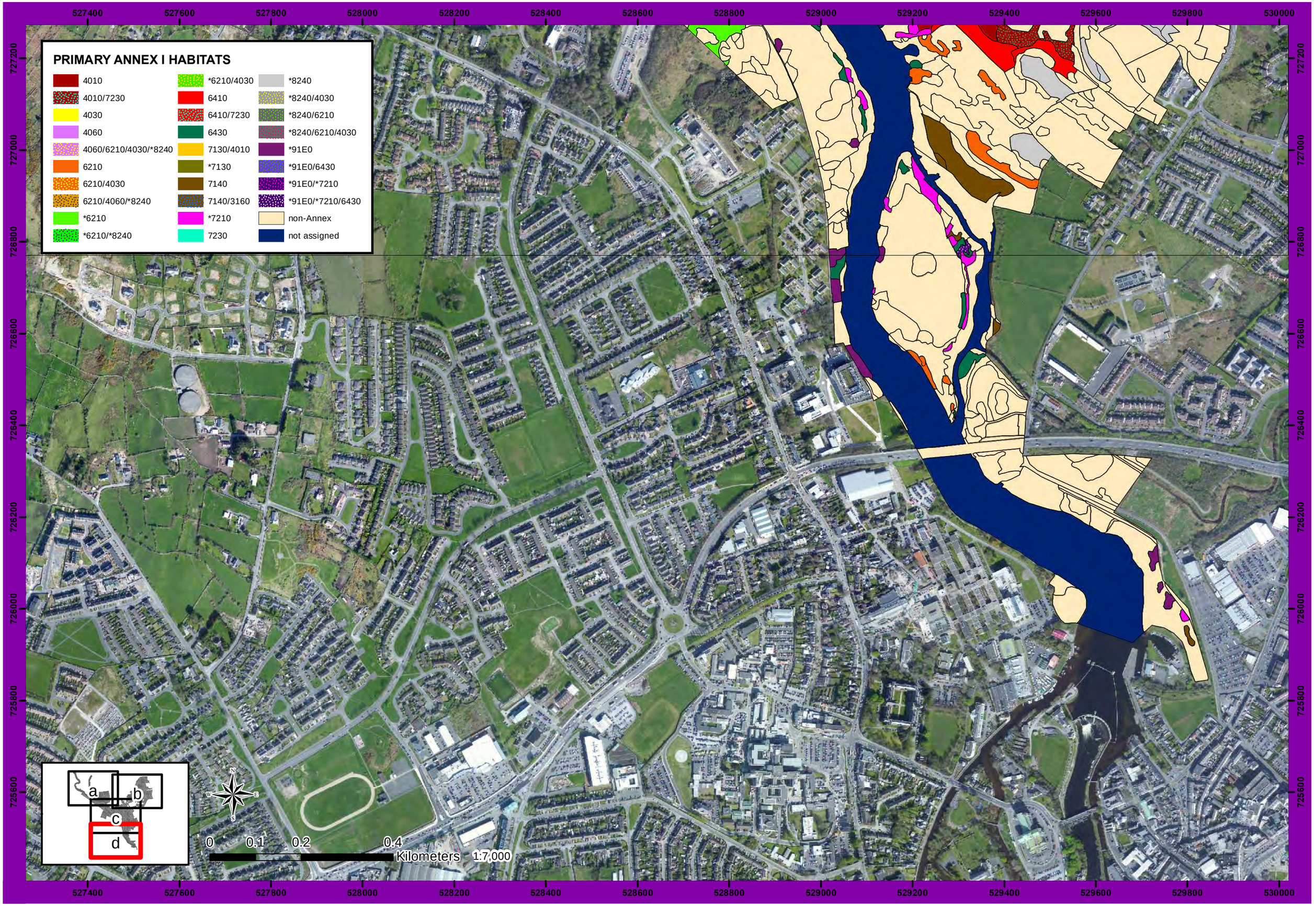


Figure 4a. Rapid assessment of Annex I habitat quality within the survey area

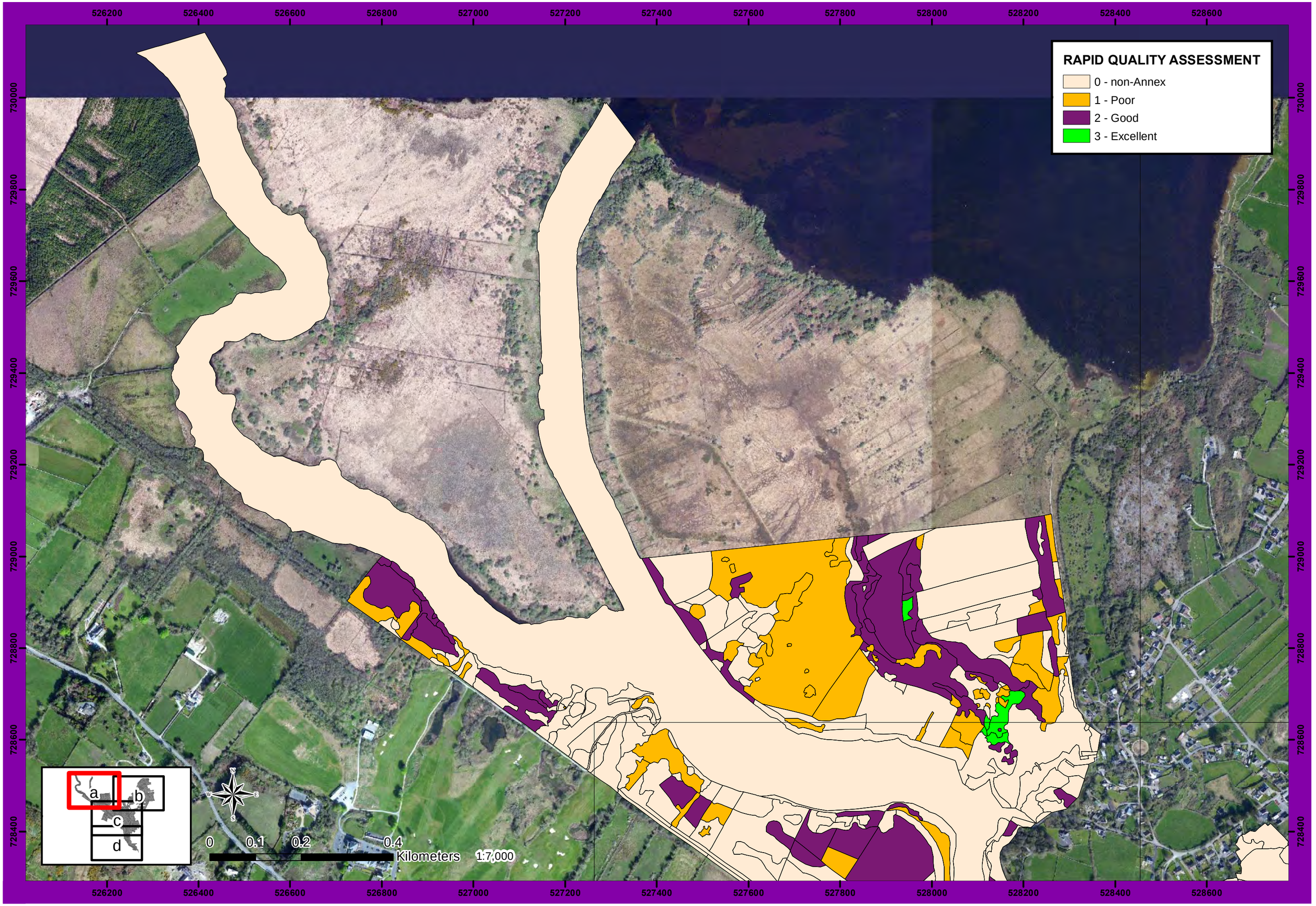


Figure 4b. Rapid assessment of Annex I habitat quality within the survey area

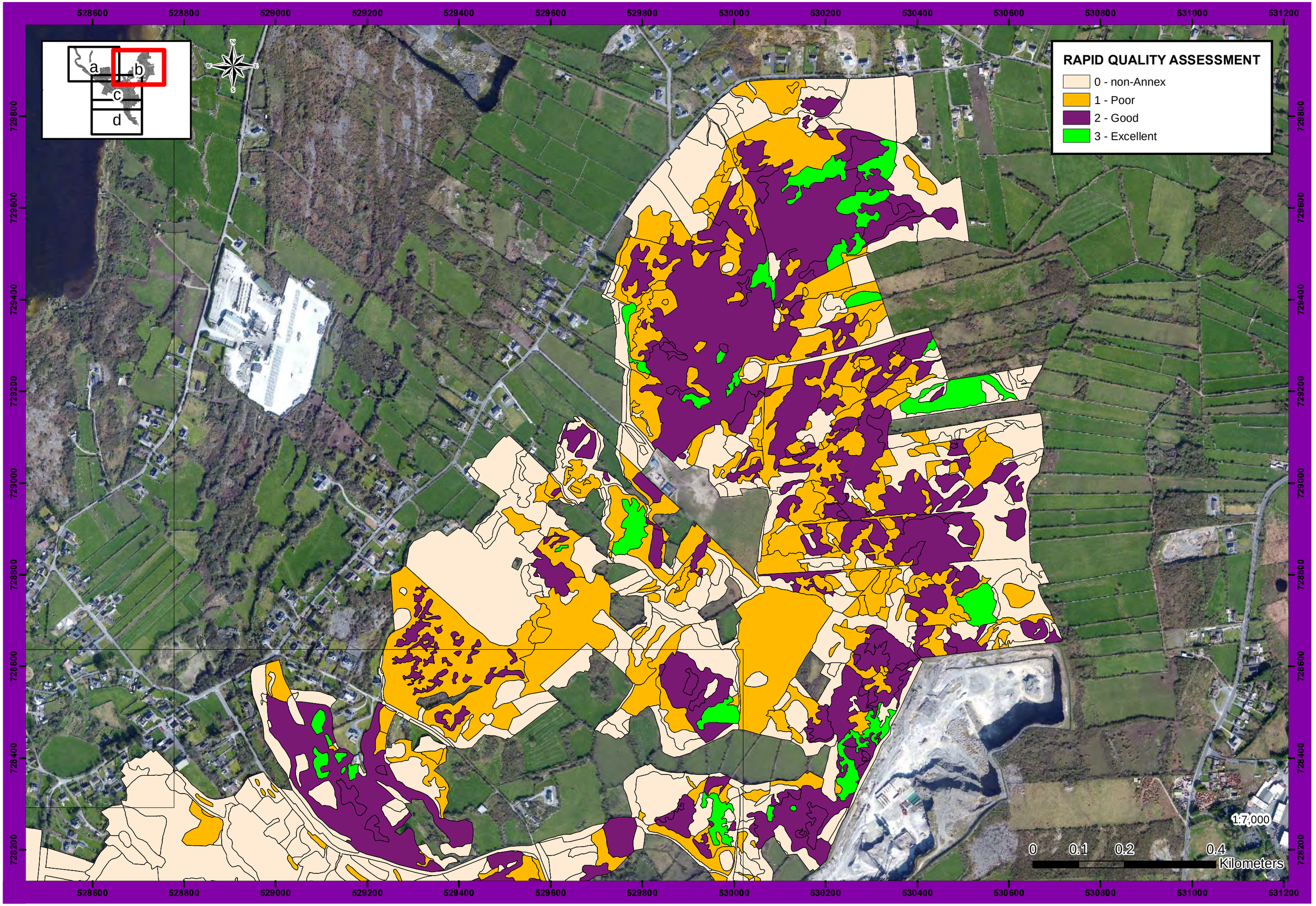


Figure 4c. Rapid assessment of Annex I habitat quality within the survey area

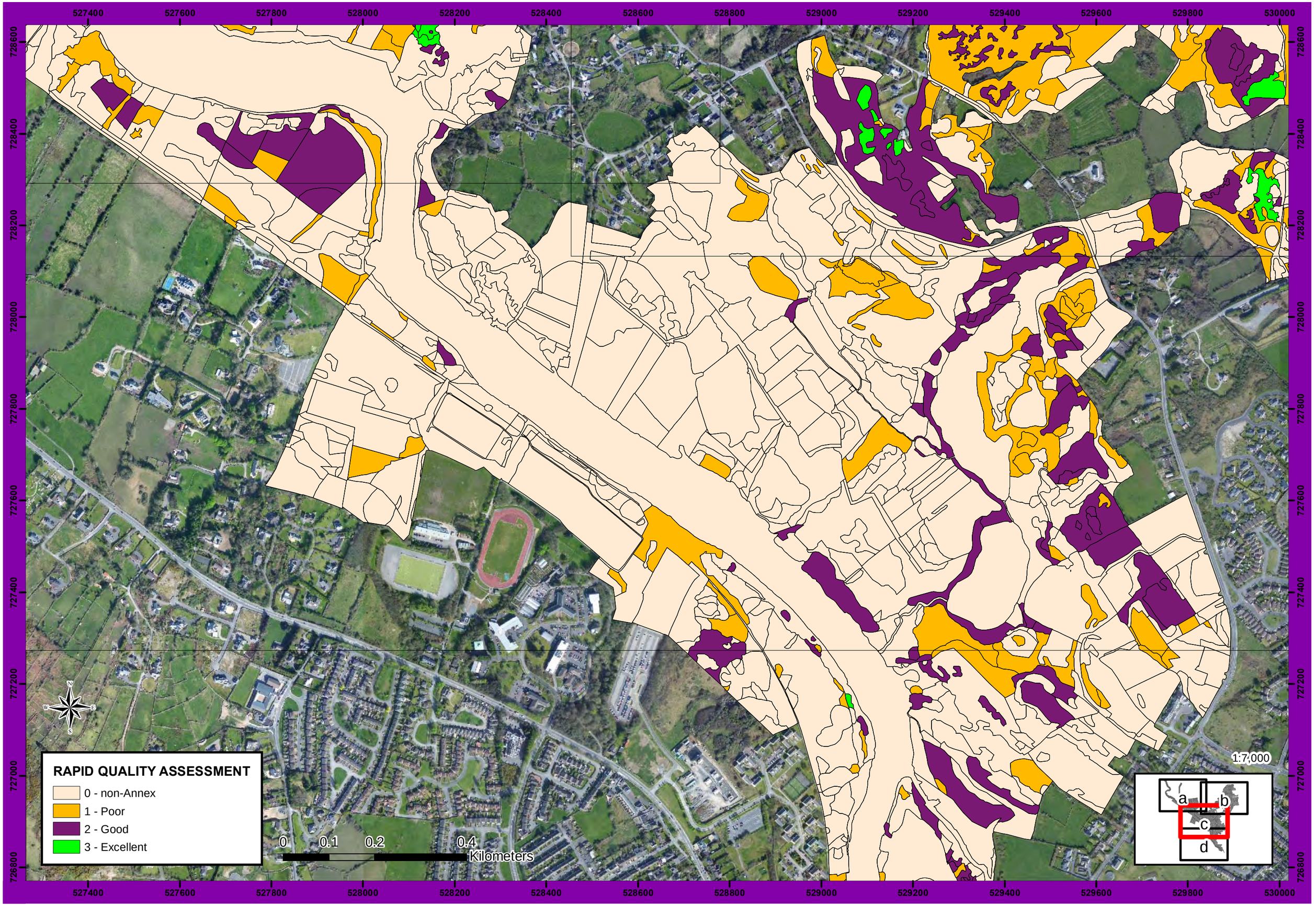


Figure 4d. Rapid assessment of Annex I habitat quality within the survey area

Figure 5a. Location of relevés and results of conservation assessment monitoring stops within the survey area

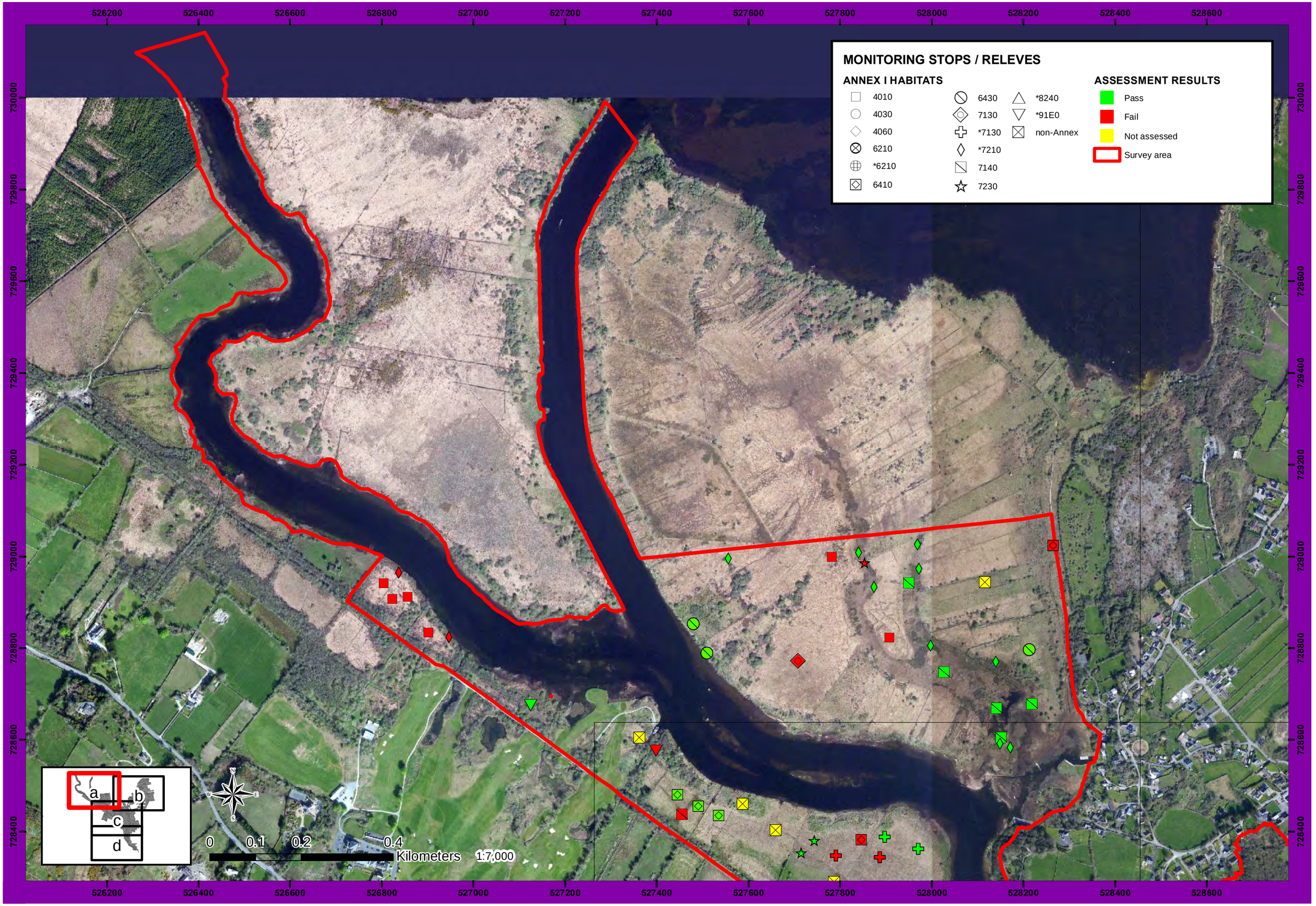


Figure 5b. Location of relevés and results of conservation assessment monitoring stops within the survey area

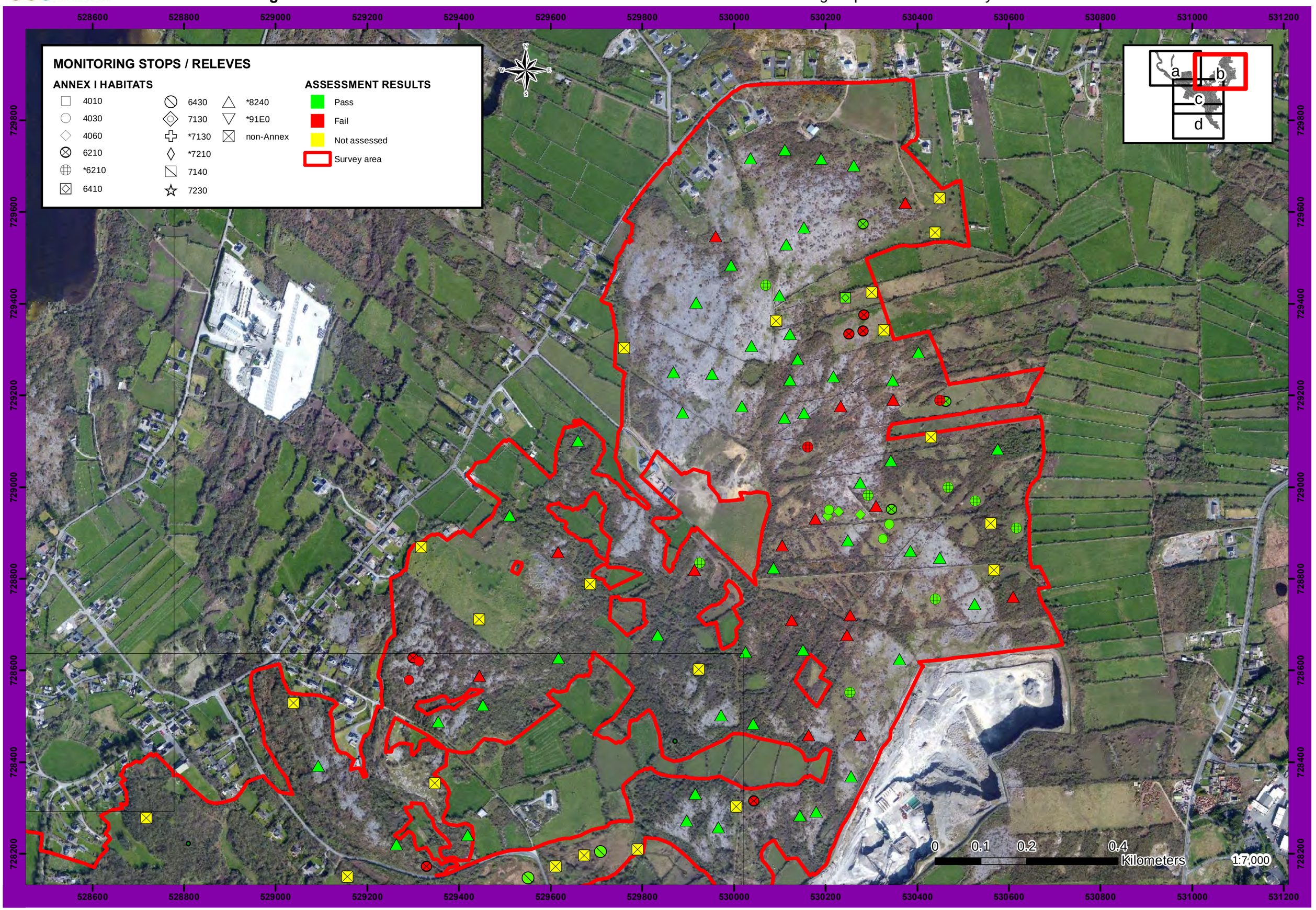


Figure 5c. Location of relevés and results of conservation assessment monitoring stops within the survey area

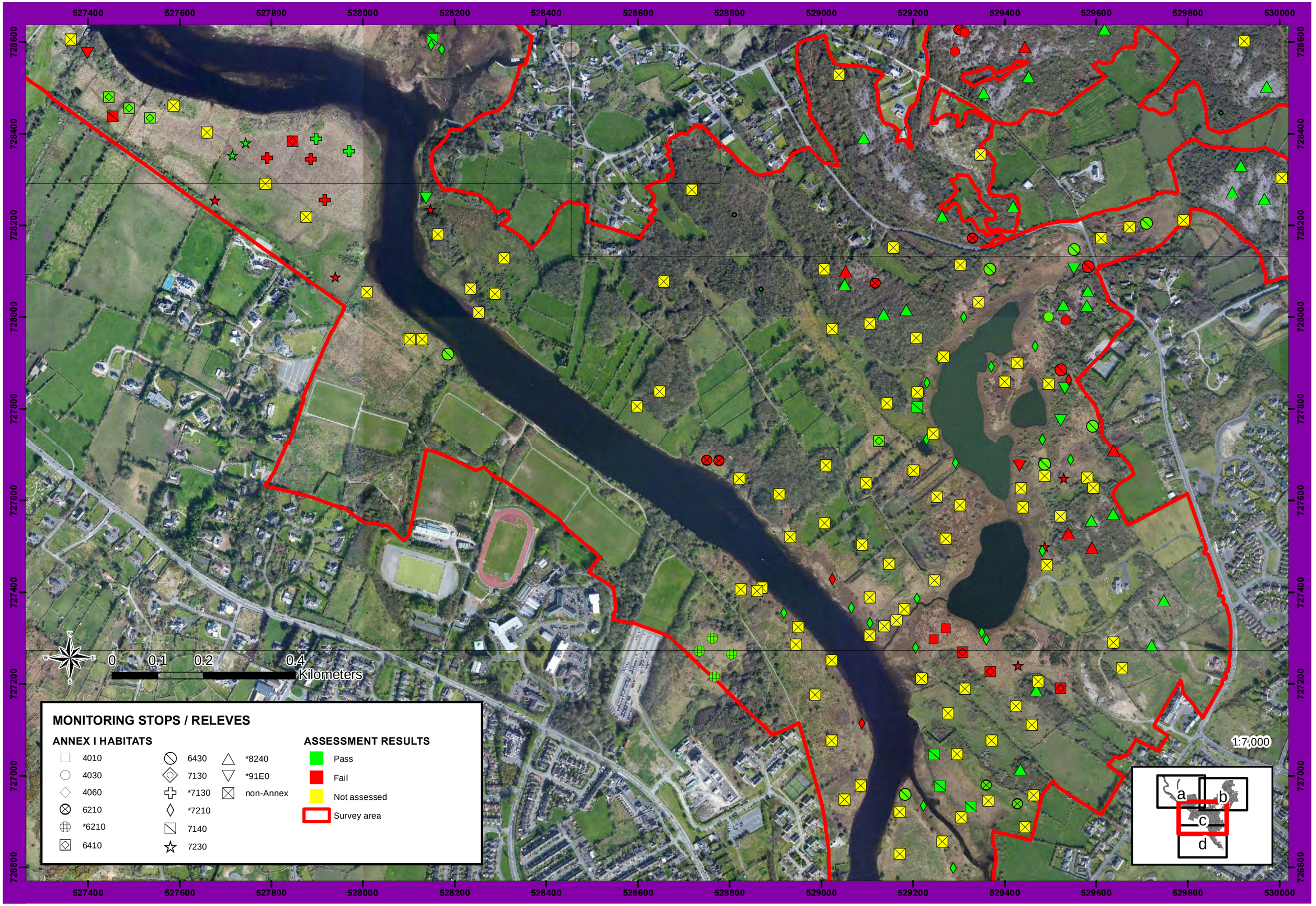


Figure 5d. Location of relevés and results of conservation assessment monitoring stops within the survey area

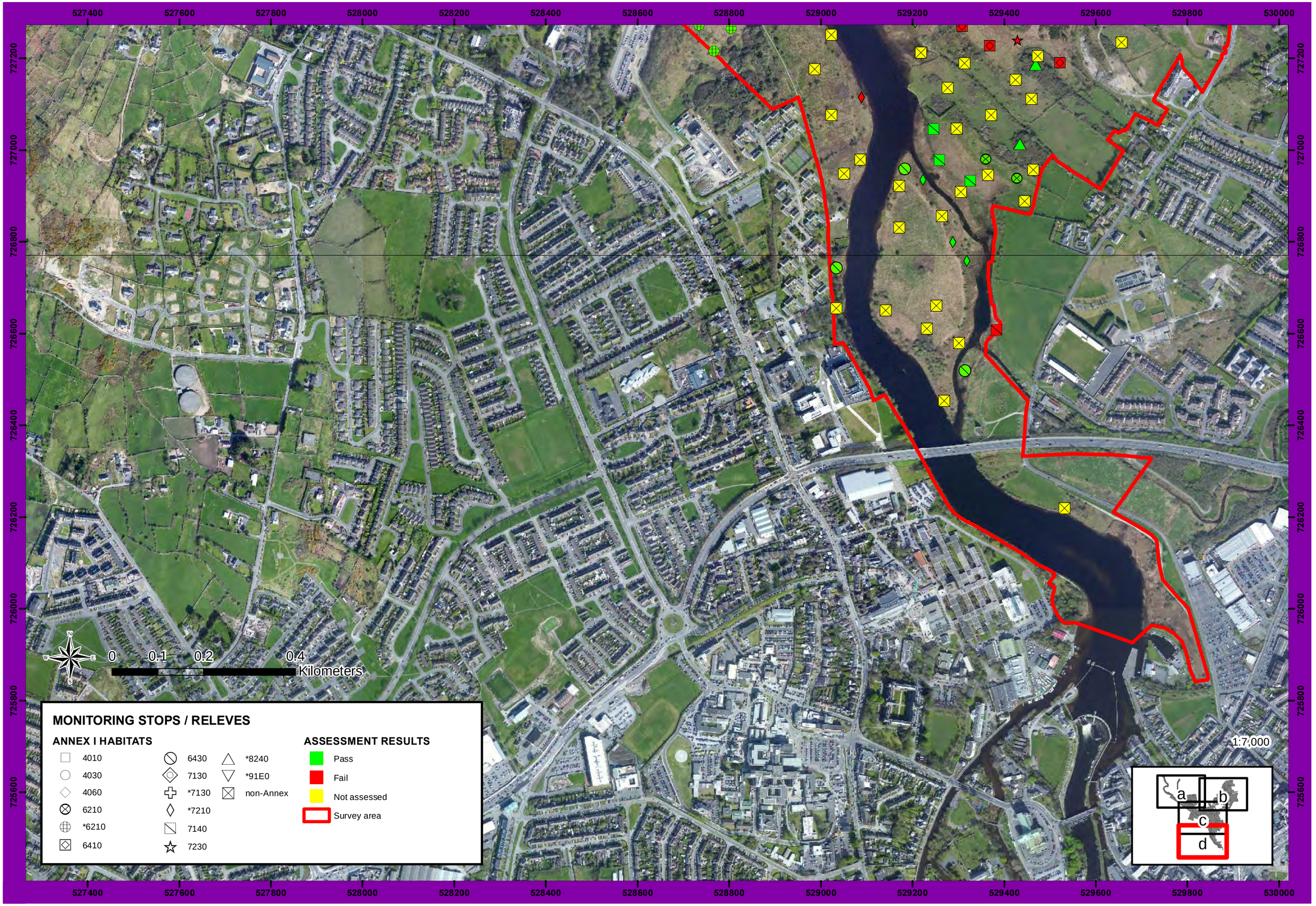


Figure 6a. Vegetation communities within the survey area

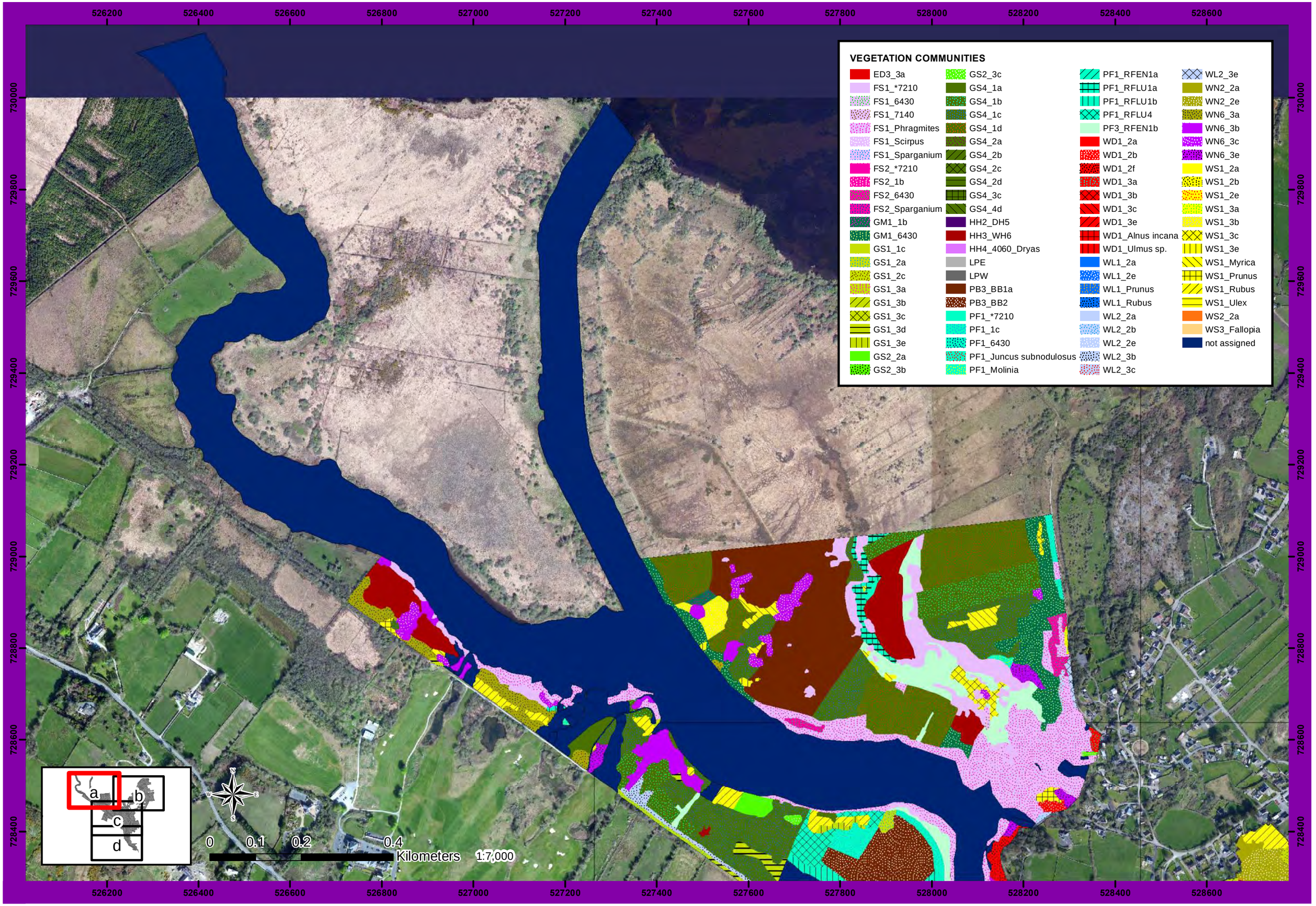


Figure 6b. Vegetation communities within the survey area

528600 528800 529000 529200 529400 529600 529800 530000 530200 530400 530600 530800 531000 531200

729800 729600 729400 729200 729000 728800 728600 728400 728200

VEGETATION COMMUNITIES

LEGEND

Veg_comm

- ED3_3a
- FS1_*7210
- FS1_6430
- FS1_7140
- FS1_Phragmites
- FS1_Scirpus
- FS1_Sparganium
- FS2_*7210
- FS2_1b
- FS2_6430
- FS2_Sparganium
- GM1_1b
- GM1_6430
- GS1_1c
- GS1_2a
- GS1_2c
- GS1_3a
- GS1_3b
- GS1_3c
- GS1_3d
- GS1_3e
- GS2_2a
- GS2_3b
- GS2_3c
- GS4_1a
- GS4_1b
- GS4_1c
- GS4_1d
- GS4_2a
- GS4_2b
- GS4_2c
- GS4_2d
- GS4_3c
- GS4_4d
- HH2_DH5
- HH3_WH6
- HH4_4060_Dryas
- LPE
- LPW
- PB3_BB1a
- PB3_BB2
- PF1_*7210
- PF1_1c
- PF1_6430
- PF1_Juncus subnodulosus
- PF1_Molinia
- PF1_RFEN1a
- PF1_RFLU1a
- PF1_RFLU1b
- PF1_RFLU4
- PF3_RFEN1b
- WD1_2a
- WD1_2b
- WD1_2f
- WD1_3a
- WD1_3b
- WD1_3c
- WD1_3e
- WD1_Alnus incana
- WD1_Ulmus sp.
- WL1_2a
- WL1_2e
- WL1_Prunus
- WL1_Rubus
- WL2_2a
- WL2_2b
- WL2_2e
- WL2_3b
- WL2_3c
- WL2_3e
- WN2_2a
- WN2_2e
- WN6_3a
- WN6_3b
- WN6_3c
- WN6_3e
- WS1_2a
- WS1_2b
- WS1_2e
- WS1_3a
- WS1_3b
- WS1_3c
- WS1_3e
- WS1_Myrica
- WS1_Prunus
- WS1_Rubus
- WS1_Ulex
- WS2_2a
- WS3_Fallopia
- not assigned

N W E S

a b c d

1:7,000

0 0.1 0.2 0.4 Kilometers

Figure 6c. Vegetation communities within the survey area

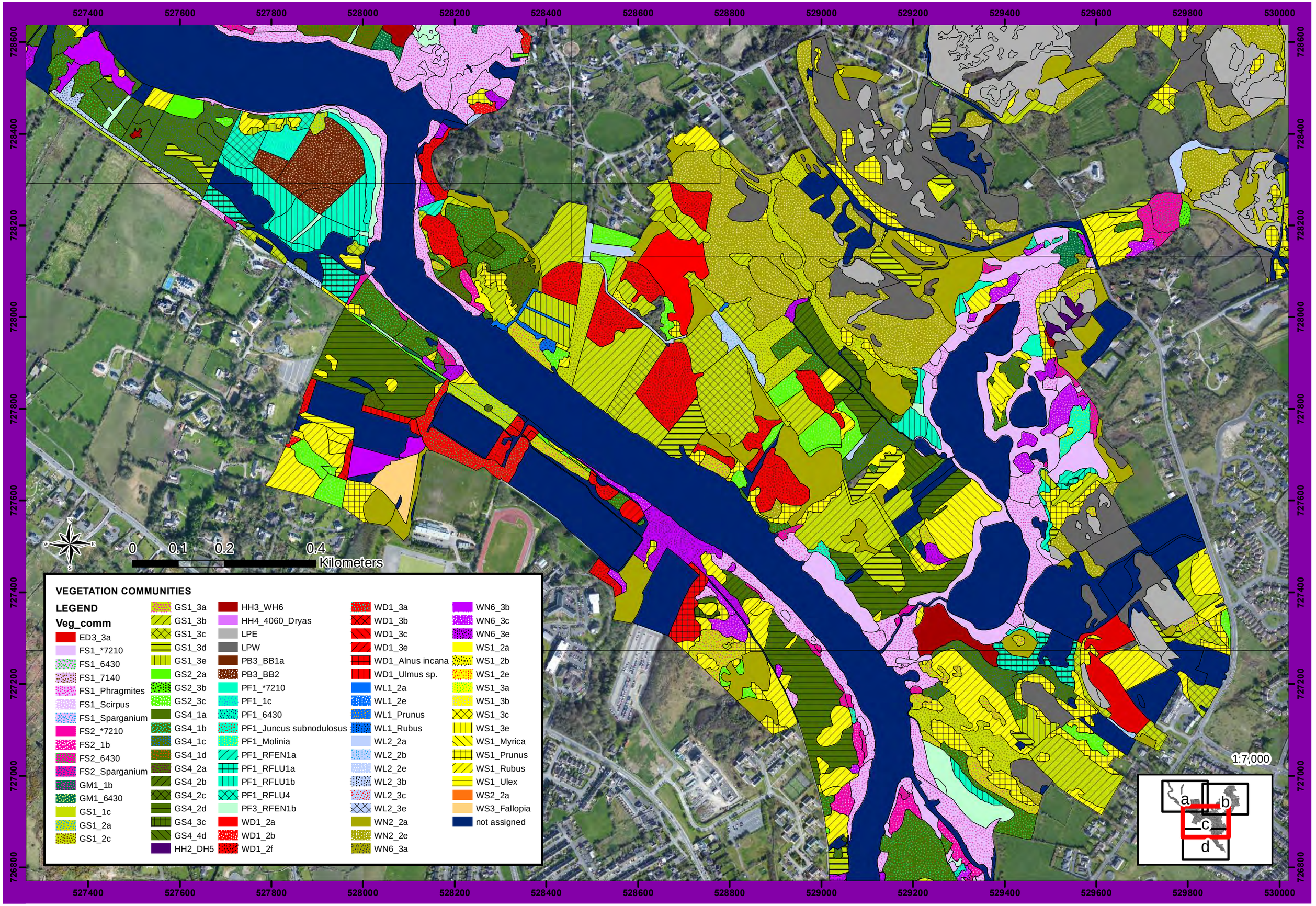
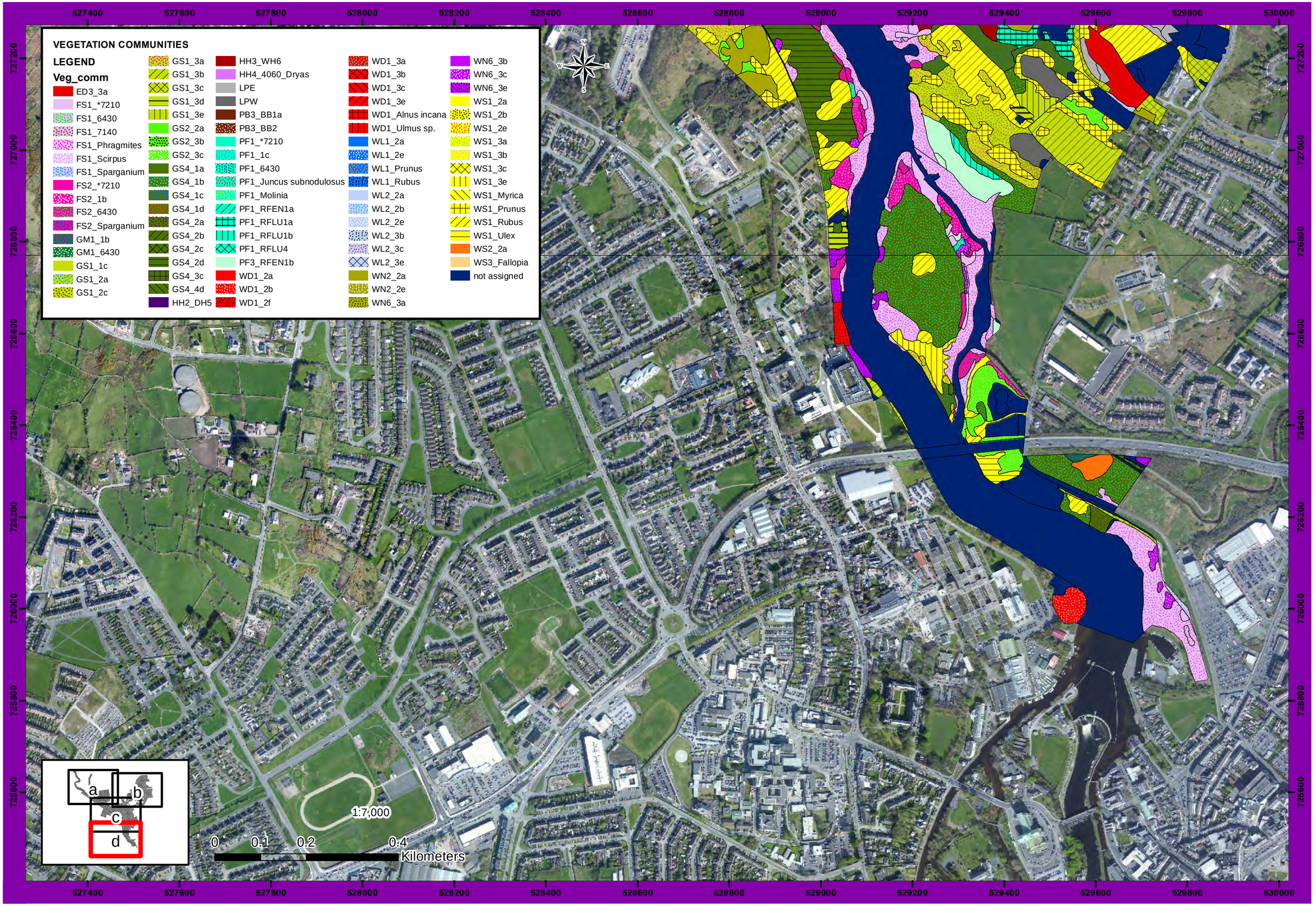


Figure 6d. Vegetation communities within the survey area



Appendix 1: Assessment criteria for *Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae [7210]

The assessment scheme presented below was developed by Crushell & Foss (2014a, b)

Assessment varies between the *Cladium* swamp (FS1) and *Cladium* fen (PF1) variants of the habitat, both of which are considered to correspond with the EU Annex I habitat *7210 Calcareous fens with *Cladium mariscus* as defined in the EU Habitats Interpretation manual.

Criteria for Condition Assessment of *Cladium* swamp

Criteria		Scale of assessment
Vegetation composition		
1	*Cladium mariscus* present	Relevé
2	Number of positive vascular indicator species present ≥ 2	Relevé
3	Vegetation cover of *Cladium* and vascular indicator species ≥ 75%	Relevé
4	Total cover of the following species < 5%: *Epilobium hirsutum, Typha latifolia*	Relevé
5	Cover of non-native species < 1%	Relevé
6	Cover of scattered native trees and scrub (woody species) < 10%	Local vicinity†
Vegetation structure		
7	At least 50% of the live leaves/flowering shoots are more than 100 cm above ground surface	Relevé
Physical structure		
8	Cover of disturbed, bare ground < 10%	Relevé
9	Cover of disturbed, bare ground < 10%	Local vicinity
10	Area showing signs of drainage resulting from ditches or heavy trampling or tracking < 10%	Local vicinity
11	Where tufa is present, disturbed proportion of vegetation cover < 1%	Local vicinity

Criteria for Condition Assessment of open *Cladium* fen

Criteria		Scale of assessment
***Cladium* fen Vegetation composition**		
1	*Cladium mariscus* present	Relevé
2	At least one brown moss species present	Relevé
3	Number of positive vascular indicator species present ≥ 3	Relevé
4	Vegetation cover of brown mosses and vascular indicator species ≥ 75%	Relevé
5	Total cover of the following species: *Anthoxanthum odoratum, Epilobium hirsutum, Holcus lanatus, Ranunculus repens* < 1%	Relevé
6	Cover of non-native species < 1%	Relevé
7	Cover of scattered native trees and scrub < 10%	Local vicinity
8	Total cover of *Juncus effusus* and *Phragmites australis* < 10%	Local vicinity
Vegetation structure		
9	At least 50% of the live leaves/flowering shoots are more than 5 cm above ground surface	Relevé
Physical structure		
10	Cover of disturbed, bare ground < 10%	Relevé
11	Cover of disturbed, bare ground < 10%	Local vicinity
12	Area showing signs of drainage resulting from ditches or heavy trampling or tracking < 10%	Local vicinity
13	Where tufa is present, disturbed proportion of vegetation cover < 1%	Local vicinity

† Within approximately 20 m^2 radius of relevé

Positive indicator species for EU Annex I habitat *Cladium mariscus* fen (7210)*

***Cladium* Swamp Variant**
Carex lasiocarpa
Phragmites australis
Equisetum fluviatile
Lemna trisulca
Potentilla palustris
Menyanthes trifoliata
***Cladium* Fen Variant**
Brown mosses
Bryum pseudotriquetrum
Calliergon sarmentosum
Campylium stellatum
Ctenidium molluscum
Drepanocladus revolvens
Drepanocladus cossonii
Fissidens adianthoides
Palustriella commutata
Palustriella falcata
Scorpidium scorpioides
Vascular Plants
Carex panicea
Carex viridula
Eleocharis quinqueflora
Juncus bulbosus
Pinguicula vulgaris
Anagallis tenella
Carex dioica
Carex lasiocarpa
Carex panicea
Carex viridula
Carex rostrata
Cirsium dissectum
Molinia caerulea
Pinguicula vulgaris
Schoenus nigricans
Selaginella selaginoides

References

Crushell, P. & Foss, P. (2014a) Coolagh Lakes, Lough Corrib SAC, Co. Galway: Wetland Survey and Conservation Assessment. Report prepared on behalf of Wetland Surveys Ireland Ltd for BEC Consultants.

Crushell, P. & Foss, P. (2014b) Coolanillaun Bog, Lough Corrib SAC, Co. Galway: Wetland Survey and Conservation Assessment. Report prepared on behalf of Wetland Surveys Ireland Ltd for BEC Consultants.

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H.2 Part 2 Habitat Surveys 2019

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Habitat Survey Results 2019

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Issue Document Verification with Document ✓

Contents

Annexes

1 Introduction

The information presented is unchanged from that presented in Appendix A.3.1 of the 2019 RFI Response report.

It was prepared to document the results of the ecological habitat surveys undertaken between June and August 2019 as part of the response to items 3a and 3b of the RFI received from An Bord Pleanála (ABP). Items 3a and 3b of the RFI required the provision of additional vegetation samples to support and aid the verification of the baseline habitat classifications and mapping presented in the 2018 EIAR and 2018 NIS.

Item 3a of the RFI states:

> *Provide details of vegetation samples (Relevé data) in each location where the development boundary overlaps with the Lough Corrib cSAC (as shown on Plates 2.3 to 2.6 of the NIS) with up to five samples for each habitat type at each location where space permits. Grid reference and photographs are to be provided for each.*

Item 3b of the RFI states:

> *Provide additional vegetation samples (Relevé data) to support the habitat mapping in other areas within the development boundary, with sufficient samples per habitat type, for empirical verification of the habitat mapping. Grid reference and photographs are to be provided for each.*

This appendix is structured as follows:

- Section 2 outlines the habitat survey work undertaken up to October 2018 in relation to the proposed road development
- Section 3 presents the methodology for the 2019 habitat surveys
- Section 4 presents an overview of the results of the 2019 habitat surveys and discussion of changes to the habitat baseline since the publication of the EIAR and NIS in October 2018 (with the full baseline and survey results data provided in **Annex 1**, **2** and **3** to this Appendix A.3.1 to the 2019 RFI Response)
- Annex 1 contains the updated habitat species list for all surveys completed up to and within 2023.
- Section 5.1 discusses whether the findings of the habitat survey have any implications for the assessment presented in the 2018 NIS
- Section 5.2 discusses whether the findings of the habitat survey have any implications for the assessment presented in the 2018 EIAR

2 Background

The habitats baseline and impact assessment presented in the 2018 EIAR and 2018 NIS were informed by a series of habitat surveys undertaken between 2013 and 2018.

To ensure sufficient ecological data was available to inform the ecological assessment of potential options for a transport solution for Galway City and its environs, habitat surveys within the Lough Corrib SAC commenced in 2013.

These surveys continued during the survey season in 2014 and included the full extents of the study area for the options assessment within lands inside and outside the Lough Corrib SAC. Given the nature of the ecological constraints within the study area identified from the desktop study and through consultation, it was determined that detailed ecological surveying to a level required for an EIA assessment was required in order to develop feasible alternatives and to identify an option that has the least adverse impact on a European site. The guiding principles to determining the level of detail required for these surveys were:

- Will there be enough data available to identify the least damaging route (not only in terms of impacts on SACs/SPAs but also on non-designated Annex I habitats and Annex II species)?
- Are there currently any undesignated areas of Annex I habitats or populations of Annex I (birds)/ II (all other species) species which could qualify for inclusion within a cSAC?
- Will there be any significant adverse effects on the favourable conservation status of any areas of Annex I habitats or populations/habitats of Annex I (birds)/ II and IV (non-bird species) species?"

The areas identified during the desktop study for habitat surveys were the Lough Corrib cSAC firstly, ecological sites (i.e. areas identified of ecological interest)[1] secondly and thirdly other areas of interest with the level of surveys undertaken for each area specifically designed as follows:

- All Annex I habitat within the Lough Corrib cSAC was mapped to the vegetation community type and included a condition/quality assessment (monitoring stops)
- All other habitats within the Lough Corrib cSAC were mapped to Fossitt level 3 with valuations as per the NRA/CIEEM guidelines
- All identified ecological sites were mapped to Fossitt level 3 with valuations as per the NRA/CIEEM guidelines
- Habitat checks were completed for all other areas within the study area. These checks included a rapid assessment for affinity to Annex I habitat types and to other habitat types of local high value as per NRA/CIEEM. Further detailed

[1] Ecological Sites are sites of potential ecological value for the habitats present: i.e. determined to be at least of a Local Importance (higher value) (refer to National Roads Authority, 2009 for more detail). The boundaries of the Ecological Sites were initially defined based on interpretation of orthophotography and collation of available existing habitat information, in conjunction with a ground truthing exercise to verify the orthophotography interpretation. These boundaries were then refined, where appropriate, based on the findings of the various habitat surveys undertaken.

botanic assessment was undertaken where required to either vegetative community level for Annex I habitat types or Fossitt level 3 with valuations as per the NRA/CIEEM guidelines for all other habitat types.

These surveys are described in full in the 2018 EIAR (Section 8.2.4.2 and Appendix A.8.1) and in the 2018 NIS (Section 4.4.1.1). The 2014 surveys were followed up by additional surveys along the Emerging Preferred Route Corridor between 2015 and 2018 to inform the biodiversity assessment of the proposed N6 Galway City Ring Road (GCRR) for the 2018 EIAR and 2018 NIS.

As outlined in the 2018 EIAR and 2018 NIS, a significant number of relevés[2] were recorded as part of those habitat surveys in support of the classification of Annex I habitats. The collection of relevé data as part of the habitat surveys undertaken between 2013 and 2018 was to inform and support the classification of Annex I habitats across the study area. As Annex I habitat areas were key biodiversity constraints in the context of informing the route selection process, they were avoided, where possible, by the various route options. Hence, the majority of the relevés recorded at that time lie outside of the proposed development boundary for the proposed N6 GCRR.

3 Methodology

The 2019 habitat surveys broadly followed the methodologies set out in the 2018 EIAR and 2018 NIS but **were focused on habitat areas within the proposed development boundary for the proposed N6 GCCR only** and adapted to respond specifically to items 3a and 3b of the request for further information from An Bord Pleanála as detailed below.

3.1 Item 3a – habitat areas within Lough Corrib cSAC

Additional relevés were recorded in all habitat areas where the proposed development boundary overlaps with Lough Corrib cSAC, with up to five samples for each habitat type taken at each location where space permitted. Grid reference and photographs were recorded for each relevé and are included in digital format in **Annex 3** of the Appendix A.3.1 to the 2019 RFI Response.

Where the area of the overlap was too small to fulfil the area requirement for taking a relevé for that habitat type, a relevé was taken from outside of the overlap to include the actual overlap area and be within the same habitat type where possible, whilst also taking due cognisance of the potential for edge habitats.

[2] Relevés are small vegetation sampling plots used to record the plant species present and their relative abundance within the sampling plot, as a representative sample of a larger habitat area. Relevés are generally a standard size for a given habitat type, but this is also dependant on the subsequent use or analysis required of the data being collected. For example, a sampling plot of 2m x 2m is standard for most habitat types for habitat classification or long-term vegetation monitoring, with larger 10m x 10m (or sometimes 20m x 20m) plots used for woodland classification or monitoring.

3.2 Item 3b – all other habitat areas within the proposed development boundary

This element of the habitat survey involved a walkover of the area within the proposed development boundary and outside of Lough Corrib cSAC, to verify and photograph habitats[3], with relevés taken as outlined below. Visual checks were undertaken of habitats to verify any changes to habitat classifications and a photo record was taken as a reference dataset to support the habitat classifications.

In addition to the visual checks, relevé samples were taken from a representative number of habitat areas for each habitat type as outlined in **Table 1** below. The percentage of polygon to be sampled for each habitat type varied depending on the following factors:

- The ecological value of the habitat type
- The number of habitat areas which exist whereby sufficient and representative relevé sampling was undertaken for habitats with a proportionally larger number of habitat areas (e.g. dry calcareous and neutral grassland GS1 habitat areas)
- It was considered adequate for habitats of a very low ecological value to carry out a lower sampling percentage (e.g. approx. 18% of amenity grassland GA2 habitat areas were sampled)
- The potential for variation within a habitat type whereby habitats with a potentially higher degree of variation within a given habitat area were sampled at a higher percentage to ensure the variation is captured (e.g. there can be large variation in vegetation composition within grassland habitats and therefore a higher percentage of sampling may be warranted)
- The ecological value and potential for habitat areas to correspond to Annex I habitat types whereby certain habitats with a higher ecological value and a potentially high affinity to Annex I habitat types were sampled at a relatively higher sampling percentage (e.g. dry calcareous and neutral grassland GS1)

Where habitat areas were sampled the number of relevés recorded within each habitat area was decided in the field by the surveyor in consideration of:

- the size of the habitat area (in some areas it was not possible to fit in more than a single relevé)
- the degree of variation within the habitat polygon (i.e. more relevés were recorded where there was a higher degree of variation within a given habitat area)
- the complexity and ecological value of the habitat type. Habitats of a high ecological value and with a higher affinity to Annex I habitat types may require more than a single relevé in order to verify and support the habitat classification

[3] The habitat areas surveyed are those included in the GIS dataset N6GCRR_2019HabitatMap_Polygons.shp included in **Annex 3** to the Appendix A.3.1 to the 2019 RFI Response.

New relevés were not taken in habitat areas where a relevé had been recorded previously (between 2014 and 2018), and the existing habitat information from that relevé accurately represented the habitat area, and the habitat classification had not changed in the interim.

Habitat Type		Sample Size	
Fossitt Code	**Annex I Code**	**% of Habitat Areas**	**No. of Relevés**
BC4	n/a	66	2
ED2	n/a	Relevé taken where habitat has changed	
ED3	n/a	100	32
ER1	n/a	Not sampled (not suitable for relevés)	
ER2	*8240	100	6
FL5	n/a	Not sampled (not suitable for relevés)	
FL6	*3180	Not sampled – relevé recorded in 2014	
FL8	n/a	Not sampled (not suitable for relevés)	
FS1	n/a	Not sampled (could not be safely accessed)	
FW1	n/a	Not sampled (not suitable for relevés)	
FW2	n/a	Not sampled (not suitable for relevés)	
FW4	n/a	100	5
GA1	n/a	23	49
GA2	n/a	18	12
GM1	n/a	100	3
GS1	*6210/6210	97	121
GS2	n/a	41	18
GS3	n/a	86	18
GS4	6410	69	76
HD1	n/a	46	28
HH1	4030	96	41
HH3	4010	100	19
PB3	*7130	100	2
PF1	n/a	100	1
PF2	n/a	100	16
Residential	n/a	Not sampled (not suitable for relevés)	
WD1	n/a	70	19
WD2	n/a	Not sampled (not suitable for relevés)	
WD4	n/a	100	1
WD5	n/a	Not sampled (not suitable for relevés)	
WL1	n/a	Not sampled (not suitable for relevés)	
WL2	n/a	Not sampled (not suitable for relevés)	
WN2	*8240	85	34

Habitat Type		Sample Size	
WN6	*91E0	100	3
WS1	*8240	50	102
WS3	n/a	Not sampled	

Relevé Recording

Relevés were recorded on a handheld computer using a prepared form in TurbovegSD. The relevé size was 2m x 2m for all habitats except Limestone pavement and scrub habitats (which were sampled using a 5m x 5m relevé) and woodland habitats (which were sampled using a 10m x 10m relevé).

A photographic record of the relevé(s) and the associated habitat area was taken; with a minimum of one photo. The grid reference of each relevé was also recorded and used to plot the locations of each relevé in a GIS database. This data is included in **Annex 3** to this Appendix A.3.1 to the 2019 RFI Response.

Plant Nomenclature and Habitat Classification

Plant nomenclature follows that of the National Vegetation Database[4]. The general habitat classifications are as set out in *A Guide to Habitats in Ireland*[5] and for Annex I habitats, the *Interpretation manual of European Union Habitats EUR28*[6] was used with reference to the corresponding National and Regional habitat survey reports, as applicable:

- *Turloughs over 10 ha: vegetation survey and evaluation* (Goodwillie, R., 1992)
- *Turlough Hydrology, Ecology and Conservation* (Waldren, S. 2015, Ed.)
- *Summary of findings from the Survey of Potential Turloughs 2015* (O'Neill, F.H. & Martin, J.R., 2015)
- *The Irish semi-natural grasslands survey 2007-2012. Irish Wildlife Manuals, No. 78* (O'Neill et al., 2013)
- *The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102* (Martin, J.R., O'Neill, F.H. & Daly, O.H., 2018)
- *Results of monitoring survey of old sessile oak woods and alluvial forests. Irish Wildlife Manuals, No. 71* (O'Neill, F.H. & Barron, S.J., 2013)
- *National survey of limestone pavement and associated habitats in Ireland. Irish Wildlife Manuals, No. 73* (Wilson, S. and Fernández, F., 2013)
- *Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79* (Perrin et al., 2014)

[4] Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland. Version 1.0.* Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
[5] Fossitt, J.A. (2000) *A Guide to Habitats in Ireland.* Heritage Council, Kilkenny.
[6] CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28*. European Commission, DG Environment.

4 Results of Ecological Habitat Surveys

4.1 Overview of 2019 surveys

As requested in the RFI from ABP, in excess of 700 relevés were recorded between June and August 2019 within the proposed development boundary. The results and analysis of this survey work are detailed in this report, with the locations of all relevés shown on **Figures 2.2.01 to 2.2.09** and **Figures 2.4.001 to 2.4.120** included in **Annex 2** to this Appendix A.3.1 to the 2019 RFI Response and the relevé data that supports the habitat classifications in each habitat area included in the digital datasets in **Annex 3** to this Appendix A.3.1 to the 2019 RFI Response. **Annex 1** to this Appendix A.3.1 to the 2019 RFI Response presents the species lists and references to the associated supporting relevé data for the habitats recorded along, and adjacent to, the proposed road development.

Section 4.2 below provides a review of the 2018 EIAR assessment in light of the changes to the habitat classifications and amendments to the habitat areas boundaries recorded in 2019.

4.2 Habitat Descriptions & 2019 Changes

The findings of the 2019 habitat surveys have resulted in changes to habitat classifications and extents within the proposed development boundary. These are summarised below. Overall the results of the 2019 habitat surveys have confirmed that the habitats are similar to those published in the 2018 EIAR and remain generally as described in Section 8.3.4 of the 2018 EIAR.

The complete list of habitat types recorded along the route of the proposed road development based on the 2019 habitat surveys, are listed below with newly represented habitats within the proposed road development inserted in red font and habitats which are not represented in the 2019 survey results indicated in struck out red font:

- Flower beds and borders (BC4)
- Buildings and artificial surfaces (BL3)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Active quarries and mines (ED4)
- Exposed siliceous rock (ER1)
- Exposed calcareous rock (ER2), including the priority Annex I habitat *8240
- Limestone/marl lakes (FL3), including the Annex I habitat 3140
- Mesotrophic lakes (FL4)
- Eutrophic lakes (FL5)
- Turloughs (FL6), which corresponds with the priority Annex I habitat *3180

- Other artificial lakes and ponds (FL8)
- Calcareous springs (FP1), including the priority Annex I habitat *7220
- Reed and large sedge swamps (FS1), including the priority Annex I habitats *7210 and the Annex I habitat 6430
- ~~Tall herb swamps (FS2), including the Annex I habitats 6430/*7210~~
- Eroding/upland rivers (FW1)
- Depositing/lowland rivers (FW2)
- Drainage ditches (FW4)
- Improved agricultural grassland (GA1)
- Amenity grassland (improved) (GA2)
- Marsh (GM1)
- Dry calcareous and neutral grassland (GS1), including the priority Annex I habitat *6210/Annex I habitat 6210
- Dry meadows and grassy verges (GS2), including the Annex I habitat 6510
- Dry-humid acid grassland (GS3), including the priority Annex I habitat *6230
- Wet grassland (GS4), including the Annex I habitat 6410
- Dense bracken (HD1)
- Dry siliceous heath (HH1), which corresponds with the Annex I habitat 4030
- ~~Dry calcareous heath (HH2), which corresponds with the Annex I habitat 4030~~
- Wet heath (HH3), which corresponds with the Annex I habitat 4010
- Rich fen and flush (PF1), including the Annex I habitats 7230/*7210
- Poor fen and flush (PF2),
- Lowland blanket bog (PB3), including the Annex I habitat *7130
- (Mixed) broadleaved woodland (WD1)
- Mixed broadleaved/conifer woodland (WD2)
- ~~(Mixed) conifer woodland (WD3)~~
- Conifer Plantation (WD4)
- Scattered trees and parkland (WD5)
- Hedgerows (WL1)
- Treelines (WL2)
- Oak-ash-hazel woodland (WN2), including the priority Annex I habitat *8240
- Riparian woodland (WN5)
- Wet willow-alder-ash woodland (WN6), including the priority Annex I habitat *91E0
- Scrub (WS1), including the priority Annex I habitat *8240

- ~~Immature woodland (WS2)~~
- Ornamental/non-native shrub (WS3)
- ~~Recently felled woodland (WS5)~~

Table 2 indicates the area of each habitat type present within the proposed development boundary which is a Key Ecological Receptor (KER) based on both the 2019 and 2018 surveys.[7]

Table 2: KER habitat types within the proposed development boundary

Habitat type	Extent Based on 2019 Surveys[8]	Extent Based on 2018 Surveys[9]
Priority Annex I habitat		
Turlough [*3180]	One (c.0.04ha of c.0.1ha is within fenceline)	One (c.0.04ha of c.0.1ha is within fenceline)
Petrifying springs [*7220]	One feature	One feature
Residual alluvial forests [*91E0]	c.0.14ha	c.0.1ha
Limestone pavement [*8240]	c. 2.71ha	c. 2.3ha
Calcareous grassland (*important orchid sites) [*6210]	0 ha (one area of 6m^2) and small areas within mosaics of *8240 above the Lackagh tunnel	None
Blanket bog (active) [*7130]	c. 0.01ha (one area of 93m^2)	None
Annex I habitat		
Wet heath [4010]	c.1.78ha	c.1.22ha
Dry heaths [4030]	c.1.5ha	c.1.96ha
Calcareous grassland [6210]	c.0.15ha	c.1.14ha
Molinia meadow [6410]	c.0.73ha	c.1.02ha
Local Importance (higher value)		
Calcareous springs (FP1)	Fifteen features	Fifteen features
Reed and large sedge swamps (FS1)	c.0.08ha	c.0.14ha
Tall-herb swamps (FS2)	None	c.0.03ha
Eroding/upland rivers (FW1)	c.120m of Sruthán na Líbeirtí c.220m of the Trusky Stream c.140m of the Bearna Stream (and tributary)	c.120m of Sruthán na Líbeirtí c.220m of the Trusky Stream c.140m of the Bearna Stream (and tributary)

[7] KERs are those biodiversity receptors within the ZoI of the proposed road development which are "both of sufficient value to be material in decision making and likely to be affected significantly"
[8] This includes either a measure of habitat area (ha), linear length of habitat lost (m/km), or a total number of point features affected (e.g. spring/seepage sites), as appropriate.
[9] This includes either a measure of habitat area (ha), linear length of habitat lost (m/km), or a total number of point features affected (e.g. spring/seepage sites), as appropriate.

Habitat type	Extent Based on 2019 Surveys[8]	Extent Based on 2018 Surveys[9]
	c.475m of the Tonabrocky Stream	c.475m of the Tonabrocky Stream
Drainage ditches (FW4)	c.0.08ha	c.0.12ha
Marsh (GM1)	c.0.06ha	c.0.2ha
Dry calcareous and neutral grassland (GS1)	c.43.5ha	c.13.7ha
Dry meadows and grassy verges (GS2)	c.9.50ha	c.8.2ha
Dry-humid acid grassland (GS3)	c.4.51ha	c.7.81ha
Wet grassland (GS4)	c.15.23ha	c.11.1ha
Poor fen and flush (PF2)	c.0.25ha	c.0.13ha
(Mixed) broadleaved woodland (WD1)	c.4.40ha	c.4.25ha
Mixed broadleaved/conifer woodland (WD2)	c.0.03ha	c.0.03ha
(Mixed) conifer woodland (WD3)	None	c.0.01ha
Oak-ash-hazel woodland (WN2)	c.3.9ha	c.4.18ha
Riparian woodland (WN5)	c.0.03ha (255m^2)	None
Scrub (WS1)	c.27.1ha	c.21.1ha
Exposed calcareous rock (ER2)	c.0.02ha	c.1.3ha (represted a mosaic with other habitat types)
Hedgerows (WL1)	c.10.2km	c.7.8km
Treelines (WL2)	c.5.2km	c.4km

The changes in Fossitt habitat classifications are mainly attributed to changes in grassland habitat types and to scrub encroachment. The largest change in grassland habitat is an increase in the area of Dry calcareous and neutral grassland (GS1) from 13.7ha to 43.5ha. The change in grassland habitat types are generally attributed to change in land use management since the surveys undertaken to inform the 2018 EIAR.

The changes in Annex I habitat classifications include:

- change in areas from Annex I habitats to non-Annex I habitat (changes from *8240, 4030, 4030/4010 mosaic, *91E0 and 6410 to non-Annex habitats)
- change in habitat areas from one Annex I habitat type to another Annex I habitat type (changes from 4030 or 4030/4010 mosaic to 4010 and in one case from 4010 to *7130)
- change in areas from non-Annex to Annex I habitat types (changes from GS4 and HD1 to 4010, from ED3 and HD1 to 4030/4010, from ED3, GS3, GS4 and HD1 to 4030, from WD1, WN2 and WS1 to *8240, and in one case from GS1 to 6210)

The main items to note in terms of Annex I habitats arising from the 2019 survey results are:

- the range of Annex I habitat types present within the proposed road development are similar to that published in the 2018 EIAR; all of the Annex I habitat types published in the 2018 EIAR were also recorded during the 2019 surveys, with the addition of one new habitat type which involved a single small area of *7310 (93m^2 in size)
- in the 2018 EIAR there was a total of 111 Annex I habitat areas while in the 2019 habitat survey results there are a total of 116 Annex I habitat areas
- the changes in the extent of Annex I habitat areas include:
    - an increase in the single area of *91E0 habitat from 0.1h to 0.14ha
    - an increase in the number and areas of *8240 increasing from 2.3ha to 2.71ha
    - the addition of a single area of *7130 of 93m^2 in size
    - the addition of small areas of *6210 within mosaics of *8240 above the Lackagh tunnel
    - an increase in 4010 from 1.22ha to 1.78ha
    - a reduction in 6210 from 1.14ha to 0.15ha
    - a reduction in 4030 from 1.96ha to 1.5ha
    - a reduction in 6410 from 1.02ha to 0.73ha

The changes in the habitat classifications in 2019 arise from a number of different factors including:

- the passage of time since the previous surveys were undertaken
- vegetation succession has occurred in the intervening time e.g. there has been an increase in the encroachment of scrub on grassland and heath habitats
- changes in land use management since the previous surveys were undertaken, in particular changes in grasslands
- the significant increase in relevé intensity of the 2019 surveys which resulted in finer scale mapping
- the application of intensive relevé sampling in 2019 as opposed to application of a combined approach of either relevés or a DAFOR[10] scale assessment across the proposed road development, which applies a finer scale approach to habitat surveying and classification

[10] DAFOR scale: D = Dominant; A = Abundant, F = Frequent, O = Occasional, R = Rare

5 Implications of the 2019 Habitat Surveys

The results and findings of the 2019 habitat surveys as they relate to both the 2018 NIS and the 2018 EIAR are discussed below. The implications for the findings and assessment in both the 2018 NIS and the 2018 EIAR as a result of changes to the habitat mapping are explained in **Section 5.1** and **5.2** respectively.

5.1 NIS

In response to the RFI from ABP, a total of 116 relevés were recorded between June and August 2019 across the overlap area between the proposed development boundary and Lough Corrib cSAC boundary. The locations of the relevés in relation to the overlap area between the proposed development boundary and Lough Corrib cSAC are shown on **Figures 2.3.01** to **2.3.05** included in **Annex 2** to this Appendix
A.3.1 and the full results of the 2019 habitat survey are shown on **Figures 2.5.01** to **2.5.15** and **2.6.01** to **2.6.15** in **Annex 2** to Appendix A.3.1 to this 2019 RFI Response.

The full relevé dataset, including GIS files, grid references and photographs, are provided in the digital datasets included in **Annex 3** to this Appendix A.3.1 t.

The findings of the 2019 habitat surveys resulted in some changes to habitat classifications and their extents within the overlap between the proposed development boundary and the Lough Corrib cSAC boundary . These are described below in **Section 5.1.2** with reference to the locations and habitat area codes as per Section 9.1.2.1 of the NIS. **Section 5.1.2** also provides a review of the NIS assessment in light of the changes to the habitat classifications and amendments to the habitat areas boundaries recorded in 2019.

5.1.1 2019 Habitat Survey Results in area of overlap

This section details the findings of the 2019 habitat surveys in the area where the proposed development boundary and the Lough Corrib cSAC boundary overlap. It is sub-divided into four sections with each section further sub-divided by habitat area references as per Section 9.1.2.1 of the NIS and as shown on **Figures 2.12.1 to 2.12.5** in **Annex 2** to this Appendix A.3.1 to the 2019 RFI Response that accompany this report. A description of the habitat type in each area is provided with the relevant supporting relevé noted.

5.1.1.1 Proposed River Corrib Bridge

The areas discussed below (areas 1.a to 1.g) are shown on **Figure 2.12.1** in **Annex 2** to this Appendix A.3.1 to the 2019 RFI Response.

Area 1.a

The relevés recorded in 2019 confirmed the habitats present in Area 1.a are a mosaic of dry meadows and grassy verges (GS2) and scrub (WS1). The relevé data also confirms the statement in the NIS that these habitat areas do not correspond with any Annex I habitat types.

The following relevés were recorded in Area 1.a in 2019: 4198_R1, 4198_R2, 4198_R3, 4077_R1 and 4078_R1.

Area 1.b

The relevés recorded in 2019 confirmed the habitats present in Area 1.b included buildings and artificial surfaces (BL3) and scrub (WS1), with the addition of areas of amenity grassland (GA2) and dry calcareous and neutral grassland (GS1) in the habitat mosaic. The relevé data also confirms the statement in the NIS that these habitat areas do not correspond with any Annex I habitat types.

The following relevés were recorded in Area 1.b in 2019: 5880_R1, 5880_R2, 5880_R3, 5880_R4 and 5506_R1.

Area 1.c

The relevés recorded in 2019 confirmed that Area 1.c is a treeline (WL2). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 1.c in 2019: 4619_R1 and 4619_R2.

Area 1.d The relevés recorded in 2019 confirmed that Area 1.d is dry calcareous and neutral grassland (GS1). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 1.d in 2014: BEC 175.

The following relevés were recorded in Area 1.d in 2019: 4400_R1, 4400_R2, 4400_R3, 4400_R4 and 4400_R5.

Area 1.e The relevés recorded in 2019 confirmed that Area 1.e is dry calcareous and neutral grassland (GS1). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 1.e in 2016: RC-LQ R1.

The following relevés were recorded in Area 1.e in 2019: 4401_R1, 4401_R2, 4401_R3, 4401_R4 and 4401_R5.

Area 1.f The relevés recorded in 2019 confirmed that Area 1.f is mixed broadleaved woodland (WD1). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 1.f in 2014: BEC 174

The following relevés were recorded in Area 1.f in 2019: 3734_R1, 3734_R2, 3734_R3, 3734_R4 and 3734_R5.

Area 1.g

The classification of this habitat area was changed from the original classification of buildings and artificial surfaces (BL3) to a mosaic of dry meadows and grassy verges (GS2), gravel (ED2) and stone wall (BL1) on account of the development of grassland habitat. A single relevé was recorded in this habitat area in 2019 (4199_R1). The grassland habitat was dominated by the grass *Agrostis stolonifera*.

Other species recorded included *Circaea lutetiana*, *Dactylis glomerata*, *Potentilla anserina*, *Ranunculus repens*, *Lapsana communis*, *Lolium perenne*, *Plantago major*, *Poa annua*, *Rumex crispus*, *Taraxacum officinale* ag. and *Valeriana officinalis*.

The relevé data confirms that this habitat area does not correspond to the qualifying interest Annex I habitat Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [*6210/6210]. It also does not correspond with any other Annex I habitat.

The following relevé was recorded in Area 1.g in 2019: 4199_R1.

5.1.1.2 Menlough

The areas discussed below (areas 2.a to 2.j) are shown on **Figure 2.12.3** in **Annex 2** to this Appendix A.3.1 to the 2019 RFI Response.

Area 2.a

The relevé (4422_R1) recorded in 2019 confirmed that Area 2.a is oak-ash-hazel woodland (WN2) and the boundary of this habitat area was amended slightly. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevé was recorded in Area 2.a in 2019: 4422_R1.

Area 2.b

The use of more accurate field mapping technology in 2019 has allowed the boundaries between the wet grassland (Area 2.b) and the adjacent area of dry calcareous and neutral grassland (Area 2.c) to be delineated more accurately. This has resulted in area 2.c now lying entirely outside of the overlap area between the proposed development boundary and Lough Corrib cSAC.

The relevés recorded in 2019 confirmed that Area 2.b is wet grassland (GS4), including the part that was added from the adjacent Area 2.c. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 2.b in 2017: RC-LQ R3

The following relevés were recorded in Area 2.b in 2019: 4275_R1, 4275_R2, 4275_R3, 4275_R4, 4275_R5, 3962_R1, 3962_R2, 3962_R3 and 3962_R4.

Area 2.c

As explained above in relation to Area 2.b, no part of the dry calcareous and neutral grassland (GS1) habitat in Area 2.c now lies within the overlap area between the proposed development boundary and Lough Corrib cSAC and it will not be directly affected by the proposed road development.

Area 2.d

The relevé (3941_R1) recorded in 2019 confirmed that Area 2.d is oak-ash-hazel woodland (WN2). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 2.d in 2019: 3941_R1.

Retained Habitat Area at Ch.10+000

The relevés recorded in 2019 confirmed that this area of habitat, which is to be retained and will not be directly affected by the proposed road development, includes oak-ash-hazel woodland (WN2), scrub (WS1) and exposed calcareous rock (ER2); all of which correspond with the Annex I habitat Limestone pavement [*8240].

The following relevés were recorded in this area in 2019: 3155_R1, 5507_R1 and 3156_R1.

Area 2.e

Area 2.e has been split into two to reflect the change of habitat classification in this area in 2019.

Area 2.e_1 remains as oak-ash-hazel woodland (WN2), however, in reviewing this habitat area in 2019, the woodland contained sufficient cover of limestone pavement to correspond with Annex I Limestone pavement *8240 habitat. The relevé recorded in this area (3790_R2) supports the change in habitat classification.

The relevé recorded in Area 2.e_2 (3790_R1) confirms that this area of habitat is oak-ash-hazel woodland (WN2). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in this area in 2019: 3790_R1 and 3790_R2

Area 2.f

The relevés recorded in 2019 confirmed that Area 2.f, within the overlap area between the proposed development boundary and Lough Corrib cSAC, is dry calcareous and neutral grassland (GS1) but also that the grassland occurs in a mosaic with spoil and bare ground habitat (ED2). As the grassland habitat was more established along the access track as far as the edge of the local road, the boundary of Area 2.f was increased to the north and now extends as far as Bóthar Nua.

The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 2.f in 2019: 4266_R1, 4266_R2, 4266_R3, 4266_R4 and 4266_R5.

Area 2.g

The relevés recorded in 2019 confirmed that Area 2.g is oak-ash-hazel woodland (WN2). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 2.g in 2019: 3936_R1 and 3936_R2.

Area 2.h

The relevés recorded in 2019 confirmed that Area 2.h is scrub (WS1). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 2.h in 2019: 3938_R1, 3938_R2 and 3938_R3.

Area 2.i

The 2019 survey confirmed that Area 2.i is a road, is devoid of any vegetation and, therefore, does not correspond with any Annex I habitat type. As there was no vegetation present a relevé was not recorded, as per the criteria set out in **Section 3.2** above. The boundary of Area 2.i was amended slightly in 2019 to account for the establishment of grassland habitat across all of the access track into the field to the south of Bóthar Nua (part of Area 2.i was merged with Area 2.f, see discussion on Area 2.f above).**Area 2.j**

The 2019 survey confirmed that Area 2.j is a road, is devoid of any vegetation and, therefore, does not correspond with any Annex I habitat type. As there was no vegetation present a relevé was not recorded, as per the criteria set out in **Section 3.2** above**.**Coolough and Proposed Lackagh Tunnel

The areas discussed below (areas 3.a to 3.j) are shown on **Figure 2.12.4** and **2.12.5** in **Annex 2** to this Appendix A.3.1 to the 2019 RFI Response.

Area 3.a

Area 3.a, a mosaic of oak-ash-hazel woodland (WN2) and scrub (WS1), lies adjacent to but outside of the overlap between the proposed development boundary and Lough Corrib cSAC and, therefore, was not resurveyed in 2019.

Area 3.b

The relevés recorded in 2019 confirmed that Area 3.b is oak-ash-hazel woodland (WN2) but also with an element of scrub (WS1) within the habitat area. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.b in 2019: 3768_R1 and 3768_R2

Area 3.c

The relevés recorded in 2019 confirmed that Area 3.g is a mosaic of oak-ash-hazel woodland (WN2) and scrub (WS1). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.c in 2019: 4541_R1, 4541_R2, 4541_R3, 4541_R4 and 4541_R5.

Area 3.d

Area 3.d, a mosaic of oak-ash-hazel woodland (WN2) and scrub (WS1), lies adjacent to but outside of the overlap between the proposed development boundary and Lough Corrib cSAC and, therefore, was not resurveyed in 2019.

Area 3.e

The relevés recorded in 2019 confirmed that Area 3.e is oak-ash-hazel woodland (WN2). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.e in 2019: 4473_R1 and 4473_R2.

Habitat Area between 3.e and 3.i - Ch. 11+050 to Ch. 11+100

A relevé was recorded in this habitat area in 2019 (3340_R1) as it lies within Lough Corrib cSAC and overlaps slightly (c.3m^2) with the proposed development boundary. The relevé recorded in 2019 confirmed that, within the overlap area between the proposed development boundary and Lough Corrib cSAC, this habitat area is oak-ash-hazel woodland (WN2) and does not correspond with the priority Annex I habitat Limestone pavement [*8240].

Consequently, as it does not correspond with Limestone pavement [*8240] this habitat area no longer needs to be retained as part of the mitigation strategy for the proposed road development.

The following relevé was recorded in this habitat area in 2019: 3340_R1.

Area 3.f

Area 3.f, where it overlaps with the proposed development boundary and Lough Corrib cSAC, comprises a mosaic of treeline (WL2), scrub (WS1) and calcareous grassland (GS1). In 2019, two relevés were recorded in the calcareous grassland habitat (4149_R1 and 4149_R3) and one relevé in treeline habitat (4149_R2). The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.f in 2019: 4149_R1, 4149_R2 and 4149_R3.

Area 3.g

The relevés recorded in 2019 confirmed that Area 3.g is oak-ash-hazel woodland (WN2) but also with an element of scrub (WS1) within the habitat area. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.g in 2019: 3754_R1, 3754_R2, 3754_R3 and 3754_R4.

Area 3.h

The relevés recorded in 2019 confirmed that Area 3.h is oak-ash-hazel woodland (WN2) but also with an element of scrub (WS1) within the habitat area. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.h in 2019: 4538_R1 and 4538_R2.

Area 3.i

The relevés recorded in 2019 confirmed that Area 3.i is oak-ash-hazel woodland (WN2) but also with an element of scrub (WS1) within the habitat area. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types. The following relevés were recorded in Area 3.i in 019: 4517_R1, 4517_R2, 4517_R3 and 4517_R4.

Area 3.j

The relevés recorded in 2019 confirmed that Area 3.j is predominantly scrub (WS1) along with some cover of oak-ash-hazel woodland (WN2) where the proposed development boundary overlaps with Lough Corrib cSAC. The relevé data also confirms the statement in the NIS that this habitat area does not correspond with any Annex I habitat types.

The following relevés were recorded in Area 3.i in 2019: 4156_R1, 4156_R2, 4156_R3 and 4156_R4.

Retained Area of QI Annex I Habitat above Lackagh Tunnel Ch.11+270-11+380

The habitat areas being retained above the Lackagh Tunnel comprise a mosaic of exposed limestone rock (ER2), calcareous grassland (GS1), scrub (WS1) and oak-ash-hazel woodland (WN2). With the exception of one area of scrub, all habitat areas above the Lackagh Tunnel that lie within the overlap area between the proposed development boundary and Lough Corrib cSAC correspond with priority Annex I Limestone pavement habitat [*8240]; one of the qualifying interest habitats of Lough Corrib cSAC.

Additional relevés were taken in this area in 2019 in support of the Annex I habitat classifications: 3087_R1, 3087_R2, 3087_R3, 3087_R4, 3087_R5, 3088_R1, 3088_R2, 3088_R3, 3088_R4, 3089_R1, 3130_R1, 3130_R2, 3322_R1, 3322_R2, 3322_R3, 3322_R4, 3322_R5, 3494_R1, 3494_R2, 3494_R3, 3494_R4, 3494_R5, 3513_R1, 3513_R2, 3705_R1 and 3705_R2.

Relevés 4155_R1, 4155_R2 and 4155_R3 were taken in 2019 in support of the non-Annex scrub (WS1) habitat being retained above the Lackagh Tunnel within the overlap area between the proposed development boundary and Lough Corrib cSAC.

5.1.1.3 Proposed Drainage Outfall – N59 Link Road North

The areas discussed below (areas 4.a to 4.d) are shown on **Figure 2.12.2** in **Annex 2** to this Appendix A.3.1 to the 2019 RFI Response.

Area 4.a

Area 4.a was classified as a mosaic of treeline (WL2), scrub (WS1) and dry meadows and grassy verges (GS2) in 2014. As a result of the resurvey in 2019 (relevé 3815_R1), this area has been reclassified as riparian woodland (WN5) due to the dominance of *Salix cinerea*, the high percentage of tree canopy cover and expansion of tree/shrub vegetation around the former railway embankment. Other plant species recorded in the relevé were *Hedera helix*, *Athyrium filix-femina*, *Phalaris arundinacea*, *Crataegus monogyna*, *Fraxinus excelsior* and *Filipendula ulmaria*. The relevé data confirms that this habitat area does not correspond with any of the qualifying interest woodland habitats of Lough Corrib cSAC: Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0], as oak are absent; and, Bog woodland [*91D0], as it not established on bog habitat. The relevé data also confirms that the riparian woodland does not correspond to the priority Annex I habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [*91E0].

The boundary of this area has also been extended due to expansion of the tree and shrub cover and, as a result, this habitat area now encompasses all of the overlap area between the proposed development boundary and Lough Corrib cSAC at this location.

Area 4.b

Area 4.b, a mosaic of reed and large sedge swamp/tall-herb swamp/wet grassland (FS1/FS2/GS4) does not overlap with the proposed development boundary and, therefore, was not resurveyed in 2019.

Area 4.c

Area 4.c, a mosaic of reed swamp (FS1) and rich fen and flush (PF1) which corresponds with the Annex I habitat Alkaline fen [7230], does not overlap with the proposed development boundary and, therefore, was not resurveyed in 2019. The habitat classification was supported by a relevé (BEC 226) recorded in this area in 2014.

Area 4.d

As noted above in relation to Area 4.a, the wet grassland habitat that formed part of Area 4.d is not present within the overlap area between the proposed development boundary and Lough Corrib cSAC and, therefore, was not resurveyed in 2019.

5.1.2 Review of the NIS Assessment

The only change to the habitat mapping of relevance to the NIS, in particular Section 9.1.4, arising from the 2019 habitat surveys relates to the habitat area in Menlough (between Ch. 10+050 and 10+100) where an additional area of Limestone pavement [*8240] habitat was identified within the overlap between the proposed development boundary and Lough Corrib cSAC (approximately 205m^2), as shown in **Plates 1** and **2** below. In surveying this habitat area in 2019, the woodland contained sufficient cover of limestone pavement to correspond with priority Annex I Limestone pavement habitat. None of the other habitat changes from 2019 resulted in additional areas of qualifying interest habitat for Lough Corrib cSAC falling within the zone of influence of the proposed road development.

Plate 1: 2018 Habitat mapping and EIAR access road AR 10/01 – Ch. 10+050 to Ch.10+100

Plate 2: 2019 Habitat mapping and EIAR AR 10/01 – Ch. 10+050 to Ch.10+100

The design of the proposed access road AR 10/01 has been amended to avoid direct and indirect impacts on this area of Limestone pavement, as shown in **Plate 3** below. The existing access road at this location will be reutilised and there will be no construction works in this area of Limestone pavement. As a result, this change in habitat classification does not affect the assessment or conclusions presented in the NIS submitted to ABP in October 2018 – i.e. the proposed road development will not result in the loss of any areas of qualifying interest Annex I habitat within Lough Corrib cSAC.

Plate 3: 2019 Habitat mapping and amended access road AR 10/01 – Ch. 10+050 to 10+100

To ensure that this additional area of Limestone pavement habitat is retained and not affected in any way by construction works, in accordance with the mitigation strategy detailed in Section 10.1.1 of the NIS, it will be fenced off in advance of any construction commencing and will be a "no-construction zone" within which no works will take place. The habitat areas to be retained during construction and operation of the proposed road development have been updated to capture this additional area of Limestone pavement habitat and are shown on Figures 2.12.1 – 2.12.5.

Therefore, the conclusion of the NIS submitted to ABP in October 2018, namely that the proposed road development will not result in the loss of any qualifying interest habitat from Lough Corrib cSAC, is confirmed and, accordingly, the proposed road development will not adversely affect the integrity of Lough Corrib cSAC as a result of habitat loss.

In conclusion, despite the amendments to the habitats baseline, the revisions to the design of the proposed road development and the mitigation strategy will ensure that the conclusions of the NIS do not change and "…*the proposed road development does not pose a risk of adversely affecting (either directly or indirectly) the integrity any European site, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion*".

5.2 EIAR

The only change to the significant residual effects already documented in the 2018 EIAR, arising as a result of the 2019 habitat survey results, are the addition of an adverse significant residual effect at the international geographic scale for the permanent loss of c.0.01ha (93m^2) of Blanket bog (active) [*7130]. All other adverse significant residual effects on habitats remain as per the 2018 EIAR.

The results of the 2019 habitat surveys confirm that the impacts of the proposed road development in terms of habitat loss or degradation remain the same as presented in the 2018 EIAR with the exception of (i) one very small area of a new Annex I habitat type affected (a single area of *7130 of 93m^2 in size) and (ii) changes in the areas and precise locations of Annex I habitats to be lost. In summary arising from the 2019 surveys there is:

- No change in the area of two Annex I habitat types to be lost (*3180 and *7220); noting that the single area of *3180 will not be lost, as per the findings in the 2018 EIAR
- A reduction in the area of three Annex I habitat types to be lost (6210, 6410 and 4030)
- An increase in the area of three Annex I habitat types to be lost (*91E0, *8240 and 4010)
- The addition of a single area (c.0.01ha, 93m^2 in size) of *7130 which will be lost
- The addition of small areas of *6210 within *8240 mosaics above the Lackagh Tunnel which will be retained and will not be lost

The same mitigation and compensatory measures as proposed in the both 2018 EIAR and updated EIAR will be implemented to avoid, minimise and compensate habitat losses within the proposed development boundary, as well as to protect surface water quality and groundwater in the receiving environment, control dust emissions from the construction site, control and prevent the spread of non-native invasive plant species, and ensure that tunnelling and deep excavations do not affect the structural integrity of the surrounding rock mass. There is no need arising from the 2019 habitat survey results to change any of the mitigation or compensatory habitat strategies.

The permanent losses of the following habitats will result in significant residual effects on the habitats listed below in Table 4.1 at geographic scales ranging from local to international. As per the 2018 EIAR and updated EIAR, the following Annex I habitats will have residual habitat losses:

- Residual alluvial forest habitat *91E0
- Limestone pavement habitat *8240
- Wet heath habitat 4010
- Dry heath habitat 4030
- Calcareous grassland habitat (non-priority) 6120

- *Molinia* meadow habitat 6410

There is one new Annex I habitat that will have a residual habitat loss, namely Blanket bog (active) *7130.

The areas of residual habitat losses differ in some cases compared to these presented in Chapter 8, Biodiversity of the 2018 EIAR and these are presented in **Table 4.1** below which is based on Table 8.40 of the 2018 EIAR. Compensatory habitat[11] will be provided as noted in **Table 4.1** below to replace the areas of Residual alluvial forest, Dry heath, Calcareous grassland and *Molinia* meadow by providing a greater area to that being permanently lost to the proposed road development.

Table 4.1: Summary of Residual Priority Annex I/Annex I habitat loss after compensation (update of Table 8.40 in Chapter 8, Biodiversity of the 2018 EIAR)

Annex I habitat type	Permanent Area of Habitat Loss (EIAR)	Area of Compensatory Habitat Created (EIAR)	Residual Habitat Loss (EIAR)	Residual Impact Significance Post-compensation	Permanent Area of Habitat Loss (2019) (Pre-Compensation)	Permanent Area of Habitat Loss (2019) (Post Compensation)
Petrifying springs [*7220]	One Petrifying spring feature	n/a	One Petrifying spring feature	Likely significant residual effect at the county geographic scale	One Petrifying spring feature	One Petrifying spring feature
Residual alluvial forest [*91E0]	c.0.1ha	c.0.18ha	None	No likely significant residual effect	c.0.14ha	None
Limestone pavement [*8240]	c.0.54ha	n/a	c.0.54ha	Likely significant residual effect at the international geographic scale	c.1.18ha	c.1.18ha
Wet heath [4010]	c.2.06ha	n/a	c.2.06ha	Likely significant residual effect at the national geographic scale	c.2.36ha	c.2.36ha
Dry heath [4030]	c.1.85ha	c.7.06ha	None	No likely significant residual effect	c.1.39ha	None

[11] "Compensation describes measures taken to make up for residual effects resulting in the loss of, or permanent damage to ecological features despite mitigation" (CIEEM, 2016). It is important to note that the reference to "compensatory habitat" areas are not compensatory measures in the context of the requirements of Article 6(4) of the Habitats Directive, as they are not compensating for an impact that would adversely affect the integrity of any European site. Rather, for the reasons set out in detail in the NIS, it is concluded that the proposed road development will not result in such an adverse effect on any European site.

Annex I habitat type	Permanent Area of Habitat Loss (EIAR)	Area of Compensatory Habitat Created (EIAR)	Residual Habitat Loss (EIAR)	Residual Impact Significance Post-compensation	Permanent Area of Habitat Loss (2019) (Pre-Compensation)	Permanent Area of Habitat Loss (2019) (Post Compensation)
Wet heath/Dry heath/*Molinia* mosaic [4010/4030/6410]	c.0.87ha	n/a	c.0.87ha[12]	Likely significant residual effect at the national geographic scale	None	None
Calcareous grassland [6210]	c.0.7ha	c.7.14ha	None	No likely significant residual effect	c.0.15ha	None
Molinia meadow [6410]	c.0.28ha	c.0.49ha	None	No likely significant residual effect	c.0.07ha	None
Blanket bog (active) [*7130]	n/a	n/a	n/a	n/a	c.0.01ha (93m^2)	c.0.01ha (93m^2) Likely significant residual effect at the international geographic scale

However, as was the case in the 2018 EIAR it remains the case that some of the Annex I habitat types that are being lost, **outside of European sites**, cannot be directly compensated. Therefore, there will be a significant residual effect at the international geographic scale for the permanent loss of c.1.18ha of Limestone pavement and c 0.01ha (93m^2) of Blanket bog (active) [*7130], at the national geographic scale for the permanent loss of c.2.36ha of Wet heath, at the county geographic scale for the loss of a Petrifying spring feature at Lackagh Quarry.

There are also a number of habitat types of a local biodiversity importance that will be permanently lost as a result of the proposed road development, and where significant residual negative effects are likely:

- Calcareous springs (FP1)
- Dry-humid acid grassland (GS3)
- Poor fen and flush (PF2)
- (Mixed) broadleaved woodland (WD1)
- Hedgerows (WL1)
- Treelines (WL2)

[12] Considered as Wet heath habitat for the purposes of the impact assessment, the loss of which cannot be directly compensated for.

Of these, the planting proposed in the landscape design will compensate for the loss of the areas of (mixed) broadleaved woodland (WD1), hedgerows (WL1) and treelines (WL2) by providing a greater area to that being permanently lost to the proposed road development, as follows:

- (Mixed) broadleaved woodland (WD1) - greater than 2.62ha being lost
- Hedgerows (WL1) - greater than 10.2km being lost
- Treelines (WL2) - greater than 5.4km being lost

In compensating for the losses of these habitat types, the proposed road development is not likely to result in a significant residual effect, at any geographic scale, on (mixed) broadleaved woodland (WD1), hedgerows (WL1) and treelines (WL2).

However, the proposed road development is likely to have a significant residual negative effect, at the local geographic scale, as a result of the permanent loss of fifteen Calcareous spring features (FP1), c.4.51ha of Dry-humid acid grassland (GS3) (reduced from c.7.81ha presented in the 2018 EIAR) and c.0.25ha of Poor fen and flush habitat (PF2) (increased from c.0.13ha presented in the 2018 EIAR).

While **Section 5.1** above deals with how the 2019 surveys relate to the NIS, it can also be confirmed that any habitat changes outside of the Lough Corrib cSAC will not result in any changes to the conclusions of the NIS. Any change in habitat areas or classification outside of the Lough Corrib cSAC do not introduce any supporting role to habitats within the Lough Corrib cSAC or any other European site.

6 Conclusion

The findings of the 2019 habitat surveys detailed above have no implications for any European sites or the assessment presented in the NIS in relation to Lough Corrib cSAC, Lough Corrib SPA, Galway Bay Complex cSAC or Inner Galway Bay SPA.

Therefore, regardless of the amendments to the habitats baseline, the revisions to the design of the proposed road development in respect of Access Road AR 10/01 and the mitigation strategy will ensure that the conclusions of the NIS submitted to ABP in October 2018, do not change and "…*the proposed road development does not pose a risk of adversely affecting (either directly or indirectly) the integrity any European site, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion*".

The only change to the significant residual effects already documented in the 2018 EIAR, arising as a result of the 2019 habitat survey results, are the addition of an adverse significant residual effect at the international geographic scale for the permanent loss of c.0.01ha (93m^2) of Blanket bog (active) [*7130]. All other adverse significant residual effects on habitats remain as per the 2018 EIAR.

The results of the 2019 habitat surveys confirm that the impacts of the proposed N6 GCRR in terms of habitat loss or degradation remain the same as presented in the 2018 EIAR with the exception of (i) one very small area of a new Annex I habitat type affected (a single area of *7130 of 93m^2 in size) and (ii) changes in the areas and precise locations of Annex I habitats to be lost.

Annex 1

Habitat survey Results - Species Lists and Relevés

A1

A1.1 Introduction

This annex presents the species lists and references to the associated supporting relevé data for the habitats recorded along, and adjacent to, the proposed road development.

The species lists and relevé references are presented in sections from west to east along the proposed road development with reference to locations that correspond with either:

- Ecological sites[13]
- Habitat areas between the ecological sites, or
- A larger habitat study area that lies between the River Corrib and Lackagh Quarry (including where the proposed road development passes through and adjacent to Lough Corrib cSAC)

Each of these descriptive sections includes a table of the overall species lists for the habitat recorded within that area, with reference to the corresponding relevés that support the habitat classifications. The relevé references are presented in the 'Key Species' column in red font (e.g. EC03 R1).

The relevés referred to in the tables below which describe each of the habitat areas are shown on **Figures 2.4.001 to 2.4.120** in **Annex 2** to this Appendix A.3.1 to the FRI Response.

The information presented in this **Annex 1** does not include species lists for the residential habitat category (see Section 8.3.4.34 of Chapter 8, Biodiversity of the EIAR) and it also does not include species lists for the aquatic habitats, which are described in full in Section 8.3.4 of Chapter 8, Biodiversity of the EIAR and in Appendix A.8.20 (Results of the 2014 N6 Galway City Transport Project Aquatic Habitat Surveys) of the EIAR, and in Appendix K of the NIS.

Plant nomenclature follows that of the National Vegetation Database[14]. The general habitat classifications as set out in *A Guide to Habitats in Ireland*[15] and for Annex I habitats, the *Interpretation manual of European Union Habitats EUR28*[16] was used with reference to the corresponding national and regional habitat survey reports, as applicable (see Section 3 of the main report). Where vegetation community codes are

[13] Ecological Sites are sites of potential ecological value for the habitats present: i.e. determined to be at least of a Local Importance (higher value) (refer to National Roads Authority, 2009 for more detail). The boundaries of the Ecological Sites were initially defined based on interpretation of orthophotography and collation of available existing habitat information, in conjunction with a ground truthing exercise to verify the orthophotography interpretation. These boundaries were then refined, where appropriate, based on the findings of the various habitat surveys undertaken.

[14] Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland. Version 1.0.* Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

[15] Fossitt, J.A. (2000) *A Guide to Habitats in Ireland.* Heritage Council, Kilkenny.

[16] CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28*. European Commission, DG Environment.

referred to in the sections below, they are also as per the relevant national and regional habitat survey reports.

A1.2 Guide to the Digital Datasets

For ease of reference in locating particular habitat areas, relevés, relevé data and the corresponding habitat photographs, the information presented in this Annex 1 to Appendix A.3.1 to the 2019 RFI Response is supplemented by the accompanying digital datasets included in **Annex 3** to Appendix A.3.1 to the 2019 RFI Response and listed in **Table A.1** below.

Table A.1: Guide to the digital datasets

Dataset Name	Type	Description
GIS Data Published in 2018		
N6GCRR_2018Habitat Map_Polygon.shp	ESRI Shapefile	Polygon shapefile of the habitat map published in October 2018
N6GCRR_2018HabitatMap_Polyline.shp	ESRI Shapefile	Polyline shapefile of the habitat map published in October 2018
N6GCRR_2018HabitatMap_Point.shp	ESRI Shapefile	Point shapefile of the habitat map published in October 2018
N6GCRR_2018RelevéLocations.shp	ESRI Shapefile	Point shapefile of the relevés recorded between 2013 and 2018
GIS Data from the 2019 Habitat Survey		
N6GCRR_2019HabitatMap_Polygons.shp	ESRI Shapefile	Polygon shapefile of the revised 2019 habitat map within the proposed development boundary.
N6GCRR_2019HabitatMap_Polyline.shp	ESRI Shapefile	Polyline shapefile of the revised 2019 habitat map along the proposed road development.
N6GCRR_ABPFI_HabitatDescriptionAreas .shp	ESRI Shapefile	Polygon shapefile of the habitat areas described in the tables in Annex 1 if the 'Habitat Survey Results 2019' report
N6GCRR_HabitatSurveyAreas_3a.shp	ESRI Shapefile	Polygon shapefile of the areas where the proposed development boundary overlaps with Lough Corrib cSAC.
N6GCRR_RelevéLocations_3a.shp	ESRI Shapefile	Point shapefile of the location of all relevés taken in areas where the proposed development boundary overlaps with Lough Corrib cSAC. Locations are approximate.
N6GCRR_RelevéExtents_3a.shp	ESRI Shapefile	Polygon shapefile of the approximate extent of relevés taken in areas where the proposed development boundary overlaps with Lough Corrib cSAC. Extents are approximate.
N6GCRR_RelevéSampleAreas_3b.shp	ESRI Shapefile	Polygon shapefile of the habitat areas outside of Lough Corrib cSAC where relevés were taken in 2019.
N6GCRR_RelevéLocations_3b.shp	ESRI Shapefile	Point shapefile of the location of all relevés taken within the proposed development boundary outside of Lough Corrib cSAC. Locations are approximate.

Dataset Name	Type	Description
N6GCRR_ABPFI_QIAnnexIHabitats_LoughCorribSAC.shp	ESRI Shapefile	Polygon shapefile of the qualifying interest habitats of Lough Corrib cSAC recorded in relation to the N6GCRRproject between 2014 and 2019.
N6GCRR_AnnexIHabitats_ProposedDevelopmentBoundary.shp	ESRI Shapefile	Polygon shapefile of the Annex I habitats within the proposed road development.
N6GCRR_RetainedHabitatAreas.shp	ESRI Shapefile	Polygon shapefile of the habitat areas being retained within the proposed road development as part of the mitigation strategy for the 2018 NIS and Chapter 8 of the 2018 EIAR.
Relevé Data		
N6GCRR_RelevéDatabase.xlsx	Microsoft Excel Workbook	The full relevé results for all relevés included in the relevé shapefiles: · N6GCRR_2018RelevéLocations.shp · N6GCRR_RelevéLocations_3a.shp · N6GCRR_RelevéLocations_3b.shp
Photographs – 2019 Habitat Survey		
Photographic record of the 2019 habitat surveys along the N6GCRR	.JPG files	Series of photos recorded during the 2019 habitat surveys along the N6GCRR
N6GCRR_HabitatPhotographs_ReadMe.pdf	PDF	A text document describing the habitat photographs database contained in the N6GCRR_HabitatPhotographs.zip
Other Supporting or Explanatory Documents		
N6GCRR_GISDatasets_Metedata.pdf	Microsoft Word Document	A text document describing the contents of each of the shapefiles that form part of this digital dataset

The reference codes for each habitat area included in the 2019 habitat map GIS dataset (N6GCRR_2019HabitatMap_Polygons.shp) and the reference codes for relevés included in the GIS relevé datasets (N6GCRR_RelevéLocations_3a.shp and N6GCRR_RelevéLocations_3b.shp) can be used to navigate the other digital datasets.

A1.2.1.1 Locating Relevé Data

If a relevé in either the N6GCRR_RelevéLocations_3a.shp or the N6GCRR_RelevéLocations_3b.shp has a "RefNo" of 1234_R1, the corresponding relevé dataset in the N6GCRR_RelevéDatabase.xlsx will have the same code in the "Relevé Ref No" row.

A1.2.2 Locating Photographs

If a given habitat area in the N6GCRR_2019HabitatMap_Polygons.shp has a "FeatureID" of 1234, any photographs available for that particular habitat area can be found in the photographic database and will begin with the same code, followed by a sequential reference number which corresponds with the number of

photographs that were recorded within a given habitat area (e.g. the photo will be labelled 1234_1 and, if there is a second photograph available, 1234_2, and so on).

If a given relevé in either the N6GCRR_RelevéLocations_3a.shp or the N6GCRR_RelevéLocations_3b.shp has a "RefNo" attribute of 1234_R1, any photographs available for that particular relevé can be found in the photographic database and will begin with the same code followed by a sequential reference number preceded by "R" (e.g. the photo will be labelled 1234_R1_1 and, if there is a second photograph available, 1234_R2_2, and so on).

A1.3 Habitats, Species Lists and Relevés Record along the Proposed Road Development

The tables below present the species lists and references to the associated supporting relevé data for the habitats recorded along, and adjacent to, the proposed road development in habitat surveys undertaken in 2019 and 2023. This should be read in conjunction with **Figures 2.4.001** to **2.4.120** in **Annex 2** to Appendix A.3.1 to the 2019 RFI Response. The species lists and relevé references are presented in sections from west to east along the proposed road development.

EC03

EC03 - Species Lists & Relevés		
Habitat code[1]	**Annex I habitat[2]**	**Key species**
CB1	1220	*Elytrigia repens*, *Jacobaea vulgaris*, *Leontodon autumnalis*, *Lotus corniculatus*, *Rumex crispus* and *Plantago lanceolata*.
CM2	1330	*Agrostis stolonifera*, *Festuca rubra*, *Eleocharis uniglumis*. *Triglochin maritima*, *Leontodon autumnalis*, *Potentilla anserina*, *Lotus corniculatus* and *Cochlearia officinalis*.
FS1	n/a	*Phragmites australis* and *Filipendula ulmaria*.
GA1	n/a	*Lolium perenne*, *Holcus lanatus*, *Trifolium repens*, *Ranunculus repens* and *Rumex* sp.
GS2	n/a	*Arrhenatherum elatius, Trifolium pratense, Holcus lanatus*, *Centaurea nigra*, *Trifolium repens*, *Agrostis capillaris*, *Poa pratensis*, *Trifolium repens*, *Jacobaea vulgaris* and *Cynosurus cristatus*.
GS3	n/a	*Anthoxanthum odoratum*, *Agrostis capillaris*, *Potentilla erecta*, *Trifolium repens* and *Poa pratensis*.
GS3/ER1	n/a	Only partially visible from the North. ER1 species include abundant *Ulex gallii, Sedum anglicum,* frequent *Rumex acetosella, Hypochaeris radicata, Erica cinerea*
GS4	n/a	*Juncus effusus* and *Juncus acutiflorus*.
GM1	n/a	*Iris pseudacorus, Filipendula ulmaria, Lythrum salicaria*, *Mentha aquatica*, *Anagallis tenella*, *Carex nigra*, *Hydrocotyle vulgaris* and *Jacobaea aquaticus.*

[1] Fossitt (2000)
[2] Where applicable, vegetation community codes are given in parenthesis.
*8240 (LPE) = exposed limestone pavement; *8240 (LPW) = wooded limestone pavement

HH1	4030 (DH1)	*Ulex gallii*, *Calluna vulgaris*, *Erica cinerea*, *Molinia caerulea*, *Anthoxanthum odoratum*, *Potentilla erecta*, *Succisa pratensis* and *Daboecia cantabrica* EC03 R1
WS1	n/a	*Ulex europaeus*, *Prunus spinosa* and *Rubus fruticosus*.

EC05

EC05 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL3/GA2	n/a	Residential area. Grassland species include *Bellis perennis, Lolium perenne, Odontits vernus, Rumex acetosella, Trifolium pratense*.
FW1/GM1	n/a	*Iris pseudacorus, Apium nodiflorum, Potentilla palustris, Filipendula ulmaria, Lythrum salicaria, Mentha aquatica Salix cinerea,*
GA1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens*
GS2	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium*
GS3	n/a	*Agrostis capillaris, Anthoxanthum odoratum, Cynosurus cristatus, Lolium perenne, Hypochaeris radicata, Achillea millefolium, Trifolium pratense, Veronica officinalis, Prunella vulgaris, Trifolium repens, Rumex obtusifolius, R acetosella, Rhytidiadelphus squarrosus. Sedum anglicum, Dicranum* sp., *Succisa pratensis, Euphrasia* sp., *Hypnum cupressiforme, Agrostis sp., Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Ranunculus repens, Solidago virgaurea, Teucrium scorodonia, Vicia sepium,*
GS3/WS1	n/a	GS3 dominant. Species include *Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium*.

GS4	n/a	*Juncus effusus, Juncus articulatus, Holcus lanatus, Agrostis stolonifera, Ranunculus repens, Hydrocotyle vulgaris, Lotus pedunculatus, Cirsium palustre, Lythrum salicaria, Rumex acetosa, Galium palustre, Potentilla erecta, Calliergonella cuspidata, Rhytidiadelphus squarrosus Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia* 360_R1 and 352_R1
EC05 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS1	n/a	*Anthoxanthum odoratum, Plantago lanceolata, Poa trivialis, Dactylis glomerata, Festuca rubra agg., Trifolium pratense, Hypochaeris radicata, Prunella vulgaris, Centaurea nigra, Lotus corniculatus, Agrostis capillaris and Leucanthemum vulgare.* 363_R1
HD1	n/a	*Pteridium aquilinum, Salix cinerea, Rubus fruticosus* agg. *Calystegia sepium.*
HD1/HH1	4030	Mosaic of HD1 and HH1. Species as described in this table.
HD1/GS3/ WS1	n/a	HD1 most common, *Prunus spinosa, Rubus fruticosus agg.* and *Ulex galii*. Grassland species as above.
HD1/HH1/ WS1	4030	HD1 dominant. *Blechnum spicant, Lonicera periclymenum, Myrica gale, Pteridium aquilinum,Teucrium scorodonia, Ulex galii, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Rubus fruticosus agg., Salix cinerea subsp. oleifolia, Ulex europeaus.*
HD1/WS1/ GS4	n/a	Species as listed in this table.
HH1	4030 (DH1)	*Ulex gallii, Erica cinerea, Daboecia cantabrica, Molinia caerulea, Calluna vulgaris, Agrostis capillaris. Succisa pratensis, Teucrium scorodonia, Hylocomium splendens, Solidago virgaurea* and *Viola* sp. EC05 R1, 2394_R1, 2396_R1, 336_R1, 338_R1 and 361_R2
HH1/HD1	4030	Dry heath and dense bracken species as described in this table. 2391_R1
HH1/WS1	4030	Dry heath and scrub species as described in this table. 2397_R1
HH1/WS1/ HD1	4030	Dry heath, scrub and dense bracken species as described in this table.
PF2	n/a	*Juncus articulatus, Juncus effusus, Hypericum elodes, Hydrocotyle vulgaris, Anagallis tenella, Carex echinata, Carex nigra, Ranunculus flammula* and *Sphagnum* sp. 341_R1
WD2	n/a	*Betula sp., Pinus pinaster, Cupressus × leylandii.*

WS1	n/a	*Prunus spinosa, Salix cinerea, Crataegus monogyna, Ulex europaeus, Hedera helix, Pteridium aquilinum, Calystegia sepium, Cirsium arvense, Ilex aquifolium, Rubus fruticosus agg.* 361_R1
WS1/HH1	4030	Predominantly scrub habitat area. Dry heath and scrubs species as described in table, with exception of abundant *Potentilla erecta* in Dry heath habitat
WS1/HD1	n/a	Species as described in table above.
WS1/GS1	n/a	Species as described in table above.
WS1/GS3	n/a	Species as described in table above.

EC05 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WS1/HD1/ GS3	n/a	*Prunus spinosa, Salix cinerea, Crataegus monogyna, Ulex europaeus, Hedera helix, Pteridium aquilinum, Rubus fruticosus* agg., *Calystegia sepium, Agrostis capillaris, Anthoxanthum odoratum, Cynosurus cristatus, Lolium perenne, Hypochaeris radicata, Achillea millefolium, Trifolium pratense, Veronica officinalis, Prunella vulgaris, Trifolium repens, Rumex obtusifolius, R acetosella, Rhytidiadelphus squarrosus. Sedum anglicum, Dicranum* sp., *Succisa pratensis, Euphrasia* sp., *Hypnum cupressiforme.* Dense bracken tends to shade out much of the grassland species beneath

EC11

EC11 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Poa annua*, *Tussilago farfara*, *Ranunculus repens*, *Papaver rhoeas*, *Persicaria maculosa*, *Atriplex patula*, *Veronica chamaedrys*, *Agrostis stolonifera*, *Sonchus asper*, *Cerastium fontanum*, *Reynoutria japonica* and *Fumaria muralis.*
ER1	n/a	The exposed rock is mostly bare. It has few crevices or clefts to harbour significant bryophyte or pteridophyte communities. Where rock outcrops occur in grassland habitats, they are often surrounded by species that prefer good drainage such as *Sedum anglica*, *Pilosella officinarum* and *Veronica serpyllifolia*.
FS1	n/a	*Phragmites australis* and *Typha latifolia.*
FS2	n/a	*Apium nodiflorum*, *Sparganium erectum*, *Epilobium hirsutum*, *Juncus articulatus*, *Hydrocotyle vulgaris* and *Glyceria fluitans.*
GA1	n/a	*Rumex obtusifolius*, *Ranunculus repens*, *Jacobaea vulgaris*, *Persicaria maculosa*, *Urtica dioica* and *Plantago major.*
GS1	n/a	*Centaurea nigra*, *Festuca rubra*, *Linum catharticum*, *Festuca rubra*, *Dactylis glomerata*, *Arrhenatherum elatius*, *Lotus corniculatus*, *Plantago lanceolata*, *Potentilla anserina*, *Leucanthemum vulgare*, *Euphrasia officinalis*, *Holcus lanatus*, *Achillea millefolium* and *Trifolium pratensis.*

GS2	n/a	*Dactylis glomerata*, *Festuca rubra*, *Holcus lanata*, *Arrhenatherum elatius*, *Anthoxanthum odoratum* and *Agrostis stolonifera.*
GS3	n/a	*Anthoxanthum odoratum*, *Agrostis capillaris*, *Nardus stricta*, *Carex disticha*, *Succisa pratensis*, *Ranunculus repens*, *Prunella vulgaris*, *Hypochaeris radicata*, *Potentilla erecta*, *Hylocomium splendens*, *Juncus bulbosus*, *Galium saxatile*, *Danthonia decumbens*, *Plantago lanceolata* and *Rhytidiadelphus squarrosus.* Well-drained areas around rock outcrops also support *Lotus corniculatus*, *Euphrasia officinalis*, *Festuca rubra*, *Succisa pratensis*, *Carex panicea* and *Achillea millefolium.*
EC11 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS3/GS4/ GS1	n/a	GS3 and GS4 as described above, GS1 species include *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense.*
GS3 / HH1 / GM1 / GS4	4030	Dense bracken near the road. *Apium nodiflorum, Nasturtium officinale agg., Typha latifolia* Grassland, Dry siliceous heath species as described in this table.
GS4	n/a	Species-poor *Juncus effusus* dominated vegetation. Typical species are *Juncus effusus*, *Juncus articulatus*, *Juncus conglomeratus*, *Filipendula ulmaria*, *Holcus lanatus*, *Lythrum salicaria*, *Lotus pedunculatus*, *Rubus fruticosus*, *Arrhenatherum elatius*, *Dryopteris dilatata*, *Dactylis glomerata*, *Anthoxanthum odoratum*, *Agrostis stolonifera* and *Carex echinata*.
	n/a (GL1diii)	Tussocky *Molinia* species-poor type occurring between and grading to heath habitats. Not considered annex habitat but of higher value than species-poor *Juncus effusus* dominated vegetation. Typical species are *Molinia caerulea*, *Ranunculus repens*, *Ranunculus acris, Succisa pratensis*, *Potentilla erecta*, *Cirsium vulgare*, *Vicia sepium* and *Anthoxanthum odoratum.* EC11 R12 and 609_R1
	6410 (GL1c)	Species include *Molinia caerulea*, *Angelica sylvestris*, *Juncus articulatus*, *Juncus conglomeratus*, *Lythrum salicaria*, *Filipendula ulmaria*, *Carex echinata*, *Carex flacca*, *Potentilla erecta*, *Lotus pedunculatus*, *Centaurea nigra*, *Galium palustre* and *Mentha aquatica.* EC11 R1
GS4/GS2	n/a	*Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pendunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia, Achillea millefolium, Arrhenatherum elatius, CCentaurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus,*

		Hypochaeris radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum officinale agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium.
GS4/WS1	n/a	*Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pendunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia.* WS1 as below.

EC11 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GM1	n/a	*Typha latifolia*, *Osmunda regalis*, *Angelica sylvestris*, *Lythrum salicaria*, *Mentha aquatica*, *Hydrocotyle vulgare*, *Potentilla palustris*, *Galium palustre*, *Juncus effusus*, *Agrostis stolonifera* and *Equisetum fluviatile.* 628_R1
HD1	n/a	*Pteridium aquilinum*, with patches of *Rubus fruticosus* agg. *Calystegia sepium*, *Osmunda regalis*, *Epilobium hirsutum* and *Ulex europaeus*. Often grading into scrub.
HD1/HH1	n/a	Dense bracken most dominant habitat, annex-I status no longer applies. Species list for dense bracken and Dry Heath as described in table.
HD1/GS4/ WS1	n/a	Dense bracken dominant. Species as described elsewhere in this table.
HH1	4030 (DH1/DH3)	Generally occurs in small patches round rock outcrops within a peatland or grassland mosaic. Typical species are *Ulex gallii*, *Calluna vulgaris*, *Erica cinerea*, *Potentilla erecta*, *Carex binervis*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Carex demissa*, *Molinia caerulea*, *Agrostis viminalis*, *Nardus stricta*, *Succisa pratensis*, *Campylopus flexuosus*, *Pleurozium schreberi*, *Scleropodium purum* and *Hypnum jutlandicum.* Scrub encroaching in 2023. EC11 R4, EC11 R7, EC11 R10, 2403_R1 and 2407_R1
HH1/HD1	4030	Heathland and dense bracken species as described in this table. 614_R1
HH3	4010 (WH4a, Wh4b, WH7)	The habitat is generally found in mosaic with blanket bog and dry heath. Typical species include *Trichophorum germanicum*, *Calluna vulgaris*, *Erica tetralix*, *Molinia caerulea*, *Carex binervis*, *Potentilla erecta*, *Eriophorum angustifolium*, *Sphagnum capillifolium* ssp. *rubellum*, *Sphagnum fallax*, *Hypnum jutlandicum*, *Campylopus atrovirens* and *Cladonia portentosa.* In flushed areas *Myrica gale*, *Molinia caerulea, Schoenus nigricans* and *Sphagnum tenellum*. Grasses and sedges are frequent in heavily poached areas. Some encroachment from *Ulex* spp. and *Salix* spp. EC11 R6, EC11 R8, EC11 R9, EC11 R11, 2406_R1 and 620_R1

PB3	*7130 (BB2, BB3)	Typical species include *Molinia caerulea*, *Calluna vulgaris*, *Schoenus nigricans*, *Rhynchospora alba*, *Erica tetralix*, *Carex panicea*, *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Narthecium ossifragum*, *Trichophorum germanicum*, *Sphagnum capillifolium* ssp. *rubellum*, *Sphagnum papillosum*, *Sphagnum tenellum*, *Sphagnum cuspidatum*, *Aulacomnium palustre*, *Drosera rotundifolia*, *Odontoschisma sphagni* and *Potentilla erecta*. Recovering hollows mostly have 100% *Sphagnum* cover with *Eriophorum angustifolium*, some *Eriophorum vaginatum*, *Erica tetralix* and *Calluna vulgaris*. *Rhynchospora alba* is locally abundant. EC11 R3 and EC11 R5

EC11 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
PB3	7150 (HW3)	*Rhynchospora* lawns occur in natural hollows and some of the recovering cutover hollows. The habitat is mostly found in the northern parts of the site but small patches present throughout. *Rhynchospora alba*, *Menyanthes trifoliata*, *Narthecium ossifragum*, *Molinia caerulea*, *Calluna vulgaris*, *Erica tetralix*, *Sphagnum papillosum*, *Sphagnum magellanicum*, *Sphagnum cuspidatum*, *Sphagnum denticulatum* and *Eriophorum angustifolium.* EC11 R2
PB4	n/a	A high cover of bare peat with occasional *Molinia caerulea*, *Juncus effusus*, *Juncus bulbosus* and *Carex panicea.*
PF2	n/a	Small linear drainage feature within acid grassland. *Juncus effusus*, *Juncus articulatus*, *Sphagnum denticulatum*, *Ranunculus flammula*, *Potamogeton polygonifolius*, *Juncus bulbosus*, *Philonotis fontana*, *Agrostis stolonifera*, *Lythrum salicaria* and *Calliergonella cuspidata*.
WL1	n/a	*Crataegus monogyna*, *Salix cinerea*, *Prunus spinosa*, *Hedera helix*, *Ilex aquifolium*, *Lonicera periclymenum* and *Rubus fruticosus* agg.
WL2	n/a	Variable habitat type. Species typically found include *Pinus contorta*, *Cupressus* sp., *Picea sitchensis*, *Salix cinerea, Fraxinus excelsior*, *Acer pseudoplatanus*, *Crataegus monogyna*, *Rubus fruticosus* agg. and *Hedera helix*
WS1	n/a	Mostly taller scrub. Typical species *Ulex europaeus*, *Prunus spinosa*, *Crataegus monogyna* and *Salix cinerea*. Low scrub is dominated by *Rubus fruticosus* agg. Usually where it has encroached upon grassland.
WS1/GS4	n/a	Scrub encroaching on GS4. Species as described in this table.

R336 to the Foraí Maola Road (Ch. 0+000 – Ch. 1+150) – Habitats between EC03, EC05 and EC11 as far as the Foraí Maola Road

R336 to the Foraí Maola Road - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
ED2	n/a	*Calliergonella cuspidata, Geranium robertianum, Daucus carota, Trifolium repens, Crepis capillaris, Anagallis arvensis, Leontodon autumnalis, Epilobium obscurum and Epilobium ciliatum.* 2398_R1
ED2/GS2	n/a	Small verge of GS2 along ED2, with species assemblage for both habitats as described in table.
ED3	n/a	*Agrostis capillaris*, *Agrostis stolonifera*, *Anagallis tenella*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Bellis perennis*, *Campylopus introflexus* (A/F), *Centaurea erythraea*, *Erica cinerea*, *Hieracium* agg., *Holcus lanatus*, *Leucanthemum vulgare*, *Lotus corniculatus*, *Nardus stricta*, *Potentilla erecta*, *Potentilla reptans*, *Jacobaea vulgaris*, *Succisa pratensis* and *Ulex gallii*
ED3a	n/a	*Agrostis stolonifera*, *Calluna vulgaris*, *Carex panicea*, *Holcus lanatus*, *Juncus effusus* and *Molinia caerulea*
GA1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Plantago lanceolata, Ranunculus acris, Stellaria media, Agrostis stolonifera*, *Cirsium vulgare*, *Dactylis glomerata*, *Holcus lanatus*, *Lolium perenne*, *Plantago major*, *Poa annua*, *Prunella vulgaris*, *Ranunculus repens*, *Rumex obtusifolius*, *Jacobaea vulgaris*, *Sonchus asper*, *Taraxacum officinale* agg. and *Trifolium repens*
GA1/GS3/ WS1	n/a	GA1 dominant. Species as described separately in this table.
GA1/GS2/ WS1/BL1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens, Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus, Asplenium ceterach, Blechnum spicant, Hedera helix agg., Polypody sp.*

R336 to the Foraí Maola Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GM1	n/a	*Angelica sylvestris*, *Cirsium palustre*, *Filipendula ulmaria* (A), *Galium palustre*, *Holcus lanatus*, *Juncus effusus* (F), *Lotus pedunculatus*, *Lythrum salicaria* (F), *Mentha aquatica*, *Potentilla anserina*, *Ranunculus acris*, *Scrophularia auriculata* and *Typha latifolia* 2629_R1
GS2	n/a	*Agrostis stolonifera*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Centaurea nigra*, *Cerastium fontanum*, *Festuca rubra*, *Holcus lanatus*, *Leontodon autumnalis*, *Lotus corniculatus*, *Plantago lanceolata*, *Ranunculus acris*, *Ranunculus repens*, *Rumex acetosa* and *Trifolium pratensis*
GS2/GS4/ WS1/ER1	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorrhiza fushii, Epilobium hirstum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pedunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus*
GS2/GS4/ WS1/GS3/ ER1	n/a	Grazed by horses, some exposed rock. *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Calluna vulgaris, Carex panicea, Carex sp., Danthonia decumbens, Erica cinerea, Erica tetralix, Hypochaeris radicata, Rumex acetosella, Sedum anglicum, Ulex gallii, Veronica officinalis.*
GS3	n/a	*Achillea millefolium*, *Agrostis* sp., *Lolium* sp., *Ranunculus repens*, *Rumex* spp., *Jacobaea vulgaris* and *Urtica dioica*
GS3/GA1/ ER1	n/a	GS3 species as above. *Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens* also present.

Habitat code	Annex I habitat	Key species
GS4	n/a	*Angelica sylvestris*, *Calystegia sepium*, *Cirsium palustre*, *Festuca rubra/ovina*, *Filipendula ulmaria*, *Holcus lanatus*, *Iris pseudacorus*, *Juncus effusus*, *Lolium perenne*, *Lythrum salicaria*, *Molinia caerulea*, *Plantago lanceolata*, *Plantago major*, *Pteridium aquilinum*, *Ranunculus acris*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex obtusifolius*, *Rumex* spp., *Jacobaea vulgaris* and *Trifolium pretense* 2634_R1
GS4/GS2	n/a	*Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorrhiza fushii, Epilobium hirstum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pedunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia, Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium.*
GS4/WS1	n/a	*Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia,* and *Ulex europaeus.* Grassland species as above.
HD1	n/a	*Pteridium aquilinum* and *Rubus fruticosus* agg.
HD1/GS2/ HH1/ER1	4030	Either HH1 or HD1 as dominant habitat. Species list for either one as listed above or below in table.
HH1	4030 (DH1)	*Ulex gallii*, *Erica cinerea*, *Hypnum jutlandicum*, *Agrostis stolonifera*, *Calluna vulgaris*, *Pteridium aquilinum*, *Daboecia cantabrica*, *Hylocomium splendens*, *Holcus lanatus*, *Campylopus introflexus*, *Deschampsia flexuosa*, *Molinia caerulea, Rubus fruticosus* agg. *Cladonia* sp. *Danthonia decumbens*, *Hypnum jutlandicum*, *Scleropodium purum, Campylopus flexuosus*, *Carex binervis*, *Hylocomium splendens*, *Juncus squarrosus*, *Nardus stricta*, *Potentilla erecta*, *Racomitrium lanuginosum*, *Sedum anglicum*, *Succisa pratensis* and *Teucrium scorodonia* R336-NFMR R1, R336-NFMR R2 and 2638_R1
HH1/WS1		*Ulex gallii* dominant. Other species include *Calystegia seium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europaeus.*
WD1	n/a	*Acer pseudoplatanus*, *Alnus cordata*, *Alnus glutinosa*, *Blechnum spicant*, *Corylus avellana*, *Crataegus monogyna*, *Dryopteris felix-mas*, *Fagus sylvatica*, *Fraxinus excelsior*, *Hedera helix*, *Phyllitis scolopendrium*, *Prunus* sp., *Quercus robur*, *Rubus fruticosus* agg., *Salix* sp., *Sorbus aria* and *Urtica dioica*

R336 to the Foraí Maola Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WD2	n/a	*Acer pseudoplatanus*, *Alnus cordata*, *Alnus glutinosa*, *Betula pubescens*, *Cupressus × leylandii*, *Fagus sylvatic*, *Fraxinus excelsior*, *Picea sitchensis*, *Pinus sylvestris*, *Pinus spp.* and *Quercus robur*
WL1	n/a	*Cotoneaster* sp., *Crocosmia x crocosmiiflora*, *Griselinia* sp. and *Lonicera nitida*
WL1a	n/a	*Calystegia sepium*, *Epilobium hirsutum*, *Filipendula ulmaria*, *Geranium robertianum*, *Hedera helix*, *Lonicera periclymenum*, *Phyllitis scolopendrium*, *Prunus spinosa* and *Pteridium aquilinum*
WL2	n/a	*Acer pseudoplatanus*, *Alnus glutinosa*, *Cupressus* sp., *Fagus sylvatica*, *Fraxinus excelsior*, *Pinus contorta*, *Pinus radiata*, *Prunus* sp. and *Sorbus aucuparia*
WS1	n/a	*Acer pseudoplatanus*, *Arrhenatherum elatius*, *Calystegia sepium*, *Dactylis glomerata*, *Epilobium* sp., *Lythrum salicaria*, *Rubus fruticosus* agg. and *Vicia cracca*
WS1/HD1	n/a	HD1 species as above, with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus*
WS1/WN6	n/a	*Salix cinerea*, *Rubus fruticosus* agg., *Angelica sylvestris* and *Arrhenatherum elatius*

The Foraí Maola Road to Troscaigh Thiar (Ch. 1+150 – Ch. 1+650) – Habitats between EC12, EC13, EC14 and the Foraí Maola Road

The Foraí Maola Road to Troscaigh Thiar - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL1	n/a	*Cladonia* spp., *Dicranum scoparium*, *Hedera helix*, *Homalothecium sericeum*, *Hypnum cupressiforme*, *Isothecium myosuroides*, *Mnium hornum*, *Polypodium vulgare* and *Racomitrium aciculare*
ED3/ED2/GS2	n/a	*Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum, Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium.*

The Foraí Maola Road to Troscaigh Thiar - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
ER1	n/a	The exposed rock is mostly bare. It has few crevices or clefts to harbour significant bryophyte or pteridophyte communities. Where rock outcrops occur in grassland habitats, they are often surrounded by species that prefer good drainage such as *Sedum anglica*, *Pilosella officinarum* and *Veronica serpyllifolia* 2698_R1
FS2	n/a	*Apium nodiflorum*, *Equisetum fluviatile*, *Glyceria fluitans*, *Iris pseudacorus*, *Mentha aquatica* and *Veronica beccabunga*
FW4	n/a	*Apium nodiflorum (often dominant), Agrostis stolonifera, Juncus effusus, Arrhenatherum elatius, Holcus lanatus, Galium palustre, Stachys palustris, Filipendula ulmaria, Lythrum salicaria and Equisetum fluviatile.* 2583_R1
GA1	n/a	*Agrostis stolonifera*, *Lolium perenne*, *Ranunculus repens*, *Rumex obtusifolius* and *Urtica dioica* 2580_R1and 2584_R2
GA1/WS1	n/a	GA1 species above with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus.*
GS1	n/a	*Anthoxanthum odoratum, Plantago lanceolata, Cynosurus cristatus, Phleum pratense, Poa trivialis, Dactylis glomerata, Festuca rubra agg., Trifolium pratense, Hypochaeris radicata, Prunella vulgaris, Centaurea nigra, Lotus corniculatus, Agrostis capillaris* and *Leucanthemum vulgare.* 2577_R2 and 2584_R1
GS2	n/a	*Agrostis stolonifera*, *Angelica sylvestris*, *Arrhenatherum elatius*, *Calystegia sepium*, *Cirsium palustre*, *Hieracium* agg., *Holcus lanatus*, *Leucanthemum vulgare*, *Plantago lanceolata*, *Potentilla anserina*, *Ranunculus repens*, *Rumex crispus*, *Scrophularia auriculata*, *Sonchus asper* and *Trifolium dubium* 2582_R2 and 2583_R2
GS2/ED3	n/a	GS2 as above. ED3 species include. *Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum.*
GS3	n/a	*Agrostis capillaris*, *Agrostis stolonifera*, *Calliergonella cuspidatum*, *Cerastium fontanum*, *Festuca rubra*, *Holcus lanatus*, *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Prunella vulgaris*, *Ranunculus repens*, *Rhytidiadelphus squarrosus*, *Rumex acetosa*, *Jacobaea vulgaris*, *Taraxacum officinale* agg., *Trifolium pratensis*, *Trifolium repens*, *Veronica chamaedrys*, *Veronica serpyllifolia* and *Viola riviniana* 2581_R2, 2582_R1 and 2582_R3

Habitat code	Annex I habitat	Key species
GS3/WS1	n/a	GS3 species as above, *with Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus.*
GS4	n/a	*Agrostis stolonifera*, *Anthoxanthum odoratum*, *Centaurea nigra*, *Cirsium palustre*, *Dactylis glomerata*, *Filipendula ulmaria*, *Holcus lanatus*, *Iris pseudacorus*, *Juncus effusus*, *Lythrum salicaria*, *Ranunculus acris*, *Ranunculus repens*, *Rumex* spp. and *Succisa pratensis* 2577_R1, 2581_R1 and 2583_R3
HD1	n/a	*Pteridium aquilinum*
HH1	4030 (DH1)	*Calluna vulgaris*, *Cladonia* sp., *Daboecia cantabrica*, *Danthonia decumbens*, *Deschampsia flexuosa*, *Erica cinerea*, *Hypnum jutlandicum*, *Molinia caerulea*, *Scleropodium purum* and *Ulex gallii* 2700_R1
HH3/WS1	4010	Mosaic of typical wet heath vegetation with *Ulex europeaus, Rubus fruticosus agg.* and *Chamaenerion angustifolium.*
Residential	n/a	*Fagus sylvatica, Acer pseudoplatanus, Festuca rubra agg.* and *Geranium robertianum* 2607_R1
WD2	n/a	*Acer pseudoplatanus*, *Betula pubescens*, *Cupressus* sp., *Fraxinus excelsior*, *Pinus* spp., *Prunus* sp. and *Rhododendron ponticum*
WD4	n/a	*Picea sitchensis, Cupressus spp. Acer pseudoplatanus, Hedera helix, Pteridium aquilinum, Urtica dioica, Kindbergia praelonga, Metzgeria furcata, Isothecium myosuroides and Hypnum species.* 2575_R1
WL1	n/a	*Crataegus monogyna*, *Cupressus* x *leylandii*, *Hedera helix*, *Prunus spinosa*, *Pteridium aquilinum*, *Rosa rugosa* and *Rubus fruticosus* agg.
WL2	n/a	*Cupressus* sp.
WS1	n/a	*Calystegia sepium*, *Crataegus monogyna*, *Dryopteris felix-mas*, *Fraxinus excelsior*, *Hedera helix*, *Lonicera periclymenum*, *Phyllitis scolopendrium*, *Prunus spinosa*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Ulex europaeus*, *Umbilicus rupestris*, *Veronica chamaedrys* and *Vicia sepium* 2581_R3 and 2582_R3
WS1/HD1/ GS2	n/a	Species poor grassland – *Lolium pratense, Urtica dioica, Galium aparine, Epilobium hirsutum* and *Centaurea nigra.* Typical WS1 and HD1 species as above.

EC12

EC12 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GA1	n/a	*Lolium perenne*, *Jacobaea vulgaris*, *Odontites verna*, *Rumex obtusifolius*, *Cerastium fontanum*, *Agrostis stolonifera*, *Ranunculus repens*, *Prunella vulgaris* and *Plantago lanceolata*
GS3	n/a	*Agrostis capillaris*, *Cynosurus cristatus*, *Achillea millefolium*, *Plantago lanceolata*, *Anthoxanthum odoratum*, *Potentilla erecta*, *Ranunculus repens* and *Leontodon autumnalis* 736_R1, 767_R4, 770_R1, 771_R1, 2419_R1 and 2417_R2
GS3/ER1	n/a	*Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium, Calluna vulgaris, Carex panicea, Carex sp., Danthonia decumbens, Erica cinerea, Erica tetralix, Hypochaeris radicata, Rumex acetosella, Sedum anglicum, Ulex gallii, Veronica officinalis.*
GS3/GS4/ WS1/BL3	n/a	Species as described in table above. 15% BL3 – new track and entrance from road.
GS3/GS4/ FW4/FL8	n/a	Grassland species as described in this table. Pond devoid of vegetation.
GS4	n/a	*Juncus effusus*, *Lythrum salicaria*, *Agrostis stolonifera*, *Juncus articulatus*, *Holcus lanatus*, *Arrhenatherum elatius*, *Ranunculus repens*, *Stachys palustris*, *Angelica sylvestris*, *Succisa pratensis* and *Filipendula ulmaria*. 735_R2, 740_R1, 764_R1, 767_R3, 769_R2, 770_R2 and 771_R2
GS4/GS3/GS2	n/a	Grassland species as described above under GS4. Small patch of GS2 near built land to west. *Achillea millefolium, Arrhenatherum elatius, Centurea nigra* *Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata* *Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus* *Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica , Veronica chamaedrys, Vicia sepium*
GS4/FW4	n/a	Grassland species as described above under GS4. *Anthoxanthum odoratum, Holcus lanatus, Juncus effusus, Arrhenatherum elatius, Glyceria fluitans, Stachys palustris, Filipendula ulmaria, Lythrum salicaria, Ranunculus repens, Galium palustre* and *Equisetum fluviatile* 734_R1

EC12 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS4/PF2	n/a	GS4 areas are dominated by such species as *Agrostis stolonifera, Juncus effusus, Arrhenatherum elatius, Potentilla erecta, Anthoxanthum odoratum, Holcus lanatus, Lythrum salicaria* and *Scleropodium purum*, whilst the PF2 areas are more dominated by *Agrostis canina, Hydrocotyle vulgaris, Juncus acutiflorus, Anagallis tenella, Viola palustris, Festuca rubra agg., Polytrichum commune* and *Hylocomium splendens.* 740_R3
HD1	n/a	*Pteridium aquilinum*, *Rubus fruticosus* 736_R3, 739_R2 and 742_R1
HD1/GS3	n/a	90% cover dense bracken. GS3 species include *Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium.*
HD1/GS3/ GS4	n/a	HD1 and GS3 dominant with small areas of GS4. Species as above.
HD1/WS1/ GS3/PF2	n/a	Bracken dominant with abundant *Ulex gallii.* Species lists for WS1, GS3 and PF2 as listed in table.
HH1	4030 (DH1)	*Ulex gallii*, *Calluna vulgaris*, *Daboecia cantabrica*, *Erica cinerea*, *Agrostis capillaris*, *Molinia caerulea*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Epilobium hirsutum* and *Ulex europaeus*. EC12 R1, EC12 R3, 734_R3, 739_R1, 764_R2, 2418_R1, 736_R4, 2414_R1, 2417_R1, 767_R2 and 2414_R2
HH1/WS1	4030	Heath sepceis as above, with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus.*
HH3	4010 (WH3)	*Molinia caerulea*, *Calluna vulgaris*, *Narthecium ossifragum*, *Succisa pratensis*, *Potentilla erecta*, *Juncus articulatus*, *Drosera rotundifolia*, *Sphagnum capillifolium*, *S. denticulatum* and *Polygala serpyllifolia*. EC12 R2 and 735_R1
PB3	*7130	*Sphagnum* species such as *S. papillosum, S. cuspidatum and S. capillifolium, as well as Eleocharis multicaulis, Carex panicea, Succisa pratensis, Carex echinata, Molinia caerulea, Narthecium ossifragum, Aulacomnium palustre, Erica tetralix* and *Eriophorum vaginatum.* 743_R1
PB3/HH1	*7130	65% PB3, 35% HH1. Species as described in table above.

EC12 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

PF2	n/a	*Agrostis canina, Agrostis stolonifera, Hydrocotyle vulgaris, Juncus acutiflorus, Juncus bulbosus, Carex nigra, Viola palustris, Anagallis tenella, Festuca rubra agg., Polytrichum commune, Hylocomium splendens* and *Sphagnum species, including S. palustre and S. capillifolium.* 736_R2, 734_R2, 767_R1 and 742_R2
WS1	n/a	*Rubus fruticosus* agg., *Ulex europaeus* and *Salix cinerea*. 739_R3, 740_R2, 769_R1 and 771_R3

EC13

EC13 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Ulex europaeus*, *Salix cinerea*, *Rubus fruticosus* agg. *Molinia caerulea*, *Rumex acetosa*, *Succisa pratensis*, *Erica cinerea*, *Centaurea nigra* and *Anthoxanthum odoratum.*
ER1	n/a	The exposed rock is mostly bare. It has few crevices or clefts to harbour significant bryophyte or pteridophyte communities. Where rock outcrops occur in grassland habitats, they are often surrounded by species that prefer good drainage such as *Sedum anglica*, *Pilosella officinarum* and *Veronica serpyllifolia*.
FS1	n/a	*Phragmites australis.*
GA1	n/a	*Rumex obtusifolius*, *Ranunculus repens*, *Cirsium arvense*, *Jacobaea vulgaris*, *Urtica dioica*, *Plantago major*, *Holcus lanatus*, *Dactylis glomerata* and *Poa annua*.
GM1	n/a	*Angelica sylvestris*, *Lythrum salicaria*, *Mentha aquatica*, *Hydrocotyle vulgare*, *Galium palustre*, *Juncus effusus*, *Agrostis stolonifera*, *Potentilla palustris Equisetum fluviatile*, *Plantago lanceolata*, *Succisa pratensis* and *Juncus articulatus.*
GS2	n/a	*Dactylis glomerata*, *Festuca rubra*, *Holcus lanata*, *Arrhenatherum elatius*, *Anthoxanthum odoratum*, *Agrostis stolonifera*, *Rumex crispus* and *Rubus fruticosus* agg.
GS3	n/a	Relatively species-rich dry acid grasslands in mosaic with dry heath. *Anthoxanthum odoratum*, *Agrostis capillaris*, *Agrostis stolonifera*, *Carex panicea*, *Succisa pratensis*, *Euphrasia officinalis*, *Pedicularis sylvatica*, *Hypochaeris radicata*, *Potentilla erecta*, *Hylocomium splendens*, *Centaurea nigra*, *Galium saxatile*, *Festuca rubra*, *Cynosurus cristatus*, *Prunella vulgaris*, *Trifolium pratense*, *Leontodon autumnalis*, *Achillea millefolium*, *Nardus stricta* and *Lotus corniculatus.*
GS4	n/a	Typical soft rush wet agricultural grasslands and patches of higher value (but non-Annex I) *Molinia* grassland. Merges to mosaic with *Molinia* meadow, marsh and poor flush. Species include *Juncus effusus*, *Molinia caerulea*, *Angelica sylvestris*, *Juncus articulatus*, *Holcus lanatus*, *Juncus conglomeratus*, *Lythrum salicaria*, *Filipendula ulmaria*, *Carex echinata*, *Carex flacca*, *Potentilla erecta*, *Galium palustre*, *Mentha aquatica* and *Arrhenatherum elatius.*
EC13 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS4	6410 (GL1c)	*Juncus effusus*, *Juncus articulatus*, *Juncus conglomeratus*, *Filipendula ulmaria*, *Holcus lanatus*, *Lythrum salicaria*, *Anthoxanthum odoratum*, *Agrostis stolonifera*, *Carex echinata*, *Potentilla erecta*, *Carex flacca*, *Eriophorum angustifolium*, *Galium palustre*, *Angelica sylvestris*, *Carex panicea* and *Dactylorhiza maculata*. EC13 R1
HD1	n/a	*Pteridium aquilinum*, with patches of *Rubus fruticosus* agg. and *Ulex europaeus*.
HH1	4030 (DH1)	Two variants occur at the site. DH1 variant is found around rock outcrops in the peatland areas. It also generally occurs in isolated patches. Dominated by a combination of *Ulex gallii* and *Calluna vulgaris. Campylopus introflexus* is common on peat that has been burned in the past. EC13 R5
	4030 (DH3)	The DH3 variant occurs in mosaic with relatively species-rich GS3 grassland. Typical species are *Ulex gallii, Calluna vulgaris*, *Erica cinerea*, *Potentilla erecta*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Carex demissa*, *Carex panicea*, *Succisa pratensis*, *Lotus corniculatus*, *Hylocomium splendens*, *Scleropodium purum*, *Hypnum jutlandicum*, *Festuca rubra* and *Trifolium pratense.* EC13 R2
HH3	4010 (WH4, WH3)	Vegetation variable across the site but the shallow peat of the rocky areas mainly supports *Trichophorum* WH4 wet heath while the deeper peats in sections are more typical of WH3. Typical species are *Trichophorum germanicum*, *Calluna vulgaris*, *Erica tetralix*, *Molinia caerulea*, *Potentilla erecta*, *Eriophorum angustifolium*, *Sphagnum capillifolium* ssp. *rubellum*, *Hypnum jutlandicum*, *Campylopus atrovirens*, *Schoenus nigricans*, *Aulacomnium palustre*, *Narthecium ossifragum*, *Sphagnum compactum*, *Sphagnum subnitens*, *Cladonia portentosa* and *Sphagnum tenellum*. *Juncus effusus*, *Juncus articulatus* and grasses frequent in degraded areas. *Salix repens.* *Carex panicea, Comarum palustre, Erica cinerea, Juncus acutiflorus, Molinia caerulea, Narthecium ossifragum, Osmunda regalis, Potentilla erecta, Succisa pratensis* EC13 R3 and EC13 R8
HH3/GS4/ PB3/GS3	4010/* 7130	Wet Heath and lowland blanket bog species as listed in this table. Additional species include *Ulex gallii*
PB3	*7130 (BB2, BB3)	Restricted to small patches in deeper hollows between rock outcrops in an area mostly covered by wet heath. *Molinia caerulea*, *Calluna vulgaris*, *Schoenus nigricans*, *Rhynchospora alba*, *Erica tetralix*, *Eriophorum angustifolium*, *Eriophorum vaginatum*, *Narthecium ossifragum*, *Sphagnum capillifolium* ssp. *rubellum*, *Sphagnum papillosum*, *Sphagnum magellanicum*, *Sphagnum cuspidatum*, *Drosera rotundifolia*, *Odontoschisma sphagni*, *Potentilla erecta* and *Eleocharis multicaulis.* EC13 R4 and EC13 R7
EC13 - Species Lists & Relevés		

Habitat code	Annex I habitat	Key species
PB3	7150 (HW3)	*Rhynchospora* lawns are scattered throughout the wetter parts of the bog, in natural hollow. *Rhynchospora alba*, *Narthecium ossifragum*, *Molinia caerulea*, *Calluna vulgaris*, *Erica tetralix*, *Sphagnum papillosum*, *Sphagnum cuspidatum* and *Eriophorum angustifolium.* EC13 R6
PF2	n/a	*Juncus articulatus*, *Sphagnum denticulatum*, *Sphagnum palustre*, *Ranunculus flammula*, *Agrostis stolonifera*, *Lythrum salicaria*.
WS1	n/a	Taller scrub dominated by *Ulex europaeus* or *Prunus spinosa.* The low scrub, dominated by *Rubus fruticosus* agg., has colonized areas of neglected/abandoned land. Extensive patches of *Salix cinerea* subsp. *oleifolia* occurs in places.

EC14

EC14 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Rubus fruticosus* agg. *Ulex europaeus*, *Chamerion angustifolium, Persicaria maculosa*, *Lythrum salicaria*, *Pteridium aquilinum* and *Calystegia sepium*.
ER1	n/a	*Anthoxanthum odoratum, Holcus lanatus, Lolium perenne, Trifolium repens, Agrostis capillaris, Sedum anglicum, Rumex acetosella, Festuca rubra agg. and Hypnum species.* 825_R1 and 827_R4
HD1	n/a	*Pteridium aquilinum*, *Rubus fruticosus* and *Dactylis glomerata*. 827_R1
HD1/WS1	n/a	HD1 as above, with *Rubus fruticosus agg.*
GS1	n/a	*Lolium perenna, Anthoxanthum odoratum, Plantago lanceolata, Cynosurus cristatus, Phleum pratense, Poa trivialis, Dactylis glomerata, Festuca rubra agg., Trifolium repens, Hypochaeris radicata, Prunella vulgaris, Centaurea nigra, Agrostis capillaris and Leucanthemum vulgare.* 825_R2, 825_R3 and 828_R1
GS2	n/a	*Dactylis glomerata*, *Centaurea nigra*, *Lolium perenne*, *Plantago lanceolata*, *Lathyrus pratensis*, *Odontites verna*, *Anthoxanthum odoratum*, *Jacobaea vulgaris* and *Rumex crispus.*
GS3	n/a	*Agrostis capillaris*, *Nardus stricta*, *Potentilla erecta*, *Succisa pratensis*, *Hylocomium splendens* and *Juncus articulatus.* 827_R3
EC14 - Species Lists & Relevés		

Habitat code	Annex I habitat	Key species
GS3/WS1	n/a	*Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium.* 20% Scrub cover. *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. oleifolia, Ulex europaeus.*
GS4	n/a	*Lythrum salicaria*, *Juncus articulatus*, *Filipendula ulmaria*, *Agrostis stolonifera*, *Potentilla anserine*, *Holcus lanatus*, *Juncus effusus* and *Cardamine pratensis.* EC14 R5 and 827_R2
GS4/GS2	n/a	Rank vegetation, *Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Alnus glutinosa, Cirsium arvense* and *Calystegia sepium.*
GS4/GS3	n/a	*Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pendunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia, Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium.*
GS4/WS1		GS4 dominant. Species as described in table.
HH1	4030 (DH1)	*Ulex gallii*, *Calluna vulgaris*, *Erica cinerea*, *Daboecia cantabrica*, *Molinia caerulea*, *Potentilla erecta* and *Hypnum jutlandicum.* EC14 R1, 2611_R1, 2618_R2, 2622_R1, 2612_R1, 2617_R1 and 2623_R1
HH3	4010 (WH3/WH7)	*Trichophorum germanicum*, *Calluna vulgaris*, *Erica tetralix*, *Ulex gallii*, *Eriophorum angustifolium*, *Molinia caerulea*, *Sphagnum capillifolium*, *Schoenus nigricans* and *Carex binervis.* EC14 R2, EC14 R4, 848_R1, 2615_R1, 875_R1, 2613_R1, 2621_R1, 2614_R1 and 2616_R1
HH3/GS4	4010	Mosaic of HH3 and GS4 habitats described above in this table.
PB3	*7130 (BB1b/BB1a)	*Schoenus nigricans*, *Rhynchospora alba*, *R. fusca*, *Trichophorum germanicum*, *Molina caerulea*, *Calluna vulgaris*, *Drosera rotundifolia*, *Erica tetralix*, *Sphagnum papillosum*, *Sphagnum denticulatum* and *Cladonia portentosa.* EC14 R3
EC14 - Species Lists & Relevés		

Habitat code	Annex I habitat	Key species
PF2	n/a	There are a couple of small flushes within an area of wet grassland. *Menyanthes trifoliata*, *Juncus articulatus*, *Potentilla anserine*, *Sphagnum palustre*, *Ranunculus flammula*, *Juncus effusus*, *Succisa pratensis*, *Polytrichum formosum*, *Agrostis stolonifera* and *Persicaria maculosa*.
PF2/HH3	4010	Flush species as described HH3 species include *Molinia caerulea, Succisa pratensis, Hylocomium splendens, Calluna vulgaris, Juncus acutiflorus, Erica tetralix, Erica cinerea* and *Pleurozium schreberi.* 875_R1
WS1	n/a	*Ulex europaeus*, *Rubus fruticosus* agg., *Salix cinerea*, *Betula pubescens*, *Sorbus aucuparia* and *Ilex aquifolium*. 2618_R1 and 861_R1
WS1/GS2/ED3	n/a	WS1 species as described above. Other species include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum*

Ann Gibbons Road (L13215) (Ch. 2+400 – Ch. 2+500) – Habitats between EC14 and EC09

Ann Gibbons Road (L13215) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Plantago major*, *Poa annua*, *Potentilla anserina*
ER1	n/a	The exposed rock is mostly bare. It has few crevices or clefts to harbour significant bryophyte or pteridophyte communities. Where rock outcrops occur in grassland habitats, they are often surrounded by species that prefer good drainage such as *Sedum anglica*, *Pilosella officinarum* and *Veronica serpyllifolia*
GA1	n/a	*Agrostis stolonifera*, *Lolium perenne*, *Ranunculus repens*, *Jacobaea vulgaris, Cirsium arvense, Arrhenatherum elatius, Dactylis glomerata, Holcus lanatus, Rumex obtusifolius, Jacobaea vulgaris* and *Urtica dioica* 2649_R2
GS2	n/a	*Arrhernatherum elatius* dominant. *Holcus lanatus, Ranunculus repens, Rumex obtusifolia, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus, Ulex europaeus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Epilobium hirsutum, Salix sp., Buddeja davidii.*
GS3	n/a	*Agrostis capillaris*, *Cynosurus cristatus*, *Holcus lanatus*, *Leontodon autumnalis*, *Plantago lanceolata*, *Potentilla erecta* and *Ranunculus repens*

GS4	n/a	Vegetation very tall in 2023. *Agrostis stolonifera*, *Filipendula ulmaria*, *Holcus lanatus*, *Juncus effusus*, *Lythrum salicaria*, *Iris pseudacorus* and *Potentilla anserina* 2648_R3 and 2649_R1
WS1	n/a	*Prunus spinosa*, *Rubus fruticosus* agg. and *Ulex europaeus* 2648_R1 and 2648_R2

EC09

EC09 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ER1	n/a	The exposed rock is mostly bare. It has few crevices or clefts to harbour significant bryophyte or pteridophyte communities. Where rock outcrops occur in grassland habitats, they are often surrounded by species that prefer good drainage such as *Sedum anglica*, *Pilosella officinarum* and *Veronica serpyllifolia*.
ED2	n/a	*Holcus lanatus, Pteridium aquilinum, Juncus effusus, Ulex europaeus, Epilobium ciliatum, Funaria hygrometrica, Polytrichum commune, Chamerion angustifolium, Pohlia wahlenbergii* and *Conocephalum conicum* 496_R2, 498_R1, 500_R1 and 506_R1
ED3	n/a	*Tussilago farfara*, *Ulex europaeus*, *Ulex gallii*, *Centaurea nigra*, *Hypochaeris radiata*, *Daucus carota*, *Lotus corniculatus*, *Carex disticha*, *Hypericum pulchellum*, *Achillea millefolium*, *Carex panacea*, *Potentilla anserina*, *Juncus effusus*, *Salix cinerea.* 500_R2 and 501_R2
ED3/WS1/ GS2	n/a	*Persicaria maculosa, Jacoobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Salix sp., Crataegus monogyna, Calystegia sepium, Epilobium angustifloium, Phragmites australis, Buddleja davidii, Alnus glutinosa* and *Cirsium arvense.*
ER1	n/a	*Anthoxanthum odoratum, Holcus lanatus, Agrostis capillaris, Sedum anglicum, Rumex acetosella, Juncus effusus, Festuca rubra agg.* and *Hypnum species.* 499_R4
FS1	n/a	*Phragmites australis*, *Agrostis stolonifera*, *Filipendula ulmaria*, *Juncus articulatus* and *Potentilla palustris*.
GA1	n/a	*Lolium perenne*, *Urtica dioica*, *Dactylis glomerata*, *Rumex obtusifolius*, *Ranunculus repens*, *Agrostis stolonifera*, *Cirsium arvense*, *Polygonum aviculare*, *Epilobium montanum*, *Plantago lanceolata*, *Holcus lanatus*, *Calystegia sepium*, *Rubus fruticosus* agg., *Persicaria maculosa*, *Sonchus asper*, *Brassica napus*, *Trifolium repens* and *Poa annua.*
GA2	n/a	Majority of area now amenity grassland. Species include *Bellis perennis, Taraxacum agg. Spp., Plantago lanceolata, Trifolium pratense, Lolium perenne,*

GA2/GS4	n/a	Area of lawn with some wet grassland indicators, *Juncus effusus, Lythrum salicaria, Iris pseudacorus* and *Filipendula ulmaria.* *Fraxinus excelsior, Acer pseudoplantus, Tilia cordata, Alnus glutinosa;* *Juncus effusus, Lythrum salicaria, Irish pseudacorus, Filipendula ulmaria*
EC09 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS2	n/a	*Dactylis glomerata*, *Arrhenatherum elatius*, *Rumex acetosa*, *Festuca rubra*, *Lotus corniculatus*, *Anthoxanthum odoratum*, *Agrostis stolonifera*, *Succisa pratensis*, *Centaurea nigra* and *Veronica chamaedrys.* Some *Thymus polytrichus* on ant hills only. Recolonized ground has some nutrient enrichment indicators such as *Cirsium arvense* and *Rumex obtusifolius*. 501_R3
GS4/WS1/ GA2/BL3	n/a	Grassland species as listed in table. *Larix sp., Ulex europaeus, Rubus fruticosus, Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Calystegia sepium, Epilobium angustifolium, Phragamites australis, Buddelja sp.* Built land comprises of recently constructed tennis court area to North.
GS2/HD1	n/a	Grassland dominant; species as listed in the table
GS3	n/a	Typical species are *Agrostis capillaris*, *Dactylis glomerata*, *Festuca rubra*, *Plantago lanceolata*, *Anthoxanthum odoratum*, *Nardus stricta*, *Rumex acetosa*, *Succisa pratensis*, *Lotus corniculatus*, *Juncus acutiflorus, Lotus penduculis, Ulex europeaus, Ranunculus repens*, *Leontodon autumnalis*, *Centaurea nigra*, *Potentilla erecta* and *Centaurium erythraea.*
	n/a	Highly species-rich variant recorded with abundant *Succisa pratensis*, on infertile ground.
	n/a	Slightly calcareous variant also recorded with *Lotus corniculatus*, *Prunella vulgaris*, *Carex disticha* and *Linum catharticum.*
GS3/GA2	n/a	Species as described above in this table with typical GS3 and GA2 species.

GS3/GS4	n/a	*Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium, Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorrhiza fushii, Epilobium hirstum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pedunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia*
GS3/GM1	n/a	*Filipendula ulmaria* abundant. *Succisa pratensis, Epilobium hirsutum, Iris pseudacorus, Mentha aquatica, Typha latifolia, Lythrum salicaria, Rubus fruticosus agg.* present.

EC09 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS4	n/a	More species poor variant containing species such as *Juncus effusus*, *Holcus lanatus*, *Iris pseudacorus, Lythrum salicaria*, *Ranunculus repens*, *Ranunculus acris*, *Filipendula ulmaria*, *Potentilla anserina Agrostis stolonifera*, *Juncus articulatus*, *Galium palustre*, *Lolium perenne*, *Dactylis glomerata*, *Lotus pedunculatus* and *Cirsium palustre*. 496_R1, 498_R3, 499_R1 and 468_R1
	6410 (GL1c)	*Molinia* meadow in mosaic with acid grassland. A high-quality habitat with high species-richness (38 spp per $2m^2$). Typical species include *Cirsium dissectum*, *Rhinanthus minor*, *Ranunculus flammula*, *Prunella vulgaris*, *Carex nigra*, *Carex demissa*, *Pedicularis sylvatica*, *Lophocolea bidentata*, *Riccardia* cf. *multifida* and *Calliergonella cuspidata.* EC09 R1
	6410 (GL1d)	*Molinia* meadow in mosaic with wet heath and has a low species-richness and forb cover. Typical species include *Molinia caerulea*, *Juncus conglomeratus*, *Juncus articulatus*, *Anthoxanthum odoratum*, *Succisa pratensis*, *Carex echinata*, *Carex panacea*, *Potentilla erecta* and *Pleurozium schreberi.* EC09 R4
GS4/WS1	n/a	*Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sepium, Chaamaenerion angustifolium, Phragmites australis, Buddleja davidii.*
GM1	n/a	*Lythrum salicaria, Mentha aquatica*, *Angelica sylvestris*, *Filipendula ulmaria*, *Arrhenatherum elatius*, *Agrostis stolonifera, Lathyrus pratensis*, *Stellaria graminea*, *Equisetum fluviatile*, *Hydrocotyle vulgaris*, *Juncus effusus* and *Juncus articulatus.* 501_R1

GM1/WS1	n/a	Field dominated by *Filipendula ulmaria* and *Lythrum salicaria* with frequent *Rubus fruticosus agg.*
HD1	n/a	*Pteridium aquilinum* with patches of *Rubus fruticosus* agg. *Epilobium hirsutum*. Often grading into *Ulex europaeus* scrub. 496_R3, 498_R2, 499_R2 and 506_R2
HD1/GS4/WS1 /GM1/ED2	n/a	Scrubby and impenetrable vegetation. Species as described in this table.
HH1	4030 (DH3, DH1)	*Calluna vulgaris*, *Erica cinerea*, *Cladonia portentosa*, *Carex binervis*, *Potentilla erecta*, *Cladonia uncialis*, *Carex panicea*, *Danthonia decumbens*, *Anthoxanthum odoratum*, *Succisa pratensis*, *Polygala serpyllifolia* and *Molinia caerulea*. Small patches of poor-quality *Ulex gallii* HH1 with *Erica cinerea* and *Rubus fruticosus* agg. in parts. EC09 R2
EC09 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
HH3	4010 (WH3)	*Calluna vulgaris*, *Erica tetralix*, *Molinia caerulea*, *Succisa pratensis*, *Carex echinata*, *Potentilla erecta*, *Juncus effusus*, *Juncus articulates*, *Sphagnum capillifolium* ssp. *rubellum*, *Pleurozium schreberi*, *Eriophorum angustifolium*, *Hylocomium* splendens and *Narthecium ossifragum*. EC09 R3
HH3/GS4/WS1 /HH1	4010/ 6410/ 4030	Species for HH3, HH1 and GS4 as above. Scrub species include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus.*
WD2	n/a	Located just outside of EC09; small area of mixed woodland dominated by *Fraxinus excelsior, Pinus spp and Picea spp.* Other species include *Crataegus monogyna, pruns spinosa* and *Salix caprea.*
WL2	n/a	*Fraxinus excelsior*, *Crataegus monogyna*, *Pteridium aquilinum* and *Rubus fruticosus* agg.
WS1	n/a	*Ulex europaeus, Prunus spinosa, Crataegus monogyna, Salix cinerea*, *Rubus fruticosus*, *Pteridium aquilinum, Calystegia sepium, Epilobium angustifolium, Epilobium hirsutum, Ulex gallii* and *Erica cinerea*. 499_R3, and 500_R3
WS1/HD1/GS4 /GS3	n/a	Scrubby and impenetrable vegetation. Species as described in this table.
WS1/HD1/GS4 /ER1	n/a	*Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sepium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii, Pteridium aquilinum, Ulex gallii.*
WS1/GS4	n/a	WS1 dominant. Species as above.

Ballard West to Ballard East (An Chloch Scoilte Junction, Ch. 3+050 – Ch. 3+450) – Habitats between EC09 and EC18

Ballard West to Ballard East - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED2	n/a	*Daucus carota, Trifolium repens, Crepis capillaris, Anagallis arvensis, Leontodon autumnalis, Epilobium obscurum* and *Epilobium ciliatum.* 2680_R2
ED2/GS4/ ED3	n/a	*Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Jacobaea vulgaris, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arhhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*
ER1	n/a	The exposed rock is mostly bare. It has few crevices or clefts to harbour significant bryophyte or pteridophyte communities. Where rock outcrops occur in grassland habitats, they are often surrounded by species that prefer good drainage such as *Sedum anglica*, *Pilosella officinarum* and *Veronica serpyllifolia*
FS2	n/a	*Apium nodiflorum*, *Epilobium hirsutum* and *Iris pseudacorus*
GA1	n/a	*Agrostis stolonifera*, *Arrhenatherum elatius*, *Calystegia sepium*, *Cirsium arvense*, *Dactylis glomerata*, *Galium aparine*, *Holcus lanatus*, *Jacobaea vulgaris*, *Juncus effusus*, *Lolium perenne*, *Plantago lanceolata*, *Plantago major*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex obtusifolius*, *Taraxacum officinale* agg., *Trifolium repens* and *Urtica dioica* 2680_R1
GA1/GS4/ WS1	n/a	GA1 and GS4 as described in this table. Wet grassland and Gorse scrub now very prominent.
GM1	n/a	*Carex panicea*, *Hydrocotyle vulgare*, *Hypericum perforatum*, *Iris pseudacorus, Juncus articulatus*, *Leontodon autumnalis*, *Lythrum salicaria*, *Mentha aquatica*, *Myosotis scorpioides*, *Potentilla palustris*, *Ranunculus acris* and *Solidago virgaurea.*
GS4	n/a	*Agrostis stolonifera*, *Arrhenatherum odoratum*, *Cirsium arvensis*, *Cynosurus cristatus*, *Dactylis glomerata*, *Filipendula ulmaria*, *Geranium robertianum*, *Holcus lanatus*, *Iris pseudacorus*, *Juncus effusus*, *Lolium perenne*, *Lythrum salicaria*, *Plantago lanceolata*, *Poa annua*, *Potentilla anserina*, *Ranunculus acris*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex acetosa*, *Rumex obtusifolius*, *Jacobaea vulgaris*, *Taraxacum officinale* agg., *Urtica dioica* and *Veronica persica* 2667_R1, 2676_R1 and 2679_R1
GS4/ER1	n/a	Wet grassland and exposed siliceous rock species as described above. 2658_R1
GS4/GM1	n/a	Frequent occurrence of *Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria.* Just outside boundary of Ballard West to Ballard East extent

Ballard West to Ballard East - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS4/WS1	n/a	Wet grassland species as described above, Scrub species include: *Larix spp., Ulex europaeus, Rubus fruticosus, Urtica dioica, salix spp., Crataegus monogyna, Calystegia spp., Epilobium hirsutum, Calystegia sepium, Epilobium angustifolium, Phragamites australis, Buddelja spp.*
PF2	n/a	*Agrostis canina, Agrostis stolonifera, Hydrocotyle vulgaris, Juncus acutiflorus, Juncus bulbosus, Carex nigra, Viola palustris, Anagallis tenella, Festuca rubra agg., Polytrichum commune, Hylocomium splendens* and *Sphagnum* species, including *S. palustre and S. capillifolium.* 2662_R1
WD1	n/a	*Acer pseudoplatanus*, *Alnus glutinosa, Cotoneaster* sp., *Crataegus monogyna*, *Dryopteris felix-mas*, *Fraxinus excelsior*, *Hedera helix*, *Heracleum sphondylium*, *Phyllitis scolopendrium*, *Rubus fruticosus* agg., *Symphoricarpos alba* and *Urtica dioica* 2670_R1
WS1	n/a	*Larix spp, Ulex europaeus, Rubus fruticosus agg., Urtica dioica, Salix spp., Crataegus monogyna, Calystegia sepium, Epilobium, angustifolium, Phragamites australis, Buddelja davidii*
WL2	n/a	Wide treeline, Mostly *Acer pseudoplatanus. Pinus contorta* also present.
WS1	n/a	*Prunus spinosa*, *Ulex europaeus*, *Crataegus monogyna*, *Rubus fruticosus* agg. A small area scrub associated with an abandoned residential property has several non-native garden shrubs including *Cotoneaster* sp. and *Symphoricarpos alba*.

EC18

EC18 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED2	n/a	Cleared vegetation with pockets of wet grassland (GS4) and scrub (WS1) remaining. *Arrhenatherum elatius*, *Juncus articulatus*, *Iris pseudacorus*, *Epilobium hirsutum*, *Filipendula ulmaria, Rubus fruticosus* agg. and *Ulex europaeus.*
ED2/ED3/ BL3	n/a	Mosaic of spoil, bare ground, recolonizing bare ground and built/artificial surfaces. Species include *Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*
ED3	n/a	*Calliergonella cuspidata, Rhytidiadelphus squarrosus, Poa annua, Dactylis glomerata, Plantago lanceolata, Trifolium repens, Lolium perenne and Jacobaea vulgaris.* 5899_R1
GS1	n/a	*Anthoxanthum odoratum, Plantago lanceolata, Cynosurus cristatus, Phleum pratense, Poa trivialis, Dactylis glomerata, Festuca rubra agg., Trifolium repens, Cerastium fontanum, Hypochaeris radicata, Prunella vulgaris, Centaurea nigra, Lotus corniculatus, Ranunculus acris, Odontites vernus, Agrostis capillaris* and *Leucanthemum vulgare.* 1106_R1
GS2/WS1	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*
GS3	n/a	*Agrostis capillaris*, *Anthoxanthum odoratum*, *Dactylis glomerata*, *Holcus lanatus*, *Prunella vulgaris*, *Plantago lanceolata*, *Rumex acetosa*, *Trifolium pratense*, *T. Repens*, *Hypochaeris radicata*, *Centaurea nigra*, *Festuca rubra/ovina* and *Rhytidiadelphus squarrosus*. Other species if near dry heath include *Succisa pratensis*, *Galium saxatile*, *Potentilla erecta* and *Pleurozium schreberi*. 1065_R2 and 2437_R2

GS3a	n/a (UG2a)	*Nardus stricta*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Cynosurus cristatus*, *Juncus effusus*, *J. articulatus*, *Festuca rubra/ovina*, *Galium saxatile*, *Trifolium repens*, *Rumex acetosa*, *Pedicularis sylvatica*, *Plantago lanceolata*, *Potentilla erecta*, *Prunella vulgaris*, *Rhytidiadelphus squarrosus*, *Hylocomium splendens* and *Pleurozium schreberi*. EC18 R6
EC18 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS4	n/a	*Arrhenatherum elatius*, *Molinia caerulea*, *Juncus effusus*, *Filipendula ulmaria*, *Lythrum salicaria*, *Juncus articulatus*, *Mentha aquatica*, *Potentilla erecta*, *Galium palustre*, *Rubus fruticosus* agg., *Cirsium palustre*, *Salix cinerea* and *Betula pubescens.* 1106_R2, 2554_R1, 2437_R1, 2438_R1 and 2440_R1
GS4	6410 (GL1c)	Localised areas of *Molinia* dominated grasslands on peaty ground and often associated with wet grassland or near heath. *Molinia caerulea*, *Agrostis stolonifera*, *Holcus lanatus*, *Anthoxanthum odoratum*, *Agrostis capillaris*, *Danthonia decumbens*, *Nardus stricta*, *Juncus articulatus*, *Succisa pratensis*, *Luzula multiflora*, *Potentilla erecta*, *Carex panacea*, *Carex echinata*, *Dactylorhiza* sp., *Filipendula ulmaria*, *Mentha aquatic*, *Pleurozium schreberi*, *Rhytidiadelphus squarrosus*, *Sphagnum* sp., *Hylocomium splendens* and *Calliergonella cuspidata.* EC18 R2 and EC18 R5
HH1/ HH3/ WS1/ PF1/ PF2/ ER1	4030/ 4010/ 7230/ 8220	*Calluna vulgaris, Erica cinerea, Potentila erecta, Ulex galli, Veronica officinalis* *Carex panicea, Comarum palustre,Erica cinerea, Juncus acutiflorus, Molinia caerulea, Narthecium ossifragum, Osmunda regalis, Potentilla erecta, Succisa pratensis* Possible increase in scrub area (Ulex europeaus)
HH3/GS1	4010	Small patch of Ulex europeaus. Main species include: *Carex panicea, Comarum palustre, Erica cinerea, Juncus acutiflorus, Molinia caerulea, Narthecium ossifragum, Osmunda regalis, Potentilla erecta, Succisa pratensis*
GS4/WS1	n/a	Grassland species as above. Other species include *Chamaenerion angustifolium, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europaeus.*
GM1	n/a	*Glyceria fluitans*, *Agrostis stolonifera*, *Equisetum fluviatile*, *Holcus lanatus*, *Filipendula ulmaria*, *Mentha aquatic*, *Apium nodiflorum*, *Lythrum salicaria* and *Iris pseudacorus.* No bryophytes.
GM1	n/a	Marsh vegetation dominated by *Epilobium hirsutum, Iris pseudacorus, Mentha aquactica* and *Filipendula ulmaria.*
HD1	n/a	*Pteridium aquilinum* 1091_R1 and 2566_R1

HD1/WS1	n/a	Dense bracken and scrub species as described in this table. 1131_R1
HH1	4030 (DH1)	*Ulex gallii*, *Calluna vulgaris*, *Erica cinerea*, *Daboecia cantabrica*, *Succisa pratensis*, *Arctostaphylos uva-ursi*, *Agrostis capillaris*, *Hylocomium splendens*, *Solidago virgaurea*, *Potentilla erecta*, *Molinia caerulea* and *Succisa pratensis.* EC18 R3, EC18 R7, 1098_R1, 2433_R1, 2435_R1, 2432_R1, 2431_R1 and 1065_R1
EC18 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
HH1/WS1	n/a	Dry heath and scrub species as described in this table. 2434_R1 and 2436_R1
HH3	4010 (WH3)	*Calluna vulgaris*, *Molinia caerulea*, *Erica tetralix*, *Narthecium ossifragum*, *Juncus articulates*, *Potentilla erecta*, *Succisa pratensis*, *Dactylorhiza* sp., *Carex echinata*, *C. panacea*, *Rhytidiadelphus squarrosus*, *Aulacomnium palustre*, *Hylocomium splendens*, *Sphagnum papillosum*, *Sphagnum capillifolium*, *Thuidium tamariscinum* and *Cladonia portentosa.* Localised areas at south with *Schoenus nigricans*, *Trichophorum germanicum*, *Eleocharis multicaulis* and *Myrica gale* EC18 R1, EC18 R4, EC18 R4, 1131_R2 and 1094_R1
HH3/GS4/ WS1	4010	HH3 as described above with *Juncus effusus* and *Rubus fruticosus agg.*
WD1/WN5	n/a	*Alnus glutinosa*, *Fraxinus excelsior*, *Betula pubescens*, *Prunus spinosa*, *Rubus fruticosus* agg., *Hedera helix*, *Ranunculus repens*, *Veronica chamaedrys*, *Phyllitis scolopendrium*, *Solidago virgaurea*, *Plagiomnium undulatum*, *Lophocolea bidentata, Fagus sylvatica*, *Quercus robur, Sanicula* sp., *Brachypodium sylvaticum*, *Geum urbanum*, *Circaea lutetiana* and *Rhododendron ponticum*.
WS1	n/a	*Prunus spinosa*, *Ulex europaeus*, *Crataegus monogyna*, *Acer pseudoplatanus*, *Sorbus aucuparia*, *Rubus fruticosus* agg. and *Pteridium aquilinum. Salix cinerea* in hollows. 2442_R1, 2440_R2, 1094_R3 and 1094_R2
WS1/GS4	n/a	*Ulex* and *Rubus* scrub have spread substantially. *Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria*, *Larix decidua, Urtica dioica, Crataegus monogyna, Calystegia sepium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis* and *Buddleja davidii* present.
WS1/GS4/ HD1	n/a	WS1 as described above. *Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pendunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia, Blechnum spicant, Lonicera periclymenum,*

		Myrica gale, Pteridium aquilinum, Teucrium scorodonia, Ulex gallii.
WS1/GS2/ BL3	n/a	Old scrubbed up farmstead. Scrub and Dry meadow/Grassy verges species list as described in table.
WS1/GS3	n/a	*Prunus spinosa* (F-A), *Crataegus monogyna*, *Rubus fruticosus* agg. and *Pteridium aquilinum*. Grassland species as described above under GS3.

EC18 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WS1/GS4/ HH3	4010	Scrub, grassland and heathland species as described above. 2424_R1
WS1/FS1	n/a	An area of *Phragmites* swamp present. *Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Calystegia sepium, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii.*

Cappagh (Ch. 3+900 – Ch. 4+650) – Habitats between EC18 and EC20

Cappagh - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL1	n/a	Few epiphytes for the most part. Significant bryophyte communities in some places but few higher plant species. *Brachythecium rutabulum*, *Cladonia* spp., *Dicranum scoparium*, *Frullania dilatata*, *Hedera helix*, *Homalothecium*, *Hypnum cupressiforme*, *Isothecium myosuroides*, *Mnium hornum* and *Racomitrium aciculare*
FW2/WS1		Deep stream lined by *Crataegus monogyna* and *Salix* scrub.
GA1	n/a	*Agrostis stolonifera*, *Cirsium arvense*, *Cynosurus cristatus*, *Holcus lanatus*, *Lolium perenne*, *Plantago major*, *Ranunculus repens*, *Rumex crispus*, *Rumex obtusifolius*, *Taraxacum officinale* agg., *Trifolium repens* and *Urtica dioica* 2525_R1
GA1/WS1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*
GA2	n/a	Amenity grassland associated with Residential area.

GS1	n/a	*Anthoxanthum odoratum, Plantago lanceolata, Cynosurus cristatus, Phleum pratense, Poa trivialis, Dactylis glomerata, Festuca rubra agg Trifolium repens, Cerastium fontanum, Ranunculus acris, Hypochaeris radicata, Prunella vulgaris, Centaurea nigra, Lotus corniculatus, Agrostis capillaris* and *Leucanthemum vulgare.* 2513_R2, 2527_R2 and 2542_R1
GS2	n/a	*Arrhenatherum elatius*, *Cirsium arvense, Calystegia sepium, Dactylis glomerata*, *Festuca rubra*, *Holcus lanatus*, *Ranunculus repens* and *Rumex crispus. Alnus glutinosa* occasionally present.
GS2/WS1	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*

Cappagh - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS4	n/a	*Agrostis stolonifera*, *Epilobium hirsutum*, *Filipendula ulmaria*, *Holcus lanatus*, *Juncus effusus*, Juncus acutiflorus, *Lythrum salicaria*, *Persicaria hydropiper, Potentilla anserina* and *Ranunculus acris.* 2511_R1, 2513_R1, 2527_R1, 2533_R1 and 2554_R1
GS4/WS1	n/a	*Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pendunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia.* WS1 as below.
PF2	n/a	*Calliergonella cuspidata*, *Carex echinata*, *Carex panicea*, *Hypericum elodes*, *Juncus articulatus*, *Juncus bulbosus*, *Ranunculus flammula* and *Sphagnum palustre*
WL1	n/a	*Crataegus monogyna*, *Hedera helix*, *Prunus spinosa*, *Rubus fruticosus* agg. and *Urtica dioica*
WL2	n/a	Varying species compositions across the site. *Pinus* sp. and *Alnus cordata* are dominant in some treelines but the majority are composed of *Fraxinus excelsior*, *Alnus glutinosa* and *Acer pseudoplatanus*

WN2	n/a	Canopy species include *Fraxinus excelsior, Corylus avellana* and *Acer pseudoplatanus, scrub species include Crataegus monogyna, Prunus spinosa and Rubus fruticosus agg. Ground layer species include Pteridium aquilinum, Hedera helix, Brachypodium sylvaticum, Geranium robertianum, Eurhynchium striatum, Thamnobryum alopecurum, Hypnum species.* 1208_R1
GS2/HD1	n/a	Some bracken encroachment along road *Alnus glutinosa, Cirsium arvense, Calystegia sepium, Salix sp.* *Pteridium aquilinum, Ulex galli*
WS1	n/a	*Crataegus monogyna*, *Prunus spinosa*, *Larix decidua, Urtica dioica, Salix sp., Calystegia sepium, Epilobium hirsutum, Epilobium angustifolium, Phragmites australis, Rubus fruticosus* agg. and *Ulex europaeus* (D)
WS1/GA2	n/a	Species as described above. *Fraxinus excelsior, Acer pseudoplantus, Tilia cordata, Alnus glutinosa* also present,
WS3	n/a	*Chamaecyparis lawsoniana*, *Cotoneaster* sp., *Fagus sylvatica purpurea, Petasites pyrenaicus.*

EC20

EC20 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL3	n/a	No.3 polygons previously labelled as Heathland (HH1/HH3) in 2018, now a residential area.
BL3/GA2	n/a	Residential area.
ED3	n/a	*Jacobaea vulgaris*, *Tussilago farfara*, *Bellis perennis*, *Ulex europaeus*, *Holcus lanatus*, *Taraxacum officinale*, *Centaurea nigra* and *Rumex obtusifolius*. *Buddelja davidii, Epilobium hirsutum, Carex nigra, Arrhenatherum elatius, Cirsium spp., Rumex spp., Salix cinerea* 5888_R1
ED3/GS4	n/a	Areas of wet grassland developing on disturbed ground. *Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*
ED3/WS1	n/a	Areas recently disturbed with scrub development taking place. *Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Calystegia sepium, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii.*
ED3/GS2/WS1	n/a	Previously disturbed area increasingly colonized by grassland and scrub, whose species assemblages are described in table.

ED3/GS4/WS1	n/a	Formerly disturbed area now revegetating with *Juncus effusus* wet grassland and *Ulex europaeus* scrub. Grassland species include *Juncus effusus, Lythrum salicaria, Iris pseudacorus* and *Filipendula ulmaria.*
ED3/WS1/GS4	n/a	Recolonising bare ground and wet grassland species as described in table with *Ulex spp.* spreading.
ED3/WS1/BL3	n/a	Recolonising bare ground and wet grassland species as described in table with *Ulex spp.* spreading.
ER1	n/a	Although the rock outcrops are generally devoid of vegetation some occasional clumps of *Calluna vulgaris* and *Blechnum spicant* were recorded growing in narrow fissures. 5890_R2
HD1	n/a	*Pteridium aquilinum* overwhelmingly dominant. Few other species apart from *Rubus fruticosus* agg. *Chamerion angustifolium* very common in places. 1194_R1, 1188_R3 and 5890_R1
HD1/HH1/HH3	4030/4010	25% heath habitat mosaic. Species include *Pteridium aquilinum, Salix sp., Ulex gallli*. Heath species as described below.
EC20 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
HD1/WD1/GS2	n/a	*Salix sp., Pteridium aquilinum, Ulex gallii, Fraxinus excelsior, Acer pseudoplatanus, Alnus glutinosa, Crataegus monogyna, Cirsium arvense, Calystegia sepium.*
HD1/WS1	n/a	*Pteridium aquilinum, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii, Ulex galii.*
HD1/WS1/ED3	n/a	Recently disturbed, scrub is revegetating. Species list for dense bracken and scrub is described in this table.
HH1	4030 (DH1 & DH3)	*Ulex gallii*, *Calluna vulgaris*, *Erica cinerea, Molinia caerulea*, *Potentilla erecta*, *Carex binervis*, *Carex panicea*, *Hypnum jutlandicum* and *Daboecia cantabrica*. 5890_R3, 5073_R1, 1187_R2, 1203_R1 and 1198_R1
HH1/WS1/ER1	4030	Nearly all HH1 scrub burnt back Exposed siliceous rock species include *Danthonia decumbens, Erica cinerea, Erica tetralix, Hypochaeris radicata, Rumex acetosella, Sedum anglicum, Veronica officinalis* Scrub species include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus*

HH3	4010 (WH4a)	Confined to shallow peat. Typical/dominant species are *Molinia caerulea, Trichophorum germanicum*, *Calluna vulgaris*, *Erica tetralix*, *Sphagnum capillifolium*, *Narthecium ossifragum* and *Racomitrium lanuginosum*. EC20 R1, EC20 R4, EC20 R5, 1188_R1, 1199_R1, 5884_R1 and 5890_R6
HH3/ED3	4010	Areas of disturbed ground along eastern margins of polygon. HH3 species as described above. *Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*
HH1/WS1	4030	Some scrub encroachment apparent. *Ulex gallii, Larix spp, Ulex europaeus, Rubus fruticosus, Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Calystegia sepium, Epilobium angustifolium, Phragamites australis, Buddeia*
HH1/HH3/WS1	4030/40 10	Heath species as described above. Scrub species include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus.*
EC20 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
HH1/WS1/HD1/ ER1/HH3	4030/4010	Heath species as described above. 70% HH1/HH3; Scrub perhaps more frequent than previously.
FS1	n/a	A small lake completely infilled with dense *Phragmites australis* reed swamp. *Phragmites* cover is generally >75%. Other flora includes *Equisetum fluviatile*, *Cammarum palustre*, *Galium palustre* and *Calystegia sepium.*
FW1	n/a	Very little associated submerged vegetation occurs apart from some sparse *Juncus bulbosus*, *Callitriche stagnalis* and *Glyceria fluitans*.
GA1	n/a	*Dactylis glomerata, Holcus lanatus, Plantago lanceolata, Trifolium pratense, Centaurea nigra, Lolium perenne, Agrostis stolonifera, Ranunculus repens, Alopecurus pratensis* 2984_R1
GA1/WS1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*
GA2/ED3/ED2	n/a	GAA pitch. Typical improved amenity grassland species present. Some patches of bare ground present.

GS1	n/a	*Anthoxanthum odoratum, Holcus lanatus, Plantago lanceolata, Cynosurus cristatus, Carex flacca, Alopecurus pratensis, Hypnum species, Agrostis canina, Rhytidiadelphus species, Dactylis glomerata, Trifolium pratense, Trifolium repens, Cerastium fontanum, Pteridium aquilinum, Agrostis stolonifera, Ranunculus repens, Alopecurus pratensis* 2451_R1, 2450_R1 and 1182_R1
GS1/HD1	n/a	*Pteridium aquilinum* locally dominant in GS1 habitat (See above for typical grassland species). Other species include *Jacobaea vulgaris, Buddleja davidii, Salix sp., Ulex gallii.*
GS2	n/a	*Holcus lanatus*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Centaurea nigra*, *Trifolium repens*, *Cynosurus cristatus* and *Dactylis glomerata*. 5888_R2
GS2/HD1	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Blechnum spicant, Lonicera periclymenum, Myrica gale, Pteridium aquilinum, Teucrium scorodonia, Ulex gallii*

EC20 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS2/WS1	n/a	Disturbed grassland with high cover of *Cirsium arvense*, *Calystegia sepium.*
GS3	n/a	In place vegetation grades in GS2 dry meadow. Typical species are *Agrostis capillaris, Anthoxanthum odoratum*, *Potentilla erecta*, *Succisa pratensis*, *Galium saxatile*, *Lotus corniculatus*, *Plantago lanceolata* and *Rhytidiadelphus squarrosus.*
GS4	n/a	Species-poor *Juncus effusus* dominated grasslands. Typical species are *Juncus effusus*, *Juncus acutiflorus, Holcus lanatus*, *Anthoxanthum odoratum*, *Cirsium palustre*, *Agrostis stolonifera*, *Filipendula ulmaria*, *Iris pseudacorus, Lythrum salicaria, Ranunculus repens*, *Ranunculus flammula*, *Trifolium repens*, *Galium palustre* and the wetland moss *Calliergonella cuspidata*. 1176_R1, 1187_R1, 1200_R1, 2448_R1, 2447_R1 and 2447_R2
	6410	*Molinia caerulea* dominated wet grassland type the dominant species generally however in some areas a more open, species-rich wetland vegetation occurs. Associated species include *Juncus acutiflorus*, *Agrostis stolonifera*, *Lythrum salicaria*, *Potentilla erecta* and *Succisa pratensis.* EC20 R3
GS4/GS1	n/a	*Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Jacobaea vulgaris, Buddleja davidii, Pteridium aquilinum.*
GS4/HD1	n/a	Scrub appears to have cleared giving bracken and wet grassland mosaic. Grassland species as described above,

		including *Iris pseudacorus.* Dense bracken as described above, including *Ulex gallii*
PB3	7130* (Active blanket bog) (BB2 and BB3)	*Schoenus nigricans*, *Molinia caerulea, Erica tetralix, Calluna vulgaris*, *Narthecium ossifragum*, *Rhynchospora alba*, *Eriophorum vaginatum*, *Eriophorum angustifolium* and *Trichophorum germanicum*, *Sphagnum papillosum*, *Sphagnum capillifolium*, *Sphagnum cuspidatum* and *Racomitrium lanuginosum.* EC20 R2
PF3	7140 (PFLU5)	*Schoenus nigricans, Sphagnum papillosum, Molinia caerulea*, *Rhynchospora alba*, *Menyanthes trifoliate*, *Carex limosa*, *Carex rostrata*, *Eleocharis multicaulis*, *Potamogeton polygonifolius* and *Aulacomnium palustris.*
WD1	n/a	*Fraxinus excelsior*, *Fagus sylvatica*, *Acer pseudoplatanus* and *Ilex aquifolium* are the main tree species.
WN2	n/a	*Fraxinus excelsior, Hedera helix, Geranium robertianum, Holcus lanatus, Prunella vulgaris, Rhytidiadelphus squarrosus, Dryopteris filix-mas, Pteridium aquilinum, Agrostis stolonifera, Acer pseudoplatanus, Rubus fruticosus agg., Hypnum jutlandicum* 1208_R1
WS1	n/a	*Ulex europaeus* is the dominant species with *Rubus fruticosus*, *Pteridium aquilinum* and *Molinia caerulea* along the margins of scrub. There is also an area of scrub vegetation dominated

EC20 - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
		by *Salix cinerea*. 2446_R1, 1201_R1, 5072_R1, 5890_R4, 5890_R5, 1199_R2, 5890_R7, and 1203_R2
WS1/ED3	n/a	Disturbed area of scrub, quickly recolonizing. *Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica, Larix decidua, Ulex europaeus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Calystegia sepium, Chamaenerion angustifolium, Phragmites australis* and *Buddleja davidii.*
WS1/GS1	n/a	WS1 dominant (described above), 20% GS1; *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense.*
WS1/HD1/GS2	n/a	60% WS1, 30% HD1, 10% GS2. Mostly *Ulex europeaus.* Species as described in table above.
WS1/HD1/GS4	n/a	*Pteridium aquilinum, Ulex europaeus* and *Rubus fruticosus agg.* GS4 species as above.
WS1/HH1/HH3	4030/4010	*Ulex europeaus* is dominant with small patches of HH1 and HH3 (species as above). Other species present include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia.*

Ballymoneen Road (Ballymoneen Road Junction, Ch. 5+550 – Ch. 5+700) – Habitats between EC20 and EC21

Ballymoneen Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED2	n/a	Spoil and bare ground. Foundations of new buildings laid.
ED3	n/a	*Poa trivialis, Trifolium repens, Cerastium fontanum, Lolium perenne, Potentilla anserina, Ranunculus repens, Rumex crispus, Plantago major, Jacobaea vulgaris, Cirsium arvense, Cirsium vulgare, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica, Matricaria discoidea, Poa annua, Taraxacum sp., Stellaria media, Jacobaea vulgaris, Sisymbrium officinale* 2476_R1
ED3/ED2/ GS2	n/a	Area disturbed by residential construction. *Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica, Alnus glutinosa, Cirisum arvense, Calystegia sepium.*
Ballymoneen Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GA1	n/a	*Agrostis stolonifera*, *Cirsium arvense*, *Jacobaea vulgaris, Arrhenatherum elatius, Dactylis glomerata, Holcus lanatus, Lolium perenne*, *Plantago major*, *Ranunculus repens*, *Rumex obtusifolius*, *Trifolium repens* and *Urtica dioica* 2458_R2 and 2458_R3
GS1	n/a	*Holcus lanatus, Plantago lanceolata, Trifolium repens, Cerastium fontanum, Cynosurus cristatus, Crepis capillaris, Agrostis canina, Jacobaea vulgaris, Buddelja davidii, Pteridium spp.* 2450_R2
GS1/WS1/ HD1	n/a	No grazing in the vicinity. Grassland, scrub and dense bracken species list as described in table.
GS2	n/a	*Arrhenatherum elatius*, *Dactylis glomerata*, *Festuca rubra*, *Prunella vulgaris* and *Succisa pratensis. Alnus glutinosa,a Cirsium arvense* and *Calystegia sepium* occasionally present.
GS4	n/a	*Agrostis stolonifera*, *Holcus lanatus*, *Juncus effusus*, *Lythrum salicaria* and *Ranunculus acris*
HD1	n/a	*Pteridium aquilium, Ulex gallii, Salix spp. Chamerion angustifolium* very common in places.
WD1/GS2	n/a	Area dominated by tall woodland. *Acer pseudoplatanus* is the main species with some *Fraxinus excelsior* and *Crataegus monogyna. Alnus glutinosa, Cirsium arvense* and *Calystegia sepium.*
WD2	n/a	*Fraxinus excelsior, Pinus sp., Crataegus monogyna, Prunus spinosa, Salix caprea, Picea sp.*

WL1	n/a	*Crataegus monogyna*, *Hedera helix*, *Prunus spinosa*, *Pteridium aquilinum*, *Rubus fruticosus* agg. and *Urtica dioica*
WL2	n/a	*Cupressus* sp., *Fraxinus excelsior*, *Picea sitchensis* and *Pinus* sp.
WL2/WS1	n/a	*Betula sp., Salix cinerea, Acer pseudoplatanus, Corylus avellana, Calystegia sepium, Rubus fruticosus agg., Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Prunus spinosa, Crataegus monogyna, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg., Larix decidua, Ulex europeaus, Urtica dioica, Chamaenerion angustifolium, Phragmites australis, Pinus contorta*
WS1	n/a	*Crataegus monogyna*, *Prunus spinosa* and *Ulex europaeus* 2458_R1
WS1/HD1	n/a	Scrub dominant. Species include *Larix decidua, Ulex europeaus, Rubus fruticosus, Urtica dioica, Salix sp., Crataegus monogyna, Calstegia sp., Epilobium hirsutum, Chamnaenerion angustifolium, Phragmites australis, Buddleja davidii, Pteridium aquilinum.*

EC21

EC21 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ER1	n/a	Although the rock outcrops are generally devoid of some occasional plants of *Sedum anglicum*, *Calluna vulgaris* and *Aira praecox* were recorded growing in small rock cracks. 1300_R1
ED2	n/a	*Rubus fruticosus agg., Holcus lanatus, Cerastium fontanum, Rumex acetosa, Cirsium arvense, Agrostis capillaris, Sagina procumbens* 1303_R2
ED3	n/a	Mineral soil dominates these areas with a sparse, weedy, recolonizing flora which includes *Jacobaea vulgaris*, *Holcus lanatus*, *Ulex europaeus*, *Cirsium arvense*, *Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Lolium perenne, Urtica dioica, Plantago major*, *Centaurea nigra*, *Rumex crispus* and *Leucanthemum vulgare*. 2970_R1
ED3/ED2	n/a	Areas used to store topsoil and materials for adjacent building work. *Urtica dioica* and *Galium aparine* very common. *Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirisum arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*
ED3/GS2	n/a	Weedy vegetation with high disturbance. High cover of *Urtica dioica* and *Epilobium hirsutum.*
FW4	n/a	*Juncus effusus, Glyceria fluitans, Apium nodiflorum, Callitriche obtusangula* 2971_R1

HD1	n/a	*Pteridium aquilinum* is overwhelmingly dominant and there are few associated species apart from *Rubus fruticosus* and *Arrhenatherum elatius*.
HH1	4030 (DH1 & DH3)	*Ulex gallii*, *Calluna vulgaris* and *Erica cinerea, Potentilla erecta*, *Carex binervis*, *Agrostis canina*, *Hypnum jutlandicum*, *Scleropodium purum*, *Nardus stricta* and *Daboecia cantabrica*. EC21 R1
HH3	4010 (WH4a)	Areas of wet heath occur on shallow peat. Typical species are *Trichophorum germanicum*, *Calluna vulgaris*, *Erica tetralix, Molinia caerulea, Sphagnum capillifolium*, *Narthecium ossifragum*, *Eriophorum angustifolium*, *Potentilla erecta*, *Succisa pratensis* and *Racomitrium lanuginosum*. EC21 R2 and EC21 R3
GA1	n/a	The dominant plant species tend to be the agricultural grasses *Lolium perenne* and *Holcus lanatus*, *Jacobaea vulgaris*, *Cirsium arvense*, *Cynosurus cristatus*, *Urtica dioica, Trifolium repens* and *Taraxacum officinale*. Other grass species such as *Dactylis glomerata* and *Arrhenatherum elatius* are also present. 1300_R2, 1299_R1, 1301_R1, 2480_R1 and 4926_R1

EC21 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GA1/GS4/ GS2	n/a	Grassland rank and ungrazed. Dominated by *Holcus lanatus* and *Arrhenatherum elatius*. Other species include *Jacobaea vulgaris, Urtica dioica, Cirsium arvense, Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Alnus glutinosa, Cirsium arvense, Calystegia sepium.*
GA2	n/a	*Plantago lanceolata, Festuca rubra, Brachythecium rutabulum, Arrhenatherum elatius, Lolium perenneJacobaea vulgaris, Agrostis capillaris, Taraxacum sp.* 1302_R1
GS2	n/a	*Arrhenatherum elatius* tends to dominate the grassy vegetation with *Centaurea nigra*, *Dactylis glomerata*, *Holcus lanatus*, *Trifolium repens* and *Anthoxanthum odoratum*. *Alnus glutinosa, Cirsium arvense* and *Calystegia sepium* also occasionally present.
GS2/GS4	n/a	GS2 species as above. *Juncus effusus, Lythrum salicaria, Iris pseudacorus* and *Filipendula ulmaria* also present.
GS3	n/a	Generally species-poor. *Agrostis capillaris, Potentilla erecta*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Cynosurus cristatus* and *Rhytidiadelphus squarrosus*.
GS4	n/a	*Juncus effusus* species-poor grassland. Typical species are *Juncus effusus, Juncus acutiflorus, Holcus lanatus*, *Cirsium palustre*, *Ranunculus repens*, *Ranunculus flammula*, *Galium palustre*, *Lythrum salicaria*, *Potentilla erecta* and the wetland moss *Calliergonella cuspidata*. 1299_R2, 1303_R3, 2972_R1, 2969_R1 and 2972_R2
GS4/HH1	4010	GS4 dominant. *Juncus effusus, Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria* and *Ulex gallii.*

WS1	n/a	*Ulex europaeus* is the dominant species with *Rubus fruticosus*, *Pteridium aquilinum* and *Molinia caerulea* along the margins. *Larix decidua, Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Calystegia sepium, Chamaenerion angustifolium, Phragmites australis* and *Buddleja davidii.* 1303_R1 and 1304_R1,
WS1/GS2	n/a	*Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii, Alnus glutinosa, Cirsium arvense.*
WS1/HD1/ ED3	n/a	*Salix sp., Pteridium aquilinum, Ulex gallii, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sepium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii, Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*

EC21 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WS1/GA1/ GS4/ER1	n/a	Area very rank and ungrazed. *Jacobaea vulgaris, Urtica dioica, Cirsium arvense, Arrhenatherum elatius, Dactylis glomerata, Holcus lanatus,Juncus effusus, Lythrum salicaria, iris pseudacorus, Filipendula ulmaria, Larix decidua,Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sepium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii.*

Keeraun Bóithrín to Knocknafroska and the N59 Link Road (Ch. 5+850 – Ch. 7+550 and the N59 Link Road Site) – Habitats between EC21, EC23, EC25 and EC63, and between EC25 and EC29 along the N59 Link Road

Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BC4	n/a	*Hedera helix, Ilex aquifolium, Prunus laurocerasus, Epilobium sp., Acer sp., Buddleja sp., Campylopus sp.* 5446_R1
BL1	n/a	*Asplenium trichomanes*, *Dactylis glomerata*, *Festuca rubra*, *Hedera helix* and *Rubus fruticosus* agg.
BL1/WS1	n/a	*Rubus fruticosus agg.* linear feature occurring between two dry stone walls.
BL3	n/a	*Acer spp., Alnus glutinosa, Prunus laurocerasus,*
BL3/WL2	n/a	*Fraxinus excelsior* copse around a ruined stone cottage.
BL3/ED2/ ED3	n/a	Mix of completed houses and disturbed ground under construction, previously scrub-wet grassland areas in 2018. Species list for spoil and recolonizing bare ground as described in this table.

BL3/WL2	n/a	Lane towards cemetery lined by *Taxus spp.*
ED2	n/a	Beginning to recolonise but vegetation cover is considered less than 50%. Species present include early colonisers – *Buddelja spp, Epilobium* spp., *Reynoutria japonica*, *Fraxinus excelsior*, *Matricaria discoidea*, *Plantago major*, *Rubus fruticosus agg., Salix cinerea, Jacobaea vulgaris*, *Taraxacum officinale* agg. and *Tussilago farfara* 4753_R1
ED2/ED3	n/a	Spoil and bare ground and recolonising bare ground species as described in this table. 2962_R1 and 2965_R3
ED3	n/a	*Arrhenatherum elatius*, *Bellis perennis*, *Buddelja davidii, Carex nigra, Centaurea nigra*, *Dactylis glomerata*, *Hypochaeris radicata, Leucanthemum vulgare*, *Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Epilobium hirsutum, Cirsium arvense, Lolium perenne, Urtica dioica*, *Plantago lanceolata*, Persicaria maculosa, Polygonum aviculare, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex* spp., *Jacobaea vulgaris*, *Tussilago farfara* and *Ulex europaeus* 2900_R1, 2950_R1 and 2951_R1

Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
ED3/GS1	n/a	Recolonising bare ground and grassland species as described in this table. 2965_R2
ED3/WS1	n/a	Recolonising bare ground as described in this table. Area now dominated by weedy grassland vegetation, such as *Cirsium arvense* and *Rubus* scrub.
ED3/WS1/ ED2	n/a	Weedy recolonizing grassland area used for feeding livestock in recent past at the time of survey. Species as described above in this table.
FW4	n/a	*Angelica sylvestris*, *Potamogeton polygonifolius*, *Ranunculus flammula* and *Ranunculus repens*
GA1	n/a	*Agrostis stolonifera*, *Buddelja davidii, Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense*, *Dactylis glomerata*, *Holcus lanatus*., *Jacobaea vulgaris, Lolium perenne*, *Persicaria maculosa*, *Plantago lanceolata*, *Plantago major, Poa annua*, *Polygonum aviculare*, *Ranunculus acris, Ranunculus repens*, *Rumex obtusifolius*, *Stellaria media, Trifolium repens* and *Urtica dioica.* Some areas also contain *Calystegia sepium, Buddelja spp., Cynosurus cristatus Some areas containing localized rush spp,* 4715_R1, 2933_R1, 2931_R1, 2898_R1, 2855_R1, 2821_R1, 2821_R2, 2818_R1, 2762_R2, 2757_R1, 4753_R2, 2832_R2 and 2764_R2
GA1/GS1	n/a	Species as described in this table.

GA1/GS2	n/a	GA1 species as described above. *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium* also present.
GA1/ED2	n/a	Half of field turned into horse gallops with sand. Grassland species as described above.
GA1/GS1/ WS1	n/a	Mix of weedy semi-improved grassland habitats, species lists for both as described in this table. Margins of field lined by scrubs species *Ulex europaeaus, Rubus fruticosus agg.*
GA1/ED2/ ED3	n/a	Disturbance along road to the north. Grassland species as listed in this table.
GA1/GS2	n/a	Rough improved grassland, not intensively managed. Grassland species as listed in this table.
GA1/ED3	n/a	Grassland species and recolonizing bare ground as listed in this table.
Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GA1/GS1/ WS1	n/a	Grassland areas weedy with high cover of *Jacobaea vulgaris, Urtica dioica* and *Cirsium arvense.* Other species include *Arrhenatherum elatius, Dactylis glomerata, Holcus lanatus, Buddleja davidii, Pteridium aquilinum, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Salix sp., Crataegus monogyna, Calystegia sp., Chamaenerion angustifolium, Phragmites australis.*
GA1/GS4	n/a	*Agrostis stolonifera*, *Cirsium* sp., *Cynosurus cristatus*, *Dactylis glomerata*, *Juncus effusus*, *Lolium perenne*, *Plantago lanceolata*, *Prunella vulgaris*, *Ranunculus repens*, *Rumex obtusifolius*, *Jacobaea vulgaris*, *Trifolium pratense* and *Urtica dioica*
GA1/GS4/ GS3	n/a	50% GA1, 35% GS4, 15% GS3. Species as described above.
GA1/GS4/ ED2	n/a	Ongoing improvements and drainage Species list for GA1/GS4 as listed above.
GA1/WL1	n/a	GA1 as above. *Corylus avellana, Crataegus monogyna, Hedera helix, Prunus spinosa, Rubus fruticosus agg.* also present.
GA1/WL2	n/a	GA1 as above. *Acer pseudoplatanus, Acer sp., Cupressus x leylandii, Fraxinus excelsior* and *Polpulus tremula* also present.

GA1/WS1	n/a	GA1 as above, with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus Jacobaea vulgaris, Urtica dioica, Arrhenatherum elatius,. Dactylis glomerata, Holcus lanatus, Larix decidua, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii.*
GA1/WS1/ ED2	n/a	Area recently disturbed, infill material deposited on site. *Buddleja davidii, Crataegus monogyna, Fraxinus excelsior, Poa trivalis, Rumex obtusifolia, Urtica dioica, Heracleum sphondylium, Dactylis glomerata, Arrhenatherum elatius, Potentilla anserina, Lolium perenne, Jacobaea vulgaris, Cynosurus cristatus, Calystegia sepium, Rubus fruticosus agg., Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpueum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*
GA1/WS1/ GS4	n/a	50% GA1, 30% WS1, 20% GS4. Species as described in this table.
GA2	n/a	*Arrhenatherum elatius*, *Bellis perennis*, *Dactylis glomerata*, *Lolium perenne*, *Plantago lanceolata*, *Ranunculus repens* and *Trifolium repens.* Tall planted trees, *Aesculus hippocastanum, Betula sp., Acer sp., Fagus sylvatica, Crataegus monogyna, Populus sp., Tilia sp., Salix cinerea, Fraxinus excelsior.* 5318_R1

Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GA2/BC4	n/a	Ornamental planting with low shrubs
GA2/BL3/ GS2	n/a	Grassland/built environment mosaic in Cemetery. Common grassland species, such as *Holcus lanatus, Ranunculus repens, Rumex obtusifolius, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Ulex europeaus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Salix sp.* and *Buddleja davidii.*
GS1	n/a	*Achillea millefolium*, *Agrostis capillaris*, *Agrostis stolonifera*, *Anthoxanthum odoratum*, *Centaurea nigra*, *Cynosurus cristatus*, *Holcus lanatus*, *Lotus corniculatus*, *Prunella vulgaris*, *Trifolium pratense*, *Trifolium repens, Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Conopodium majus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum carthicum, Pilosella aurantiaca* and *Polygala vulgaris.* Weedy areas of GS1 also contain *Buddleja davidii* and *Jacobaea vulgaris. Arrhenatherum elatius, Cirsium repens, Dactylis glomerata, Pteridium aquilinum, Rubus fruticosus, Ranunculus repens, Rumex obtusifolius,* 5500_R1, 5496_R1, 2965_R1, 2944_R1, 2925_R1, 2869_R3, 2869_R2, 2869_R1, 2868_R1, 2867_R2, 2866_R3, 2866_R2, 2841_R1, 2831_R2, 2808_R1, 2801_R1, 2771_R1 and 2769_R1

GS1/GA1	n/a	Grassland species as described above. 2867_R1
GS1/GS2	n/a	Grassland species as described in this table.
GS1/GS4	n/a	Grassland species as described in this table.
GS1/ED3		Weedy with a high cover of *Rumex* spp. Surface water seen on day of survey. Species include *Jacobaea vulgaris, Buddleja davidii, Pteridium aquilinum, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*
GS1/WD5	n/a	GS1 with *Cupressus × leylandii, Acer pseudoplatanus*
GS2	n/a	*Agrostis stolonifera*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Centaurea nigra*, *Cirsium arvense*, *Dactylis glomerata*, *Festuca rubra*, *Lolium perenne*, *Lotus corniculatus*, *Rumex acetosa*, *Rumex obtusifolius*, *Trifolium pratensis*, *Trifolium repens, Veronica chamaedrys, Achillea millefolium, Cerastium fontanum, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Urtica dioica and Vicia sepium.* 2952_R2
GS2/GS1	n/a	60-70% GS2, 30-40% GS1; Species as listed above.

Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
GS2/ED3	n/a	Beside a building site. Species include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum*
GS2/WS1	n/a	Rank grassland containing elements of scrub vegetation. Dominated by bindweed in some areas. *Rubus fruticosus agg., Ranunculus repens, Rumex obtusifolia, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum spondylium, Calystegia sepium, Rubus fruticosus, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinium, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*

GS3	n/a	*Anthoxanthum odoratum, Holcus lanatus, Hypochaeris radicata, Arrhenatherum elatius, Rhytidiadelphus squarrosus, Agrostis capillaris, Juncus acutiflorus, Ulex europaeus, Festuca species, Cerastium fontanum, Luzula multiflora* 2768_R1, 2785_R1 and 2916_R1
GS3/WS1	n/a	Undukating ground with thin soils and localized patches of gorse scrub. *Ulex europeaus, Succisa pratensis, Juncus acutiflorus, Lotus pedunculatus.*
GS4	n/a	*Agrostis stolonifera*, *Centaurea nigra*, *Cirsium palustre*, *Filipendula ulmaria*, *Galium palustre*, *Holcus lanatus*, *Iris pseudacorus, Juncus articulatus*, *Juncus effusus*, *Lotus pedunculatus*, *Lythrum salicaria*, *Plantago lanceolata*, *Potentilla anserina*, *Prunella vulgaris*, *Ranunculus acris*, *Ranunculus repens*, *Rumex obtusifolius* and *Jacobaea vulgaris.* 5501_R1, 2815_R1, 2831_R1, 2866_R4, 2915_R2, 2941_R1, 4754_R1, 2944_R2, 2907_R1, 2841_R2, 2816_R1, 2785_R2, 2769_R2 and 2762_R1
GS4/GA1	n/a	*Ulex europeaus, Sphagnum sp., Succisa pratensis, Molinia caerulea, Hypericum elodes, Potentilla erecta, Viola palustris, Buddleja davidii, Crataegus monogyna, Fraxinus excelsior, Poa trivalis, Rumex obtusifolia, Urtica dioica, Heracleum sphondylium, Dactylis glomerata, Arrhenatherum elatius, Potentilla anserina, Lolium perenne, Jacobaea vulgaris, Cynosurus cristatus.*
GS4/GS2	n/a	Species as described in this table.
GS4/HD1/ WS1	n/a	65% GS4, 20% HD1, 15% WS1. Species as described in table above.

Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
GS4/WS1	n/a	*Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pendunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia.* WS1 as described in table below.
HD1	n/a	*Rubus fruticosus agg., Kindbergia praelonga, Holcus lanatus, Pteridium aquilinum, Brachythecium sp.* 5456_R1
HD1/WS1	n/a	Dense bracken and scrub species as described in this table. 2907_R2, 2912_R1 and 2917_R1
WD1	n/a	*Acer pseudoplatanus*, *Alnus glutinosa, Aesculus pseudoplatanus*, *Fagus sylvatica*, *Fraxinus excelsior* and *Hedera helix* 2830_R1
WD1/ED2	n/a	Partial removal under housing development. Woodland species as listed in table.

WL1	n/a	Dominated by *Rubus fruticosus* agg. *Hedera helix* also common. *Crataegus monogyna* is present and has matured to form small shrubs/trees along the hedgerow. Occasional *Fraxinus excelsior*.
WL2	n/a	*Acer pseudoplatanus*, *Fraxinus excelsior, Sorbus aria agg.*[3] and *Populus* spp. 5318_R2
WS1	n/a	*Acer pseudoplatanus*, *Calystegia sepium*, *Cirsium arvense Crataegus monogyna*, *Dactylis glomerata*, *Epilobium hirsutum, Epilobium angustifolium, Fraxinus excelsior*, *Fuchsia magellanica*, *Hedera helix*, *Ilex aquifolium, Larix spp. Prunus spinosa*, *Pteridium aquilinum*, *Reynoutria japonica, Rhododendron ponticum*, *Rubus fruticosus* agg., *Salix cinerea*, *Sorbus* sp., *Ulex europaeus* (D and *Urtica dioica. Some areas also contained Lythrum salicaria, Juncus spp., Buddleja spp., Salix purpureum, Corylus avellana, Symphoricarpus alba, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp.* 2763_R1, 2837_R1, 4740_R1, 2764_R1, 2832_R1, 2915_R1, 2952_R1, 2956_R1, 4732_R1 and 4751_R1
WS1/BL1	n/a	*Asplenium ceterach, Blechnum spicant, Hedera helix agg., Polypody sp.*
WS1/ED3	n/a	*Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Salix sp., Crataegus monogyna, Calystegia speium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii.*

Keeraun Bóithrín to Knocknafroska and the N59 Link Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WS1/HD1	n/a	*Larix decidua, Ulex europeaus, Rubus fruticosus agg., Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Calystegia sepium, Epilobium angustifolium, Phragmites australis, Buddleja davidii, Pteridium aquilinum, Ulex galii.*
WS1/GS1	n/a	Scrub and grassland species as described above. 4940_R1
WS1/GS2	n/a	Scrubby and ungrazed. *Jacobaea vulgaris, Buddleja davidii, Pteridium aquilinum, Larix decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sepium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Buddleja davidii.*
WS1/GS2/ HD1	n/a	Shared area with EC23. Scrub and grassland species as described above. *Salix spp., Pteridium aquilinum, Ulex gallii*
WS1/GA1	n/a	Scrubby field edge dominated by briar. Possibly same species as described in GA1/WS1.

[3] *Sorbus* species are difficult to identify and require a number of characteristics (and potentially genetic work) to definitely confirm species present in the *Sorbus aria* aggregate group, this includes both *Sorbus aria sensu stricto* and *Sorbus hibernica*. Variability is common with both *Sorbus* species and taxonomic difficulties are still an ongoing discussion throughout Britain and Europe (Fay and Rich, 2022). Fay, M.F., Rich, T.C.G. (2022) SORBUS ARIA: Rosaceae, *Curtis's Botanical Magazine*, 39(4), 655-668.

WS1/GA2	n/a	Scrub and grassland species as described above. 4757_R1
WS3	n/a	*Calystegia sepium, Cirsium arvense, Corylus avellana, Crataegus monogyna, Hedera helix, Ilex aquifolium, Prunus spinosa, Salix cinerea subs. Oleifolia, Ulex europeaus, Acer pseudoplatanus, Symphoricarpos albus, Rubus fruticosus agg., Prunus laurocerasus, Fuchsia* species 4853_R1
WS3/GA2	n/a	Ornamental planting in green area of estate, c. 60m outside of Keeraun-Boithrin boundary

EC23

EC23 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
HD1	n/a	*Pteridium aquilinum*, *Rubus fruticosus* agg.
GM1	n/a	*Juncus effusus, Juncus acutiflorus, Agrostis stolonifera, Epilobium hirsutum*, *Typha latifolia*, *Epilobium palustre*, *Hydrocotyle vulgaris*, *Lotus pedunculatus*, *Filipendula ulmaria* and *Calliergonella* sp.
GS3	n/a	*Agrostis capillaris*, *Anthoxanthum odoratum*, *Cynosurus cristatus*, *Festuca rubra/ovina*, *Hypochaeris radicata*, *Trifolium repens*, *Lotus corniculatus*, *Plantago lanceolata*, *Trifolium repens*, *Rumex acetosa* and *Rhytidiadelphus squarrosus.* EC23 R1
GS3/GA1	n/a	*Achillea millefolium, Agrostis sp., Anthoxanthum odoratum, Digitalis purpurea, Erica cinerea, Euphrasia sp., Galium saxatile, Holcus lanatus, Hypochaeris radicata, Juncus acutiflorus, Lotus corniculatus, Pilosella officinarum, Poa sp., Potentilla erecta, Prunella vulgaris, Ranunculus repens, Rumex acetosella, Solidago virgaurea, Succisa pratensis, Teucrium scorodonia, Vicia sepium, Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens.*
GS3/HD1	n/a	75% GS3, 25% HD1. Species as described in this table.
GS4	n/a	*Juncus effusus*, *Ranunculus repens*, *Rumex acetosa*, *Calystegia soldanella*, *Cirsium palustre*, *Filipendula ulmaria*, *Stachys palustris*, *Holcus lanatus*, *Agrostis stolonifera*, *Lotus pedunculatus*, *Lythrum salicaria*, *Calliergonella cuspidata* and *Rhytidiadelphus squarrosus*.
GS4/HD1	n/a	Species as described in this table.
WN2	n/a	*Crataegus monogyna, Fraxinus excelsior, Hedera helix, Rubus fruticosus agg., Rumex obtusifolius, Geranium robertianum, Poa trivialis, Galium aparine, Urtica dioica, Dryopteris dilatata* 2834_R1
GM1/GS4	n/a	*Epilobium hirsutum, Iris pseudacorus, Mentha aquatic, Filipendula ulmaria, Typha latifolia, Lythrum salicaraia,* *Rubus fruticosus, Juncus effusus*
WS1	n/a	*Crataegus monogyna, Rubus fruticosus agg.* and *Pteridium aquilinum. Ulex europeaus, Buddelya spp., Larix spp.,*
WS1/GS2/ HD1	n/a	Shared area with Keeraun Boithrin to Knocknafroska and the N59 Link Road. HD2 species include *Salix spp., Pteridium aquilinum, Ulex gallii*

EC63

EC63 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	Variable but includes species such as *Holcus lanatus*, *Fumaria officinalis*, *Trifolium pratensis*, *T. repens*, *Plantago lanceolata* and *Sisymbrium officinale*. 5806_R1
HD1	n/a	*Pteridium aquilinum*, *Rubus fruticosus* agg. and *Chamerion angustifolium*.
GA2	n/a	*Lolium perenne*, *Bellis perennis* and *Trifolium repens*.
GA2/WS3	n/a	GA2 species as described above, with *Tilia cordata, Fraxinus excelsior* and *Alnus glutinosa*.
GS2	n/a	*Holcus lanatus*, *Plantago lanceolata*, *Trifolium repens*, *Jacobaea vulgaris*, *Dactylis glomerata*, *Arrhenatherum elatius*, *Cirsium arvensis* and occasional *Leucanthemum vulgare*. *Alnus glutinosa* frequently planted.
GS2/HD1	n/a	GS2 species with *Alnus gluinosa, Cirsium arvense, Calystegia sepium, Pteridium aquilinum, Salix sp.* and *Ulex gallii.*
GS4	n/a	*Juncus effusus*, *Filipendula ulmaria*, *Rumex obtusifolius*, *Chamerion angustifolium*, *Arrhenatherum elatius*, *Holcus lanatus* and *Ranunculus repens*.
WD1	n/a	Strip of planted woodland dominated by *Fraxinus excelsior.*
WL1	n/a	*Cupressus x leylandii*, *Griselinia* sp., *Fuchsia magellanica*, *Fagus sylvatica F. purpurea*., *Crataegus monogyna*, *Hedera helix*, *Ilex aquifolium*, *Fraxinus excelsior*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Viburnum opulus*, *Buddleja davidii*, *Alnus glutinosa*, *Ulex europaeus*, *Betula pubescens*, *Cornus* sp. *Ulex europaeus*, *Alnus incana*, *Salix caprea* and *Calystegia sepium*.
WL2	n/a	Possibly WD1, the strip of trees is wide. *Fraxinus excelsior, Acer pseudoplatanus, Alnus glutinosa, Crataegus monogyna*
WS1	n/a	*Ulex europaeus*, *Calystegia sepium, Rubus fruticosus* agg., *Urtica dioica* and some *Salix cinerea* on damp ground. *Larix decidua, Crataegus monogyna, Calystegia sepium, Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis* and *Buddleja davidii* present. 255_R1, 255_R2 and 5806_R2
WS1/GS2	n/a	Scrub dominating up to 80% of polygon area *Larix spp., Ulex europaeus, Rubus fruticosus, Urtica dioica* *Salix sp., Crataegus monogyna* *Calystegia sp., Epilobium hirsutum, Calystegia sepium, Epilobium angustifolium, Phragamites australis, Buddeia*

EC63 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WS1/HD1/ ED3	n/a	Gorse scrub dominates with very little grassland. *Buddleja davidii* frequent. *Laris decidua, Ulex europeaus, Rubus fruticosus agg., Urtica dioica, Salix sp., Crataegus monogyna, Calystegia sp., Epilobium hirsutum, Chamaenerion angustifolium, Phragmites australis, Pteridium aquilinum, Ulex gallii, Jacobaea vulgaris, Cirsium vulgare, Matricaria discoidea, Persicaria maculosa, Polygonum aviculare, Arrhenatherum elatius, Epilobium hirsutum, Cirsium arvense, Centaurea nigra, Lolium perenne, Urtica dioica.*

EC25

EC25 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED2	n/a	Recently cleared for residential dwellings
ED2/HH1/ GS3	4030	Recent disturbance and exposed bare ground with remnant pockets of heath and dry-humid acid grassland. *Sphagnum palustre, Sphagnum papilosum, Succisa pratensis, Calliergenella cusipidata, Juncus acutiflorus, Ranunculus flammula, Hydroper vulgaris, Potentilla erecta, Potamogeton polygonifolius*
ED3	n/a	*Hypochaeris radicata*, *Jacobaea vulgaris*, *Agrostis capillaris*, *Achillea millefolium*, *Trifolium pratensis*, *Centaurium erythraea*, *Anthoxanthum odoratum*, *Trifolium dubium*, *Anagallis arvensis*, *Plantago lanceolata*, *Cirsium arvensis*, *Ulex europaeus*, *Juncus effusus*, *Potentilla anserine*, *Rubus fruticosus*, *Leontodon autumnalis*, *Linum catharticum* and *Hypericum tetrapterum*. 2786_R2
ED3/WS1	n/a	75% ED3, 25% WS1. Species lists as described in this table.
FL1	3160	Two small ponds, both surrounded by reed swamp with adjacent blanket bog and scrub. Typical species are *Phragmites australis*, *Potamogeton polygonifolius*, *Hypericum elodes* and *Menyanthes trifoliata.*
FL4	n/a	*Carex lasiocarpa*, *Hypericum elodes*, *Menyanthes trifoliata*, *Schoenoplectus lacustris* and *Potamogeton polygonifolius*
FS1	n/a	*Phragmites australis*, *Mentha aquatica* and *Myrica gale.*
FW4	n/a	*Holcus lanatus, Agrostis stolonifera, Galium palustre, Juncus effusus, Glyceria fluitans, Iris pseudacorus* 2809_R1
GA1	n/a	*Lolium perenne*, *Rumex crispus*, *Plantago major*,*Jacobaea vulgaris*, *Trifolium repens*, *Bellis perennis*, *Cerastium fontanum*, *Cirsium arvensis* and *Achillea millefolium*.
EC25 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1	n/a	*Achillea millefolium, Agrostis capillaris, Agrostis stolonifera, Anthoxanthum odoratum, Arrhenatherum elatius, Brachythecium rutabulum, Brachythecium species, Carex viridula, Centaurea nigra, Cynosurus cristatus, Euphrasia arctica, Festuca rubra, Holcus lanatus, Hypochaeris radicata, Kindbergia praelonga, Leontodon autumnalis, Lolium perenne, Lotus corniculatus, Plagiomnium undulatum, Plantago lanceolata, Poa trivialis, Pteridium aquilinum, Ranunculus acris, Ranunculus repens, Rhytidiadelphus squarrosus, Rumex obtusifolius, Trifolium dubium, Trifolium pratense, Trifolium repens* 2777_R1, 2786_R1, 2795_R1, 2794_R3, 2795_R2, 1636_R1, 1635_R1, 2776_R2 and 1652_R3
GS1/GS4	n/a	Grassland species as described in this table. 1679_R1
GS1/WS1	n/a	Grassland and scrub species as described in this table. 1633_R1
GS2	6150 (GL3e)	*Arrhenatherum elatius*, *Dactylis glomerata*, *Epilobium hirsutum*, *Galium saxatile*, *Cirsium arvensis*, *Urtica dioica*, *Rumex obtusifolius*, *Euphrasia* spp., *Plantago lanceolata*, *Cynosurus cristatus*, *Prunus vulgaris*, *Lathyrus pratensis*, *Anthoxanthum odoratum*, *Helictotrichon pubescens*, *Ranunculus acris*, *Heracleum sphondylium* and *Pimpinella major.* EC25 R6
GS2/ED3/ ED2	n/a	Area of abandoned farmland, adjoining an ongoing housing development. *Holcus lanatus, Ranunculus repens, Rumex obtusifolia, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Ulex europeaus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Salix* sp., *Buddleja davidii, Epilobium hirsutum, Carex nigra, Arrhenatherum elatius, Cirsium* sp., *Rumex* sp., *Salix cinerea.*
GS3	n/a	*Leontodon autumnalis*, *Succisa pratensis*, *Achillea millefolium*, *Festuca rubra*, *Prunus vulgaris*, *Plantago lanceolata*, *Jacobaea vulgaris*, *Rumex acetosella*, *Potentilla erecta*, *Euphrasia spp.*, *Trifolium pratensis*, *Agrostis capillaris* and *Anthoxanthum odoratum*, *Holcus lanatus*, *Agrostis canina*, *Pteridium aquilinum*, *Centaurea nigra*, *Lolium perenne*, *Leontodon hispidus*, *Plantago major*, *Hylocomium splendens*, *Juncus acutus*, *Lotus penduculatus*, *Dactylis glomerata* and *Solidago virgaurea* EC25 R7, 1634_R2, 5810_R1, 5811_R1 and 1650_R2

EC25 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS3/ER1	n/a	Lightly grazed pasture with outcropping rock. Species include *Succisa pratensis, Juncus acutiflorus, Lotus pendunculatus* and *Ulex europeaus.*

GS3/ED2/ED3	n/a	Disturbed area with mosaic of GS3/ED2 (*i.e.* bare soil) and ED3. *Agrostis canina*, *Arrhenatherum elatius*, *Dactylis glomerata*, *Festuca spp.*, *Leontodon autumnalis*, *Odontites vernus*, *Potentilla reptans*, *Prunella vulgaris*, *Pteridium aquilinum*, *Ranunculus repens*, *Rubus fruticosus*, *Rumex obtusifolius*, *Jacobaea vulgaris*, *Succisa pratensis*, *Tussilago farfara* and *Ulex europaeus*.
GS3/PF2	n/a	Localised pockets of Poor Fen and flushing habitats within acidic grassland, whose species list comprises *Succisa pratensis, Juncus acutiflorus, Lotus penduculis, Ulex europaeus.* Poor fen and flushing species as described in this table, with the inclusion of *Carex flacca, Ranunculus repens, Sphagnum cuspidatum, Aulacomnium palustre, Anagallis tenella, Calliergenella cuspidate, Hydrocotyle vulgaris, Potentilla erecta.*
GS3/PF2/WS1/HD1/GS2	n/a	Diverse pockets of dry-humid acid grassland and poor fen & flush. Fen and flush species include *Juncus acutiflorus, Carex flacca, Scorzonoides autumnalis, Ranunculus repens, Ranunculus flammula, Sphagnum cuspidatum, Aulacomnium palustre, Anagallis tenella, Sphagnum papillosum, Sphagnum palustre, Euphrasia spp., Succisa pratensis,Calliergenella cuspidate, Hydrocotyle vulgaris, Potentilla erecta, Potamogeton polygonifolius*
GS3/HD1/WS1/GS4	n/a	GS3 areas grazed by horses, slightly improved. *Succisa pratensis, Juncus acutiflorus, Lotus penduculis, Ulex europeaus, Pteridium aquilinum, Sphagnum sp., Molinia caerulea, Hypericum elodes, Potentilla erecta, Viola palustris, Calystegia sepium, Rubus fruticosus agg., Lythrum salicaaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*
GS4	n/a	*Juncus effusus*, *Rumex acetosa*, *Stachys palustris*, *Rumex acetosella*, *Agrostis stolonifera*, *Anthoxanthum odoratum*, *Rumex crispus*, *Juncus acutiflorus*, *Lythrum salicaria*, *Rubus fruticosus* agg., *Arrhenatherum elatius*, *Rumex obtusifolius* and *Galium palustre.* EC25 R8, 2774_R1, 1642_R1, 1633_R2, 1653_R3, 1679_R2, 1651_R2, 1632_R2 and 2810_R1
GS4/WS1	n/a	*Ulex europeaus* scrub spreading onto rough GS4. Grassland species include *Succisa pratensis, Sphagnum sp., Molinia caerulea, Hypericum elodes, Potentilla erecta* and *Viola palustris.*
EC25 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

HD1	n/a	*Pteridium aquilinum*, *Ulex europaeus*, *Ulex gallii* and *Erica cinerea*. 2786_R3, 1632_R1 and 1632_R3
HD1/GS4/ WS1	n/a	*Pteridium aquilinum, Ulex europeaus, Sphagnum sp., Succisa pratensis, Molinia caerulea, Hypericum eodes, Potentilla erecta, Viola palustris, Cakystegia sepium, Rubus fruticosus, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.* GS4 areas decrease in 2023 since previous surveys.
HD1/WS1/ GS2	n/a	50% HD1, 30% WS1, 20% GS2. Species as described in this table.
HH1	4030 (DH1)	*Ulex gallii*, *Daboecia cantabrica*, *Calluna vulgaris*, *Molinia caerulea* and *Cladonia portentosa*.
HH1/HH3	4030	Polygon tightly grazed and locally poached. Lobe to South now comprises dry and wet heath mosaic with spreading scrub/bracken areas. *Sphagnum palustre, Sphagnum papilosum, Succisa spp, Calliergenella cuspidata, Juncus acutiflorus, Ranunculus flammula, Hydrocotyle vulgaris, Potentilla erecta, Potamogeton polygonifolius*
HH3	4010 (WH1b)	*Molinia caerulea*, *Narthecium ossifragum*, *Succisa pratensis*, *Calluna vulgaris*, *Erica tetralix*, *Drosera rotundifolia*, *Pedicularis sylvatica*, *Potentilla erecta*, *Dactylis maculate*, *Sphagnum capillifolium*, *Sphagnum palustre, Sphagnum papilosum, Narthecium ossifragum, Sphagnum cuspidatum, Carex panicea*, *Agrostis stolonifera* and *Schoenus nigricans*.EC25 R1, EC25 R3, 1655_R1 and 1653_R1
HH3/HH1/ WS1/HD1	4010/40 30	Species as described in this table. Area of ground closed in further from scrub, particularly gorse encroachment onto heath habitats.
PB3	*7130 (BB1b)	*Molinia caerulea*, *Erica tetralix*, *Narthecium ossifragum*, *Rhynchospora alba*, *Sphagnum papillosum*, *Sphagnum capillifolium*, *Eriophorum angustifolium*, *Potentilla erecta*, *Drosera rotundifolia* and *Sphagnum cuspidatum*. EC25 R2
PB3	7150 (HW3)	*Rhynchospora* hollows are abundant within the extensive area of blanket bog. *Rhynchospora alba*, *Sphagnum papillosum*, *Narthecium ossifragum*, *Drosera rotundifolia*, *Eriophorum angustifolium*, *Sphagnum cuspidatum* and *Erica tetralix.* EC25 R4

EC25 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

PB3/HH3	*7130/4010	PB3 species as described above. *Calluna vulgaris* cover >20%, *Molinia caerulea*, *Carex panicea, Narthecium ossifragum, Sphagnum cuspidatum, Sphagnum papillosum* and *Erica tetralix* also present.
PF2	n/a	There are several small flushes throughout the site in association with blanket bog, wet heath, transition mire and wet grassland. *Hypericum elodes*, *Menyanthes trifoliata*, *Ranunculus flammula*, *Potamogeton polygonifolius*, *Sphagnum denticulatum*, *Sphagnum cuspidata, Juncus acutus, Sphagnum papillosum*, *Aulocomnium palustre, Anagallis tenella, Sphagnum palustre, Euphrasia sp., Scorzonoides autumnalis, Succisa pratensis, Molinia caerulea*, *Carex echinata*, *Schoenus nigricans* and *Anagallis arvensis.* 5807_R1, 5808_R1, 2776_R1, 5259_R1, 1653_R2, 5810_R3, 1655_R2 and 1650_R1
PF2/HH3	n/a	Tightly grazed and locally poached. *Sphagnum papillosum, Sphagnum palustre, Succisa pratensis, Calliergonella cuspidata, Juncus acutus, Ranunculus flammula, Hydrocotyl vulgaris, Potentilla erecta, Potamogeton polygonifolius, Molinia caerulea, Carex panacea, Narthecium ossifragum, Erica tetralix, Calluna vulgaris.*
PF3	7140 (PFLU5)	*Phragmites australis*, *Schoenus nigricans*, *Menyanthes trifoliata*, *Narthecium ossifragum*, *Equisetum hyemale*, *Myrica gale*, *Hypericum elodes*, *Potamogeton polygonifolius*, *Eriophorum angustifolium*, *Potentilla palustris*, *Erica tetralix*, *Sphagnum palustre*, *Carex rostrata*, *Campylium stellatum* and *Vaccinium oxycoccos.* EC25 R5
WL2	n/a	*Fraxinus excelsior* copse
WS1	n/a	*Ulex europaeus*, *Crataegus monogyna*, *Prunus spinosa*, *Rubus fruticosus* agg., *Calystegia sepium, Lythrum salicaria, Juncus* sp., *Pteridium aquilinum*, *Urtica dioica* and *Salix cinerea.* 1655_R3, 1652_R1, 1651_R1, 1650_R3, 1652_R2, 1659_R1, 1657_R1, 1642_R2, 1634_R1, 5810_R2 and 2794_R2
WS1/ED3	n/a	*Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Corylus avellana, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg., Salix cinerea subsp. oleifolia, Ulex europeaus, Blackstonia perfoliate, Buddleja davidii, Epilobium hirsutum, Carex nigra, Arrhenatherum elatius, Rumex sp., Cetranthus ruber, Centaurium erythraea, Centaurea nigra, Hypericum perforatum, Leucanthemum vulgaris, Lotus corniculatus, Pilosella officinarum, Plantago lanceolata, Trifolium pratense* and *Ulex europaeus.*
EC25 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WS1/HD1	n/a	*Calystegia sepium, Rubus fruticosus agg., Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*
WS1/HD1/ GS4/GS1	n/a	Expanding scrub. *Calystegia sepium, Rubus fruticosus agg., Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg., Ulex europeaus, Sphagnum sp., Succisa pratensis, Molinia caerulea, Hypercium elodes, Potentilla erecta, Viola palustris, Ranunculus repens, Rumex obtusifolius, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum sphondylium.*
WS1/HH1	4030	Dense gorse scrub and bracken evident throughout (species described above), encroaching on heath habitat (ungrazed/unmanaged). Dry heath habitat as described above.
WS1/GS3	n/a	*Succisa pratensis, Juncus actutiflorus, Lotus penduculis. Ulex gallii* and *Ulex europeaus* spreading on to area of GS3.
WS1/PF2	n/a	*Juncus acutiflorus, Carex flacca, Scorzonoides autumnalis, Ranunculus repens, Ranunculus flammula, Sphagnum cuspidatum, Aulacomnium palustre, Anagallis tenella, Sphagnum papillosum, Sphagnum palustre, Euphrasia sp, Succisa pratensis, Calliergenella cuspidate, Hydrocotyle vulgaris, Potentilla erecta, Potamogeton polygonifolius*

Upper Dangan/NUIG (Ch. 8+150 – Ch. 9+300) – Habitats between EC25 and the west bank of River Corrib (excluding EC30)

Upper Dangan/NUIG - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL1	n/a	*Crataegus monogyna*, *Fraxinus excelsior*, *Hedera helix* and *Rubus fruticosus* agg.
BL3	n/a	*Acer pseudoplatanus, Alnus glutinosa, Prunus laurocerasus,*
ED2	n/a	*Bellis perennis*, *Lolium perenne* and *Taraxacum officinale* agg.
ED3	n/a	*Trifolium repens, Lolium perenne, Galium aparine, Agrostis stolonifera, Urtica dioica, Stachys sylvatica, Bryum species, Arctium minus, Geranium lucidum, Persicaria lapathifolia* 5088_R3
Upper Dangan/NUIG - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

ED3/HD1		Recent cutting of treeline and localized removal of scrub. Recolonising bare ground species as described in this table. Dense bracken species include *Pteridium aquilinum.*
ED3/WS1	n/a	Recolonising bare ground and scrub species as described in this table. 3003_b_R1
GA1	n/a	*Agrostis stolonifera*, *Arrhenatherum elatius, Bellis perennis*, *Buddleja davidii, Crataegus monogyna, Cirsium* sp., *Cynosurus cristatus, Dactylis glomerata, Fraxinus excelsior, Heracleum sphondylium, Holcus lanatus*, *Lathyrus pratensis*, *Lolium perenne*, *Plantago major*, *Ranunculus repens*, *Rumex crispus*, *Rumex obtusifolius*, *Poa trivialis, Potentilla anserina, Jacobaea vulgaris*, *Taraxacum officinale* agg. and *Urtica dioica* 2992_R2 and 2986_R2
GA2	n/a	*Bellis perennis*, *Cirsium arvense*, *Festuca rubra*, *Holcus lanatus*, *Lolium perenne*, *Lolium* spp., *Plantago lanceolata*, *Plantago major*, *Ranunculus repens*, *Rumex obtusifolius*, *Senecio vulgaris*, *Taraxacum officinale* agg., *Trifolium repens* and *Vicia cracca.* Some trees/scrub also present*; Aesculus hippocastanum*, *Betula sp.*, *Acer sp.*, *Fagus sylvatica, Crataegus monogyna, Populus sp., Tilia cordata., Salix cinerea* and *Fraxinus excelsior*. 3031_R1, 4299_R1, 4299_R2, 5510_R1 and 5880_R1
GS1	n/a	A more species poor variant of calcareous/neutral grassland supported the following species: *Centaurea nigra*, *Dactylis glomerata*, *Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum sphondylium, Leontodon hispidus*, *Lolium perenne*, *Prunella vulgaris*, *Ranunculus repens*, *Rubus fruticosus agg., Rumex* spp., *Jacobaea vulgaris* and *Urtica dioica* 2994_R3, 2995_R1, 2992_R1, 2986_R1, 2996_R1, 4302_R1, 5088_R1, 5880_R4, 5880_R3 and 5880_R2
	n/a	Species-rich variant of calcareous grassland which did not meet criteria for EU Annex I habitat. Species recorded include *Anthoxanthum odoratum, Calliergonella cuspidata*, *Holcus lanatus, Briza media*, *Festuca ovina*, *Linum catharticum*, *Trifolium pratense*, *Homalothecium lutescens*, *Lathyrus pratensis*, *Lolium perenne*, *Prunella vulgaris*, *Ranunculus repens*, *Carex flacca*, *Cerastium fontanum*, *Euphrasia* spp., *Plantago lanceolata*, *Ranunculus acris, Agrostis stolonifera*, *Alchemilla mollis*, *Carex panacea*, *Centaurea nigra*, *Cirsium arvense*, *Cynosurus cristatus*, *Dactylis glomerata*, *Festuca* spp., *Leontodon autumnalis*, *Leontodon hispidus*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Rumex crispus*, *Taraxacum officinale agg.* and *Trifolium repens* UD-NUIG R1
Upper Dangan/NUIG - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1/GS2	n/a	Typical GS1 species as above. *Achillea millefolium, Arrhenatherum elatius, Agrostis stolonifera, Pteridium aquilinum, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium* also present.
GS1/GS2/WS1	n/a	Grassland in transition to GS2 due to lack of grazing. Species include *Rubus fruticosus agg., Raunculus repens Rumex obtusifolius, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum sphondylium, Ranunculus repens, Rumex obtusifolia, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Ulex europeaus, Rhinanthus minor, Cynosurus cristatus, Epilobium hirsutum, Salix sp., Buddleja davidii, Calystegia sepium, Lythrum salicaria, Juncus sp., Renoutria japonica, Acer pseudoplatanus, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*
GS1/WS1	n/a	*Rubus fruticosus, Ranunculus repens, Rumex obtusifolia* *Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum spondylium* WS1 area continuing to spread, species listed as described in this table.
GS2	n/a	Some areas are unmowed areas of grassland for pollinators. *Arrhenatherum elatius*, *Achillea millefolium*, *Buddleja davidii, Calystegia sepium*, *Centaurea nigra*, *Cirsium arvense*, *Crataegus monogyna*, *Cynosurus cristatus*, *Dactylis glomerata*, *Epilobium hirsutum*, *Heracleum sphondylium*, *Holcus lanatus*, *Ranunculus repens, Rumex obtusifolius, Lathyrus pratensis*, *Plantago lanceolata*, *Prunella vulgaris*, *Prunus spinosa*, *Pteridium aquilinum*, *Ranunculus acris*, *Ranunculus repens*, *Rhinanthus minor, Rubus fruticosus* agg., *Rumex crispus*, *Rumex obtusifolius*, *Rumex* spp., *Salix cinerea*, *Jacobaea vulgaris*, *Taraxacum officinale* agg., *Trifolium pratense, Ulex europaeus*and *Urtica dioica* 3003_R2, 4198_R1, 4198_R2, 4198_R3 and 3005_R1
GS2/WS1	n/a	Rank grassland *Arrhenatherum elatius* dominant. *Salix spp., Rubus fruticosus agg., Buddelja davidii* and *Populus* sp. scrub.
GS4	n/a	Species-poor *Juncus effusus* wet grassland with *Agrostis stolonifera*, *Cirsium palustre*, *Galium palustre*, *Holcus lanatus*, *Potentilla anserina*, *Ranunculus acris* and *Ranunculus repens*

Upper Dangan/NUIG - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS4	n/a	A more species rich wet grassland variant included *Agrostis stolonifera*, *Arrhenatherum elatius*, *Centaurea nigra*, *Cirsium arvense*, *Cynosurus cristatus*, *Dactylis glomerata*, *Epilobium montanum*, *Festuca rubra*, *Filipendula ulmaria*, *Holcus lanatus*, *Iris pseudacorus*, *Juncus articulatus*, *Juncus effusus*, *Lolium perenne*, *Lythrum salicaria*, *Phragmites australis*, *Plantago lanceolata*, *Potentilla anserina*, *Prunella vulgaris*, *Ranunculus repens*, *Rhinanthus minor*, *Rubus fruticosus* agg., *Rumex acetosa*, *Rumex* spp., *Succisa pratensis*, *Taraxacum officinale* agg., *Trifolium pratense*, *Urtica dioica* and *Vicia cracca.*
GS4/GA1	n/a	Previously recorded as Rich fen and flushing (PF1) in 2018. Wet grassland and amenity grassland species as described in table.
FP1	n/a	Permanent wet circular feature. Margins trampled by horses. Standing water present. *Glyceria fluitans, Ranunculus flammula, Rumex crispus, Lytherum salicaria, Juncus effusus, Calliergonella cuspidate, Nastursium officinale, Equisetum fluiviatile*
HD1	n/a	*Rubus fruticosus agg., Kindbergia praelonga, Pteridium aquilinum* 2994_R2
HD1/WS1	n/a	Dense bracken and scrub species as described in this table. 3003_R3
WD1	n/a	*Acer pseudoplatanus*, *Aesculus hippocastanum*, *Anthriscus sylvestris*, *Arrhenatherum elatius*, *Brachypodium sylvaticum.*, *Crataegus monogyna*, *Fagus sylvatica*, *Fraxinus excelsior*, *Fagus sylvatica*, *Geranium robertianum*, *Geum urbanum*, *Hedera helix*, *Heracleum sphondylium*, *Pinus* spp., *Prunus avium*, *Rubus fruticosus* agg., *Salix cinerea*, *Tilia cordata*, *Torilis japonica*, *Ulmus glabra, Urtica dioica* and *Vicia sepium* 3382_R1, 4304_R1, 4308_R1, 4547_R1, 4550_R1, 4551_R1, 4555_R1, 5556_R1, 5577_R1 and 5776_R1
WD1/GS2	n/a	Open canopy with GS2. Ash dieback prevalent on canopy. Woodland species as listed in table.
WD3	n/a	Copse of *Picea* sp.
WL1	n/a	*Acer pseudoplatanus*, *Crataegus monogyna*, *Cupressus x leylandii*, *Epilobium ciliatum*, *Escallonia* spp., *Fagus purpurea*, *Fagus sylvatica*, *Fraxinus excelsior*, *Fuchsia magellanica*, *Geranium robertianum*, *Griselinia* sp., *Hedera helix*, *Ilex aquifolium*, *Plantago lanceolata*, *Prunus laurocerasus*, *Prunus spinosa*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Rumex obtusifolius*, *Ulmus glabra*, *Urtica dioica* and *Vicia* sp.
WL2	n/a	*Acer pseudoplatanus*, *Aesculus hippocastanum*, *Alnus glutinosa*, *Betula* sp., *Cornus* sp., *Crataegus monogyna*, Corylus avellana, *Cupressus x Leylandii*, *Fagus sylvatica*, *Reynoutria japonica*, *Fraxinus excelsior*, *Hedera helix*, *Prunus lusitanica*, *Prunus spinosa*, *Rubus fruticosus* agg., *Salix caprea*, *Salix cinerea*, *Sorbus* sp., *Symphoricarpos albus*, *Tilia cordata* and *Urtica dioica*

Upper Dangan/NUIG - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WL2/WS1		*Picea* sp. treeline with spreading *Pteridium aquilinum* and *Rubus fruticosus agg.*
WN2	n/a	*Hedera helix*, *Fraxinus excelsior*, *Rubus fruticosus* agg. *Acer pseudoplatanus*, *Crataegus monogyna*, *Ilex aquifolium*, *Phyllitis scolopendrium* and *Thuidium* sp. Small amount of *Alnus glutinosa* and *Salix cinerea.* Locally frequent *Ulmus glabra.* UD-NUIG R3, 4309_R1 and 5579_R1
WS1	n/a	Scrub species as described in this table. *Fraxinus excelsior, Salix cinerea s. oleifolia, Hedera helix, Phalaris arundinacea, Athyrium filix-femina* 3815_R1
WN6	*91E0	*Alnus glutinosa* main canopy species with frequent *Fraxinus excelsior* and *Salix cinerea* subsp. *oleifolia*. Abundant ruderals in the ground layer.
WS1	n/a	Abundant *Reynoutria japonica* in places with young *Acer pseudoplatanus*, *Buddleja davidii*, *Salix purpureum*. Recent removal disturbance and dumping of garden waste in some areas. *Betula pubescens*, *Crataegus monogyna*, *Calystegia sepium, Cirsium arvense, Ilex aquifolium, Dactylis glomerata*, *Epilobium hirsutum*, *Fraxinus excelsior*, *Galium aparine*, *Hedera helix*, *Prunus spinosa*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Salix cinerea*, *Salix cinerea* subsp. *oleifolia*, *Ulex europaeus* and *Urtica dioica,* 5506_R1, 4077_R1, 4078_R1, 2988_R1, 2994_R1, 2995_R2, 5088_R2 and 3005_R2
WS1/FS1	n/a	*Rubus fruticosus agg*. and ruderals establishing and spreading onto common *Phragmites australis* dominated habitat. *Urtica dioica, Filipendula ulmaria, Ranunculus repens.*
WS1/GA1	n/a	Scrub and grassland species as described in this table.
WS1/GS1	n/a	Scrub and grassland species as described in this table. Spread of bramble scrub due to lack of grazing.
WS1/GS2	n/a	Scrub and grassland species as described in this table. 4733_R1
WS1/HD1	n/a	Scrub and bracken species as described in this table.
WS1/HD1/ED3/GS2	n/a	Scrub and bracken species as described in this table. *Buddelja* spreading throughout.
WS3	n/a	Predominantly tall confiers with *Larix spp., Picea spp.* and *Chamaecyparis lawsoniana*.
WN6	*91E0	*Ranunculus repens*, *Hedera helix*, *Salix cinerea*, *Scrophularia auriculata*, *Alnus glutinosa*, *Urtica dioica*, *Crataegus monogyna*, *Filipendula ulmaria*, *Circaea lutetiana*, *Geranium robertianum*, *Heracleum sphondylium*, *Phyllitis scolopendrium*, *Taraxacum officinale* agg. and *Holcus lanatus* UD-NUIG R5 and 3381_R1

EC29

EC29 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

FS1	n/a	Species-poor, tall reed swamp vegetation dominates wide, wet drains which occur intermittently on both sides of the railway embankment. *Phragmites australis, Epilobium hirsutum*, *Urtica dioica*, *Menyanthes trifoliata* and *Equisetum fluviatile*.
GA1	n/a	*Holcus lanatus*, *Ranunculus repens*, *Lolium perenne*, *Cynosurus cristatus*, *Bellis perennis* and *Plantago lanceolata.*
GS1	6210 (GL1b)	Relatively species-rich calcareous grassland is frequent on shallow soil which overlies the limestone of the old railway embankment. Parts correspond to annex habitat, while other areas do not meet criteria. Typical species are *Centaurea nigra, Trifolium pratense, Festuca rubra*, *Plantago lanceolata*, *Lotus corniculatus*, *Briza media*, *Anthoxanthum odoratum*, *Leontodon hispidus*, *Rhinanthus minor*, *Linum catharticum*, *Vicia cracca* and *Prunella vulgaris*. EC29 R1
GS2	n/a	*Arrhenatherum elatius, Dactylis glomerata, Holcus lanatus*, *Agrostis capillaris*, *Trifolium repens*, *Ranunculus repens*, *Trifolium pratense* and *Anthoxanthum odoratum*.
GS4	n/a	*Anthoxanthum odoratum, Holcus lanatus, Centaurea nigra, Filipendula ulmaria, Juncus effusus, Juncus inflexus* 1720_R1
GS4/GM1	n/a	*Juncus effusus, Iris pseudacorus*, *Holcus lanatus*, *Lythrum salicaria*, *Cirsium palustre*, *Ranunculus acris*, *Juncus articulatus*, *Agrostis stolonifera* and *Filipendula ulmaria.*
GS4/WS1	n/a	Grassland species as described above. Scrub species include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. oleifolia, Ulex europaeus*
PF1	7230	*Succisa pratensis*, *Juncus acutiflorus*, *Potentilla erecta*, *Prunus vulgaris*, *Anagallis tenella*, *Equisetum* sp., *Anthoxanthum odoratum*, *Cirsium palustre*, *Carex panicea*, *Call cusp*, *Lythrum salicaria*, *Mentha aquatica*, *Schoenus nigricans* and *Hydrocotyle vulgaris*.
WL2	n/a	*Acer pseudoplatanus, Acer sp., Cupressus x leylandii, Fraxinus excelsior,* and *Polpulus tremula.*

EC30

EC30 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GA2	n/a	Rank grassland with *Holcus lanatus, Centaurea nigra, Ranunculus repens, Ranunculus acris, Rumex obtusifolius, Achillea millefolium.*
WD1	n/a	*Fraxinus excelsior*, *Fagus sylvatica, Aesculus hippocastanum, Acer pseudoplatanus, Alnus cordata Betula spp. Corylus avellana, and Populus sp, Prunus laurocerasus, Salix cinerea, Sorbus aucuparia, Sorbus aria, Hedera helix*, *Urtica dioica*, *Rubus fruticosus*, *Galium aparine*, *Dactylis glomerata*, *Ranunculus repens*, *Cirsium vulgare* and *Geranium robertianum.* 3035_R1, 3029_R1 and 3028_R1

WN2	n/a	*Fraxinus excelsior*, *Salix cinerea*, *Salix caprea*, *Rubus fruticosus*, *Fagus sylvatica*, *Hedera helix*, *Urtica dioica*, *Acer pseudoplatanus*, *Calystegia sepium*, *Reynoutria japonica*, *Crataegus monogyna*, *Betula pubescens*, *Geranium robertianum*, *Arum maculatum*, *Polystichum setiferum*, *Thuidium tamariscinum* and *Eurhynchium spp.* 5581_R1
WS1/WN2	n/a	*Fraxinus excelsior* overtopping *Salix cinerea, Rubus fruticosus agg., Cotoneaster sp.* and occasional *Acer pseudoplatanus.*

EC31

EC31 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS1	6210* (GL3a)	Species-rich calcareous grassland occurs in mosaic with lowland hay meadow. Orchids are abundant in places. *Briza media*, *Dactylorhiza fuchsii*, *Lotus corniculatus*, *Anthyllis vulneraria*, *Blackstonia perfoliata*, *Carex flacca*, *Linum catharticum*, *Listera ovata* and *Pilosella officinarum*. EC31 R2
GS2	n/a	Species-poor meadow and verge. Typical species include *Dactylis glomerata*, *Helictotrichon pubescens*, *Centaurea nigra*, *Trifolium repens*, *Rumex crispus*, *Cirsium arvensis* and *Plantago lanceolata.*
	6510 (GL3e)	Occurs on the site in mosaic with calcareous grassland (6210). *Plantago lanceolata*, *Trifolium pratense*, *Heracleum sphondylium*, *Helictotrichon pubescens*, *Lathyrus pratensis*, *Holcus lanatus*, *Centaurea nigra*, *Anthoxanthum odoratum*, *Dactylis glomerata* and *Agrostis capillaris, Dactylorhiza fuchsia* and *Dactylorhiza incarnata.* EC31 R1
GS4	n/a	*Filipendula ulmaria*, *Urtica dioica*, *Juncus effusus*, *Iris pseudacorus*, *Convolvulus arvensis*, *Galium aparine*, *Festuca arundinacea*, *Juncus conglomeratus*, *Epilobium hirsutum* and *Valeriana officinalis.*
WD1	n/a	*Fagus sylvatica*, *Fraxinus excelsior*, *Hedera helix*, *Rubus fruticosus*, *Ilex aquifolium*, *Primula vulgaris*, *Acer pseudoplatanus* and *Conopodium majus.*
WL2	n/a	*Betula sp.* and *Salix cinerea* treeline.
WN2	n/a	*Fraxinus excelsior*, *Acer pseudoplatanus*, *Hedera helix*, *Crataegus monogyna*, *Circaea lutetiana*, *Geranium robertianum*, *Rubus fruticosus* agg. *Urtica dioica*, *Geum urbanum*, *Rumex sanguineus* and *Ranunculus ficaria*.
WN6	*91EO	Typical species include *Alnus glutinosa*, *Salix cinerea*, *Crataegus monogyna*, *Listera ovata*, *Holcus mollis*, *Carex remota* and *Agrostis stolonifera*. EC31 R3
WS1	n/a	Scrub composition varies but dominant species include *Crataegus monogyna*, *Prunus spinosa* and *Rubus fruticosus* agg.

of Lough Corrib SAC) (Ch. 9+400 – Ch. 11+400) – Habitats between the River Corrib and Lackagh Quarry

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL1	n/a	*Crataegus monogyna*, *Fraxinus excelsior*, *Hedera helix*, *Prunus spinosa* and *Rubus fruticosus* agg.
BL3	n/a	*Acer pseudoplantus, Alnus glutinosa, Prunus laurocerasus, Hedera helix agg.*
BL3/WS1/ GS2/ED3		*Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg. Salix cinerea subsp. oleifolia, Ulex europaeus, Achillea millefolium, Arrhenatherum elatius, Centaurea nigra, Cerastium fontanum, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypochaeris radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum officinale agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense* and *Tripleurospermum maritimum.*
ED2	n/a	*Lolium perenne* and *Potentilla anserina*
ED3	n/a	*Agrostis stolonifera*, *Lolium perenne*, *Plantago major*, *Potentilla anserina*, *Ranunculus repens*, *Rumex* spp., *Stellaria media*, *Trifolium pratense* and *Veronica persica, Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Tripleurospermum maritimum.*
ED3/WS1	n/a	*Blackstonia perfoliata, Budleja davidii, Centranthus ruber, Centuria erytheraea, Centaurea nigra, Hypericum perforatum, Leucrantyenemum vulgaris, Lotus corniculatus, Pilosella officinarum, Plantago lanceolata, Trifolium pratense, Ulex europaeus, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia.*

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
ER2	*8240 LPE	The most frequently recorded species across these 39 relevés were: *Anthoxanthum odoratum, Asperula cynanchica*, *Asplenium ruta-muraria*, *Brachythecium rutabulum, Briza media*, *Bryum capillare, Calliergonella cuspidata, Carex flacca*, *Carlina vulgaris*, *Centaurea nigra*, *Ceterach officinarum*, *Corylus avellana*, *Crataegus monogyna*, *Ctenidium molluscum*, *Dicranum scoparium, Encalypta streptocarpa*, *Epilobium montanum*, *Epilobium parviflorum, Euphrasia salisburgensis*, *Festuca ovina*, *Festuca rubra*, *Fissidens dubius*, *Fragaria vesca*, *Fraxinus excelsior*, *Galium verum*, *Geranium robertianum*, *Grimmia pulvinata*, *Hedera helix*, *Homalothecium lutescens, Homalothecium sericeum*, *Hypericum pulchrum*, *Hypochaeris radicata*, *Ilex aquifolium*, *Koeleria macrantha*, *Lapsana communis*, *Leontodon hispidus*, *Leucanthemum vulgare*, *Linum catharticum*, *Lotus corniculatus*, *Mycelis muralis*, *Neckera complanata, Neckera crispa*, *Phyllitis scolopendrium*, *Pilosella officinarum*, *Plantago lanceolata*, *Plantago maritima, Polygala vulgaris*, *Potentilla erecta*, *Prunus spinosa*, *Ranunculus acris, Rosa spinosissima*, *Rubus fruticosus* agg., *Rubus idaeus*, *Scleropodium purum, Jacobaea vulgaris*, *Sesleria caerulea*, *Solidago virgaurea*, *Sonchus asper*, *Sorbus aria*, *Succisa pratensis*, *Taraxacum officinale* agg., *Teucrium scorodonia*, *Thymus polytrichus*, *Tortella nitida*, *Tortella tortuosa, Trifolium pratense* and *Veronica chamaedrys*. Relevés BEC 115, BEC 118, BEC 343 and BEC 345, 3087_R1, 3087_R2, 3087_R3, 3087_R4, 3087_R5, 3130_R1, 3130_R2, 3169_R1, 3618_R2, 3089_R1, 3494_R3, 3494_R4, 3494_R5 and 3322_R3
ER2/GS1/ WS1	*8240	*Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense, Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria*.
ER2/WS1	*8240/6210	Exposed calcareous rock and scrub species as described in this table. 3618_R1
FL6	*3180 *Potentilla anserina-Carex nigra* vegetation community (Waldren, 2015, Ed.).	Typical FL6/ GM1 vegetation with *Agrostis stolonifera*, *Apium inundatum*, *Caltha palustris*, *Cinclidotus fontinaloides*, *Eleocharis palustris*, *Equisetum palustre*, *Filipendula ulmaria*, *Glyceria fluitans*, *Mentha aquatica*, *Myosotis aquatica* , *Persicaria amphibia*, *Persicaria maculata*, *Potentilla anserina*, *Prunella vulgaris*, *Ranunculus repens*, *Rumex crispus*, *Rumex obtusifolius*, *Jacobaea aquaticus*, *Urtica dioica* and *Veronica catenata*
FS2	6430	*Epilobium palustre, Epilobium hirsutum, Galium palustre, Valeriana dioica*, *Menyanthes trifoliata*, *Phragmites australis*, *Calliergonella cuspidata*, *Equisetum fluviatile*, *Carex rostrata*, *Ranunculus acris, Prunus spinosa*, *Iris pseudacorus*, *Holcus lanatus* and *Agrostis stolonifera*. EC36 R4

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
FS2/WS1	6430	Species as above, with scrub species such as *Crataegus monogyna, Prunus spinosa, Ulex europeaus, Rubus fruticosus agg., Calystegia sepium, Cirsium arvense, Ilex aquifolium, Pteridium aquilinum* and *Salix cinerea* also present.
FW2	3260	Annex code updated as in Inspectors Report – see Appendix A.8.20 of the EIAR and Appendix N of the NIS for details.
FW4	n/a	*Calliergonella cuspidata, Kindbergia praelonga, Filipendula ulmaria, Glyceria fluitans, Salix caprea, Salix cinerea s. oleifolia* and *Fontinalis antipyretica* 4267_R1
GA1	n/a	*Agrostis stolonifera*, *Arrhenatherum elatius*, *Capsella bursa-pastoris, Cerastium fontanum, Centaurea nigra*, *Cirsium arvense*, *Crepis* sp., *Cynosurus cristatus*, *Dactylis glomerata*, *Heracleum sphondylium, Holcus lanatus*, *Jacobaea vulgaris, Lolium perenne*, *Odontites vernus*, *Plantago lanceolata*, *Plantago major*, *Poa annua, Poa trivialis, Potentilla anserina*, *Prunella vulgaris*, *Ranunculus acris*, *Ranunculus repens*, *Rumex obtusifolius*, *Rumex* spp., *Stellaria media, Taraxacum officinale* agg., *Trifolium pratense*, *Trifolium repens, Urtica dioica* and *Veronica* sp.
GA1/WS1	n/a	60% GA1, 40% WS1 species lists as described above.
GA2	n/a	*Bellis perennis*, *Festuca rubra*, *Holcus lanatus*, *Lolium perenne*, *Plantago lanceolata*, *Rumex acetosa*, *Rumex obtusifolius*, *Taraxacum officinale* agg. and *Trifolium repens*
GS1	n/a (GL2C, GL3B, GL3C, and GL3E)	The following species were commonly encountered in non-Annex I calcareous grassland: *Agrostis capillaris*, *Agrostis stolonifera*, *Arrhenatherum elatius, Anthoxanthum odoratum*, *Brachythecium rutabulum*, *Campanula rotundifolia, Carlina vulgaris, Centaurium erythraea, Conopodium majus, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris,* *Calliergonella cuspidata*, *Carex flacca*, *Centaurea nigra*, *Cerastium fontanum*, *Cirsium arvense*, *Cynosurus cristatus*, *Dactylis glomerata*, *Daucus carota*, *Festuca rubra*, *Holcus lanatus*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Lolium perenne*, *Lotus corniculatus*, *Odontites vernus*, *Plagiomnium undulatum*, *Plantago lanceolata*, *Plantago major, Potentilla anserina*, *Prunella vulgaris*, *Ranunculus acris*, *Ranunculus repens*, *Rhinanthus minor*, *Rubus fruticosus agg.*, *Rumex acetosa*, *Rumex obtusifolius, Taraxacum officinale* agg., *Trifolium pratense*, *Trifolium repens, Urtica dioica* and *Veronica chamaedrys.* Relevés BEC 175, BEC 258, BEC 363, RC-LQ R1, RC-LQ R6, RC-LQ R7, RC-LQ R8, 3999_R1, 4270_R1, 4399_R1, 4399_R2, 4400_R1, 4400_R2, 4400_R3, 4400_R4, 4400_R5, 4401_R1, 4401_R2, 4401_R3, 4401_R4, 4401_R5, 4402_R1, 4402_R2, 4415_R1 and 5853_R1, 4259_R1, 4259_R2, 4268_R1, 4243_R1, 4245_R1, 4245_R2, 4246_R1, 4248_R1 and 4149_R3
River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		

Habitat code	Annex I habitat	Key species
GS1	6210	The following species were commonly encountered in calcareous grassland which corresponded with the Annex I Calcareous grassland [6210] habitat: *Achillea millefolium*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Brachythecium rutabulum* , *Briza media*, *Calliergonella cuspidata*, *Campanula rotundifolia*, *Carex caryophyllea*, *Carex flacca*, *Centaurea nigra*, *Ctenidium molluscum*, *Cynosurus cristatus*, *Dactylis glomerata*, *Daucus carota*, *Festuca ovina*, *Festuca rubra*, *Galium verum*, *Helictotrichon pubescens*, *Hypericum pulchrum*, *Hypochaeris radicata*, *Leontodon autumnalis*, *Leontodon hispidus*, *Leucanthemum vulgare*, *Linum catharticum*, *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Plantago maritima*, *Polygala vulgaris*, *Potentilla erecta*, *Prunella vulgaris*, *Ranunculus acris*, *Rosa spinosissima*, *Rubus fruticosus* agg., *Scleropodium purum*, *Sesleria caerulea*, *Solidago virgaurea*, *Succisa pratensis*, *Taraxacum officinale* agg., *Thymus polytrichus*, *Trifolium pratense* and *Trifolium repens* Relevé BEC 7
	*6210	The following species were commonly encountered in calcareous grassland which corresponded with the priority Annex I calcareous grassland [*6210] habitat: *Agrostis capillaris*, *Anthoxanthum odoratum*, *Anthyllis vulneraria*, *Asperula cynanchica*, *Briza media*, *Calliergonella cuspidata*, *Campanula rotundifolia*, *Carex caryophyllea*, *Carex flacca*, *Carex panicea*, *Centaurea nigra*, *Ctenidium molluscum*, *Cynosurus cristatus*, *Dactylis glomerata*, *Dactylorhiza fuchsii*, *Danthonia decumbens*, *Daucus carota*, *Euphrasia officinalis ag.*, *Festuca rubra*, *Galium verum*, *Gymnadenia conopsea*, *Helictotrichon pubescens*, *Holcus lanatus*, *Hypericum pulchrum*, *Koeleria macrantha*, *Leontodon hispidus*, *Leucanthemum vulgare*, *Linum catharticum*, *Listera ovata*, *Lotus corniculatus*, *Pilosella officinarum*, *Plantago lanceolata*, *Plantago maritima*, *Polygala vulgaris*, *Potentilla erecta*, *Prunella vulgaris*, *Rhinanthus minor*, *Rhytidiadelphus squarrosus*, *Rosa spinosissima*, *Scleropodium purum*, *Sesleria caerulea*, *Solidago virgaurea*, *Succisa pratensis*, *Thymus polytrichus*, *Trifolium pratense* and *Trifolium repens* Relevés BEC 15, BEC 17 and BEC 102.
	*8240	Grassland species as described in this table. 3322_R1 and 3322_R5
GS1/ED2	n/a	Grassland and spoil and bare ground species as described in this table. 3729_R1, 3729_R2, 3729_R3, 3729_R4 and 4266_R1

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1/ER2	*8240/6210	*Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense. Asplenium ruta-muraria, Carlina vulgaris, Centranthus ruber, Dryopteris sp., Galium verum, Geranium robertianum, Geranium sanguineum, Hedera helix agg., Leucranthenmum vulgaris, Mycelis muralis, Origanum vulgare, Potentilla sterilis, Rosa spinosissima, Solidago virgaurea, Succisa vulgaris, Teucrium vulgaris.*
GS1/ER2/ WS1	*8240/6210	*Asplenium ruta-muraria, Carlina vulgaris, Centranthus ruber, Dryopteris sp., Galium verum, Geranium robertianum, Geranium sanguineum, Hedera helix agg., Leucranthenmum vulgaris, Mycelis muralis, Origanum vulgare, Potentilla sterilis, Rosa spinosissima, Solidago virgaurea, Succisa vulgaris, Teucrium vulgaris, Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria*
GS1/GS2		*Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense, Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium*
GS1/GS4	n/a	Grassland species as described in this table. 4270_R2
GS1/WS1	6210	Grassland species as described in this table. 85% grassland cover. Scrub species include *Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria,*
GS1/WS1	n/a	*Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. oleifolia, Ulex europaeus*
River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1/WS1/ BL1	*8240/6210	WS1 species as below in table. Grassland species include *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense*
GS1/WS1/ ER1	*8240/6210	*Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria, Calluna vulgaris, Carex panicea, Carex sp., Danthonia decumbens, Erica cinerea, Erica tetralix, Hypochaeris radicata, Rumex acetosella, Sedum anglicum, Ulex gallii* and *Veronica officinalis.* Grassland species as described above in this table.
GS1/WS1/ HD1	6210	*Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria, Blechnum spicant, Lonicera periclymenum, Myrica gale, Pteridium aquilinum, Teucrium scorodonia* and *Ulex gallii.* Grassland species as described above in this table.
GS2	n/a	*Agrostis stolonifera*, *Arrhenatherum elatius*, *Briza media*, *Calystegia sepium*, *Carex flacca*, *Carex hirta*, *Centaurea nigra*, *Chamerion angustifolium*, *Cirsium arvense*, *Cirsium vulgare*, *Crepis* sp., *Cynosurus cristatus*, *Dactylis glomerata*, *Epilobium ciliatum*, *Epilobium hirsutum*, *Equisetum fluviatile*, *Festuca rubra*, *Filipendula ulmaria*, *Galium aparine*, *Heracleum sphondylium*, *Holcus lanatus*, *Juncus inflexus*, *Lathyrus pratensis*, *Leontodon hispidus*, *Lolium perenne*, *Achillea millefolium, Cerastium fontanum, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Rumex crispus, Stellaria graminea, Veronica chamaedrys, Plantago lanceolata*, *Poa annua*, *Prunella vulgaris*, *Pteridium aquilinum*, *Ranunculus acris*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex acetosa*, *Rumex obtusifolius*, *Sonchus asper*, *Stellaria media*, *Succisa pratensis*, *Taraxacum officinale* agg., *Trifolium pratense*, *Trifolium repens*, *Urtica dioica* and *Vicia sepium* 4199_R1
GS2/HD1	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Blechnum spicant, Lonicera periclymenum, Myrica gale, Pteridium aquilinum, Teucrium scorodonia, Ulex gallii*
River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS2/GS4/ WS1	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorrhiza fushii, Epilobium hirstum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorpioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pedunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula, Typha latifolia*
GS2/WL1	n/a	Grassland species as above. WL1 consists of *Corylus avellana, Crataegus monogyna, Hedera helix agg., Prunus spinosa, Rubus fruticosus agg.*
GS2/WS1	n/a	*Calystegia sepium* dominant. *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*
GS4	n/a	*Agrostis stolonifera*, *Anthoxanthum odoratum*, *Calliergonella cuspidata*, *Cirsium arvense*, *Cirsium palustre*, *Cynosurus cristatus Epilobium montanum*, *Filipendula ulmaria*, *Galium palustre*, *Hypericum elodes*, *Juncus articulatus*, *Mentha aquatica*, *Molinia caerulea*, *Juncus effusus*, *Arrhenatherum elatius*, *Holcus lanatus*, *Lychnis flos-cuculi*, *Lythrum salicaria*, *Plantago lanceolata*, *Potentilla anserina*, *Potentilla erecta*, *Trifolium repens*, *Ranunculus flammula*, *Ranunculus repens*, *Ranunculus acris, Rumex obtusifolius*, *Jacobaea vulgaris*, *Sphagnum* spp., *Succisa pratensis*, *Ulex europeaus, Trifolium pratense, Viola palustris* and *Valeriana officinalis* Relevé: RC-LQ R3, 3962_R1, 3962_R2, 3962_R3, 3962_R4, 4275_R1, 4275_R2, 4275_R3, 4275_R4, 4275_R5 and 4275_R6
GS4/WS1	n/a	*Salix* scrub, with species rich GS4 understorey as described above.

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
WD1	n/a	The most frequently recorded species within this habitat were: *Aseculus hippocastanum, Acer pseudoplatanus*, *Arum maculatum*, *Betula spp. Circaea lutetiana, Corylus avellana, Crataegus monogyna, Eurhynchium striatum, Fagus sylvatica, Fraxinus excelsior, Hedera helix, Ilex aquifolium, Isothecium alopecuroides, Isothecium myosuroides, Kindbergia praelonga, Lejeunea cavifolia, Metzgeria furcata, Neckera complanata, Phyllitis scolopendrium, Prunus laureocerasus, Radula complanata, Rhynchostegiella tenella, Rubus fruticosus agg., Salix cinerea, Sorbus acuparia, Sorbus aria, Thamnobryum alopecurum*, *Thuidium tamariscinum*, *Tortella tortuosa* and *Urtica dioica*, Relevés: BEC 174, RC-LQ R2, 3734_R1, 3734_R2, 3734_R3, 3734_R4, 3734_R5, 4255_R1 and 4256_R1
WD1	n/a	A lot of *Acer pseudoplatanus, Fagus sylvatica* present. Previously Oak-ash-hazel woodland (no Annex-I habitat qualification
WL1	n/a	*Calystegia sepium*, *Circaea lutetiana*, *Corylus avellana*, *Crataegus monogyna*, *Euonymus europaeus*, *Fraxinus excelsior*, *Hedera helix*, *Heracleum sphondylium*, *Ilex aquifolium*, *Lathyrus pratensis, Lonicera periclymenum*, *Prunus spinosa*, *Pteridium aquilinum*, *Quercus robur*, *Rubus fruticosus* agg., *Sambucus nigra*, *Sorbus aria*, *Sorbus aucuparia*, *Urtica dioica* and *Viburnum opulus* Some overgrown hedgerow, bramble spreading from the margins at polygon c.150m NE of Menlo castle
WL2	n/a	*Acer pseudoplatanus*, *Betula spp.*, *Alnus glutinosa*, *Corylus avellana*, *Crataegus monogyna*, *Fraxinus excelsior*, *Hedera helix*, *Ilex aquifolium*, *Prunus spinosa*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Salix cinerea,* and *Sambucus nigra* 4149_R2, 4619_R1 and 4619_R2
WL2/BL1/ GS2	n/a	WL2 a described above. Grassland species include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium.*
WN2	n/a (WL2A WL2E)	Oak-ash-hazel woodland in this area was typically either *Corylus avellana* or *Fraxinus excelsior* woodlands. The following species were recorded in areas that did not conform to any Annex I habitat type: *Acer pseudoplatanus*, *Arum maculatum*, *Brachypodium sylvaticum*, *Circaea lutetiana*, *Corylus avellana*, *Crataegus monogyna*, *Eurhynchium hians,*

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

		Eurhynchium striatum, *Fissidens taxifolius*, *Fraxinus excelsior*, *Frullania dilatata*, *Geranium robertianum*, *Geum urbanum*, *Hedera helix*, *Homalothecium sericeum*, *Hypnum resupinatum*, *Ilex aquifolium*, *Isothecium alopecuroides*, *Isothecium myosuroides*, *Kindbergia praelonga*, *Lonicera periclymenum*, *Metzgeria furcata*, *Neckera complanata*, *Phyllitis scolopendrium*, *Plagiomnium undulatum*, *Potentilla sterilis*, *Primula vulgaris*, *Prunus spinosa*, *Quercus robur*, *Radula complanata*, *Rhytidiadelphus triquetrus*, *Rubus fruticosus* agg., *Rumex sanguineus*, *Thamnobryum alopecurum*, *Thuidium tamariscinum*, *Ulota bruchii*, *Veronica chamaedrys* and *Viola* spp. Relevés: BEC 139, BEC 336, BEC 340, BEC 366, BEC 404, RC-LQ R9, RC-LQ R10, 3297_R2, 3754_R1, 3754_R2, 3754_R4, 3768_R2, 4541_R1, 4541_R2, 4541_R5, 5505_R1, 5505_R2, 4422_R1, 4422_R3, 4422_R4, 3857_R1, 3936_R1, 3936_R2, 3936_R3, 3941_R1, 4414_R1, 4473_R1, 3790b_R1, 3790b_R2 and 4538_R2
WN2	*8240 (LPW)	Woodland which corresponded with the Annex I Limestone pavement [*8240] habitat included the following species: *Asplenium trichomanes , Brachypodium sylvaticum*, *Carex flacca*, *Corylus avellana*, *Crataegus monogyna*, *Ctenidium molluscum*, *Euonymus europaeus*, *Eurhynchium striatum*, *Fissidens dubius*, *Fragaria vesca*, *Fraxinus excelsior*, *Frullania dilatata*, *Geranium robertianum*, *Hedera helix*, *Homalothecium sericeum*, *Ilex aquifolium*, *Isothecium alopecuroides*, *Kindbergia praelonga*, *Lonicera periclymenum*, *Metzgeria furcata*, *Neckera complanata*, *Neckera crispa*, *Phyllitis scolopendrium*, *Plagiomnium undulatum*, *Potentilla sterilis*, *Prunus spinosa*, *Pteridium aquilinum*, *Radula complanata*, *Rhytidiadelphus triquetrus*, *Rosa spinosissima*, *Rubus fruticosus* agg., *Scapania aspera*, *Scleropodium purum*, *Sesleria caerulea, Solidago virgaurea*, *Thamnobryum alopecurum*, *Thuidium tamariscinum*, *Tortella tortuosa*, *Ulota bruchii, Ulota crispa*, *Veronica chamaedrys* and *Viola* spp. Relevés BEC 9, BEC 42, BEC 120, BEC 121, BEC 144, BEC 145, BEC 240, BEC 246, BEC 333, BEC 335, RC-LQ R4, 3155_R1, 3494_R1, 4413_R1, 4413_R2, 5508_R1, 3619_R1, 3638_R1, 3177_R2 and 3790_R3
WN2/ER2	*8240	Woodland and exposed calcareous rock species as described in this table. 3790a_R1
WN2/GS2	n/a	Woodland and scrub as described in this table. Small GS2 area found within.
WN2/WS1	n/a	Woodland and scrub species as described in this table. Scrub species include *Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp.* and *Sorbus aria.* 3768_R1
River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WN2/WD1	n/a	Predominant *Fraxinus excelsior* in canopy, overtopping *Crataegus monogyna, Sorbus aria agg.*[4]*, Fagus sylvatica, Salix cinerea, Alnus glutinosa*
WN2/WS5	*8240	WS5 - Partly clear-felled. Species list for WN2 as list in the table.
WN6	*91E0 (WN6_3c)	*Agrostis stolonifera*, *Calliergonella cuspidatum*, *Corylus avellana*, *Crataegus monogyna*, *Epilobium hirsutum*, *Equisetum fluviatile*, *Eurhynchium striatum*, *Filipendula ulmaria*, *Fraxinus excelsior*, *Galium aparine*, *Galium palustre*, *Geranium robertianum*, *Hedera helix*, *Juncus effusus*, *Kindbergia praelonga*, *Lythrum salicaria*, *Prunus spinosa*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex sanguineus*, *Salix cinerea* subsp. *oleifolia* and *Thamnobryum alopecurum* 3297_R1 and 3297a_R2
WS1/GS1	n/a	Predominantly scrub area (75%), species list as described in table.
WS1	n/a	*Symphoricarpos alba, Crataegus monogyna*, *Rubus fruticosus agg., Calystegia sepium, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Corylus avellana, Pteridium aquilinum, Fraxinus excelsior, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp.* and *Hedera helix agg., Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Ulex europaeus*
WS1/ER2	*8240	Limestone pavement as described above. Scrub species include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix xinerea subsp. oleifolia* and *Ulex europeaus.*
WS1/GA1	n/a	70% WS1, 30% GA1. Species as described in table above.
WS1/GS1	n/a	WS1 species as above. Grassland species include *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense*
WS1/GS2	n/a	Scrub and grassland species as described above.

River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

[4] *Sorbus* species are difficult to identify and require a number of characteristics (and potentially genetic work) to definitely confirm species present in the *Sorbus aria* aggregate group, this includes both *Sorbus aria sensu stricto* and *Sorbus hibernica*. Variability is common with both *Sorbus* species and taxonomic difficulties are still an ongoing discussion throughout Britain and Europe (Fay and Rich, 2022). Fay, M.F., Rich, T.C.G. (2022) SORBUS ARIA: Rosaceae, *Curtis's Botanical Magazine*, 39(4), 655-668.

WS1	n/a	The following species were recorded within scrub habitat that does not meet the criteria for the Annex I Limestone pavement [*8240] habitat: *Agrostis capillaris*, *Agrostis stolonifera*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Brachypodium sylvaticum*, *Calliergonella cuspidata*, *Centaurea nigra*, *Circaea lutetiana*, *Corylus avellana*, *Crataegus monogyna*, *Dactylis glomerata*, *Festuca rubra*, *Filipendula ulmaria*, *Fragaria vesca*, *Fraxinus excelsior*, *Geum urbanum*, *Hedera helix*, *Holcus lanatus*, *Ilex aquifolium*, *Juncus conglomeratus*, *Kindbergia praelonga*, *Molinia caerulea*, *Myrica gale*, *Odontites vernus*, *Oxyrrhynchium hians*, *Plagiomnium undulatum*, *Plantago lanceolata*, *Potentilla erecta*, *Potentilla palustris*, *Primula vulgaris*, *Prunus spinosa*, *Pteridium aquilinum*, *Radula complanata*, *Ranunculus repens*, *Rhytidiadelphus squarrosus*, *Rosa canina*, *Rubus fruticosus* agg., *Rumex sanguineus*, *Salix cinerea*, *Symphoricarpos albus*, *Thamnobryum alopecurum*, *Thuidium tamariscinum*, *Trifolium pratense*, *Trifolium repens*, *Ulex europaeus*, *Urtica dioica*, *Veronica montana* and *Vicia sepium* 3938_R1, 3938_R2, 3938_R3, 4142_R1, 4155_R1, 4155_R2, 4155_R3, 4156_R1, 4156_R2, 4156_R3, 4156_R4, 4156_R5, 4270_R3, 4422_R2, 4517_R4, 4538_R1, 4541_R3, 4541_R4, 3754_R3 and 5505_R3
WS1	*8240 (LPE)	The following species were typical of areas of scrub that corresponded with the Annex I Limestone pavement [*8240] habitat: *Agrimonia eupatoria*, *Asplenium adiantum-nigrum*, *Brachythecium rutabulum*, *Calliergonella cuspidata*, *Campylium stellatum v. protensum*, *Cladonia pocillum*, *Didymodon insulanus*, *Dryopteris filix-mas*, *Epipactis atrorubens*, *Euphrasia salisburgensis*, *Euphrasia species*, *Fissidens taxifolius*, *Galium sterneri*, *Galium verum*, *Holcus lanatus*, *Homalothecium sericeum*, *Hylocomium brevirostre*, *Hypnum lacunosum*, *Hypochaeris radicata*, *Isothecium myosuroides*, *Lathyrus pratensis*, *Leontodon hispidus*, *Leontodon saxatilis*, *Plagiomnium species*, *Ranunculus acris*, *Schistidium apocarpum*, *Schistidium crassipilum*, *Trichostomum brachydontium*, *Trifolium pratense*, *Ulota bruchii*, *Veronica chamaedrys* and *Veronica montana* Relevés BEC 8, BEC 18, BEC 35, BEC 148, BEC 242, 3088_R1, 3088_R2, 3088_R3, 3088_R4, 3705_R1, 3705_R2, 3494_R2, 5507_R1 and 3322_R2
WS1	6210	Scrub species as described in this table. 3513_R1, 3513_R2 and 3322_R4
WS1/ER1	n/a	*Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia, Ulex europaeus, Calluna vulgaris, Carex panicea, Carex sp., Danthonia decumbens, Erica cinerea, Erica tetralix, Hypochaeris radicata, Rumex acetosella, Sedum anglicum, Ulex gallii* and *Veronica officinalis.*
River Corrib to Lackagh Quarry and Surrounding areas (which includes part of Lough Corrib SAC) - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WS1/HD1	n/a	*Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia, Ulex europaeus, Blechnum spicant, Lonicera periclymenum, Myrica gale, Teucrium scorodonia* and *Ulex gallii.*
WS1/ER2	*8240	Scrub and exposed calcareous rock species as described in this table. 3156_R1 and 3177_R1
WS2	n/a	*Anthriscus sylvestris*, *Corylus avellana*, *Crataegus monogyna*, *Fraxinus excelsior*, *Geranium robertianum*, *Hedera helix*, *Rubus fruticosus* agg. and *Salix* spp.
WS5	n/a	New area recently cleared, felled in Oak-ash-hazel woodland, species list as described in table above.

EC33

EC33 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Sonchus oleraceus*, *Arrhenatherum elatius*, *Rubus fruticosus*, *Jacobaea vulgaris*, *Potentilla sterilis*, *Epilobium montana*, *Chamerion angustifolium*, *Hedera helix*, *Lonicera periclymenum* and *Cirsium arvensis.*
ER2	*8240 (LPE_3a)	*Hedera helix*, *Rosa spinosissima*, *Asplenium ruta-muraria*, *Ctenidium molluscum*, *Geranium robertianum*, *Sesleria caerulea*, *Ilex aquilinum*, *Prunus spinosa*, *Sorbus aria agg.*[5], *Corylus avellana*, *Teucrium scorodonia*, *A. Trichomanes*, *Thymus polytrichus*, *Fragaria vesca* and *Viburnum opulus.* EC33 R3
FS1	n/a	*Phragmites australis, Lythrum salicaria* and *Filipendula ulmaria.*
HD1	n/a	*Pteridium aquilinum*, *Arrhenatherum elatius*, *Sonchus oleraceus*, *Holcus lanatus* and *Galium aparine*.
GS1	6210 (GL3a)	*Briza media*, *Galium verum*, *Prunella vulgaris*, *Succisa pratensis*, *Dactylis fuchsia*, *Thymus polytrichus*, *Trifolium pratensis*, *Sesleria albicans*, *Anthoxanthum odoratum* and *Lotus corniculatus.* Also some wet elements in grassland adjacent to wetland e.g. *Schoenus nigricans, Molinia caerulea* and *Galium boreale.* EC33 R2 and EC33 R4
EC33 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

[5] *Sorbus* species are difficult to identify and require a number of characteristics (and potentially genetic work) to definitely confirm species present in the *Sorbus aria* aggregate group, this includes both *Sorbus aria sensu stricto* and *Sorbus hibernica.* Variability is common with both *Sorbus* species and taxonomic difficulties are still an ongoing discussion throughout Britain and Europe (Fay and Rich, 2022). Fay, M.F., Rich, T.C.G. (2022) SORBUS ARIA: Rosaceae, *Curtis's Botanical Magazine*, 39(4), 655-668.

GS2	n/a	Species-poor variant. Typical species include *Lolium perenne*, *Odontites verna*, *Ranunculus repens*, *Cirsium arvensis*, *Centaurea nigra*, *Holcus lanatus* and *Agrostis capillaris.*
GS2	6510 (GL3e)	Typical species include *Plantago lanceolata*, *Odontites verna*, *Ranunculus acris*, *Prunus vulgaris*, *Jacobaea vulgaris*, *Lolium perenne*, *Cerastium fontanum*, *R. repens*, *Centaurea nigra*, *Leucanthemum vulgare* and *Trifolium repens.* EC33 R1
WL1/GS2	n/a	GS2 species as above with species poor variant. WL1 species include *Corylus avellana, Crataegus monogyna, Hedera helix, Prunus spinosa* and *Rubus fruticosus agg.*
WN2	n/a	*Corylus avellana*, *Hedera helix*, *Fraxinus excelsior*, *Veronica chamaedrys*, *Rubus fruticosus*, *Primula vulgaris*, *Rhytidiadelphus triquetrus*, *Geranium robertianum* and *Brachythecium rutabulum.*
WN6	*91E0	Occurs in mosaic with scrub and reed swamp (FS1). *Salix cinerea*, *Fraxinus excelsior*, *Iris pseudacorus*, *Phragmites australis* and *Filipendula ulmaria*.
WS1	n/a	*Prunus spinosa*, *Crataegus monogyna*, *Rubus fruticosus*, *Arrhenatherum elatius*, *Euonymus europaeus*, *Lonicera periclymenum* and *Calystegia sepium*.

EC36

EC36 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL3/ED3/ WS1	n/a	*Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*
ER2	*8240 (LPE_1b/1c)	*Acer pseudoplatanus*, *Asplenium ruta-muraria*, *Buddleja davidii.*, *Calluna vulgaris*, *Carex flacca*, *Carlina vulgaris*, *Centranthus ruber*, *Ceterach officinalis*, *Corylus avellana*, *Cotoneaster* sp., *Festuca ovina*, *Fissidens dubius*, *Fraxinus excelsior*, *Geranium robertianum*, *Hedera helix*, *Ilex aquifolium*, *Linum catharticum*, *Lotus corniculatus*, *Mycelis muralis*, *Potentilla erecta*, *Prunus spinosa*, *Rosa spinosissima*, *Rubus fruticosus* agg., *Sesleria albicans*, *Sorbus aria agg.*[6], *Succisa pratensis*, *Teucrium scorodonia*, *Thalictrum minus*, *Thymus praecox*, *Tortella tortuosa* and *Trichostomum crispulum.* EC36 R6
GA1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Poa annua, Rumex obtusifolius, Stellaria media, Holcus lanatus*, *Trifolium repens*, *Ranunculus repens*, *Cirsium arvense*, *Ranunculus acris*, *Rumex crispus*, *Agrostis stolonifera*, *Heracleum sphondylium* with *Plantago major*, *Ononis repens*, *Rumex obtusifolius*. Occasional GS4 species *e.g. Juncus effusus*, *Potentilla anserina* and *Carex hirta*. 1875_R1
GA1/BL3/ WL2	n/a	Grassland (GA1) and Built environment dominate this mosaic, accounting for 90% of the area. Grassland species include *Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens,* WL2 species include *Acer pseudoplatanus, Acer sp., Cupressus × leylandii, Fraxinus excelsior, Populus tremula*

[6] *Sorbus* species are difficult to identify and require a number of characteristics (and potentially genetic work) to definitely confirm species present in the *Sorbus aria* aggregate group, this includes both *Sorbus aria sensu stricto* and *Sorbus hibernica*. Variability is common with both *Sorbus* species and taxonomic difficulties are still an ongoing discussion throughout Britain and Europe (Fay and Rich, 2022). Fay, M.F., Rich, T.C.G. (2022) SORBUS ARIA: Rosaceae, *Curtis's Botanical Magazine*, 39(4), 655-668.

EC36 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS1	n/a	Non-annex variant. Typical species include *Ranunculus acris*, *Holcus lanatus*, *Dactylis glomerata*, *Centaurea nigra*, *Plantago lanceolata*, *Cirsium arvense*, *Jacobaea vulgaris*, *Cynosurus cristatus*, *Prunella vulgaris*, *Festuca rubra*, *Trifolium repens*, *Lolium perenne*, *Agrostis stolonifera*, *Trifolium pratense*, *Taraxacum officinale* agg. Some *Daucus carota*, *Lotus corniculatus*, *Galium verum*, *Linum catharticum*. Some GS4 species locally e.g. *Filipendula ulmaria* and *Carex hirta*. 1841_R1, 1843_R1, 1858_R1, 1862_R1, 1890_R1, 1890_R2, 1897_R1, 1897_R2, 4608_R1, 4610_R1, 4611_R1, 4612_R1 and 4613_R1
	6210/6210* (GL3a)	Annex Habitat sometimes with orchids. Typical species include *Briza media*, *Sesleria caerulea*, *Anthyllis vulneraria*, *Succisa pratensis*, *Lotus corniculatus*, *Leontodon hispidus*, *Carex flacca*, *Centaurea nigra*, *Linum catharticum*, *Ctenidium molluscum*, *Pilosella officinarum*, *Primula veris*, *Galium verum*, *Carlina vulgaris*, *Rhinanthus minor*, *Solidago virgaurea*, with orchids *Gymnadenia conopsea* and *Dactylorhiza fuchsii* and *Neottia ovata*, *Primula veris, Leucanthemum vulgare, Daucus carota, Crepis capillaris, Avenula pubescens* and *Homalothecium lutescens*. Some encroaching scrub of *Pteridium aquilinum*, *Prunus spinosa* and *Crataegus monogyna*. EC36 R1 and EC36 R3
GS1/GA1	n/a	Species as described in this table.
GS1/ GS2b	n/a	Species-poor GS2b *Arrhenatherum elatius*, *Ranunculus repens*, *Cirsium arvense*, *Rumex obtusifolius*, *Rumex crispus*, *Potentilla anserina*, *Heracleum sphondylium*, *Cerastium fontanum*, *Juncus effusus*, *Lolium perenne*, *Agrostis stolonifera*, *Holcus lanatus*, *Alopecurus pratensis*, *Urtica dioica, Potentilla anserina*, with occasional GS1 species *e.g. Prunella vulgaris*, *Centaurea nigra*, *Trifolium pratensis*, *Achillea millefolium, Leontodon hispidus*, *Rosa spinosissima*, *Centaurea nigra*, *Anthyllis vulneraria*, *Linum catharticum*, *Prunella vulgaris*, *Lotus corniculatus* and *Euphrasia officinalis* agg.

EC36 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS1/GS2/ WS1	n/a	Typical GS1 species as described above. Other species include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus*
GS1/ HD1	n/a	Typical GS1 species with *Pteridium aquilinum*. Some areas highly grazed, others with low grazing.
GS1/WL1	n/a	Typical GS1 species with *Corylus avellana, Crataegus monogyna, Hedera helix, Prunus spinosa* and *Rubus fruticosus agg.*
GS1/WS1	n/a	Typical GS1 species with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus.*
GS2	n/a	Low species-diversity variant. Typical species: *Arrhenatherum elatius*, *Ranunculus repens*, *Cirsium arvense*, *Rumex obtusifolius*, *Rumex crispus*, *Potentilla anserina*, *Heracleum sphondylium*, *Cerastium fontanum*, *Juncus effusus*, *Lolium perenne*, *Agrostis stolonifera*, *Holcus lanatus*, *Alopecurus pratensis, Dactylis glomerata, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium* and *Urtica dioica*. Occasional GS1 species e.g. *Prunella vulgaris*, *Centaurea nigra*, *Trifolium pratensis*, *Achillea millefolium*, in shorter vegetation.

EC36 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS2	n/a	More species-rich variant. Typical species are *Heracleum sphondylium* (LD), *Stachys sylvatica*, *Phleum pratense*, *Calystegia sepium*, *Lolium perenne*, *Rumex obtusifolius*, *Lathyrus pratensis*, *Tussilago farfara*, *Arrhenatherum elatius* (LA), *Cirsium arvense* (LA), *Dactylis glomerata* and *Lapsana communis.* Occasional GS1/ 6210 indicators e.g. *Knautia arvensis*, *Galium verum*, *Centaurea nigra* (LA), *Rhinanthus minor*, *Rosa spinosissima*, *Leucanthemum vulgare*, *Daucus carota*, *Pimpinella saxifraga*, *Dactylorhiza fuchsii*, *Succisa pratense* (LA), *Carex flacca*, *Thymus polytrichus*, *Lotus corniculatus.* Scattered scrub frequent e.g. *Rubus fruticosus* agg. *Prunus spinosa*, *Pteridium aquilinum*, *Corylus avellana*, *Sorbus* sp.

	6510	Typical species are (but not limited to) *Cynosurus cristatus*, *Festuca rubra/ovina*, *Dactylis glomerata*, *Phleum pratense*, *Agrostis capillaris*, *Briza media*, *Holcus lanatus*, *Anthoxanthum odoratum*, *Rhinanthus minor*, *Centaurea nigra*, *Plantago lanceolata*, *Lotus corniculatus*, *Achillea millefolium*, *Daucus carota*, *Agrimonia eupatoria*, *Thymus praecox*, *Hypochaeris radicata*, *Prunella vulgaris*, *Ranunculus acris, Cerastium fontanum*, *Prunus spinosus* and *Filipendula ulmaria*. EC36 R7
GS2/ WS1	n/a	GS2 species: *Centaurea nigra*, *Leucanthemum vulgare*, *Arrhenatherum elatius*, *Centranthus ruber*, *Plantago lanceolata*, *Polygala vulgaris*, *Calliergonella cuspidata*, *Agrostis stolonifera*, *Potentilla erecta*, *Hypochaeris radicata*, *Brachypodium sylvaticum*, with frequent WS1 species: *Rubus fruticosus* agg., *Fraxinus excelsior*, *Acer pseudoplatanus*, *Chamerion angustifolium*, *Salix caprea* and *Corylus avellana.* 6210 species in shorter vegetation e.g. *Briza media*, *Lotus corniculatus*, *Carex flacca*, *Galium verum*, *Carlina vulgaris* and *Tortella tortuosa.* 1881_R1
GS4	n/a	High species-diversity wet grassland. Typical species include *Juncus conglomeratus*, *Agrostis stolonifera*, *Potentilla erecta*, *Dactylorhiza fuchsii*, *Prunella vulgaris*, *Juncus bufonius*, *Filipendula ulmaria* (LD), *Lotus corniculatus*, *Lathyrus linifolius*, *Juncus effusus*, *Holcus lanatus*, *Carex flacca*, *Succisa pratensis* (LA), *Anthoxanthum odoratum*, *Molinia caerulea*, *Hypochaeris radicata*, *Vicia cracca*, *Centaurea nigra*, *Carex panicea*, *Plantago lanceolata*, *Potentilla anserina*, *Vicia sepium*, *Cirsium arvense* (LD), *Lathyrus pratensis*, *Persicaria amphibia* and *Alopecurus pratensis*. Occasional 6210 species e.g. *Lotus corniculatus*, *Rhinanthus minor*, *Euphrasia officinalis* agg. and *Gymnadenia conopsea.*

EC36 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GS4/ FS2	n/a	Central wet channel supports tall-herb swamp FS2 (with local areas of reed and large sedge swamp FS1): *Juncus effusus*, *Nasturtium aquaticum* (LD), *Glyceria fluitans*, *Juncus articulatus*, *Typha latifolia*, *Eleocharis palustris*, *Potamogeton natans*, *Iris pseudacorus*, *Lemna minor* and *Lemna minuta*. Vegetation cover decreases in channel to southeast. Wet grassland with typical GS4 species (above) with additions such as *Trifolium pratense*, *Ranunculus acris*, *Hypericum pulchrum*, *Equisetum palustre*, *Epilobium hirsutum*, *Cirsium palustre*, *Mentha aquatica*, *Carex nigra*, *Carex disticha*, *Galium palustre*, *Epilobium palustre*, *Dactylorhiza fuchsii*, *Lythrum salicaria*, *Daucus carota* and *Jacobaea aquatica.*

GS4/WS1	n/a	*Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia, Ulex europeaus, Angelica sylvestris, Carex echinata, Carex panicea, Comarum palustre, Dactylorhiza fuschii, Epilobium hirsutum, Equisetum fluviatile, Filipendula ulmaria, Galium palustre, Hydrocotyle vulgaris, Hypericum scorioides, Jacobaea aquatica, Juncus acutiflorus, Juncus effusus, Lotus pedunculatus, Lythrum salicaria, Mentha aquatica, Persicaria hydropiper, Ranunculus flammula and Typha latifolia.*
HD1	n/a	*Pteridium aquilinum* (D), *Cirsium arvense* and *Rumex crispus*.
WL1	n/a	*Crataegus monogyna*, *Prunus spinosa*, *Fraxinus excelsior*, *Rubus fruticosus* agg. *Pteridium aquilinum* (at edges), *Corylus avellana*, *Calystegia sepium*, *Urtica dioica*, Hedera *helix* and *Ilex aquifolium*.
WL1/GS1/ ED3	n/a	WL1 species as described above. Other species present includes *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense, Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum.*
WL1/GS2	n/a	*Corylus avellana, Crataegus monogyna, Hedera helix, Prunus spinosa, Rubus fruticosus agg., Achillea millefolium, Arrhenatherum elatius, Centaurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypochaeris radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum officinale agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys* and *Vicia sepium.*
WL2	n/a	*Fraxinus excelsior* dominant (mature and young trees) with *Prunus spinosa*, *Hedera helix*, *Asplenium scolopendrium*, *Rubus fruticosus* agg. *Thamnobryum alopecurum*, *Crataegus monogyna*, *Calystegia sepium*, *Urtica dioica*, *Corylus avellana* and *Populus tremula*.
EC36 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WN2	n/a	*Fraxinus excelsior* with *Crataegus monogyna, Hedera helix, Acer pseudoplatanus*, *Populus tremula, Ilex aquifolium*, *Lonicera periclymenum*, *Dryopteris dilatata*, *Carex remota*, *Eurhynchium striatum* and *Neckera complanata, Prunus spinosa*, *Ilex aquilinum*, *Corylus avellana*, *Fragaria vesca*, *Hedera helix*, *Rubus fruticosus*, *Viola* spp., *Geranium robertianum*, *Rosa canina*, *Circaea lutetiana* and *Brachypodium sylvaticum*. 1885_R1, 4473_R2 and 1893_R1

	*8240 (LPW_2a)	*Corylus avellana, Ilex aquifolium*, *Euonymus europaeus*, *Fraxinus excelsior*, *Crataegus monogyna* and *Rubus fruticosus* agg. Ground flora includes *Thamnobryum alopecurum*, *Eurhynchium striatum*, *Neckera crispa Dryopteris filix-mas*, *Asplenium scolopendrium*, *Melica uniflora*, *Circaea lutetiana*, *Potentilla sterilis*, *Primula vulgaris* and *Geranium robertianum. Calystegia sepium, Cirsium arvense, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia and Ulex europeaus* EC36 R2, 1889_R1 and 1883_R1
WS1	n/a	*Corylus avellana*, *Prunus spinosa*, *Crataegus monogyna*, *Rubus fruticosus* agg., *Salix sp., Sorbus aria,Pteridium aquilinum* and *Hedera helix*. Occasional mature *Fraxinus excelsior* trees. 4612_R2
WS1/GS2	n/a	WS1 dominant,(as described above) with some grassland species; *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium*

EC37

EC37 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Cirsium arvense*, *Tripleurospermum inodorum*, *Persicaria maculata*, *Rumex crispus*, *Stellaria media*, *Euphorbia helioscopia*, *Plantago major*, *Rumex obtusifolius*, *Sonchus oleraceus*, *Sisymbrium officinale*, *Cirsium vulgare*, *Centaurea nigra*, *Potentilla anserina* with scattered *Rubus fruticosus* agg. scrub.
EC37 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

ER2	*8240 (LPE_1b)	Typical species include *Teucrium scorodonia*, *Geranium robertianum*, *Asplenium ruta-muraria*, *Asplenium scolopendrium*, *Tortella tortuosa*, *Fissidens dubius*, *Fragaria vesca*, *Sesleria caerulea*, *Mycelia muralis*, *Hedera helix*, *Ctenidium molluscum*, *Erica cinerea*, *Asperula cynanchica*, *Plantago maritima*, *Thymus polytrichus*, *Briza media*, *Calluna vulgaris* and *Hedera helix.* Invading scrub comprises *Corylus avellana*, *Prunus spinosa*, *Crataegus monogyna*, *Euonymus europaeus* and *Rubus fruticosus* agg. EC37 R3
GA1/GS2	n/a	*Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium*
GA1/WS1	n/a	30% scrub cover. *Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Jacobaea vulgaris, Lolium perenne, Plantago lanceolata, Plantago major, Poa annua, Ranunculus acris, Ranunculus repens, Rumex obtusifolius, Stellaria media, Trifolium repens, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*
GS1	n/a	Low species-diversity variant. Typical species include *Trifolium repens*, *Cirsium arvense*, *Calliergonella cuspidata*, *Ranunculus repens*, *Dactylis glomerata*, *Lolium perenne*, *Cynosurus cristatus*, *Odontites verna*, *Cerastium fontanum*, *Trifolium pratense*, *Prunella vulgaris*, *Pteridium aquilinum*, *Plantago lanceolata*, *Brachythecium rutabulum*, *Holcus lanatus*, *Festuca rubra*, *Filipendula ulmaria* and *Bellis perennis*.
	n/a	Higher species-diversity variant. Typical species include *Cynosurus cristatus*, *Alopecurus pratensis*, *Trifolium repens*, *Cirsium palustre*, *Ranunculus repens*, *Ranunculus acris*, *Festuca rubra*, *Cerastium fontanum*, *Lolium perenne*, *Taraxacum officinale*, *Rumex acetosa*, *Trifolium pratense*, *Holcus lanatus* and *Plantago lanceolata. Leucanthemum vulgare*, *Trisetum flavescens*, *Thymus polytrichus*, *Lotus corniculatus Briza media* and *Cirsium arvense*. EC37 R5, EC37 R7 and 4956_R1
	6210 and *6210 (GL3a)	Typical GS1 species (mentioned above) with calcareous indicator species frequent e.g. *Lotus corniculatus*, *Centaurea nigra*, *Briza media*, *Carex flacca*, *Daucus carota*, *Sesleria caerulea*, *Anthyllis vulneraria* and *Thymus polytrichus;* and frequent orchids *Anacamptis pyramidalis* and *Dactylorhiza fuchsia*. EC37 R1, EC37 R4, EC37 R6 and EC37 R8

EC37 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1/ED3	n/a	Patches of *Reynoutria japonica* *Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina. Rumex crispus Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense*
GS1/ ER2	6210 (GL3A LPE_4B)	Species include *Sesleria albicans*, *Anacamptis pyramidalis*, *Briza media*, *Carex flacca*, *Thymus polytrichus*, *Teucrium scorodonia*, *Linum catharticum*, *Pilosella officinarum*, *Carlina vulgaris*, *Lotus corniculatus*, *Blackstonia perfoliata*, *Plantago maritima*, *Tortella tortuosa*, *Fissidens dubius* and *Ctenidium molluscum*.
GS2	n/a	*Arrhenatherum elatius* generally dominant with *Vicia cracca*, *Plantago lanceolata*, *Taraxacum officinale*, *Potentilla anserina*, *Potentilla reptans*, *Dactylis glomerata*, *Trifolium repens*, *Rhytidiadelphus squarrosus*, *Rubus fruticosus* agg., *Ranunculus acris*, *Festuca rubra*, *Agrostis stolonifera*, *Holcus lanatus*, *Calystegia sepium*, *Cirsium arvense*, *Lathyrus pratensis*, *Heracleum sphondylium.* Where it occurs in a mosaic with *8240, there are some calcareous indicators (e.g. *Carex flacca*, *Briza media*, *Galium verum*, *Sesleria albicans*, *Leucanthemum vulgare*, *Dactylorhiza fuchsii*) but not enough for 6210 and *A. elatius* still abundant in tall vegetation.
GS2/GS1	n/a	Roughly 60:40 GS2:GS1 GS2 species include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium,* GS1 species include *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense*
GS2/WS1	n/a	Some areas of GS2 occur in a mosaic with small areas of WS1. Species present include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus. agg., Salix cinerea subsp. Oleifolia, Ulex europaeus.*

EC37 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WL1/GS2	n/a	*Corylus avellana, Crataegus monogyna, Hedera helix, Prunus spinosa, Rubus fruticosus agg., Achillea millefolium, Arrhenatherum elatius, Centaurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypochaeris radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum officinale agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys* and *Vicia sepium.*
WN2	n/a	*Corylus avellana* (D), *Crataegus monogyna*, *Hedera helix* (LD), *Primula veris*, *Ilex aquifolium*, *Rubus fruticosus* agg., *Arum maculatum*, *Primula vulgaris*, *Prunus spinosa*, *Kindbergia praelonga*, *Thamnobryum alopecurum* and *Eurhynchium striatum.* Grades to WS1 at edges. 1973_R1 and 1979_R1
WN2/ WS1	*8240 (LPW_2a in mosaic with WS1)	*Corylus avellana* dominant (mostly <3m in height) with typical *8240 (LPW) species in understorey e.g. *Prunus spinosa*, *Rubus fruticosus* agg., *Sorbus aria*, *Sorbus aria agg.*[7], *Fragaria vesca*, *Neckera crispa*, *Rosa spinosissima*, *Thuidium tamariscinum*, *Ilex aquifolium*, *Brachypodium sylvaticum* and *Hedera helix*. EC37 R2
WS1	n/a	Scrub with occasional mature *Fraxinus excelsior*. *Pteridium aquilinum* often abundant at edges. Additional species: *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Salix cinerea subsp. oleifolia, Rubus fruticosus agg.*, *Prunus spinosa*, *Corylus avellana* (particularly on limestone pavement), *Epilobium hirsutum*, *Chamerion angustifolium*, *Ulex europaeus* and *Hedera helix.* 1949_R1, 1974_R1 and 1982_R1
WS1/GS1	n/a	60% Scrub area, the remainder improved grassland. Species list for both habitats as described in this table. *Reynoutria japonica* also present
WS1/GS2	n/a	80% Scrub cover, remainder grassland habitat. Species list as described above in this table.
WS2	n/a	*Betula pendula, Alnus glutinosa Fraxinus excelsior, Acer pseudoplatanus* and *Ilex aquifolium*

Lackagh Quarry to the N84 Headford Road (Ch. 11+250 – Ch. 12+100) – Habitats between EC36, EC37 and EC39, including Lackagh Quarry

Lackagh Quarry to the N84 Headford Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

[7] *Sorbus* species are difficult to identify and require a number of characteristics (and potentially genetic work) to definitely confirm species present in the *Sorbus aria* aggregate group, this includes both *Sorbus aria sensu stricto* and *Sorbus hibernica*. Variability is common with both *Sorbus* species and taxonomic difficulties are still an ongoing discussion throughout Britain and Europe (Fay and Rich, 2022). Fay, M.F., Rich, T.C.G. (2022) SORBUS ARIA: Rosaceae, *Curtis's Botanical Magazine*, 39(4), 655-668.

BL3/ED3	n/a	Species include *Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum.*
BL3/GA2	n/a	Residential area. Grassland species include *Bellis perennis, Lolium perenne, Odontits vernus, Rumex acetosella, Trifolium pratense.*
BL3/GS1	n/a	Grassland species include *Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense.*
ED2	n/a	*Festuca rubra, Centaurea nigra, Plantago maritima, Didymodon insulanus, Rubus fruticosus agg., Carex flacca, Potentilla sterilis, Teucrium scorodonia, Agrostis capillaris and Calliergonella cuspidata* 4560_R1, 5379_R1 and 5413_R1
ED3	n/a	*Achillea millefolium*, *Agrostis canina*, *Arrhenatherum elatius*, *Bellis perennis*, *Blackstonia perfoliata*, *Briza media*, *Carex panicea*, *Centaurea nigra*, *Centaurium erythraea*, *Dactylis glomerata*, *Festuca rubra*, *Festuca* spp., *Galium verum*, *Gymnadenia conopsea*, *Hypericum pulchrum*, *Leontodon autumnalis*, *Leucanthemum vulgare*, *Lolium perenne*, *Lotus corniculatus*, *Odontites verna*, *Pilosella officinarum*, *Pimpinella major*, *Potentilla reptans*, *Prunus vulgaris*, *Pteridium aquilinum*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex* spp., *Salix cinerea*, *Jacobaea vulgaris*, *Solidago virgaurea*, *Succisa pratensis*, *Tussilago farfara*, *Ulex europaeus* and *Vicia cracca* 5412_R1 and 5381_R1
ED3/GS1/ WS1	n/a	*Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum, Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense, Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria.*
Lackagh Quarry to the N84 Headford Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

ED3/GS1/ WS1/FL8	n/a	*Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum, Campanula rotundifolia, Carex flacca, Carlina vulgaris, Centaurium erythraea, Centurea nigra, Conopodium majus, Cynosurus cristatus, Daucus carota, Lathyrus pratensis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella aurantiaca, Polygala vulgaris, Trifolium pratense, Corylus avellana, Crataegus monogyna, Prunus spinosa, Rubus fruticosus agg., Salix sp., Sorbus aria, Juncus sp., Phragmites australis, Salix sp., Typha latifolia.*
GA1	n/a	*Arrhenatherum elatius, Capsella bursa-pastoris, Cerastium fontanum, Jacobaea vulgaris, Poa annua, Ranunculus acris, Stellaria media, Agrostis* spp., *Bellis perennis*, *Centaurea nigra*, *Cirsium arvense*, *Cirsium* spp., *Cynosurus cristatus*, *Dactylis glomerata*, *Epilobium montanum*, *Holcus lanatus*, *Lolium perenne*, *Odontites vernus*, *Pimpinella major*, *Plantago lanceolata*, *Plantago major*, *Polypodium* spp., *Prunella vulgaris*, *Prunus spinosa*, *Pteridium aquilinum*, *Ranunculus repens*, *Rumex* spp., *Trifolium repens* and *Urtica dioica*
GA1/WS1	n/a	Mostly GA1 (as above) with small patches of WS1. Species in scrub area include *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europaeus.*
GS1	n/a	Calcareous grassland that does not meet EU Annex I habitat criteria. Species include *Agrostis canina*, *Arrhenatherum elatius*, *Bellis perennis*, *Briza media*, *Carex* spp., *Centaurea nigra*, *Cirsium arvense*, *Cirsium vulgare*, *Ctenidium molluscum*, *Cynosurus cristatus*, *Dactylis glomerata*, *Holcus lanatus*, *Leontodon hispidus*, *Leontodon saxatilis*, *Leucanthemum vulgare*, *Lolium perenne*, *Lolium* spp., *Lotus corniculatus*, *Pimpinella major*, *Plantago lanceolata*, *Polygonum* sp., *Potentilla reptans*, *Prunella vulgaris*, *Ranunculus repens*, *Rumex obtusifolius*, *Rumex* spp., *Jacobaea vulgaris*, *Solidago virgaurea*, *Trifolium dubium*, *Trifolium pratense* and *Trifolium repens* 1970_R1, 4561_R1, 4563_R1, 4563_R2, 5391_R1, 5403_R1, 5407_R1, 5408_R1, 5411_R1 and 5629_R1
	6210	Annex I habitat with the following species: *Briza media*, *Calliergonella cuspidata*, *Centaurea nigra*, *Festuca rubra*, *Anthoxanthum odoratum*, *Anthyllis vulneraria*, *Carex panicea*, *Pimpinella major*, *Plantago lanceolata*, *Achillea millefolium*, *Blackstonia perfoliata*, *Leucanthemum vulgare*, *Lotus corniculatus*, *Rubus fruticosus* agg., *Centaurium erythraea*, *Tussilago farfara, Carex flacca*, *Hypericum pulchrum*, *Leontodon hispidus*, *Linum catharticum*, *Potentilla anserina*, *Prunella vulgaris*, *Taraxacum officinale* agg., *Trifolium pratense, odoratum*, *Agrostis capillaris*, *Knautia arvensis*,

Lackagh Quarry to the N84 Headford Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

		Pimpinella major, *Cotoneaster* sp., *Daucus carota*, *Helictotrichon pubescens*, *Hypericum pulchrum*, *Lathyrus pratensis*, *Plantago lanceolata*, *Potentilla anglica*, *Ranunculus repens*, *Solidago virgaurea*, *Alchemilla vulgaris*, *Calystegia sepium*, *Cirsium dissectum*, *Teucrium scorodonia*, *Agrostis canina*, *Alchemilla mollis*, *Campanula rotundifolia*, *Dactylorhiza fuchsii*, *Lolium perenne*, *Odontites vernus*, *Plantago major*, *Plantago maritima*, *Potentilla reptans*, *Rumex* spp., *Salix cinerea*, *Trifolium dubium* and *Vicia cracca* LQ-N84 R1 and LQ-N84 R2
GS1/GS2	n/a	Small area of grassland on rocky mound, waste land that is becoming encroached by bramble and scrub; Small patch of *Reynoutria japonica*. *Angelica sylvestris*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Calystegia sepium*, *Crataegus monogyna*, *Dactylis glomerata*, *Epipactis helleborine*, *Festuca rubra*, *Festuca vivipara*, *Homalothecium sericeum*, *Hylocomium splendens*, *Lathyrus pratensis*, *Leontodon hispidus*, *Leucanthemum vulgare*, *Linum catharticum*, *Lotus corniculatus*, *Lythrum salicaria*, *Petasites pyrenaicus*, *Pimpinella major*, *Pimpinella saxifraga*, *Plantago lanceolata*, *Potentilla anserina*, *Potentilla reptans*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Salix caprea*, *Salix cinerea*, *Jacobaea vulgaris*, *Trifolium dubium*, *Trifolium pratense* and *Vicia cracca*
GS1/WS1	n/a	Species as described in this table.
GS2	n/a	*Arrhenatherum elatius*, *Calystegia sepium*, *Centaurea nigra*, *Dactylis glomerata*, *Epilobium montanum*, *Filipendula ulmaria*, *Fraxinus excelsior*, *Lathyrus pratensis*, *Leucanthemum vulgare*, *Plantago lanceolata*, *Prunus spinosa*, *Ranunculus repens*, *Rubus fruticosus* agg., *Rumex crispus*, *Salix cinerea*, *Jacobaea vulgaris*, *Tussilago farfara* and *Ulex europaeus* 5410_R1
HD1	n/a	*Dactylis glomerata*, *Prunus spinosa*, *Pteridium aquilinum* and *Rubus fruticosus* agg.
WL1	n/a	*Calystegia sepium*, *Cirsium arvense*, *Corylus avellana*, *Crataegus monogyna*, *Euonymus europaeus*, *Fraxinus excelsior*, *Hedera helix*, *Ilex aquifolium*, *Lathyrus pratensis*, *Lonicera periclymenum*, *Prunus spinosa*, *Pteridium aquilinum*, *Quercus robur*, *Rosa canina*, *Rubus fruticosus* agg., *Salix caprea*, *Salix cinerea*, *Sorbus aria*, *Urtica dioica* and *Viburnum opulus*
WL1/WS1	n/a	WL1 as above, with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus*
WN2	n/a	*Fraxinus excelsior, Crataegus monogyna, Hedera helix, Ilex aquifolium* 4033_R1
Lackagh Quarry to the N84 Headford Road - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WS1	n/a	*Prunus spinosa, Crataegus monogyna, Urtica dioica, Rubus fruticosus agg., Calliergonella cuspidata, Salix aurita, Fragaria vesca, Galium odoratum, Reynoutria japonica, Veronica chamaedrys* and *Salix caprea.* 4563_R2
WL1	n/a	*Calystegia sepium*, *Cirsium arvense*, *Corylus avellana*, *Crataegus monogyna*, *Euonymus europaeus*, *Fraxinus excelsior*, *Hedera helix*, *Ilex aquifolium*, *Lathyrus pratensis*, *Lonicera periclymenum*, *Prunus spinosa*, *Pteridium aquilinum*, *Quercus robur*, *Rosa canina*, *Rubus fruticosus* agg., *Salix caprea*, *Salix cinerea*, *Sorbus aria*, *Urtica dioica* and *Viburnum opulus*
WL1/WS1	n/a	WL1 as above, with *Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia* and *Ulex europeaus*
WN2	n/a	*Fraxinus excelsior, Crataegus monogyna, Hedera helix, Ilex aquifolium* 4033_R1
WS1	n/a	*Prunus spinosa, Crataegus monogyna, Urtica dioica, Rubus fruticosus agg., Calliergonella cuspidata, Salix aurita, Fragaria vesca, Galium odoratum, Veronica chamaedrys* and *Salix caprea.* 4563_R2

EC39

EC39 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Cirsium arvense*, *Tripleurospermum inodorum*, *Polygonum aviculare*, *Plantago major*, *officinale*, *Cirsium arvensis*, *Plantago major*, *Potentilla anserina* with scattered *Rubus fruticosus* agg. scrub.
ED3/GS2	n/a	ED3 species as above. Grassland species include *Achillea millefolium, Arrhenatherum elatius, Centurea nigra, Cerastium fontanum, Cirsium arvense, Dactylis glomerata, Heracleum sphondylium, Holcus lanatus, Hypocharis radicata, Jacobaea vulgaris, Lotus corniculatus, Plantago lanceolata, Ranunculus acris, Ranunculus repens, Rumex crispus, Stellaria graminea, Taraxacum agg., Trifolium pratense, Urtica dioica, Veronica chamaedrys, Vicia sepium.*
ER2	*8240 (LPE_1b)	Exposed limestone pavement: *Hedera helix*, *Corylus avellana*, *Prunus spinosa*, *Geranium robertianum*, *Sesleria albicans*, *Asplenium ruta-muraria*, *Teucrium scorodonia*, *Mycelis muralis*, *Epipactis helleborine*, *Fissidens dubius*, *Ctenidium molluscum*, *Tortella tortuosa* and *Scapania asper* in grykes. EC39 R1 and EC39 R2
EC39 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

FL5	n/a	*Nymphaea alba*, *Elodea Canadensis*, *Lemna* sp. The smallest water body near the eastern edge had *Potamogeton natans*, *Hippuris vulgaris*, *Elodea canadensis*, *Alisma plantago-aquatica* and *Ranunculus trichophyllus* on exposed mud at edge.
FS1	n/a	*Phragmites australis*, *Schoenoplectus lacustris* and *Cladium mariscus* are the main species. EC39 R12 and 2073_R2
	*7210	*Cladium mariscus* and *Phragmites australis.*
FW4	n/a	Mostly no emergent vegetation. Some drains with *Sparganium natans*, *Utricularia vulgaris* and *Myriophyllum* sp.
GA1	n/a	*Lolium perenne* and *Trifolium repens sward. Cirsium arvense* and *Rumex obtusifolius*. Also *Poa pratensis*, *Odontites verna* and *Polygonum persicaria*. 2374_R2
GS1	n/a	*Trifolium repens*, *Cirsium arvense*, *Calliergonella cuspidata*, *Ranunculus repens*, *Dactylis glomerata*, *Lolium perenne*, *Cynosurus cristatus*, *Anthoxanthum odoratum*, *Cerastium fontanum*, *Trifolium repens*, *Prunella vulgaris*, *Pteridium aquilinum*, *Plantago lanceolata*, *Brachythecium rutabulum*, *Holcus lanatus*, *Festuca rubra*, *Filipendula ulmaria* and *Bellis perennis*, *Achillea millefolium, Agrostis stolonifera, Arrhenatherum elatius, Cirsium arvense, Heracleum sphondylium, Jacobaea vulgaris, Plantago major, Potentilla anserina, Ranunculus acris, Stachys palustris, Trifolium pratense, Urtica dioica, Veronica chamaedrys*
	n/a	High-diversity calcareous grassland. Aforementioned species with calcareous indicator species frequent e.g. *Lotus corniculatus*, *Centaurea nigra, Briza media*, *Carex flacca*, *Daucus carota*, *Sesleria caerulea*, *Anthyllis vulneraria* and *Thymus polytrichus;* and frequent orchids *Anacamptis pyramidalis*, *Dactylorhiza fuchsii*. EC39 R5 and 2374_R1
	6210 (GL3a)	Aforementioned species and *Agrostis capillaris*, *Trifolium pratense*, *Odontites verna*, *Ranunculus acris*, *Festuca rubra*, *Leucanthemum vulgare, Centaurea nigra*, *Hypochaeris radicata*, *Prunella vulgaris*, *Plantago lanceolata, Blackstonia perfoliata* and *Galium verum*. EC39 R11 and 2096_R1
GS1/ED3	6210	GS1 as above. *Blackstonia perfoliata, Budleja davidii, Centranthus ruber, Centaurea erytheraea, Centaurea nigra, Hypericum perforatum, Leucanthemum vulgaris, Lotus corniculatus, Pilosella officinarum, Plantago lanceolata, Trifolium pratense, Ulex europaeus. Reynoutria japonica* also present.

EC39 - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
GS2	n/a	*Arrhenatherum elatius, Vicia cracca*, *Plantago lanceolata*, *Taraxacum officinale*, *Potentilla anserina*, *Dactylis glomerata*, *Trifolium repens*, *Rubus fruticosus* agg., *Ranunculus acris*, *Festuca rubra*, *Agrostis stolonifera*, *Holcus lanatus*, *Calystegia sepium*, *Cirsium arvense*, *Lathyrus pratensis*, *Heracleum sphondylium.* and *Rhytidiadelphus squarrosus*. 2080_R2 and 2375_R1
	6510	Typical species: *Leucanthemum vulgare*, *Trifolium pratense*, *Potentilla anglica*, *Plantago lanceolata*, *Helictotrichon pubescens*, *Odontites verna*, *Calliergonella cuspidata*, *Trifolium dubium*, *Trisetum flavescens*, *Festuca rubra*, *Holcus lanatus*, *Leontodon hispidus*, *Cerastium fontanum*, *Pimpinella major, Carex flacca* and *Daucus carota*. EC39 R13
GS2/WS1	n/a	Species lists as above. *Reynoutria japonica* also present.
GS4	6410 (GL1d and GL1c)	*Molinia caerulea*, *Carex panacea*, *Carex nigra*, *Carex elata*, *Carex echinata*, *Carex pulicaris*, *Carex disticha*, *Carex ovalis*, *Juncus articulatus*, *Filipendula ulmaria*, *Potentilla erecta*, *Cirsium dissectum* and *Achillea ptarmica*. *Calliergonella cuspidata* is the main bryophyte, but *Climacium dendroides* and *Rhytidiadelphus squarrosus* occur towards grazed edges. At the edges of the wet meadows, where *Molinia caerulea* is very sparse or absent, other species occurring more frequently include *Potentilla anserina*, *Carex nigra*, *Holcus lanatus*, *Ranunculus repens*, *Galium palustre*, *Festuca arundinacea* and *Eleocharis palustris*. EC39 R6, EC39 R7, EC39 R8, EC39 R10, EC39 R14 and EC39 R15
	n/a	*Potentilla anserina, Agrostis stolonifera, Ranunculus flammula, Glyceria fluitans, Juncus articulates, Filipendula ulmariam, Molinia caerulea, Carex binervis, Alopecurus geniculatus, Phragmites australis, Calliergonella cuspidata* 2091_R1 and 2073_R1
PF1	n/a	Non-annex habitat as the vegetation does not contain brown mosses. Typical species are *Phragmites australis*, *Schoenus nigricans*, *Myrica gale*, *Carex panicea*, *Carex nigra*, *Carex elata*, *Molinia caerulea*, *Hydrocotyle vulgaris*, *Menyanthes trifoliata*, *Filipendula ulmaria*, *Juncus acutiflorus*, *Agrostis stolonifera*, *Epilobium palustre* and *Ranunculus flammula*. EC39 R3 and 2076_R1
	7230 (RFLU4)	*Schoenus nigricans*, *Juncus subnodulosus*, *Molinia caerulea*, *Hydrocotyle vulgaris*, *Carex panacea*, *C. peliocarpa*, *Juncus articulatus*, *Ranunculus flammula*, *Cirsium dissectum*, *Parnassia palustris*, *Drosera anglica*, *Calliergonella cuspidata*, *Scorpidium scorpioides*, *S. cossonii*, *Campylium stellatum*, *Myrica gale* EC39 R9

EC39 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WN2/ER2	*8240 (LPE_2a)	Wooded limestone pavement: dominated by *Corylus avellana* with *Crataegus monogyna* and *Prunus spinosa* scrub. Bryophytes include *Neckera complanata*, *Rhytidiadelphus triquetrus*, *Eurhynchium striatum*, *Neckera complanata* and *Thuidium tamariscinum* as well as *Ctenidium molluscum* and *Thamnobryum alopecurum.*
WN2	n/a	*Corylus avellana* dominated canopy with scrub (*Prunus spinosa* & *Crataegus monogyna.* Understorey with typical WN2 woodland flora such as *Circaea lutetiana*, *Phyllitis scolopendrium*, *Viola* sp., *Primula vulgaris*, *Hedera helix*, *Geum urbanum*, *Rumex sanguineus*, *Arum maculatum*, *Fragaria vesca*, *Brachypodium sylvaticum* and *Thamnobryum alopecurum.* 2086_R1 and 2086_R2
WS1	n/a	*Corylus avellana*, *Crataegus monogyna*, *Salix cinerea* and *Salix caprea* trees. *Prunus spinosa* is frequent in the more open areas with *Rubus fruticosus* agg. and *Pteridium aquilinum* locally abundant. *Fraxinus excelsior*. *Pteridium aquilinum* often abundant at edges. Additional species: *Rubus fruticosus*, *Prunus spinosa*, (particularly on limestone pavement), *Epilobium hirsutum*, *Chamerion angustifolium*, *Ulex europaeus* and *Hedera helix.* 2080_R1
WS1/WN6	n/a	Scrub grading to wet woodland at north-western edge of Ballindooly Lough. *Salix cinerea*, *Phragmites australis*, *Mentha aquatica*, *Filipendula ulmaria*, *Lysimachia* sp. and *Carex* sp.

Ballindooley to Parkmore Industrial Estate/Galway Racecourse (Ch. 12+550 – Ch. 14+400) – Habitats between EC39, EC42, EC44, EC47, EC49 and the Parkmore Industrial Estate/Galway Racecourse

Ballindooley to Parkmore Industrial Estate/Galway Racecourse - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BL3/ED3	n/a	Species include *Capsella bursa-pastoris, Crepis sp., Elytrigia repens, Geranium molle, Jacobaea vulgaris, Lapsana communis, Lolium perenne, Persicaria maculosa, Plantago lanceolata, Plantago major, Potentilla anserina, Rumex crispus, Sagina nodosa, Scorzoneroides autumnalis, Trifolium pratense, Tripleurospermum maritimum*.
ED2	n/a	*Dactylis glomerata, Poa trivialis, Lolium perenne* 5177_R1

Ballindooley to Parkmore Industrial Estate/Galway Racecourse - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ED3	n/a	*Achillea millefolium*, *Anagallis arvensis*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Bellis perennis*, *Blackstonia perfoliata*, *Buddleja davidii*, *Carex flacca*, *Carex nigra*, *Centaurea nigra*, *Centaurium erythraea*, *Cirsium sp.*, *Crepis sp.*, *Cynosurus cristatus*, *Dactylis glomerata*, *Dactylorhiza fuchsia*, *Epilobium ciliatum*, *Epilobium montanum*, *Epilobium hirsutum*, *Epilobium parviflorum*, *Euphrasia officinalis agg.*, *Festuca rubra*, *Hedera helix*, *Holcus lanatus*, *Hypericum perforatum*, *Leucanthemum vulgare*, *Linum catharticum*, *Lotus corniculatus*, *Medicago lupulina*, *Odontites vernus*, *Plantago lanceolata*, *Poa pratensis*, *Potentilla anserina*, *Potentilla reptans*, *Primula veris*, *Prunella vulgaris*, *Rubus fruticosus agg.*, *Rumex spp.*, *Salix caprea.*, *Salix cinerea*, *Scrophularia auriculata*, *Jacobaea vulgaris*, *Sonchus asper*, *Stachys palustris*, *Tussilago farfara* and *Veronica chamaedrys* 4585_R2 and 4804_R1
ED3/WS1	n/a	*Buddleja davidii*, *Salix cinerea* and common ruderal species spreading on recolonizing ground. Grazed by horses.
GA1	n/a	*Achillea millefolium*, *Bellis perennis*, *Buddleja davidii*, *Crataegus monogyna*, *Fraxinus excelsior*, *Arrhenatherum elatius*, *Potentilla anserina*, *Cerastium fontanum*, *Cerastium glomeratum*, *Cirsium arvense*, *Cirsium* spp., *Cynosurus cristatus*, *Dactylis glomerata*, *Elytrigia repens*, *Heracleum sphondylium*, *Holcus lanatus*, *Lolium perenne*, *Plantago lanceolata*, *Poa trivialis*, *Ranunculus repens*, *Rumex obtusifolius*, *Rumex* spp., *Jacobaea vulgaris*, *Taraxacum officinale* agg., *Trifolium repens* and *Urtica dioica* 5115_R1, 5126_R1, 5130_R1, 5131_R1, 5138_R1, 5138_R2 and 5143_R1
GA1/GS2	n/a	Occasional *Knautia arvernsis* and *Achillea millefolium*. GS2 species as described in this table.
GA1/WS1	n/a	Species as described for GA1 and WS1 in this table.
GA1/GS4/ WS1/GS2/ GA2	n/a	Species as described for these habitats in this table. Ungrazed.
GA2	n/a	*Achillea millefolium*, *Bellis perennis*, *Cerastium fontanum*, *Lolium perenne*, *Plantago lanceolata*, *Ranunculus repens*, *Taraxacum officinale* agg. and *Trifolium pretense* 5140_R1
GS1	n/a	*Agrostis stolonifera*, *Arrhenatherum elatius*, *Bellis perennis*, *Centaurea nigra*, *Cerastium fontanum*, *Cirsium arvense*, *Cirsium repens*, *Dactylis glomerata*, *Heracleum sphondylium*, *Holcus lanatus*, *Lolium perenne*, *Lolium spp.*, *Plantago lanceolata*, *Potentilla anserina*, *Pteridium aquilinum*, *Heracleum spondylium*, *Prunella vulgaris*, *Ranunculus repens*, *Ranunculus repens*, *Rubus fruticosus Rumex obtusifolia.*, *Taraxacum officinale agg.* and *Urtica dioica* 4782_R1, 4783_R1, 5133_R1, 5135_R1 and 5196_R1

Habitat code	Annex I habitat	Key species
GS1	6210	*Sesleria caerulea, Carex flacca, Juncus conglomeratus, Lotus corniculatus, Leontodon hispidus, Potentilla palustris, Calliergonella cuspidata, Ctenidium molluscum, Scleropodium purum, Dicranum scoparium* 4585_R1
GS2	n/a	Species-poor variant. *Arrhenatherum elatius*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Phleum pratense*, *Dactylis glomerata*, *Plantago lanceolata*, *Cirsium arvense*, *Ranunculus acris*, *Ranunculus repens*, *Cerastium fontanum*, *Leucanthemum vulgare*, *Epilobium ciliatum*, *Potentilla anserina*, *Scorzoneroides autumnalis* and *Taraxacum officinale agg.* 5239_R1
	n/a	More species-rich variant. Species include: *Agrostis capillaris*, *Agrostis stolonifera*, *Alopecurus pratensis*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Calystegia sepium*, *Centaurea nigra*, *Cerastium fontanum*, *Cirsium arvense*, *Dactylis glomerata*, *Heracleum sphondylium*, *Holcus lanatus*, *Phleum pratense*, *Plantago lanceolata*, *Potentilla anserina*, *Ranunculus acris*, *Ranunculus repens, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Rhinanthus minor, Cynosurus cristatus, Epilobium hirsutum, Salix* sp., *Buddleja davidii*, *Rumex* spp., *Scorzoneroides autumnalis*, *Trifolium repens* and *Urtica dioica*
GS4	n/a	*Calliergonella cuspidate*, *Carex disticha*, *Carex flacca*, *Carex hirta*, *Cirsium arvense*, *Dactylis glomerata*, *Equisetum arvense*, *Holcus lanatus*, *Juncus effusus*, *Juncus inflexus*, *Lathyrus pratensis*, *Lythrum salicaria, Iris pseudacorus, Filipendula ulmaria, Persicaria amphibia*, *Phleum pratense*, *Plantago lanceolata*, *Poa trivialis*, *Rumex crispus*, *Rumex obtusifolius*, *Scorzoneroides autumnalis*, *Taraxacum officinale* agg. and *Trifolium dubium*
WD1	n/a	*Acer pseudoplatanus*, *Fagus sylvatica*, *Fraxinus excelsior*, *Rubus fruticosus* agg. and *Urtica dioica*
WL1	n/a	*Alnus incana*, *Anthriscus sylvestris*, *Arrhenatherum elatius*, *Asplenium scolopendrium*, *Brachypodium sylvaticum*, *Calystegia sepium*, *Circaea lutetiana*, *Convolvulus arvensis*, *Corylus avellana*, *Crataegus monogyna*, *Dactylis glomerata*, *Dryopteris filix-mas*, *Euonymus europaeus*, *Fraxinus excelsior*, *Fuchsia magellanica*, *Galium aparine*, *Geranium robertianum*, *Geum urbanum*, *Hedera helix*, *Heracleum sphondylium*, *Lathyrus pratensis*, *Lonicera periclymenum*, *Prunus domestica*, *Prunus spinosa*, *Pteridium aquilinum*, *Ribes* spp., *Rosa canina*, *Rosa* spp., *Rubus fruticosus* agg., *Rumex sanguineus*, *Salix cinerea*, *Salix* spp., *Sambucus nigra*, *Urtica dioica*, *Vicia sepium* and *X Cuprocyparis leylandii*
WL2	n/a	*Acer pseudoplatanus*, *Alnus incana*, *Betula* sp., *Cornus* sp., *Cupressus* x *leylandii*, *Lonicera nitida*, *Picea glauca*, *Pinus radiata* and *Sorbus aucuparia*, *Acer sp., Fraxinus excelsior, Polpulus tremula*

Habitat code	Annex I habitat	Key species
WL2/WS1	n/a	*Acer pseudoplatanus, Acer sp., Cupressus x leylandii, Fraxinus excelsior, Polpulus tremula, Calystegia sepium, Cirsium arvense, Crataegus monogyna, Ilex aquifolium, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus agg., Salix cinerea subsp. oleifolia, Ulex europeaus*
WN2	n/a	*Acer pseudoplatanus*, *Corylus avellana*, *Fraxinus excelsior*, *Hedera helix*, *Pteridium aquilinum*, *Rubus fruticosus* agg., *Salix caprea* and *Salix cinereal* 4572_R1
WS1	n/a	*Alnus glutinosa*, *Alnus incana*, *Arrhenatherum elatius*, *Crataegus monogyna*, *Dactylis glomerata*, *Fraxinus excelsior*, *Hebe* sp., *Hedera helix*, *Plantago lanceolata*, *Prunus spinosa*, *Prunus laurocerasus*, *Rubus fruticosus* agg., *Salix cinerea* and *Sorbaria* sp. 4822_R1
WS1/GS2	n/a	Species as described above.
WS1/BL3/ ED3	n/a	Species as described above.

EC42

EC42 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
ER2	*8240 (LPE_1B)	Open pavement areas have a characteristic sparse flora. The most conspicuous species include *Rosa spinosissima*, *Corylus avellana*, *Prunus spinosa*, *Mycelis muralis*, *Asplenium ruta-muraria*, *Jacobaea vulgaris*, *Teucrium scorodonia*, *Thymus polytrichus*, *Lotus corniculatus*, *Plantago maritima*, *Geranium robertianum*, *Phyllitis scolopendrium*, *Sesleria albicans* and *Carex flacca.* EC42 R1, EC42 R2 and EC42 R5
	*8240 (Wooded) (LPE_2B)	The dominant shrub/tree species is *Corylus avellana* with *Fraxinus excelsior*, *Prunus spinosa*, *Crataegus monogyna*, *Ilex aquifolium* and *Sorbus aria* also frequent in the low canopy. Common ground layer species include *Brachypodium sylvaticum*, *Rubus fruticosus*, *Hedera helix*, *Potentilla sterilis*, *Neckera crispa*, *Fragaria vesca*, *Thuidium tamariscinum*, *Primula vulgaris* and *Thamnobryum alopecurum*.
GA1	n/a	The characteristic species noted included *Lolium perenne*, *Holcus lanatus*, *Cirsium arvense*, *Cirsium vulgare*, *Trifolium repens*, *Taraxacum officinale* and *Rumex obtusifolius*.

Habitat code	Annex I habitat	Key species
GM1	n/a	The main species in the vegetation include *Juncus articulatus*, *Juncus effusus*, *Mentha aquatica*, *Galium palustre*, *Ranunculus repens*, *Comarum palustre*, *Carex nigra*, *Carex panacea*, *Carex disticha*, *Carex echinata*, *Carex rostrata*, *Cirsium palustre*, *Epilobium* sp., *Potentilla anserina*, *Luzula campestris*, *Menyanthes trifoliata*, *Hypericum tetrapterum*, *Filipendula ulmaria*, *Molinia caerulea*, *Salix aurita*, *Anthoxanthum odoratum*, *Hydrocotyle vulgaris*, *Persicaria amphibia*, *Eleocharis palustris*, *Glyceria fluitans*, *Apium nodiflorum* and the wetland moss *Calliergonella cuspidata*.
GS1	n/a	Common calcareous grassland species noted include *Lotus corniculatus*, *Briza media*, *Carex flacca*, *Galium verum*, *Linum catharticum*, *Thymus polytrichus* and *Leontodon* sp. 2355_R1
	6210	Typical species include *Lotus corniculatus*, *Briza media*, *Molinia caerulea*, *Carex flacca*, *Lathyrus pratensis*, *Scleropodium purum*, *Calliergonella cuspidata*, *Euphrasia* sp., *Centaurea nigra*, *Holcus lanatus*, *Hypericum maculatum*, *Potentilla erecta*, *Thuidium tamariscinum*, *Hypochaeris radicata*, *Trifolium pratense*, *Ctenidium molluscum*, *Leucanthemum vulgare*, *Festuca rubra*, *Hypericum pulchrum*, *Potentilla sterilis*, *Danthonia decumbens*, *Linum catharticum*, *Thymus polytrichus*, *Prunella vulgaris*, *Veronica chamaedrys*, *Daucus carota* and *Galium verum*. EC42 R4
GS2	n/a	*Arrhenatherum elatius* tends to dominate the tall grassy vegetation with *Centaurea nigra*, *Dactylis glomerata*, *Holcus lanatus*, *Trifolium repens* and *Anthoxanthum odoratum*.
GS4	n/a	*Arrhenatherum elatius, Convovulus arvensis, Dactylis glomerata, Epilobium hirsutum, Filipendula ulmaria, Lythrum salicaria, Plantago lanceolata, Potentilla anserina, Rumex acetosa, Salix sp., Urtica dioica, Vicia sepium, Rumex crispsus, Anthoxanthum odoratum, Carex nigra, Carex echinata, Cirsium palustre, Rhytidiadelphus squarrosus* 2356_R1
WN2	*8240	*Corylus avellana*, *Ilex aquifolium*, *Hedera helix*, *Brachypodium sylvaticum*, *Fraxinus excelsior*, *Potentilla sterilis*, *Rubus fruticosus*, *Crataegus monogyna*, *Fragaria vesca*, *Primula vulgaris*, *Taraxacum* agg., *Brachythecium rutabulum*, *Geum urbanum*, *Lonicera periclymenum*, *Prunus spinosa*, *Thamnobryum alopecurum*, *Viola* sp., *Thuidium tamariscinum* and *Phyllitis scolopendrium*. EC42 R3
WS1	n/a	*Corylus avellana, Prunus spinosa, Crataegus monogyna, Ilex aquifolium, Sorbus aria, Rubus fruticosus, Hedera helix, Fragaria vesca, Thuidium tamariscinum, Geranium robertianum, Primula vulgaris* and *Kindbergia praelonga.* 2354_R1
WS1/GS1	n/a	Mature *Fraxinus excelsior.* Species as described above.

EC44

EC44 - Species Lists & Relevés

Habitat code	Annex I habitat	Key species
ER2	*8240 (LPE_1e)	*Hedera helix*, *Corylus avellana*, *Sesleria albicans*, *Teucrium scorodonia*, *Pteridium aquilinum*, *Neckera crispa*, *Ctenidium molluscum* and *Rubia peregrina*
GS1	n/a	*Briza media*, *Dactylis glomerata*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Festuca rubra*, *Centaurea nigra*, *Linum catharticum*, *Lotus corniculatus*, *Euphrasia* sp., *Carex flacca*, *Rubus fruticosus*, *Blackstonia perfoliata*, *Daucus carota*, *Leucanthemum vulgare*, *Hypericum androsaemum* and *Potentilla reptans.* EC44 R4
GS2/GA1	n/a	*Rumex sanguineus*, *Cirsium arvense*, *Holcus lanatus*, *Plantago lanceolata*, *Jacobaea vulgaris*, *Cerastium fontanum*, *Urtica dioica*, *Heracleum sphondylium*, *Ranunculus repens* and *Potentilla anserina*
WN2/ER2	*8240 (LPW_2a)	*Corylus avellana* dominated canopy (4-5m high) with occasional *Crataegus monogyna*, *Ilex aquifolium* and *Sorbus aucuparia. Prunus spinosa* localised <2m high. Ground flora dominated by bryophytes notably *Eurhynchium striatum*, but also *Rhytidiadelphus triquetrus* and *Thuidium tamariscinum* and *Neckera spp*. common on base of trees. *Hedera helix* locally frequent. EC44 R1, EC44 R2
WN2	n/a	*Corylus avellana* dominated canopy (6-9m high) with occasional *Prunus spinosa* & *Crataegus monogyna.* Understorey with typical WN2 woodland flora such as *Veronica montana*, *Circaea lutetiana*, *Sanicula europaeus*, *Viola* sp., *Primula vulgaris*, *Hedera helix*, *Carex sylvatica*, *Brachypodium sylvaticum*, *Fragaria vesca*, *Epipactis helleborine*, *Thamnobryum alopecurum* and *Plagiomnium undulatum.*
WS1/WN2	n/a	*Prunus spinosa* dominant scrub species with occasional *Crataegus monogyna* and *Corylus avellana*. Also *Rubus fruticosus* agg. and occasionally *Pteridium aquilinum* and *Urtica dioica*.
WS1	*8240	*Corylus avellana*, *Hedera helix*, *Eurhynchium striatum*, *Brachypodium sylvaticum*, *Thamnobryum alopecurum*, *Crataegus monogyna*, *Kindbergia praelonga*, *Potentilla sterilis*, *Viola riviniana*, *Lonicera periclymenum*, *Ctenidium molluscum*, *Plagiochila asplenioides*, *Rubus fruticosus*, *Fragaria vesca*, *Solidago virgaurea*, *Sorbus aucuparia*, *Prunus spinosa*, *Primula vulgaris*, *Fissidens* sp., *Carex* sp., *Phyllitis scolopendrium*, *Epipactis helleborine* and *Sanicula europaeus.* EC44 R3
WS1	n/a	*Prunus spinosa*, *Crataegus monogyna*, *Urtica dioica*, *Rubus fruticosa* and *Pteridium aquilinum.* 2250_R1

EC47

EC47 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1	n/a	*Pseudoscleropodium purum*, *Rhytidiadelphus squarrosus*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Cynosurus cristatus*, *Trifolium repens (O-LF)*, *Geranium robertianum*, *Rubus fruticosus* agg., *Fragaria vesca Lotus corniculatus*, *Galium verum* and *Cirsium arvense.*
WN2/ER2	*8240 (LPW_2b)	*Fraxinus excelsior*, *Corylus avellana*, *Crataegus monogyna*, *Hedera helix*, *Rubus fruticosus* agg., *Asplenium scolopendrium*, *Viola sp.*, *Dryopteris filix mas*, *Fragaria vesca*, *Primula veris*, *Veronica chamaedrys*. *Eurhynchium striatum*, *Rhytidiadelphus triquetrus*, *Thamnobryum alopecurum* and *Scapania aspera*. EC47 R1
WS1/WN2/ ER2	n/a and *8240	*Prunus spinosa*, *Crataegus monogyna*, *Fraxinus excelsior*, *Corylus avellana*, *Ilex aquifolium*, *Urtica dioica*, *Geranium robertianum*, *Hedera helix*, *Veronica chamaedrys. Urtica dioica*. Bryophytes 70% cover: *Thamnobryum alopecurum* and *Eurhynchium striatum*. Some small areas of *8240 (LPW), within the woodland, but too small to map.
GA1	n/a	*Anthoxanthum odoratum, Holcus lanatus, Trifolium repens, Cynosurus cristatus, Lolium perenne, Lathyrus pratensis, Veronica chamaedrys, Agrostis stolonifera, Ranunculus repens.* 2316_R1
WS1	n/a	*Crataegus monogyna, Fraxinus excelsior, Geranium robertianum, Agrostis stolonifera, Urtica dioica* 2319_R1

EC48

EC48 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WS1/WN2/ ER2	n/a	*Prunus spinosa*, *Corylus avellana*, *Crataegus monogyna*, *Urtica dioica*, *Geranium robertianum*, *Primula veris*, *Thamnobryum alopecurum*, *Eurhynchium striatum* and *Thuidium tamariscinum.*
WS1/ER2	n/a	*Crataegus monogyna, Prunus spinosa* scrub on sloping terrain. Outcropping calcareous rock substrate.
WS1	n/a	*Crataegus monogyna, Sambucus nigra, Geranium robertianum, Veronica montana, Galium aparine, Agrostis stolonifera, Urtica dioica, Calliergon sp.* 2321_R1

EC49

EC49 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

ED3/GS1/ W S1	n/a	Bare flat disturbed ground with Pockets of grassland: *Centaurea nigra*, *Achillea millefolium*, *Linum catharticum*, *Blackstonia perfoliata* and *Centaurium erythraea*. Piles of spoil with *Buddleja davidii*, *Rubus fruticosus* agg, *Prunus spinosa*, *Centranthus ruber*, *Petasites* sp. and *Cotoneaster* sp.
ED3	n/a	2325_R3
ED3/WS1	n/a	Abundant *Buddleja davidii*. *Calystegia sepium, Rubus fruticosus agg., Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg., Epilobium hirsutum, Carex nigra, Arrhenatherum elatius, Cirsium sp., Rumex sp.*
ER2	n/a	*Rubus fruticosus agg., Salix sp., Centranthus ruber, Hypnum jutlandicum, Campylopus atrovirens* 2323_R1
ER2/WS1	n/a	Old quarry area. Recognising with bramble scrub, ruderals and GS1 species (list as described in table).
GS1	n/a	*Anthoxanthum odoratum*, *Cynosurus cristatus*, *Trifolium repens*, *Ranunculus acris*, *Carex flacca*, *Linum catharticum*, *Rhinanthus minor*, *Euphrasia* sp., *Odontites verna, Rubus fruticosus agg., Ranunculus repens, Rumex obtusifolius, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium arvense, Pteridium aquilinum and Heracleum sphondylium.* 2324_R1 and 2325_R1
WN2	n/a	*Corylus avellana*, *Crataegus monogyna*, *Hedera helix*, *Rubus fruticosus* agg. *Phyllitis scolopendrium*, *Arum maculatum*, *Lonicera periclymenum*, *Primula veris*, *Dryopteris filix mas, Thamnobryum alopecurum* and *Thuidium tamariscinum.* 5322_R1
WS1	n/a	*Prunus spinosa, Crataegus monogyna, Acer pseudoplatanus, Fraxinus excelsior, Rubus fruticosus agg., Pteridium aquilinum, Calystegia sepium, Lythrum salicaria, Juncus sp., Buddleja davidii, Salix purpureum, Salix cinerea, Corylus avellana, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg., Agrostis canina, Ranunculus acris, Anthoxanthum odoratum, Holcus lanatus, Plantago lanceolata, Trifolium repens, Jacobaea vulgaris, Calliergon species* 2325_R2

Galway Racecourse to Ardaun (Ch. 14+400 – Ch. 18+350 and along the R446 tie-in) – Habitats between EC56, EC57 and EC59

Galway Racecourse to Ardaun - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
BC4	n/a	*Epilobium sp., Griselinia sp.* 5094_R1
BL3/BC4	n/a	Plot of dry meadow and grassy verge remains on eastern side of car park, bound by treeline of *Alnus glutinosa, Prunus laurocerasus,*

		BC4 species list as described above.
ED2	n/a/	*Plantago lanceolata, Agrostis stolonifera, Ranunculus repens, Bellis perennis, Plantago major* 5062_R1
ED2	n/a	Previously Treelines, now infill gravel track; Previously amenity grassland, now infill gravel aggregate; Treelines adjacent to infill access track and stone wall
ED3	n/a	*Buddleja davidii, Hypericum spp., Leucanthemum vulgare, Reseda luteola, Jacobaea vulgaris, Agrostis stolonifera, Holcus lanatus, Prunella vulgaris, Rumex obtusifolius, Rumex crispus, Plantago lanceolata, Ranunculus repens* 5310_R2, 5308_R1, 5310_R1, 5204_R1, 5101_R1, 5134_R1, 5134_R2, 5059_R1, 5059_R2 and 5062_R2
ED3/GS2	n/a	Mosaic of habitats forming around motorway attenuation ponds. *Holcus lanatus, Ranunculus repens, Rumex obtusifolia, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Ulex europeaus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Salix sp., Buddleja davidii, Epilobium hirsutum, Carex nigra, Cirsium sp., Rumex sp., Salix cinerea.*
GA1	n/a	*Arrhenatherum elatius, Bellis perennis*, *Buddelja davidii, Cirsium arvense*, *Cirsium vulgare*, *Crataegus monogyna, Cynosurus cristatus, Dactylis glomerata*, *Fraxinus excelsior, Holcus lanatus*, *Heracleum sphondylium, Lolium perenne*, *Plantago lanceolata*, *Poa annua*, *Poa trivialis, Potentilla anserina*, *Ranunculus repens*, *Rumex obtusifolius*, *Jacobaea vulgarisTaraxacum officinale* agg., *Trifolium repens* and *Urtica dioica* 4866_R1, 4879_R1, 5034_R1, 5042_R1, 5044_R1, 5060_R1, 5060_R2, 5066_R1, 5308_R2 and 5308_R3
GA2	n/a	*Bellis perennis*, *Cirsium arvense*, *Festuca rubra*, *Holcus lanatus*, *Lathyrus pratensis*, *Lolium* spp., *Plantago lanceolata*, *Poa annua*, *Potentilla anserina*, *Prunella vulgaris*, *Jacobaea vulgaris, Senecio vulgaris*, *Taraxacum officinale agg.*, *Trifolium repens* and *Trifolium* spp. *Acer pseudoplatanus, Acer campestre, Aesculus hippocastanum, Populus sp., Crataegus monogyna, Fagus sylvatica, Fraxinus excelsior, Tilia cordata, Salix cinerea* and *Betula sp.* occasionally present. 5033_R1 and 4896_R1

Galway Racecourse to Ardaun - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
GA2/BL3/ BC4	n/a	Footpaths, walkway and ornamental shrubs as part of roadside planting. *Acer sp., Betula sp., Prunus laurocerasus, Alnus glutinosa*. *Reynoutria japonica* also present.

GS1	n/a	*Achillea millefolium*, *Agrostis stolonifera*, *Arrhenatherum elatius*, *Arctium lappa*, *Bellis perennis*, *Centaurea nigra*, *Cerastium fontanum*, *Cirsium arvense*, *Cirsium vulgare*, *Dactylis glomerata, Epilobium hirsutum*, *Heracleum sphondylium, Holcus lanatus*, *Jacobaea vulgaris Leucanthemum vulgare*, *Lolium perenne*, *Plantago lanceolata*, *Plantago major*, *Potentilla anserina*, *Prunella vulgaris*, *Ranunculus acris, Ranunculus repens*, *Rumex crispus*, *Rumex obtusifolius*, *Jacobaea vulgaris*, *Stachys palustris, Taraxacum officinale* agg., *Trifolium pratense*, *Trifolium repens*, *Urtica dioica, Veronica chamaedrys* and *Veronica montana* 5310_R3, 5107_R1, 5059_R3, 5062_R4, 5062_R3, 5046_R1 and 5039_R1
GS2	n/a	*Arrhenatherum elatius*, *Centaurea nigra*, *Cirsium arvense*, *Dactylis glomerata*, *Epilobium parviflorum*, *Epilobium* sp., *Festuca rubra*, *Holcus lanatus, Heracleum sphondylium*, *Plantago lanceolata*, *Pteridium aquilinum*, *Ranunculus repens*, *Ranunculus acris, Rhinanthus minor, Rubus fruticosus* agg., *Rumex obtusifolius*, *Jacobaea vulgaris*, *Taraxacum officinale* agg., *Trifolium pratense*, *Ulex europaeus*, *Urtica dioica*, *Vicia cracca* and *Vicia sepium* 5165_R1 and 5039_R2
GS2/ED3		Abundant *Epilobium hirsutum* in addition to *Carex nigra,* occasional *Arrhenatherum elatius, Cirsium sp.* and *Rumex sp.*
GS2/GS1	n/a	Amenity grassland no longer mown. Grassland has moderate diversity with *Centaurea nigra, Rhinanthus minor* and *Cynosurus cristatus. Rubus fruticosus agg., Ranunculus repens, Rumex obtusifolia, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum sphondylium, Ranunculus acris, Achillea milefolium, Pteridium aquilinum, Ulex europeaus, Epilobium hirsutum, Salix sp., Buddleja davidii.*
GS2/ER2	n/a	*Holcus lanatus, Ranunculus repens, Rumex obtusifolius, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Ulex europeaus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Buddleja davidii, Rubus fruticosus agg., Salix cinerea, Fraxinus excelsior.*
WD1	n/a	Screen planting with *Corylus avellana, Sorbus aria, Sorbus aucuparia, Fraxinus excelsior.* Occasional occurrence of *Betula spp., Fagus sylvatica*

Galway Racecourse to Ardaun - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**
WD1/WS1	n/a	*Acer pseudoplatanus*, *Arrhenatherum elatius*, *Arum maculatum*, *Asplenium scolopendrium*, *Athyrium filix-femina*, *Brachypodium sylvaticum*, *Chamaecyparis lawsoniana*, *Corylus avellana*, *Crataegus monogyna*, *Dactylis glomerata*, *Dryopteris filix-mas*, *Kindbergia praelonga*, *Eurhynchium*

		striatum, *Fagus sylvatica*, *Fraxinus excelsior*, *Hedera hibernica*, *Picea* sp., *Pinus sylvestris*, *Polystichum setiferum*, *Prunus spinosa*, *Rubus fruticosus* agg., *Salix caprea*, *Salix cinerea*, *Jacobaea vulgaris*, *Veronica hederacea*, *Veronica montana* and *Viola canina* 5094_R2 and 5066_R3
WD5	n/a	Scattered trees with *Tilia cordata*
WL1	n/a	*Cornus* sp., *Corylus avellana*, *Crataegus monogyna*, *Escallonia* sp., *Fagus sylvatica*, *Fuchsii* sp., *Hedera helix*, *Prunus laurocerasus*, *Prunus spinosa*, *Rubus fruticosus* agg., *Salix caprea*, *Salix cinerea*, *Sorbaria*, *Sorbus aucuparia* and *Ulex europaeus*
WL2	n/a	*Acer pseudoplatanus*, *Alnus glutinosa*, *Alnus incana*, *Betula pubescens*, *Cornus* spp., *Corylus avellana*, *Crataegus monogyna*, *Fagus sylvatica*, *Fraxinus excelsior*, *Prunus spinosa*, *Rosa rugosa*, *Rubus fruticosus* agg., *Salix cinerea*,*Sorbus aucuparia*, *Symphoricarpos albus* and *Viburnum opulus* 2476_R1
WN2	n/a	*Corylus avellana*, *Cupressus x Leylandii*, *Fagus sylvatica*, *Fraxinus excelsior*, *Ilex aquifolium* and *Sorb aucuparia* 5492_R1 and 5066_R2
WS1	n/a	*Calystegia sepium, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Fraxinus excelsior, Symphoricarpos alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg., Dactylis glomerata, Holcus lanatus, Lolium perenne, Plantago lanceolata, Prunus spinosa, Pteridium aquilinum, Rubus fruticosus* agg., *Trifolium pratense* and *Trifolium repens* 5283_R1, 5050_R1 and 5061_R1
WS1/ED3	n/a	Abundant spread of *Buddleja davidii.* Scrub species as above. *Epilobium hirsutum, Carex nigra, Arrhenatherum elatius, Cirsium sp., Rumex sp., Salix cinerea.*
WS2	n/a	*Fraxinus excelsior, Betula sp., Populus sp.* and *Crataegus monogyna*
WS3	n/a	With young trees. Species include *Chamaecyparis lawsoniana*, *Picea sitchensis* and *Larix decidua*

EC56

EC56 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

ED2	n/a	*Prunella vulgaris, Agrostis stolonifera, Ranunculus repens, Bellis perennis, Cirsium arvense, Plantago major, Didymodon species* 127_R2
ED3	n/a	*Anthoxanthum odoratum, Holcus lanatus, Lolium perenne, Jacobaea vulgaris, Agrostis stolonifera, Ranunculus repens, Cirsium arvense, Cirsium vulgare, Heracleum sphondylium, Rumex conglomeratus* 127_R3
ER2	*8240 (LPE_1b)	*Corylus avellana*, *Ulex europaeus*, *Juniperus communis*, *Hedera helix*, *Rosa spinosissima*, *Teucrium scorodonia*, *Sesleria albicans*, *Mycelis muralis*, *Asplenium ruta-muraria*, *Geranium robertianum*, *Carlina vulgaris*, *Neckera crispa*, *Fissidens dubius*, *Tortella tortuosa*, *Ctenidium molluscum, Festuca rubra*, *Koeleria macrantha*, *Thymus praecox*, *Antennaria dioica*, *Lotus corniculatus*, *Hypericum pulchrum*, *Gentiana verna*, *Carex caryophyllea*, *Dactylorhiza fuchsia*, *Succisa pratensis*, *Rubus fruticosus*, *Phyllitis scolopendrium*, *Fragaria vesca*, *Dactylis glomerata* and *Solanum dulcamara.* EC56 R2 and EC56 R5
FL8/FS1	n/a	Wetland forming in excavated attenuation pond area adjacent to west side of M6/N6 junction. *Phragmites australis*, *Typha latifolia*, *Sparganium erectum*, *Schoenoplectus lacustris*, *Apium nodiflorum*, *Nasturtium officinale*, *Lemna minor* and *Epilobium hirsutum. Clematis vitalba* also present.
GA1	n/a	Semi-improved neutral grassland in part with locally frequent *Cynosurus cristatus.* Other species: *Buddleja spp., Crataegus monogyna, Fraxinus excelsior, Poa trivialis, Rumex obtusifolia, Urtica dioica, Heracleum spondylium, Dactylis glomerata, Arrhenatherum elatius, Potentilla anserina, Lolium perenne, Jacobaea vulgaris.*
GA2	n/a	*Dactylis glomerata, Festuca rubra, Arrhenatherum elatius, Centaurea nigra, Festuca arundinacea, Holcus lanatus, Plantago lanceolata, Trifolium pratense, Trifolium repens, Jacobaea vulgaris, Trifolium dubium, Agrostis stolonifera, Ranunculus repens, Bellis perennis, Alopecurus pratensis, Taraxacum species, Calliergon species* 129_R1 and 107_R1
GS1	n/a	*Anthoxanthum odoratum*, *Festuca rubra*, *Holcus lanatus*, *Cynosurus cristatus*, *Plantago lanceolata*, *Centaurea nigra*, *Trifolium repens*, *Trifolium pratense*, *Lotus corniculatus*, *Ranunculus bulbosus*, *Achillea millefolium*, *Luzula campestris*, *Pteridium aquilinum*, *Hypochaeris radicata*, *Dactylorhiza fuchsii*, *Danthonia decumbens*, *Potentilla anserina*, *Jacobaea vulgaris, Bellis perennis, Agrostis canina*, *Prunella vulgaris*, *Taraxacum* agg., *Leucanthemum vulgare*, *Euphrasia* sp., *Briza media*, *Sonchus* sp., *Urtica dioica*, *Succisa pratensis*, *Rumex obtusifolius*, *Odontites verna*, *Pimpinella saxifraga* and *Primula vulgaris.* EC56 R8, EC56 R9, 118_R1, 127_R1, 113_R2 and 113_R3

EC56 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

GS1	6210 (GS1_3a)	*Succisa pratensis*, *Briza media*, *Danthonia decumbens*, *Festuca ovina*, *Schoenus nigricans*, *Cynosurus cristatus*, *Sesleria albicans*, *Carex pulicaris*, *Carex panacea*, *Carex demissa*, *Carex flacca*, *Pinguicula vulgaris*, *Trifolium repens*, *Antennaria dioica*, *Blackstonia perforata*, *Plantago maritima*, *Anagallis tenella*, *Selaginella* sp., *Linum catharticum*, *Cirsium dissectum*, *Molinia caerulea*, *Gentiana verna*, *Euphrasia* sp., *Polygala vulgaris*, *Prunella vulgaris, Lathyrus linifolius*, *Dactylorhiza fuchsii*, *Platanthera bifolia*, *Calliergonella cuspidata*, *Ctenidium molluscum*, *Fissidens adianthoides* and *Didymodon ferrugineus.* EC56 R1, EC56 R3, EC56 R4 and EC56 R7
GS2	n/a	*Calliergonella cuspidata, Trifolium repens, Festuca rubra, Trifolium dubium, Rhytidiadelphus squarrosus, Carex flacca, Veronica serpyllifolia, Medicago lupulina, Ranunculus repens, Carex panicea* 129_R2
GS2/GS1	n/a	Calcareous grassland with rough grassland and establishing scrub within wayleave area. Species include *Holcus lanatus, Ranunculus repens, Rumex obtusifolius, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Ulex europeaus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Salix sp., Buddleja davidii, Dactylis glomerata, Centaurea nigra, Agrostis stolonifera, Arrhenatherum elatius, Cirsium arvense, Heracleum sphondylium.*
GS2/ED3	n/a	*Holcus lanatus, Ranunculus repens, Rumex obtusifolius, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Ulex europeaus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Salix sp., Buddleja davidii, Carex nigra, Cirsium sp., Rumex sp. Salix cinerea.*
GS2/WS1	n/a	*Holcus lanatus, Ranunculus repens, Rumex obtusifolia, Ranunculus acris, Achillea millefolium, Pteridium aquilinum, Rubus fruticosus agg., Ulex europaeus, Centaurea nigra, Rhinanthus minor, Cynosurus cristatus, Arrhenatherum elatius, Epilobium hirsutum, Salix sp., Buddleja davidii, Calystegia sepium, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium avellana, Pteridium aquilinum, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*
GS2/GS1/ ER2/GA2	n/a	GS2 covers the greatest area. Pockets of GS1, and a more extensive area of GS1 on embankments between slip road and attenuation pond. Fringing area maintained as GA2.
GS4/GS1	n/a	*Holcus lanatus*, *Juncus effusus*, *Juncus articulates*, *Carex flacca*, *Carex panacea*, *Potentilla anserina*, *Epilobium hirsutum* and *Ranunculus repens.* On drier patches *Centaurea nigra*, *Leucanthemum vulgare* and *Daucus carota.* 113_R1
EC56 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

HD1/GS1	n/a	Grassland species as described in this table. *Pteridium aquilinum.* 114_R2
WN2/ER2	*8240 (LPW_2a)	*Corylus avellana*, *Crataegus monogyna*, *Rosa spinosissima*, *Fragaria vesca*, *Viola* sp. *Rubus fruticosus* agg., *Neckera crispa*, *Rhytidiadelphus triquetrus*, *Ctenidium molluscum*, *Eurhynchium striatum*, *Thamnobryum alopecurum* and *Thuidium tamariscinum.* EC56 R6
WN2	*8240	*Corylus avellana, Crataegus monogyna, Ilex aquifolium, Eurhynchium striatum, Neckera complanata, Geranium robertianum, Thamnobryum alopecurum, Urtica dioica, Hedera helix s. hibernica, Poa* sp., *Fragaria vesca, Prunus spinosa, Rubus fruticosus* agg., *Thamnobryum alopecurum* 116_R1, 5491_R1 and 5338_R1
	n/a	Similar to WN2/ER2, and with similar species, as well as the following: *Acer pseudoplatanus, Prunus spinosa.* Other ground flora species include *Arum maculatum*, *Circaea lutetiana* and *Hedera helix*. *Bryophyte cover <50% Thamnobryum alopecurum* and *Thuidium tamariscinum*. 116_R2
WS1	n/a	*Crataegus monogyna*, *Prunus spinosa*, *Ilex aquifolium*, *Sorbus aria agg.*[8], *S. aucuparia*, *Rubus fruticosus* agg., *Corylus avellana*, *Acer pseudoplatanus*, *Ilex aquifolium*, *Salix caprea*, *Hedera helix*, *Lonicera periclymenum*, *Fragaria vesca*, *Pteridium aquilinum*, *Brachypodium sylvaticum*, *Fraxinus excelsior* and *Ulex europaeus*. 96_R1 and 114_R1
WS1/GS1	n/a	Semi-improved GS1; bramble scrub spreading throughout. *Rubus fruticosus agg., Ranunculus repens, Rumex obtusifolia, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum spondylium, Calystegia sepium, Rubus fruticosus, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja davidii, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corylus avellana, Pteridium aquilinium, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg.*
WS1/GS1/ ER2	*8240 – limestone pavement areas only	Scrub and grassland to south, species described as in this table; Diverse grassland and exposed rock (shattered limestone pavement) to north. *Buddleja spp., Rubus fruticosus agg., Salix cinerea, Fraxinus excelsior.*

EC57

EC57 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

[8] *Sorbus* species are difficult to identify and require a number of characteristics (and potentially genetic work) to definitely confirm species present in the *Sorbus aria* aggregate group, this includes both *Sorbus aria sensu stricto* and *Sorbus hibernica*. Variability is common with both *Sorbus* species and taxonomic difficulties are still an ongoing discussion throughout Britain and Europe (Fay and Rich, 2022). Fay, M.F., Rich, T.C.G. (2022) SORBUS ARIA: Rosaceae, *Curtis's Botanical Magazine*, 39(4), 655-668.

ED3	n/a	*Brassica rapa*, *Urtica dioica*, *Polygonum persicaria*, *Cirsium arvense*, *Potentilla anserina* and *Matricaria discoidea.*
GS1	n/a	*Cynosurus cristatus*, *Holcus lanatus*, *Poa pratensis*, *Cirsium arvense*, *Trifolium repens*, *T. Pratense*, *Rumex acetosa*, *Pteridium aquilinum* and *Prunus spinosa*. 137_R1 and 137_R2
	6210 (GS1_3A)	*Anthyllis vulneraria*, *Briza media*, *Danthonia decumbens*, *Anthoxanthum odoratum*, *Festuca rubra*, *Koeleria macrantha*, *Leontodon hispidus*, *Potentilla erect*, *Sesleria albicans*, *Carex caryophyllea*, *C. panacea*, *C. flacca*, *Antennaria dioica*, *Linum catharticum*, *Galium verum*, *Plantago maritima*, *Succisa pratensis*, *Centaurea nigra*, *Euphrasia* sp. *Polygala vulgaris*, *Prunella vulgaris* and *Lotus corniculatus*. EC57 R1 and EC57 R2
	*6210 (GS1_3A)	Includes a small area of orchid rich grassland (Priority Annex I *6210). Includes the orchids *Dactylorhiza fuchsii*, *Platanthera bifolia* and *Listera ovata* and without the *Anthyllis vulneraria* listed above, plus *Molinia caerulea* and *Lathyrus linifolius.* EC57 R4
GS1/WS1	n/a	Some ruderal patches due to overgrazing/poaching. *Calystegia sepium, Rubus fruticosus, Lythrum salicaria, Juncus sp., Acer pseudoplatanus, Buddleja, Salix purpureum, Salix cinerea, Prunus spinosa, Crataegus monogyna, Corallis avellana, Pteridium aquilinium, Fraxinus excelsior, Symphoricarpus alba, Urtica dioica, Filipendula ulmaria, Ranunculus repens, Cotoneaster sp., Hedera helix agg. Rumex obtusifolia, Dactylis glomerata, Centaurea nigra, Holcus lanatus, Agrostis stolonifera, Arrhenatherum elatius, Cirsium repens, Pteridium aquilinum, Heracleum spondylium*
GS2	n/a	*Holcus lanatus*, *Poa pratensis*, *Lolium perenne*, *Dactylis glomerata*, *Rumex acetosa*, *Ranunculus repens* and *Cynosurus cristatus.*
WN2/ER2	*8240 (LPW_2a)	*Corylus avellana, Crataegus monogyna*, *Prunus spinosa*, *Fragaria vesca*, *Viola* sp., *Rubus fruticosus* agg., *Hedera helix*, *Lonicera periclymenum*, *Brachypodium sylvaticum*, *Arum maculatum*, *Circaea lutetiana*, *Geum urbanum*, *Phyllitis scolopendrium, Dryopteris filix-mas, Rhytidiadelphus triquetrus*, *Eurhynchium striatum*, *Thamnobryum alopecurum* and *Thuidium tamariscinum.* EC57 R3
WS1	n/a	*Prunus spinosa, Rubus fruticosus agg., Pteridium aquilinum, Eurhynchium striatum, Kindbergia praelonga, Thuidium tamariscinum, Corylus avellana, Crataegus monogyna, Hedera helix s. hibernica* 140_R1, 144_R1 and 144_R2

EC57 - Species Lists & Relevés		
Habitat code	**Annex I habitat**	**Key species**

WS1/ER2	n/a	*Prunus spinosa*, *Crataegus monogyna*, *Corylus avellana*, *Rubus fruticosus* agg., *Pteridium aquilinum*, *Hedera helix*, *Rosa spinosissima, Teucrium scorodonia*, *Solidago virgaurea*, *Brachypodium sylvaticum*, *Fragaria vesca*, *Lathyrus linifolius* and *Molinia caerulea.*
WS1/ER2	*8240	*Prunus spinosa*, *Corylus avellana*, *Fraxinus excelsior*, *Crataegus monogyna*, *Ulex europaeus*, *Rosa spinosissima*, *Rubus fruticosus* agg., *Pteridium aquilinum*, *Hedera helix*, *Teucrium scorodonia*, *Lonicera periclymenum*, *Solidago virgaurea*, *Sesleria albicans*, *Brachypodium sylvaticum*, *Fragaria vesca*, *Thymus praecox*, *Molinia caerulea*, *Ctenidium molluscum* and *Scleropodium purum*. EC57 R5

Annex 2

Drawings - see Part 4 of this Appendix H

Annex 3

Habitat Survey Results - Digital Data Sets

A3

The digital datasets of the results of the 2019 Habitat Surveys are included in the attached DVD and include the following three sets of data.

A.3.1 Photo Dataset

The photo dataset contains a photographic record of the 2019 habitat surveys. This includes a series of photos recorded in 2019 habitat surveys along the route of the proposed road development. For each relevé it includes, at a minimum, one photo. Additionally there is a large selection of photos taken for all habitat types across the entire proposed road development.

The pdf file *N6GCRR_HabitatPhotographs_ReadMe.pdf* within the *N6GCRR_HabitatPhotographs.zip* photo dataset explains how the photos are filed and arranged.

A.3.2 Relevé Dataset

The relevé dataset contains the full results of all relevés taken between 2013 and 2019 in a Microsoft Excel Workbook. These relate to the following relevé shapefiles (which themselves are included as part of the GIS dataset as described in **Section A.3.3** below):

- N6GCRR_2018RelevéLocations.shp
- N6GCRR_RelevéLocations_3a.shp
- N6GCRR_RelevéLocations_3b.shp

The *N6GCRR_RelevéDatabase.xlsx* file includes a ReadMe tab providing information for users.

A.3.3 GIS Dataset

The GIS dataset contains 15 separate shapefiles which includes three which were used in the preparation of the habitat map published in the EIAR and 11 used to provide data in response to the 2019 RFI Response.

H.3 Soil Depth measurements of various transects in Polygon 1f (10 March 2020)

Appendix H – Part 3: Summary of Soil Depth Measurement Data

This Appendix H – Part 3 presents the results of the soil depth transects undertaken in 2020 during the oral hearing in polygon 1f within Lough Corrib SAC and it replicates the document submitted to ABP at that time[1]. Soil depth measurements were taken along three transects in the northern and western sections of Polygon 1f at 1m intervals (see **Plate 1**). These transects were selected as having the highest proportion of rock and shallowest soils. A total of 290 depth measurements were made. The range of soil depths was 0-35cm, with the average across all measurements being 7.7cm and the median across all measurements being 7.0cm (see **Table 1** and **Table 2** for a full summary of results).

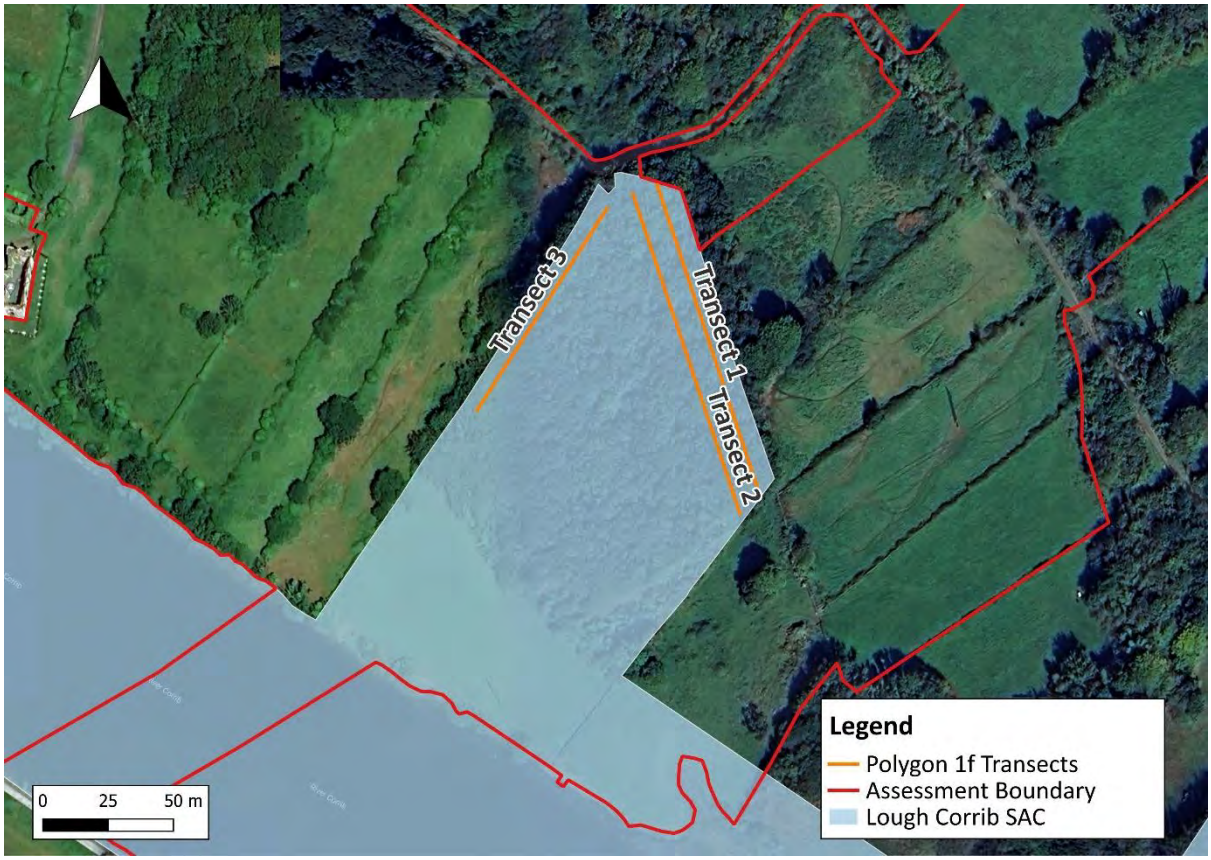

Plate 1. Locations of transects within polygon 1f for soil depth measurements at 1m intervals.

Table 1. Summary of soil depth measurements recorded across all transects in polygon 1f.

	Transect 1 (125m)	**Transect 2 (128m)**	**Transect 3 (91m)**	**Across all Transects**
Average Depth	10.0cm	6.5cm	6.4cm	7.7cm
Median Depth	8cm	6cm	6cm	7.0cm

1 https://www.n6galwaycityringroad.ie/sites/default/files/media/Soil%20Depth%20measurements%20of%20various%20transects%20in%20Polygon%201f,%20dated%2010%20March%202020.pdf

Table 2. All soil depth measurements recorded across all transects in polygon 1f.

Transect 1 (cm)	Transect 2 (cm)	Transect 3 (cm)
8	2	11
9	4	9
5	13	10
9	11	5
20	3	12
13	3.5	6
17	15	8
10	3	5
15	7.5	2
8	0	6.5
6.5	4	6
3.5	9.5	2.5
18	7	10
13.5	3.5	5.5
9	6	7
16	1	1.5
5.5	6	3
8	4.5	6.5
4.5	8	7
9	18.5	6
14	10	5
21	7	1.5
11	10	7
10	6	14.5
14	8	8.5
10	7.5	13.5
15	4	9
4	2.5	10
3.5	5	10
11	7.5	4.5
4	10	8
8	5.5	6
7	5	4.5
17	5.5	9
8	9	12
16	9	3
8	6.5	1.5
3	3	3
4.5	15	4
8	5	5
5	6.5	10
4	6	12
12	8	8
10	15.5	4.5
10	8.5	4
2	9.5	5
6	11	9
7.5	2.5	9.5
6.5	5	6
4	4.5	4.5
9.5	4.5	12
6.5	9.5	4

20.5	7.5	9.5
24	7.5	3.5
24	8	11
4	2.5	5
13.5	6.5	7
18.5	3	3
15.5	2	8
8	7	4
9.5	5	2
21	3.5	5
5	11.5	3.5
7.5	8	4
9.5	9	4
6	4	2.5
13	12	10
3	9.5	2
17	5.5	9
4.5	3.5	3.5
17	6.5	5
4.5	8	3
7	7	3.5
4	2.5	10.5
2.5	5	6
27	8	3
8.5	2	2
12.5	5	9.5
7	11	-
11.5	6.5	-
12.5	2.5	-
15	9	-
5.2	11	-
35	8.5	-
17	7	-
18	5	-
18	6	-
20	2	-
10.5	3.5	-
4.5	2	-
7	13	-
5	9.5	-
2.5	4	-
2.5	10.5	-
2	5	-
4	4.5	-
4.5	7	-
8	1.5	-
3.5	7	-
6.5	4.5	-
4	5	-
4	5.5	-
10	6	-
7	2.5	-
-	6	-
-	9	-
-	5	-

	-	4	-
Average Depth (cm)	**10.0**	**6.5**	**6.4**
Median Depth (cm)	**8**	**6**	**6**