



Irish Semi-natural Grasslands Survey

**Annual Report No. 3:
Counties Donegal, Dublin, Kildare & Sligo**



**F.H. O'Neill, J.R. Martin, F.M. Devaney, K.E. McNutt,
P.M. Perrin, A. Delaney**

December 2010





BOTANICAL, ENVIRONMENTAL & CONSERVATION CONSULTANTS LTD.

www.botanicalenvironmental.com

26 Upper Fitzwilliam Street, Dublin 2

Tel: 01 6619713

Email: info@botanicalenvironmental.com

Acknowledgements

We are grateful to everyone who contributed to the planning and completion of this project.

The work has been funded by the National Parks and Wildlife Service (Department of the Environment, Heritage and Local Government).

We would like to thank Marie Dromey for her guidance throughout the project, and Deirdre Lynn for helpful comments on an earlier draft of this report. Naomi Kingston advised on database redesign. We acknowledge the help of NPWS field staff, local authority personnel and BSBI recorders who suggested sites for survey, especially Mary Toomey, Ralph Sheppard, Val Swann and Hans Visser. We also thank staff at the National Biodiversity Data Centre. The assistance of Nick Hodgetts for identification of problematic bryophyte samples is also gratefully acknowledged.

We are grateful to Dolores Byrne, Edwina Cole, Orla Daly, Joanne Denyer, Mairéad Gabbett, Chris MacMahon, Saoirse O'Donoghue, Michelle O'Neill, Jenni Roche and Sam Thomas for their hard work in the field.

Finally, we thank the farmers and landowners of Donegal, Dublin, Kildare and Sligo for giving us permission to survey their land and for the background information they provided.

Cover: Lowland hay meadow (Annex I habitat 6510) at Rossnowlagh Lower, Co. Donegal. (Photo © Fiona Devaney & BEC Consultants)

Executive Summary

In 2010, 203 sites and 912 relevés in Donegal, Dublin, Kildare and Sligo were surveyed as part of the Irish Semi-natural Grasslands Survey (ISGS). Eighty-eight of these sites were associated with an NPWS conservation site (SAC, NHA, pNHA or SPA). Wet grassland was the most frequent semi-natural grassland habitat, recorded at 82.3% of sites and covering 37.9% of the total area of grassland surveyed. Freshwater marsh was the least frequent and represented less than 1% of the grassland surveyed in 2010. The EU Habitats Directive Annex I grassland habitat with the highest frequency of occurrence was *Molinia* meadows (6410), recorded at 31 sites (15.3% of sites), followed by Festuco-Brometalia (6210), recorded at 26 sites (12.8% of sites), Species-rich *Nardus* grassland (6230), recorded at eight sites (3.9% of sites), and Lowland hay meadows (6510), recorded at six sites (3.0% of sites). One site with Hydrophilous tall herb communities (6430) was recorded in 2010. In terms of area, however, 6230 covered by far the greatest area, 295.4 ha, due to the large area of this Annex I habitat recorded in the Curragh, Co. Kildare. This was followed by 6210 (165.1 ha), 6410 (117.3 ha) and 6510 (14.9 ha).

The median area of the semi-natural grassland sites in Donegal, Dublin, Kildare and Sligo was 13.8 ha and the county medians ranged from 8.8 ha in Donegal to 24.8 ha in Sligo, with individual sites ranging in size from 0.5 ha to 385.9 ha. Conservation scores were calculated for all sites surveyed in 2010. Of the 32 sites that scored highly (a score of 40% or over) in the conservation evaluation, 22 were associated with an NPWS conservation site. Sligo was found to contain many of the highest quality grasslands surveyed in 2010. Of the 13 sites that received high threat evaluations (a score of over 50%), eight were associated with an NPWS conservation site.

The main habitat adjacent to surveyed sites was improved grassland, adjacent to 81.8% of sites, with scrub the next most frequent category, adjacent to 65.5% of sites.

Primary areas of Annex I grassland have been identified which represent the best examples of Annex I grassland habitat surveyed during the ISGS; these provide a focus for semi-natural grassland conservation and monitoring in Ireland. In 2010, 24 primary areas of Annex I grassland habitat were identified. The ISGS has now identified 74 areas of primary Annex I grassland habitat in the 12 counties studied between 2007 and 2010.

The main negative impact recorded for Annex I grassland habitats surveyed in 2010 was problematic native species (e.g. bracken), with application of fertiliser and abandonment also highlighted as problems. The overall quality of each of the Annex I grassland habitats surveyed was *Unfavourable – Bad*, emphasising their vulnerability in Ireland and the urgency with which they need to be studied and monitored. However, in most cases the implementation of appropriate management would improve the condition of the Annex I habitat, and assessment scores of *Favourable* would be attainable in the medium term.

The ISGS vegetation classification utilised hierarchical cluster analysis to analyse all relevé data recorded during the ISGS between 2007 and 2010. The classification contained five main vegetation groups: three dry (or dry-humid) and two wet. The dry calcareous grassland group, which accounted for 18.1% of the relevés, was named *Festuca rubra* – *Plantago lanceolata*, based on the top indicator species. The dry-humid acidic group, which contained 23.9% of relevés analysed, was called *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus*. The dry neutral group *Lolium perenne* – *Trifolium repens* contained 17.3% of relevés. The wet neutral grassland group *Agrostis stolonifera* – *Juncus effusus*, the largest group, accounted for 36.0% of the relevés. The wet acidic group, *Molinia caerulea* – *Cirsium dissectum*, was the smallest group, containing 4.7% of relevés. The five vegetation groups were further subdivided into 34 vegetation types, 13 more than in 2009, with the addition of the 912 relevés recorded in 2010 resulting in more vegetation types being identified.

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1: INTRODUCTION

1.1 General background

Grassland habitats are reported to cover between 60% (Byrne 1996) and 73% (O'Sullivan 1982) of the land area of Ireland, but the overwhelming majority of this is improved agricultural grassland, with semi-natural grassland habitats contributing only a small percentage of the total. The current dominance of grassland habitats in Ireland is the result of millennia of human activity altering the predominantly wooded landscape that existed 5000 years ago (Hall and Pilcher 1995). The low-intensity agricultural practices that once allowed the development of species-rich semi-natural grassland have now all but ceased, threatening the existence of this habitat type within Ireland. Any semi-natural grasslands that remain are threatened either by the abandonment of all management, which for most grassland areas results in reversion to scrub and ultimately woodland, or by the intensification of management, resulting in the replacement of a diverse array of species with a small number of high-yielding ones.

During the last fifty years, agriculture in Ireland has changed completely with increases in mechanisation, the implementation of arterial drainage schemes and the application of fertilisers. Ireland's entry into the European Union in 1973 resulted in financial incentives to improve agricultural productivity (Feehan 2003), and as a result the nature of Ireland's grasslands has been radically altered. The majority of the remaining areas of semi-natural grassland owe their continued existence to edaphic and topographical conditions that make them unsuitable for fertiliser application, reseeding or drainage.

1.2 Vegetation studies of Irish grasslands

Since Braun-Blanquet and Tüxen (1952) made the initial attempts at classifying the grasslands of Ireland, the number of vegetation studies of this habitat has been disproportionately small considering the large area of Ireland that grasslands occupy. One reason for this is that the overwhelming majority of Irish grassland vegetation is low-diversity agricultural grassland. The most notable research on Irish grasslands was conducted by O'Sullivan (1965, 1968, 1976, 1982), who collected field data from a broad range of grassland habitats. In addition to this research contributing to the most comprehensive classification of Irish grasslands to date (O'Sullivan 1982), the data from the thousands of individual relevés collected provide researchers with a well-documented and archived dataset (D. Bourke pers. comm.). The majority of the other grassland vegetation studies carried out in Ireland have been more limited in their aims. Research has either focused on a particular region of Ireland, such as the Burren (Ivimey-Cook and Proctor 1966, O'Donovan 1987, Keane and Sheehy Skeffington 1995), Leinster (Byrne 1996), Sligo (O'Donovan 2007) or Fermanagh (Eakin 1995), or on a particular grassland vegetation type, such as callows grassland (Heery 1991, Tolkamp 2001), esker grasslands (Bleasdale 1998, Tubridy 2006), hay meadows (Martin 1991) or Calaminarian grasslands (Holyoak 2008). However, some of the most recent studies have been broader in their remit.

O'Donovan and Byrne (2004) carried out research in Sligo and Westmeath with the aim of developing a method for mapping semi-natural grassland across Ireland, and Dwyer *et al.* (2007) carried out a countrywide study of priority Annex I grassland habitats within Special Areas of Conservation (SACs). More recently in 2007, the semi-natural grasslands in both Roscommon and Offaly were surveyed (Martin *et al.* 2007), serving as a pilot study for the current project. In 2008, the current project commenced with a comprehensive survey of the semi-natural grasslands of Cork and Waterford (Martin *et al.* 2008). It continued in 2009 with a detailed survey of grasslands in Cavan, Leitrim, Longford and Monaghan (O'Neill *et al.* 2009).

1.3 Classification of Irish grasslands

Braun-Blanquet and Tüxen (1952) were the first to systematically classify Irish grasslands based on the Zurich-Montpellier phytosociological approach, but it was not until 1982 that the first comprehensive classification was published (O'Sullivan 1982). Using the same phytosociological approach, O'Sullivan divided all non-coastal Irish grassland into three classes: the Molinio-Arrhenatheretea, the Nardetea and the Festuco-Brometea. The Molinio-Arrhenatheretea, which includes lowland meadows and pastures on neutral soils, was the most frequent group, based on over 2,500 relevés and estimated to cover 65% of the land area of Ireland. The Molinio-Arrhenatheretea is divided into the Arrhenatheretalia elatoris and Molinietalia caeruleae orders. The Arrhenatheretalia elatoris generally includes drier meadows and pastures, including improved agricultural fields dominated by *Lolium perenne* and *Trifolium repens*. The Molinietalia caeruleae represents wet meadows and pasture communities on clay, loam and humus-rich gley soils that are generally not fertilised. The Nardetea includes acid grassland communities and was estimated to cover 4.4% of the land area of Ireland. The Festuco-Brometea, represented in Ireland by the sole order Brometalia erecti, includes dry limestone grasslands on base-rich soils, and was estimated to be the least frequent of the three major classes of grassland, covering only 0.3% of the Irish land area. White and Doyle (1982) in their catalogue of Irish vegetation types drew heavily on the work of O'Sullivan (1982), reapplying his classification of Irish grasslands and adding some rarer associations, such as the Violetea calaminariae class, which includes the grassland vegetation of areas rich in heavy metals, and the Carici rupestris-Kobresietea bellardii class of arctic-alpine grass heaths, of which one association, the Breutelio-Seslerietum, has been described in Ireland from Ben Bulbin in Co. Sligo.

Fossitt (2000) is the most widely utilised grassland classification in Ireland. Unlike O'Sullivan (1982), which is a vegetation classification, Fossitt (2000) is a habitat classification which utilises soils, geology and landscape features, in addition to plant communities, to define each habitat. Fossitt (2000) presents a simplified and standardised way to classify habitats in Ireland; however, it is based on the results of previous phytosociological studies rather than being based objectively on empirical data. The five Fossitt habitat categories directly relevant to this survey of semi-natural grassland are as follows:

- **Fossitt Code GS1 - Dry calcareous and neutral grassland.** This encompasses all unimproved and semi-improved grasslands on both calcareous and neutral soil. It is associated with free-draining mineral soils and low-intensity agriculture.
- **Fossitt Code GS2 - Dry meadows and grassy verges.** This habitat is found on free-draining mineral soils. The management is different from that in GS1 in that the grassland has little or no grazing but instead is managed primarily by mowing.
- **Fossitt Code GS3 - Dry-humid acid grassland.** This grassland is found on free-draining acid soils that are not waterlogged. It is found mainly on mineral-rich or peaty podzols in uplands, but is also found on siliceous sandy soils in the lowlands.
- **Fossitt Code GS4 - Wet grassland.** This habitat type is found on poorly drained mineral and organic soils and includes grassland that is seasonally or periodically flooded. It encompasses a range of wet grassland types, from wet rushy pasture to callows.
- **Fossitt Code GM1 - Freshwater marsh.** This habitat is found on waterlogged mineral and shallow peat soils near lake and river edges and other wetland habitats, where the watertable is close to the surface for most of the year. It is characteristically rich in broadleaf herbs, and grasses and sedges should not exceed 50% of the ground cover.

The grasslands section of the National Vegetation Classification (NVC) used to classify British plant communities (Rodwell 1991, 1992, 1995, 2000) does not utilise Irish data, but it does provide an indication of the range of plant communities likely to exist in Ireland. It also provides this in a system that does not follow the subjective methods inherent in the central European phytosociological approach of Braun-Blanquet and Tüxen (1952). Recently, Perrin *et al.* (2008a, b) produced an NVC-style classification of Irish woodland vegetation employing a range of more objective techniques. These techniques were also applied to the analysis of the semi-natural grasslands of Roscommon, Offaly, Cork, Waterford, Cavan, Leitrim, Longford and Monaghan for the Irish Semi-natural Grasslands Survey (ISGS) 2007-2009 (Martin *et al.* 2007, 2008, O'Neill *et al.* 2009). The latest of these vegetation classifications utilised hierarchical cluster analysis to analyse relevé data from these eight counties and produced four main groups: two dry grassland groups, named *Plantago lanceolata* – *Festuca rubra* and *Potentilla erecta* – *Galium saxatile*, and two wet grassland groups, named *Agrostis stolonifera* – *Juncus effusus* and *Juncus acutiflorus* – *Calliergonella cuspidata*. The four vegetation groups were further subdivided into 21 vegetation types. This vegetation classification proposed by O'Neill *et al.* (2009) highlights the limitations of Fossitt (2000), which only classifies semi-natural grassland into four groups and marsh into one group that is rigidly defined by the proportions of forbs (broadleaf herbs) and graminoids (grasses, sedges and rushes) present.

1.4 Conservation of Irish grasslands

Semi-natural grasslands are an extremely vulnerable habitat in Ireland. Areas of semi-natural grassland that are accessible to machinery are particularly vulnerable to agricultural improvement. Keane and Sheehy Skeffington (1995) showed that the addition of fertiliser to semi-natural grasslands

resulted in a change of sward composition and a loss of plant species diversity. The vulnerability of semi-natural grasslands to agricultural improvement, afforestation and scrub encroachment was demonstrated by Byrne (1996), who found that 38% of the sites documented by O’Sullivan during the 1970s no longer supported semi-natural grassland communities by 1994. Similar trends have also been demonstrated in England and Wales, where a review of available data showed that only between one and two percent of remaining lowland grasslands comprise semi-natural communities (Blackstock *et al.* 1999). Stevens *et al.* (2010) recently completed a comprehensive study of lowland grasslands in Wales which recognised lowland grassland as a priority for detailed survey and assessment because of the rapid losses and damage that had been taking place to the habitat over a number of decades.

Grasslands of conservation interest are protected in Ireland through conservation designations that vary in the level of protection they provide to the species and habitats found within them. Grasslands located within National Parks and Nature Reserves can have the highest level of protection, as they are State-owned and managed for conservation. SACs and Special Protection Areas for birds (SPAs) designated as a result of EU directives provide the next highest level of protection, while Natural Heritage Areas (NHAs) designated under domestic legislature provide the third tier of protection. As not all NHAs have been designated, proposed NHA (pNHA) is used to distinguish non-designated sites. Throughout this report when referring collectively to SACs, NHAs and pNHAs, the term ‘NPWS conservation sites’ is often used. As there has been no comprehensive survey of semi-natural grassland for almost 30 years, the application of conservation designations to protect areas of semi-natural grassland has taken place in the absence of an accurate record of the extent of each habitat on the ground.

The EU Habitats Directive has contributed to the conservation of semi-natural grassland in Ireland by listing and defining 28 types of Annex I habitat of conservation importance in Europe (Anon. 2007). Under this directive, Ireland has a responsibility to designate SACs to protect any of these habitats that occur within the State and to maintain them at a favourable conservation status. Six Annex I grassland habitats of conservation importance have been recorded within Ireland by the National Parks and Wildlife Service (NPWS):

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (6210).¹
- Species-rich *Nardus* grasslands on siliceous substrates in mountain areas (and sub-mountain areas, in Continental Europe) (6230).
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) (6410).

¹ Festuco-Brometalia is an old synonym for the order Brometalia-erecti. It is *not* synonymous with the class Festuco-Brometea as indicated in Fossitt (2000)

- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430).
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510).
- Calaminarian grasslands of the *Violetalia calaminariae* (6130).

Only two grassland habitats in Ireland, the orchid-rich variant of 6210 and 6230, are accorded priority status.

As semi-natural grasslands in Ireland almost always exist within farming systems, there is the possibility that agri-environment schemes such as the Rural Environmental Protection Scheme (REPS), the Agri-Environment Options Scheme (AEOS) and the NPWS Farm Plan Scheme (A. Bleasdale pers. comm.) will contribute to the conservation of semi-natural grassland. However, there is currently little evidence that these schemes are contributing to the conservation of semi-natural grassland in Ireland.

1.5 Assessment and monitoring of Irish grasslands

The systematic monitoring and assessment of the Annex I grassland habitats located within the State has started, with 33 orchid-rich calcareous grassland sites (6210) and nine species-rich *Nardus* grasslands (6230) having been surveyed during 2006 (Dwyer *et al.* 2007). The methodology employed for the monitoring and assessment adapted those published by the EU (Anon. 2006), the Joint Nature Conservancy Council (JNCC) in Britain (JNCC 2004) and the methodology already utilised for dune systems in Ireland (Ryle *et al.* 2009). In addition to Dwyer *et al.* (2007), 41 areas of Annex I grassland within 34 different sites in Roscommon and Offaly were surveyed during 2007, the most common being *Festuco-Brometalia* (6210) and *Molinia* meadows (6410) (Martin *et al.* 2007). A further 48 areas of Annex I grassland within 46 sites in Cork and Waterford were assessed in 2008, mostly *Molinia* meadows (6410) and species-rich *Nardus* grassland (6230) (Martin *et al.* 2008). In 2009 a similar number of Annex I areas were identified, with 49 areas of Annex I grassland identified within 45 sites in Cavan, Leitrim, Longford and Monaghan, the majority again in 6410 and 6230 grassland. At the conclusion of the 2009 ISGS survey, a list of sites containing particularly good examples of Annex I grassland was compiled from the grassland studies of 2006 to 2009, and 47 sites were identified as containing particularly good examples of Annex I grassland (O'Neill *et al.* 2009). Additional studies of Annex I grassland habitats within Ireland include studies of the Shannon Callows (Heery 1991) and Calaminarian grasslands (Holyoak 2008), the latter study having a particular emphasis on bryophytes. In the UK, the process of monitoring, assessing and reporting on Annex I grassland habitats is far in advance of Ireland, as indicated by the recent publication of *The European Context of British Lowland Grasslands* (Rodwell *et al.* 2007). However, the National Parks and Wildlife Service has recently published *The Status of EU Protected Habitats and Species in Ireland* (Anon. 2008); this lists the overall conservation status of each of the Annex I grassland habitats as *Bad* or *Poor*.

1.6 Scope of this report

This document reports on a survey of semi-natural grasslands and marsh communities in counties Donegal, Dublin, Kildare and Sligo conducted in summer 2010, which represents the third year of the *Irish Semi-natural Grasslands Survey* (ISGS). It follows on from the surveys of Cavan, Leitrim, Longford and Monaghan grasslands in 2009 (O'Neill *et al.* 2009) and Cork and Waterford grasslands in 2008 (Martin *et al.* 2008). A pilot survey was also carried out in 2007 to examine Offaly and Roscommon grasslands (Martin *et al.* 2007). The remit of the project this year, 2010, was to survey 200 sites across the four counties, recording relevés in each of the semi-natural grassland types which occur, and to map all habitat types found at each site using GIS. A further aim was to conduct a conservation assessment of any Annex I grassland habitats found. Data from the survey were to be combined with those from the previous studies carried out in Offaly, Roscommon, Cork, Waterford, Cavan, Leitrim, Longford and Monaghan, to be used to evaluate existing classification systems and to create an objective classification that described the diversity of vegetation types found. A scheme to assess the conservation value of each site as a whole was used to highlight important sites. The results section of this report will primarily report on results from the 2010 field season, while the discussion will comment on data collected from the pilot and main surveys between 2007 and 2010.

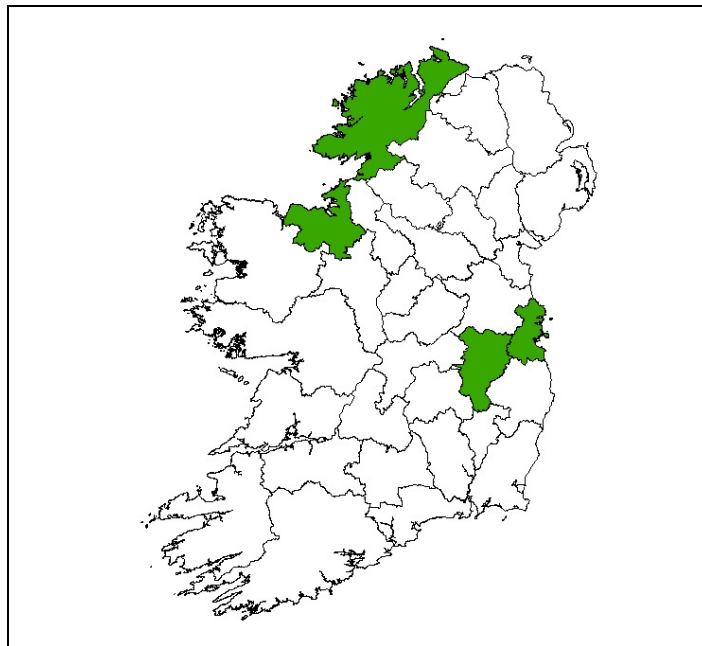
1.7 Study area

Counties Donegal and Sligo are located in the northwest of Ireland, while Dublin and Kildare are located in the east of the country (Fig. 1.1). Donegal is the largest of the four counties (4843.1 km²), followed by Sligo (1837.7 km²) and Kildare (1694.2 km²); Dublin has the smallest area at 921.3 km² (OSI 2010). The Central Statistics Office and Eurostat list Donegal and Sligo within the Border region and Kildare within the Mid-East region. Dublin county comprises a single region of its own but is often grouped in CSO reports, such as the farm survey report, with the Mid-East region (CSO 2007).

The survey this year is unusual in having two such disjunct areas on which to report. Geographically, Donegal boasts the most northerly point in Ireland, at Inishtrahull, an uninhabited off-shore island, while Dublin's Lambay Island is one of the most easterly locations in the country. The northwestern area of Ireland, within which Donegal and Sligo are located, is agriculturally less well developed than the eastern part of the country, which includes Dublin and Kildare. This is evidenced by the much smaller farm sizes in the Border region: less than 27 ha, compared to over 41 ha in the Mid-East and Dublin region (CSO 2007). The two regions also differ in terms of the main farm types recorded there, with sheep farms being the most frequent specialist farm type in the Border region, compared to the specialist tillage farms that are most frequent in the Mid-East and Dublin region (CSO 2007). Indeed, while the urban district of Co. Dublin occupies a significant portion of the county, parts of north Co. Dublin may be considered to be among the most intensively commercially farmed areas in the country.

Donegal is in the province of Ulster, Sligo is in Connacht and Dublin and Kildare are in Leinster. Of these four counties, only Kildare is inland, the three others having significant lengths of coastline. The highly indented Donegal coastline is the longest of the counties surveyed in 2010 (650 km), followed by Sligo (195 km) and Dublin (99 km) (Anon. 1996). The coastal habitats of Donegal and Sligo include machair, a priority habitat in Ireland under EU law. Six coastal SACs listing machair as a qualifying interest have been designated in Donegal; a further 20 SACs in Donegal and three in Sligo list machair as being present. Machair is a special form of coastal grassland habitat which was surveyed as part of the coastal monitoring project (Ryle *et al.* 2009). However, under Fossitt (2000) machair is listed as CD6, and is therefore not a grassland habitat within the remit of this survey.

Figure 1.1 Map of Ireland showing the survey area of counties Donegal, Sligo, Dublin and Kildare.



The four counties vary considerably in terms of their geological and edaphic characteristics. A review of the principal soil and sub-soil types in Donegal using the digital soils map of Fealy *et al.* (2006) shows that the county has a high proportion of peat throughout, both blanket and upland peats. These peats range altitudinally from the uplands of Glenveagh National Park all the way down to the coast. Outcropping acidic rock is prevalent in many of the upland areas and on the coast. The highest point in Donegal, Mount Errigal, is virtually unvegetated non-calcareous rock. A gradual shift in soil character takes place moving east through the county, approaching Co. Tyrone: soils become less peaty, better drained and generally more suitable for agriculture, with higher levels of agricultural intensification occurring as a result. Acid substrates are overwhelmingly in the majority throughout the bulk of Donegal; the only area where calcareous soils and bedrock becomes notable is towards the extreme south and southwest of the county, where outcropping limestone rock is a feature of some parts of the landscape. Drumlins are also a feature of this southern area.

Sligo has quite a different character from Donegal, despite their proximity. Calcareous rock, including limestone bedrock, is present throughout many parts of the county. Calcareous soils, as a result, are more frequent, particularly in the centre of the county. Peaty areas are more concentrated in the west and more interspersed with better drained soils than is the case in Donegal. The drumlin belt that characterises much of Co. Leitrim continues west to Sligo and runs throughout much of the south and southeast of the county.

The prevailing soils in the east tend to be less acidic in character. Among the main exceptions are the peaty areas of central and northwest Kildare, the site of important raised bogs and fens that are qualifying interests for a number of SACs in the county, including Pollardstown Fen, Mouds Bog and Ballynafagh Bog and Lake. Pollardstown Fen is the largest remaining calcareous spring-fed fen in Ireland (Anon. 2010). Less organic, more acidic soils occur in eastern Kildare, north Co. Dublin and the southern part of Dublin occupied by the Dublin Mountains. In contrast to the northwest counties, Dublin and Kildare have a greater proportion of tills, soils which tend to be better drained and more suitable for agriculture. Kildare is home to the Curragh plains, possibly the oldest and most extensive expanse of semi-natural grassland in Ireland. Feehan and McHugh (1992) note that “the Curragh is perhaps the oldest, and certainly the most extensive tract of man-maintained seminatural grassland in the country” which has existed as such for at least the past 2000 years. The Curragh is of geological interest due to the deposits of fluvioglacial outwash sands and gravels that underlie much of the area (Feehan and McHugh 1992). These deposits occur over carboniferous limestone bedrock and vary in thickness between 20 m and 60 m (Missteart and Brown 2008). This area is also of considerable hydrogeological importance due to the existence of a regionally important aquifer, the Curragh aquifer, which is the largest gravel aquifer in Ireland and whose discharge feeds major springs to Pollardstown Fen (Missteart and Brown 2008).

One of the main landuse types of Co. Dublin is urban district. However, Dublin does contain the Phoenix Park, one of the largest public parks in Europe, as well as a number of other public parks under the jurisdiction of state bodies such as the Office of Public Works (OPW) or one of the four local authorities in the county (three county councils and one city council).

Climatically, the northwest is much wetter than the east, with average annual rainfall (30-year average between 1961 and 1990) at the weather station in Malin Head, Co. Donegal, of 1060 mm, compared to just 711 mm at Casement Aerodrome, Co. Dublin (Met Éireann 2010). The Donegal weather station also recorded a higher number of days with rainfall in excess of 5 mm: 76 days, compared to just 45 days in Dublin. In terms of temperatures, the northwest’s climate is seen to be cooler in summer than the east, with a July mean temperature of 13.8°C in Donegal, compared to 15.2°C in Dublin. However, the winters in the northwest are milder, with a January mean of 5.4°C in Donegal, compared to 4.9°C in Dublin, the annual average number of days with ground frost recorded in Donegal being less than half that recorded in the Dublin station: 43 compared to 94. These marked differences between the two areas in turn affect not only the plant species that can survive, but also

lead to differences in soil characteristics including moisture, texture, nutrient retention and drainage, which has further consequences on the type of vegetation that can be supported.

2: METHODS

2.1 Site selection

The target for this project was to visit 200 sites across counties Donegal, Dublin, Kildare and Sligo, recording at least one relevé in each site. The number of sites selected in each county was calculated based on a combination of the size of the county and the amount of agricultural intensification within each county (Lafferty *et al.* 1999). Based on agricultural intensification, Donegal and Sligo were expected to contain larger amounts of semi-natural grassland than Dublin or Kildare. Furthermore, a downward adjustment of potential surveyable area was made by excluding all upland SACs from this survey to prevent overlap with the on-going National Survey of Upland Habitats (Perrin *et al.* 2009). Every effort was made to select an even geographic spread of sites. However, the method used in previous years of selecting 3-5 sites per 10 km square was found to be unworkable due to the uneven distribution of potential grassland sites, due mainly to the occurrence of extensive areas of upland heath, urban housing and improved agricultural land within the survey area. Therefore, there were many occurrences of 10 km squares that contained no potential grassland sites for survey. Despite the unevenness of grassland habitat distribution, however, the number of sites to be surveyed in each county was maintained as per calculations made above. As in previous years, additional sites were selected to allow for those that would not be surveyed due to problems such as a lack of semi-natural grassland habitats or owners denying access.

In addition to this stratified sampling of the survey area, the criteria listed below were considered during site prioritisation to ensure that a broad range of semi-natural grassland sites was included in the survey:

- NPWS conservation sites¹, particularly those which have an Annex I grassland habitat listed as being present within the site.
- Large areas of semi-natural grassland for which little or no data are currently available.
- Sites which occur on different soil and sub-soil types, as indicated by the digital soils map of Fealy *et al.* (2006).
- Sites that represent the geographical variation that exists in the study area, such as altitudinal range, with the exclusion noted above of upland SACs.
- Sites associated with important landscape features (e.g., eskers, hills).
- Sites adjacent to river systems, ensuring a representative sample of wet grasslands and marshes.
- Sites highlighted by previous publications, such as McDonnell (2007), that had not been comprehensively surveyed.
- Large sites of natural grassland or inland marsh indicated by CORINE 2000 (EPA 2000), although this resource has been of limited use due to its coarse mapping resolution and the extensive changes that have taken place in many habitats, including grasslands, since it was recorded.
- Information from the Botanical Survey of the British Isles (BSBI) county recorders.

¹ Note that, throughout this report, the term “NPWS conservation sites” is used to refer to NHAs, proposed NHAs (pNHAs), SACs and SPAs

- Sites suggested following consultation with the National Biodiversity Data Centre (NBDC).
- Information from NPWS regional staff.

Each of the criteria listed above was used in conjunction with the 2005 set of aerial orthographical photographs, which were used to either identify or confirm all sites.

A subjective approach to site selection was adopted for this survey, primarily due to the practical restraints on the project and the need to acquire a critical mass of data for several habitat types. For example, for rarer grassland habitats, such as marsh, it was desirable to include a minimum number of sites within the survey to ensure that a reasonable level of information about this habitat type was obtained. It was also desirable to survey NPWS conservation sites, such as SACs, that contained semi-natural grassland so that comparisons could be made with sites outside this network. Given that a limited number of sites could be surveyed within the financial and time limits of the project, a purely randomised approach could well have omitted some or all of these sites. A similar case can be made for most of the criteria listed above. Furthermore, difficulties with obtaining access permission and accurately identifying semi-natural grassland habitats from aerial photographs and GIS datasets made a randomisation approach to site selection unworkable.

For the location and summary data of all sites see Appendices 1 and 2.

2.2 General site survey

For all sites selected for field survey, a site pack was compiled. Each site pack included a cover sheet that detailed general site information for the field surveyors (e.g., townlands, geology, soil types, grid reference), a blank six-inch map, an aerial photograph of the site at a scale appropriate for mapping, and copies of any previous survey notes. Fully charged-up electronic handheld Personal Digital Assistants (PDAs) loaded with TurbovegCE version 1.5 for recording site and relevé data were carried by each team of two. Paper data sheets (Appendix 3) were also carried for recording general site data, Annex I grassland habitat assessment data and Annex I grassland habitat impacts, as well as for recording site and relevé species in the event of PDA battery failure. Copies of the Annex I grassland habitat assessment criteria (Appendix 5) and impact criteria (Appendix 7) were also carried by individual surveyors.

For each selected site, a decision was made upon arrival in the field on the validity of surveying it, based on the presence of semi-natural grassland habitats and the area they covered: sites with semi-natural grassland covering less than the minimum size of 0.5 ha were rejected. Similarly, sites deemed to be comprised primarily of improved grassland or non-grassland habitat (e.g., heath, scrub) were rejected. Permission was sought from the owner or owners of a site before entering and whenever possible the management of the site was discussed with the landowner. Sites for which access was denied were rejected. In some cases landowners were contacted by telephone before leaving for a site by using the Land Direct on-line service provided by the Land Registry Office. For a

small fee the name and address of the registered landowner for a particular site could be obtained. Eircom's on-line telephone directory was then utilised to get telephone numbers.

The minimum site size for this project was 0.5 ha; sites at which recent habitat loss had reduced the area of suitable habitat to less than 0.5 ha were rejected. An exception was made for sites found, on arrival at the site, to contain only a small area of a nationally rare Annex I grassland habitat (e.g., Calaminarian grassland). Areas of non-grassland habitat (such as woodland) >400 m² and linear habitats (such as rivers) >4 m wide were excluded from the site. Species-poor *Molinia*-dominated vegetation on deeper, often degraded peats (>0.5 m deep) were deemed to be peatland and excluded from the site. Areas of improved grassland (GA under Fossitt (2000)) that had recently been ploughed, re-seeded with *Lolium perenne* and *Trifolium repens* and fertilised were also excluded.

Some intermediate, semi-improved grassland types were retained within sites, especially if it was considered that areas were of potential conservation importance if negative practices such as overgrazing or fertiliser application were to be removed. When semi-improved grassland habitats were recorded, an 'i' was inserted into the Fossitt category of the habitat type deemed to have been present prior to improvement. Thus, for example, GSi4 denotes semi-improved wet grassland of potential conservation value.

The following details were recorded for each site surveyed. Unless otherwise indicated, these details were recorded on the general site data sheet:

Internal habitats: All habitats that were observed within the boundaries of a site were noted. The internal grassland habitats recorded within each site were categorised as Annex I grassland habitats (Anon. 2007), non-Annex I semi-natural grassland habitats (Fossitt 2000) and semi-improved grassland. Non-grassland habitats, as defined by Fossitt (2000), which had been retained within the site (<400 m² in area or linear habitats <4 m wide) were also listed.

Following Dwyer *et al.* (2007), no differentiation was attempted to be made in the field between Semi-natural dry grassland and scrubland facies on calcareous substrates (6210) and Semi-natural dry grassland and scrubland facies on calcareous substrates – important orchid sites (6211²). The main reason for Dwyer *et al.* (2007) not distinguishing orchid-rich sites is the ephemeral nature of orchids, with large orchid populations present one year and absent the next. Therefore all areas referred to as 6210 in this report may potentially include areas of 6211.

Site geography: Where the site was associated with a particular geographical feature, for example, in a valley, on a drumlin or by a lake, this was recorded. In addition, if seasonal flooding was observed or thought to occur on the site, this was noted here. In contrast to previous reports (e.g. O'Neill *et al.* 2009, Martin *et al.* 2008), topography was no longer recorded at site level as this was

² The code 6211 is used to refer to the priority habitat variant of category 6210 following the precedent set by the JNCC (2004)

found to be too broad a level to provide useful information. Topography of relevés, however, was still recorded (see section 2.3 below).

Site management: Semi-natural grasslands are habitats that require some human management, in most cases grazing or mowing. Land managers were consulted, wherever possible, to ascertain current management practices. Variables recorded include frequency and timing of grazing/mowing, type of livestock, fertiliser application and burning.

Adjacent habitats: Adjacent habitats, including boundary habitats such as hedgerows or walls, observed during the field survey were recorded for each site using the categories defined by Fossitt (2000). Unlike previous years, the adjacent habitats Fence and Dry ditch are no longer recorded as it was decided to restrict adjacent habitat data only to Fossitt (2000) habitats. Boundary transition (abrupt or diffuse) was likewise not recorded in 2010 as most sites had both boundary types present and the information provided did not add significantly to the overall site profile.

Fauna: In addition to domestic animals such as cattle, sheep and horses using grassland for pasture, there are also several relatively common wild animals that utilise semi-natural grassland habitats; some may contribute to the overall maintenance of the habitat, for example by grazing (e.g. deer), while others simply use the habitats for foraging (e.g. badger). The presence of such species was recorded. Anthills were also recorded within the fauna section, as there is evidence that they can indicate the presence of areas of old semi-natural grassland (Breen and O'Brien 1995). Observations of Annex II species of animals (EU Habitats Directive), such as marsh fritillary, or Annex I species of birds (Birds Directive), such as chough, were also recorded.

Damaging operations: Three damaging operations were listed on the data entry form: drainage, dumping and recent afforestation in the vicinity. The occurrence of dumping at a site can be associated with illegal activities, whereas drainage and afforestation represent changes in management practice which are typically detrimental to semi-natural grassland habitats. Burning is included under site management. Camp fires were recorded separately as a damaging operation under 'Other'. Grazing levels (overgrazing, undergrazing and appropriate grazing) and encroachment (scrub, heath and bracken) are no longer recorded at a site level as these data were found to be recorded at too coarse a resolution to be entirely useful. All three grazing levels were recorded at many sites, and a small amount of encroachment was accorded the same weighting on a small site as a large site, despite being proportionately more damaging in the smaller site. Scrub, heath and bracken are still recorded as adjacent habitats where they are large enough to be mapped out, and as internal habitats where they are smaller than the minimum mapping area. Grazing and encroachment are, however, recorded if they impact on Annex I grassland habitats (see section 2.4 Future prospects).

Archaeological features: Where a site was associated with a particular archaeological feature (e.g., lazy beds, ringforts), this was recorded.

Habitat mapping: A habitat map of the site was drawn in the field using the colour aerial photograph in the site pack as a base map. A handheld GPS (Garmin GPSMap 76 with MapSource or Magellan MobileMapper CE with ArcPad 7) was used in the field to accurately map site boundaries, areas of Annex I grassland habitats (Anon. 2007), non-Annex I semi-natural grasslands (Fossitt 2000) and semi-improved grassland habitats, particularly where these were not visible on the photograph. The minimum mapping unit for habitats was 400 m², with a minimum habitat width of 4 m. An accurate habitat map of each site was produced using these data within ArcGIS 9.3.

Site area: Site area (ha) was derived from the ArcGIS habitat maps as accurately as is possible in the absence of a Digital Terrain Model (DTM). In the absence of a DTM, areas of habitat on steep slopes are likely to be underestimated due to the fact that only a vertical projection has been used to calculate area.

Site summary: In addition to the specific site data gathered and recorded on the field sheet, a general description of each site was also written. A specific format was adhered to when writing descriptions of the sites. Included within these descriptions were:

- A summary of the location and geography of the site
- A description of the habitats and vegetation types present at the site
- A summary of management at the site and any damaging activities
- Rare/protected or notable species recorded at the site
- Archaeological features recorded on site
- Any relevant information given by the landowner / locals.

General site survey results are in section 3.1.

For a summary of each site, see the Addendum to this report.

Summary information on the grassland habitats recorded at each site is in Appendix 4.

Site species list: For the semi-natural grassland habitats present at each site, a comprehensive list of vascular plant species and the major components of the bryophyte flora found were input into a Turboveg database (TurbovegCE 1.5) on the PDA; these data were subsequently downloaded to a Microsoft® Access relational database. The site bryophyte list was supplemented, particularly in the case of smaller and less obvious taxa, by the intensive sampling conducted within each relevé; macro-lichens were also recorded from relevés and added to the site list. Identification of bryophytes and lichens in the laboratory was conducted as required and problematic species were referred to an expert. Species names used throughout the survey for vascular plants, bryophytes and macro-lichens are according to the current National Biodiversity Data Centre (NBDC) species checklist; at time of writing, this is Ireland2008v2.

As noted above, the site species list was input into the Turboveg database. The remainder of the site data, with the exception of the habitat maps, were input into the Access database. When there was ownership information available for a site, this was also added to the Access database. Digital photographs were taken at all of the surveyed sites, and all of these images were submitted on CD with the ArcGIS project.

2.3 Relevé survey

A minimum of one 2 m x 2 m relevé was recorded from within each grassland habitat area mapped in each site. Multiple relevés were recorded where there was significant variation in the sward composition within a habitat type, for example, in transitional areas, or where Annex I grassland habitat assessments were conducted. For each relevé, a 10-figure grid reference was obtained using a GPS unit, and topography, altitude, slope and aspect were recorded.

Cover in vertical projection for each vascular and bryophyte species was recorded on the Domin scale (Kent and Coker 1992), as were other general parameters: bare soil, bare rock, leaf litter, surface water, total field layer and total bryophyte cover. The Domin scale is superior to the Braun-Blanquet scale as the greater number of recording subdivisions permits more variation in vegetation composition to be detected in subsequent analysis. It also provides for a more sensitive means of monitoring changes in sward composition over time.

For each relevé, additional data were also recorded to define the structure of the grassland within the 2 m x 2 m plot. These were:

- Overall cover of forbs(broadleaf herbs), measured on the Domin scale
- Ratio of forb species to graminoid (grass / sedge / rush) species
- An estimate of the median graminoid height
- An estimate of the median forb height
- A digital photograph of the relevé.

Five soil sub-samples were taken from each relevé (one from the centre and one from each corner) with an aluminium corer to a depth of 10 cm, and combined for analysis. Soil pH of field-fresh material was recorded using a glass electrode and a 1:1 soil / water paste. Soil samples were air-dried and retained for subsequent laboratory analyses of total organic carbon and total phosphorus. A soil profile was examined to a minimum depth of 30 cm, and the soil type defined according to a simplified version of the Great Soil Groups of Gardiner and Radford (1980) with the aid of the soil identification key in Trudgill (1989). The simplified categories are as follows:

- Well-drained mineral: includes brown earths, grey/brown podzolics and brown podzolics
- Gleys: includes gleys and peaty gleys
- Podzols
- Basin peat
- Lowland blanket bog peat

- Upland peat
- Other: includes rendzinas, regosols, lithosols, skeletal soils, alluvial soils and some coastal soils such as shallow peat over sand.

All of the above relevé data, with the exception of the digital photographs, were added directly to the Turboveg database (one database was used to hold both site and relevé data) and subsequently downloaded to the Access database. All digital images were submitted on CD with the ArcGIS project.

2.4 Assessment of Annex I grassland

The conservation status of all mapped areas of Annex I grassland habitat within Dublin, Donegal, Kildare and Sligo was assessed. The methodology used was similar to that used by the NPWS for their survey of dune systems (Ryle *et al.* 2009) and grassland (Dwyer *et al.* 2007), with subsequent adjustments to criteria made over the course of the ISGS in previous years (Martin *et al.* 2007, 2008, O'Neill *et al.* 2009). *JNCC Common Standards Monitoring Guidelines* (JNCC 2004) were used as a guide to help evaluate the conservation status of the habitats in conjunction with *Assessment, Monitoring and Reporting Under Article 17 of the Habitats Directive* (Anon. 2006).

For each habitat assessment, three parameters were scored: area, structure and functions, and future prospects. For a habitat at a site to receive an overall assessment of *Favourable*, the habitat had to be assessed as *Favourable* within each of the three assessment parameters (Table 2.1). Any deviation from stability, as indicated by a negative change in area, structure and functions (determined by defined criteria assessed at monitoring stops; see Appendix 5) or future prospects (determined by defined criteria assessed at the Annex I habitat level; see Appendix 7), implies a negative impact, and the assessment is affected accordingly.

Table 2.1 Summary matrix of the parameters and conditions required to assess the conservation status of habitats (modified from Ryle *et al.* (2009)).

	Favourable	Unfavourable - Inadequate	Unfavourable - Bad
Area	Stable	>0% - <1% decline/year	≥1% decline/year
Structure & Functions	Stable	1 – 25% monitoring stops decline/failure	>25% monitoring stops decline/failure
Future Prospects	Good (≥0)	Poor (<0 to -3)	Bad (<-3)
Overall	All green	Combination of green and / or amber	One or more red

Results of Annex I grassland assessments are in section 3.2 as follows:

Area assessment: p. 41; Structure and functions: p. 42 and Appendix 5; Future prospects: p.44 and Appendix 7; Overall condition assessment: p. 46 and Appendix 9

Area assessment

Loss of extent was assessed by comparing the area of the Annex I grassland habitat mapped during the 2010 survey with the estimated extent of the habitat apparent in 2000 following interpretation of the aerial photographs from 2000. This comparison was made using the GIS. While small changes in area were difficult to detect, this was regarded as the best approach for the baseline assessment in the absence of an established monitoring scheme. On a technical note, the 2005 aerial photographs have been utilised when producing base maps with the 2010 boundaries superimposed over them. There was therefore an unavoidable bias towards the 2005 extent, with small habitat changes (such as scrub encroachment of less than 400 m²) that occurred between 2005 and 2010 not being mapped. However, changes in extent greater than 400 m² were mapped and these changes were reflected in the overall final percentage area change (see results in section 3.2 below).

Structure and functions assessment

The information required for the structure and functions assessment was recorded at monitoring stops, as described in Ryle *et al.* (2009). Areas of Annex I grassland habitat measuring less than 400 m² were not assessed. In cases where the area was only slightly larger than 400 m², only one or two monitoring stops were recorded to avoid stops being positioned adjacent to each other. Where the habitat area was large enough, a minimum of four monitoring stops were made, with an increasing number of stops recorded with increasing area. Table 2.2 shows the scale used to determine the number of monitoring stops to record, and is that proposed in O'Neill *et al.* (2009) to ensure adequate coverage of the Annex I grassland habitat. At each monitoring stop a full relevé was also recorded, with the exception of soil data, which were generally only recorded from the first stop in each Annex I grassland habitat. Each series of monitoring stops was positioned to encompass the variation that existed within the habitat, but did not include seriously disturbed areas or areas suffering from encroachment. Structure and functions were assessed at each monitoring stop using a number of criteria, namely: high quality positive indicator species, positive indicator species (non-high-quality), negative indicator species, forb:graminoid ratio, encroachment, sward height, litter cover, extent of bare ground, and grazing and disturbance levels. Threshold values for each of these criteria differ for each of the Annex I grassland habitats assessed and are given in O'Neill *et al.* (2009). For the Annex I habitat to receive a *Favourable* assessment for structure and functions, a pass was generally required for all criteria within all monitoring stops; however, high quality sites which narrowly failed on litter, bare ground or disturbance (less critical components of structure and functions that may also vary seasonally) were re-examined and, using expert judgement, a decision was made on whether a *Favourable* assessment for structure and functions was warranted.

Table 2.2 Monitoring stop scale for Annex I grassland habitats

Area (ha)	Number of monitoring stops
<0.04	0
0.04 - 0.25	2
>0.25 – 4	4
>4 – 8	6
>8 – 16	8
>16 – 32	10
>32 – 64	12
>64	14+

Positive and negative indicator species and the threshold values for other factors varied by habitat type (Appendix 5). The assessment criteria of Dwyer *et al.* (2007) were adapted for habitats Festuco-Brometalia (6210) and species-rich *Nardus* grasslands (6230). For *Molinia* meadows (6410), Hydrophilous tall herb fringe communities (6430) and Lowland hay meadows (6510), the assessment criteria proposed in the pilot study by Martin *et al.* (2007) were adapted. For this report, all the structure and functions criteria were reviewed using the data collected during the 2007 and 2008 surveys, the *Interpretation Manual of European Union Habitats* (Anon. 2007) and White and Doyle (1982). For Calaminarian grasslands (6130), a similar approach was taken, but due to the importance of metalliferous bryophyte species Holyoak (2008) was also consulted. The main change to the assessment criteria used during 2009 was to divide the positive indicator species into High Quality (H.Q.) and non-H.Q. indicator species, with H.Q. indicators almost always species only found in high quality grassland habitats (QUB 2008). In 2009, three species were also added to the positive indicator species list for 6230 (see below). No further changes were made to the assessment criteria in 2010.

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (6210)

This Annex I grassland habitat is the most readily identifiable since it typically occurs on obvious geological features such as eskers, outcropping limestone rock and in association with limestone pavement. This habitat has been well documented (Dwyer *et al.* (2007), Ivimey-Cook and Proctor (1966), O'Donovan (1987), Keane and Sheehy Skeffington (1995), Tubridy (2006), Breen and O'Brien (1995), Bleasdale (1998), Byrne (1996)).

- Species-rich *Nardus* grasslands on siliceous substrates in mountain areas (6230)

For this habitat, the list of positive indicator species was based on those proposed by Dwyer *et al.* (2007). The data presented in Martin *et al.* (2008) also indicated that the moss species *Hylocomium splendens* and *Rhytidiadelphus loreus* should be included in the list of positive indicator species.

Three additional species listed within the Nardetalia (White and Doyle 1982) were also included in 2009: the diagnostic species *Carex binervis*, *Festuca vivipara* and *Veronica officinalis*.

- *Molinia* meadows on calcareous, peaty or clayey-silt laden soils (6410)

For this habitat, the positive indicator species selected included the character species listed for the Molinietalia and the Junco conglomerati – Molinion (White and Doyle 1982), except for *Juncus effusus*, which was considered too common to be a reliable positive indicator species. *Crepis paludosa* and *Caltha palustris* from the Calthion palustris alliance (White and Doyle 1982) were also included as they are also listed for this habitat in Anon. (2007). Martin *et al.* (2007) listed the top 11 indicator species for this habitat type and, with the exception of *Plantago lanceolata*, which cannot always be regarded as a positive indicator for the condition of *Molinia* meadows, an additional seven species are provided by this list. These species are *Carex panicea*, *Potentilla erecta*, *Calliergonella cuspidata*, *Trifolium pratense*, *Carex flacca*, *Centaurea nigra* and *Rhinanthus minor*.

- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)

For this habitat, the native diagnostic species from the Glechometalia hederaceae and Convolvuletalia sepium, the character species from the Aegopodion podagraiae, and diagnostic and differential species from the Filipendulion, all listed in White and Doyle (1982), were included. As *Filipendula ulmaria* is often abundant in the Filipendulion, it was also included as a positive indicator species for this habitat. The uncommon Irish species *Crepis paludosa* and *Trollius europaeus* are listed for this habitat in Anon. (2007), and so they were also included as positive indicator species. After examining all data collected in this Annex I grassland habitat during 2007 and 2008 it was decided, based on the frequency of species within the examples of the habitat surveyed to date, to also include *Equisetum fluviatile*, *Galium palustre*, *Iris pseudacorus* and *Mentha aquatica* in the list of positive indicator species.

- Lowland hay meadows (6510)

For this habitat, the positive indicator species used in the assessment included the character and diagnostic species listed for the Arrhenatherion elatioris (White and Doyle 1982), except *Bellis perennis* and *Taraxacum* agg., as these can also be indicative of improved grassland (Fossitt 2000). *Arrhenatherum elatius* and *Dactylis glomerata* are other character species of the Arrhenatherion elatioris that were not included in the list of positive indicator species. This was due to the fact that a high cover score for both of these species would indicate a lack of management, such as mowing, and an increase in the rank nature of the grassland. JNCC (2004) lists both these species as negative indicators for lowland meadows when their cover is high. As the Arrhenatherion elatioris represents only plant communities found on well-drained soils, six species that are found within lowland meadows on more impeded soils were also included within the assessment: *Centaurea nigra*, *Filipendula ulmaria*, *Lotus corniculatus*, *Rhinanthus minor*, *Succisa pratensis* and *Thalictrum flavum*. These six species are listed as positive indicator species for NVC habitat MG4 (JNCC 2004), a UK habitat thought to correspond closely to lowland hay meadows (6510). *Sanguisorba officinalis* was also included from the NVC MG4 list, although it should be noted that it is a rare species in Ireland.

Martin *et al.* (2007) list the top eight indicator species for this habitat type, providing an additional six species: *Plantago lanceolata*, *Trifolium pratense*, *Ranunculus acris*, *Festuca pratensis*, *Phleum pratense* and *Crepis capillaris*.

- Calaminarian grasslands of the *Violetalia calaminariae* (6130)

For this habitat, the positive indicator species used in the assessment included the two character species listed for the *Violetea calaminariae*, *Minuartia verna* and *Silene vulgaris* (White and Doyle 1982). *Armeria maritima* from the *Sileno-Armerietum maritimae* *metallicolae* association (White and Doyle 1982) and *Cochlearia pyrenaica* ssp. *alpina* were also included as they are listed for this habitat in Anon. (2007). As the four vascular plants listed only exhibit facultative heavy metal tolerance, the thirteen bryophyte species listed by Holyoak (2008) as obligate heavy metal tolerant were also included in the positive indicator species list.

Future prospects assessment

The future prospects assessment relates to the likely development and maintenance of the Annex I grassland habitat in favourable condition for the foreseeable future. In order to assess this likelihood, pressures, threats and impacts were recorded for each area of Annex I grassland habitat surveyed using the impact codes from the list provided in Appendix 7 (Ssymank 2010). Following Ssymank (2009, 2010) and recommendations made in Ellmauer (2010), the intensity of each impact at each site was assessed and given a score ranging from 0.5 to 1.5 (Table 2.3), corresponding to the EU criteria of low impact/importance, medium impact/importance, high impact/importance. Threats were assigned a negative value, positive impacts/management were assigned a positive value and a score of zero indicated that the impact was balanced in terms of its positive and negative effects. The percentage of the Annex I habitat under this pressure was also recorded, along with the source of the pressure, i.e. whether originating inside or outside of the Annex I habitat. The percentage habitat criterion was ranked from 0.5 to 3 to correspond with the ranges <1% to 100% (Table 2.3), while pressures that were sourced inside the Annex I habitat were given a score of 1 and outside a score of 0.5. As the data collected here are baseline data, trends of impact intensity could not be determined. When assessments are repeated in future years, it will be possible to record whether a particular impact is increasing, decreasing or static in trend by comparing with assessment data from previous years.

By multiplying together the scores of intensity, area and source and then combining the result with the negative, positive or neutral effect of each (i.e., by multiplying the score by -1, +1 or 0 respectively), a final score for each impact was produced. (Thus a neutral impact would always receive a score of 0 by this scheme.) For an Annex I habitat that was subject to multiple impacts on a site, the final scores were summed to gain an overall future prospect score for the habitat. Areas of Annex I grassland habitat that scored ≥ 0 were determined to have *Favourable* future prospects, while those scoring between <0 and -3 were *Unfavourable – Inadequate* and <-3 *Unfavourable – Bad*, as shown in Table 2.1. Furthering this quantitative analysis of future prospects, each site containing an Annex I

grassland habitat was examined by an expert who took part in the field assessment to determine whether these scores were a true reflection of the future prospects of the habitat.

Table 2.3 Scoring system used to calculate Future prospects scores for Annex I grassland habitats assessed in 2010

Impact	Value	Score
Source of impact	Inside Annex I habitat	1
	Outside Annex I habitat	0.5
% Area of Annex I habitat impacted	<1%	0.5
	1-25%	1
	25-50%	1.5
	51-75%	2
	>75%	2.5
	100%	3
Intensity of impact	High	1.5
	Medium	1
	Low	0.5

All results for the assessment of Annex I grassland habitats (under the parameters area, structure and functions, future prospects) are in section 3.2. All assessment data were input into the Access database.

Structure and functions results for individual monitoring stops are in Appendix 6

Future prospects results for each assessed area of Annex I grassland are in Appendix 8

Condition assessment results for each assessed area of Annex I grassland are in Appendix 9

Primary areas of Annex I habitat

It was proposed in Martin *et al.* (2008) that a list of premium quality sites containing Annex I grassland habitats above a minimum size and of adequate structure and functions (according to field assessments) should be produced. Hereafter referred to as **primary areas** of Annex I grassland, these represent the best examples of Annex I grassland habitat so far recorded during the ISGS and are judged to be of primary importance due to a combination of the area they cover and their structure and functions. They should provide a focus for monitoring and conservation efforts in the future. A list of primary areas of Annex I grassland habitat surveyed in 2010 was compiled. Criteria for primary areas of Annex I grassland habitat include: an extent of at least 1 ha, except for Calaminarian grassland (6130) (currently no areas greater than 0.25 ha have been recorded for this habitat); structure and functions should generally be *Favourable*; however, assessed areas with stops which failed but were considered to be near misses (e.g. only one positive indicator species off a pass, or within 10% of the required forb:graminoid ratio) were sometimes included if the condition of the habitat was otherwise good. Future prospects and past changes in extent were not taken into account when compiling this list of sites.

2.5 Ranking of sites using conservation and threat evaluations

Conservation of habitats is often best achieved on a site-by-site basis, with specific management plans based on the individual characteristics of a given habitat at a particular site (e.g., management, history, rarity). However, it is also useful to be able to evaluate sites in the context of others, and to make general comparisons regarding status. A broad range of sites is surveyed in the Irish Semi-natural Grasslands Survey (ISGS), with varying degrees of naturalness. As part of the survey methodology, data are collected which allow the general condition of the site to be evaluated, with regard in particular to its conservation value and the presence of threats to the grassland. Factors which contribute to the conservation value of a site include size, habitat diversity and quality, species richness and the presence of plant species which are of conservation interest, and factors such as these have been used when evaluating sites for conservation in the UK (Usher, 1989). By assigning a conservation score to each site, the sites can be compared and sites which are of particularly high conservation value can be identified. This will allow management efforts to focus on the sites which are most valuable from a conservation point of view, and also provides a basis for monitoring individual sites into the future. Human activities such as agriculture, recreation and development can pose threats to semi-natural grassland habitats, as can the abandonment of traditionally managed land.

Conservation status was scored on the basis of seven criteria (Table 2.4). As the methodology for calculating conservation scores in 2010 was identical to that that presented in O'Neill *et al.* (2009), in which scores were calculated for all sites surveyed between 2007 and 2009, scores were only calculated for the sites surveyed during ISGS 2010. The final score for each site is given as a percentage of the total possible score of 47.5. The 2010 results for the 32 highest scoring sites are given in section 3.3, and the full list of site conservation scores for the 203 sites surveyed in 2010 is given in Appendix 10. A discussion of these scores in relation to those from previous years of the study is given in Chapter 5.

The assessment of threats to each site was based on the criteria detailed in Table 2.3. Damaging activities consisted mainly of drainage, dumping, quarries and recent afforestation in the vicinity of grassland sites. Agricultural improvement primarily included fertiliser application, liming, topping and supplementary feeding. The negative adjacent habitats of improved grassland and cultivated land follow the definitions of Fossitt (2000). The presence of certain negative species indicating habitat disturbance or sward improvement was used as a further measure of the extent to which sites were under threat. Fourteen species were used for this assessment: *Brassica napus*, *B. rapa*, *Capsella bursa-pastoris*, *Chenopodium album*, *Cirsium arvense*, *Lolium perenne*, *Matricaria discoidea*, *Plantago major*, *Poa annua*, *Polygonum aviculare*, *Rumex crispus*, *Senecio jacobaea*, *Stellaria media* and *Trifolium repens*. Unlike previous years, the presence of encroachment and negative grazing were not scored as they were not recorded at a site level, as noted above in section 2.2.

Table 2.4 Criteria used in the calculation of the conservation score for each site.

Criterion	Scoring	Max. score
Semi-natural grassland habitats	1 for each semi-natural grassland habitat 0.5 for each semi-improved grassland habitat where the corresponding semi-natural grassland habitat is not present	5
Annex I grassland habitats	Annex I grassland habitats are divided into primary and secondary areas on the basis of quality (see section 3.2) 2 One secondary Annex I grassland habitat 4 One primary Annex I grassland habitat 4 Two or more secondary Annex I grassland habitats 8 Two or more primary Annex I grassland habitats	12
Adjacent and internal semi-natural habitats	0.5 for each of the following habitat groups which were recorded during the survey: F (Freshwater) GS (Semi-natural grassland) H/P (Heath, bog and fen) WN/WS/WL (Woodland and scrub) ER/CS/CM/CB/LR/LS (Exposed rock, salt marsh and coastal habitats)	2.5
Area	Sites are divided into eight groups on the basis of the percentile distribution. The range is greater in the larger site groups, and this is reflected by the steep increase in the scores for larger sites. 0 0-<0.5ha 4 20-<40ha 1 0.5-<5ha 6 40-<80ha 2 5-<10ha 9 80-<160ha 3 10-<20ha 12 ≥ 160 ha	12
Species density*	To remove the bias towards larger sites, the number of species present on each site was divided by the log ₁₀ (area +1). The resulting figures were then divided according to percentiles as shown. 0 < 25 spp. 2 52 – 65 spp. 1 25 – 51 spp. 3 66 – 80 spp. 4 ≥ 80 spp.	4
Notable species	Notable species include those listed on the Flora (Protection) Order 1999 (FPO) and the Red Data Book (RDB) (Curtis & McGough 1988) of vascular plants. 0 No notable species 2 One RDB species 4 One FPO species 4 Two RDB species 8 Two or more FPO species 6 Three or more RDB species	8
High quality indicator species	High quality indicator species were identified as described in section 3.2. Sites were scored on the number of high quality (HQ) indicator species present. 0 1-10 HQ species 2 16-20 HQ species 1 11-15 HQ species 3 21-25 HQ species 4 >25 HQ species	4
Maximum total score		47.5

* Woody species were excluded from this calculation

Conservation and threat scores were entered separately into the Access database and were *not* combined to produce one overall score. Combining scores can lead to misinterpretation when comparing sites, for example comparing a high quality site with many threats and a medium quality site with no threats. Therefore threats were scored separately from conservation value so that sites with a high conservation score which are threatened could be identified. The scores are written as

percentages of the total possible score. This allows a simple comparison to be made between sites even if data were not available in all of the categories shown in Tables 2.4 and 2.5.

Table 2.5 Criteria used in the calculation of the threat score for each site.

Criteria	Scoring						Max. score
Negative adjacent habitats	0	No negative adjacent habitats					2
	1	Improved grassland (GA) or Cultivated land (BC) adjacent					
	2	Improved grassland (GA) and Cultivated land (BC) adjacent					
Damaging activities*	0	No damaging activities	1	One damaging activity			3
	2	Two damaging activities	3	Three or more damaging activities			
Agricultural Improvement*	0	No improvements	1	One improvement type			3
	2	Two improvement types	3	Three or more improvement types			
Negative species**	1	1-3 species	2	4-6 species	3	7-9 species	5
	4	10-12 species	5	13-14 species			
Maximum total score							13

* See section 2.5 for description of criteria.

** See section 2.5 for list of species scored.

Conservation and threat score results are summarised in section 3.3

Full details in Appendices 10 and 11.

2.6 Vegetation data analysis

Data preparation

Analysis to produce a working classification of grassland and marsh for Ireland combined all relevé data collected from counties Roscommon and Offaly during the pilot survey (Martin *et al.* 2007; $n = 305$), counties Cork and Waterford (Martin *et al.* 2008; $n = 785$), from counties Cavan, Leitrim, Longford and Monaghan (O'Neill *et al.* 2009; $n = 1053$) and the relevé data recorded from counties Donegal, Dublin, Kildare and Sligo in 2010 ($n = 912$). An additional 23 relevés recorded in Offaly in 2010 (BEC, unpublished data), were also included for analysis. Of these 3,078 relevés recorded between 2007 and 2010, five were excluded due to lack of bryophyte species data. The remaining data samples were examined for univariate outliers that might signal vegetation samples not within the remit of the survey. Twenty-seven such relevés were identified and were excluded; these were deemed to represent swamp, wet heath or flush communities which had been misclassified in the field.

Only plant records which had been identified to the species level were included in the analysis, as records at the genus level (e.g., *Carex* sp.) may be amalgams of species with markedly different ecological preferences and therefore meaningless. Twenty-two relevés were excluded in which genus level records of greater than 10% had been deleted. Due to possible confusion in identification, for example due to non-fertile samples or hybridisation, records for *Agrostis vinealis* and *Agrostis canina* were combined for the purposes of the analysis, as were records for *Juncus acutiflorus* and *Juncus articulatus* and records for *Sphagnum auriculatum* and *Sphagnum denticulatum*. To reduce noise, species recorded in fewer than five relevés were also excluded.

Domin scores were converted to percentage cover using mid range values, as mean values cannot be calculated directly from a non-linear scale. This preparation resulted in a dataset of 3,024 relevés and 380 species for vegetation analysis. As soil data were not recorded from all four of the monitoring stops within any given area of Annex I grassland habitat, summary statistics for pH values were calculated on a subset of these relevés. The median values were used in the summary statistics for pH, percentage loss on ignition and total phosphorus.

Multivariate outlier analysis was used to examine the remaining relevés. The mean distance of each sample from each other sample was calculated using Quantitative Sørensen (Bray-Curtis) as the distance measure. Nine relevé samples with a mean distance greater than the threshold of three standard deviations above the grand mean were found, but all were found to be unusual grassland swards within the remit of the survey and were included in the analysis.

Analysis techniques

Two complementary statistical techniques were used to analyse the dataset. Analysis was conducted using PC-ORD 5 (MjM Software, Oregon) with the aim of defining an objective classification that largely followed the procedures in Perrin *et al.* (2006a, b, 2008a, b) and Martin *et al.* (2007, 2008). Perrin *et al.* (2006a, b) discuss the advantages of these techniques over the more commonly used methods of Detrended Correspondence Analysis and TWINSpan.

1) Hierarchical, polythetic, agglomerative cluster analysis. This was the main method selected for grouping the data into vegetation types. From a data matrix of n samples \times p species, an $n \times n$ distance matrix is calculated by measuring the dissimilarity (or similarity) between each pair of samples. The most similar samples, which are selected using a predetermined criterion of minimum distance (linkage method), are merged into a group and their attributes are combined. The procedure is repeated $n-1$ times until the samples have been merged (clustered) into two groups, with the results being displayed as a dendrogram (McCune and Grace 2002). Quantitative Sørensen (Bray-Curtis) was selected as the distance measure, as it has been shown to be one of the most effective measures for ecological community analysis, being less prone to exaggerating the influence of outliers and retaining greater sensitivity with heterogeneous datasets (McCune and Grace 2002). Flexible beta was used as the linkage method with $\beta = -0.25$ (Lance and Williams 1967). This option is compatible with Sørensen distance and is space-conserving, i.e. properties in theoretical space defined by the original dissimilarity matrix are preserved as groups form during the cluster procedure. Space-distorting strategies can lead to undesirable effects such as high levels of chaining, the sequential addition of single items to existing groups (Legendre and Legendre 1998; McCune and Grace 2002).

2) Indicator Species Analysis (ISA). This method of Dufrene and Legendre (1997) was used to identify species that differentiated between clusters of samples. ISA produces percentage indicator values (IndVals) for species and works on the concept that, for a predetermined grouping of samples, an ideal indicator species will be found exclusively within one group and will be found in all the

samples in that group at maximum abundance. IndVals are thus a simple combination of measures of relative abundance between groups and relative frequency within groups. At any given level of clustering, species are assigned to the group for which their IndVal is maximal. Dufrene and Legendre (1997) concluded that ISA was more sensitive at identifying indicator species than TWINSpan.

Results of the cluster analysis are given in section 3.4. A full treatment of the resulting vegetation classification is given in Chapter 4.

3: RESULTS

3.1 General site survey

During the Irish Survey of Semi-natural Grasslands (ISGS) from April to September 2010, 4552.8 ha of grassland and marsh were surveyed: 1438.1 ha in Donegal, 1546.1 ha in Sligo, 749.6 ha in Dublin and 818.9 ha in Kildare. An additional 4.4 ha of tall-herb swamp vegetation (FS2 in Fossitt (2000)), recorded at two sites in Kildare, were also surveyed. This section of the results summarises the distribution of grassland and marsh habitats (GS and GM under Fossitt (2000)). The location of each site is shown in Appendix 1. In total, 203 sites were surveyed: 103 (50.7%) in Donegal, 52 (25.6%) in Sligo, 26 (12.8%) in Dublin and 22 (10.8%) in Kildare. The median site area in 2010 was 13.5 ha (the mean site area of 22.4 ha is skewed by a small number of exceptionally large sites), with sites ranging in size from 0.5 ha to 385.9 ha. The median site areas for the four counties showed some variability, with Donegal sites having the smallest median size (8.8 ha) and Sligo by far the highest (24.8 ha). Dublin and Kildare had similar values to the overall median site area (12.7 ha and 13.6 ha respectively).

An additional 36 sites were visited but rejected from the survey. This is equal to 15.1% of the 239 sites which were visited. The reasons for rejecting sites fell into four broad categories: strong evidence of improvement for agricultural or amenity use, dominance of non-grassland habitats, difficulty in obtaining permission to access a site, and active quarrying. Some sites were rejected for more than one reason. Table 3.1 indicates the number of sites which were rejected within each of the different categories.

Table 3.1 The number of sites that were rejected and the reasons for rejection. Thirty-six sites were rejected but there are 50 reasons for rejection as many sites were rejected for more than one reason.

Reason for rejection	Number of sites
Agricultural improvement	28
Non-grassland habitat	13
Access difficulty	6
Active quarrying	2
Development	1
<i>Number of sites rejected</i>	<i>36</i>

The most frequently cited reasons for rejecting sites were agricultural improvement and dominance of non-grassland habitats. Agricultural improvement can include conversion to improved grassland for agricultural or amenity use, or conversion to arable land. Non-grassland habitats encountered most frequently included sand dune systems, dense bracken and heath. The next most frequently recorded reason for site rejection was difficulty in obtaining access to the site. This was generally due to the refusal of permission by the owner, or difficulty in making contact with the owner. In one instance access was prevented due to the location of the site on an island with a rocky shore that

posed dangers for shoring a boat. For reasons of personal safety, land was not entered if certain livestock (e.g. a bull) were present or if quarrying or building was in progress.

The majority of the sites surveyed (73.9%) were owned privately, either by a single or by multiple owners (Table 3.2), while a total of 16 sites (7.9%) were in public ownership: 11 owned by local authorities, two owned by NPWS and three owned by another State body. For the remaining 37 surveyed sites (16%), the ownership was not determined. Undetermined ownership could sometimes be a result of disputed land ownership or in some cases areas of commonage where the owners of the commonage rights were unknown.

Table 3.2 The number of sites included in the survey that were in public and private ownership.

Ownership	Number of sites
Private	150
Unknown	37
Public	16
<i>Total</i>	<i>203</i>

Grassland habitats

A detailed habitat map has been produced for each site showing the Fossitt (2000) and Annex I grassland habitats, the position of all relevés and the location of any associated NPWS conservation sites (pNHAs, NHAs and SACs) (see Addendum). Table 3.3 shows the area in hectares covered by the different grassland habitats surveyed in 2010 (defined according to Fossitt (2000)), together with the percentage by area and percentage by frequency of the habitats within each of the four counties surveyed in 2010.

Table 3.3 Summary habitat statistics of sites surveyed in Donegal, Sligo, Dublin and Kildare in 2010.

		GS1	GS2	GS3	GS4	GM1	GA1/GA2	Overall
Donegal	Area (ha)	287.6	20.4	63.8	727.2	30.1	309.0	1438.1
	% county area	20.0	1.4	4.4	50.6	2.1	21.5	100
	% freq	33.0	12.6	27.2	89.3	2.9	65.0	
	No. of sites							103
Sligo	Area (ha)	290.4	37.9	133.2	769.6	5.7	309.2	1546.1
	% county area	18.8	2.4	8.6	49.8	0.4	20.0	100
	% freq	63.5	25.0	40.4	94.2	15.4	76.9	
	No. of sites							52
Dublin	Area (ha)	81.1	439.4	61.6	71.6	1.6	94.3	749.6
	% county area	10.8	58.6	8.2	9.6	0.2	12.6	100
	% freq	34.6	73.1	19.2	38.5	7.7	42.3	
	No. of sites							26
Kildare	Area (ha)	24.9	41.8	495.9	158.8	3.7	93.9	818.9
	% county area	3.0	5.1	60.6	19.4	0.5	11.5	100
	% freq	31.8	31.8	18.2	72.7	13.6	36.4	
	No. of sites							22
<i>Overall</i>	<i>Area (ha)</i>	<i>684.0</i>	<i>539.5</i>	<i>754.6</i>	<i>1727.2</i>	<i>41.1</i>	<i>806.4</i>	<i>4552.8</i>
	<i>% survey area</i>	<i>15.0</i>	<i>11.8</i>	<i>16.6</i>	<i>37.9</i>	<i>0.9</i>	<i>17.7</i>	<i>100</i>
	<i>% freq</i>	<i>40.9</i>	<i>25.6</i>	<i>28.6</i>	<i>82.3</i>	<i>7.9</i>	<i>62.1</i>	
	<i>No. of sites</i>							<i>203</i>

GS4 (wet grassland) was the most extensive of the semi-natural grassland habitats recorded in the survey, accounting for 37.9% of all grassland surveyed in 2010. This was followed in order of decreasing extent by GS3 (dry-humid acid grassland) at 16.6%, GS1 (dry calcareous and neutral grassland) at 15.0%, GS2 (dry meadows and grassy verges) at 11.9% and GM1 (marsh) at less than 1%.

GS4 covered a large proportion of the surveyed area within the two northwest counties, making up approximately half of the grassland surveyed in each county; almost 87% of all wet grassland surveyed in 2010 occurred in the northwest. However, less than a fifth of Kildare's grassland was classed as wet grassland, and less than a tenth of Dublin's. GM1, which made up only a small percentage of the total grassland surveyed, occurred at a similar proportion to GS4 across the area surveyed, with 87.1% of all GM1 occurring in the northwest, most of it in Donegal (30.1 ha, or 73.2% overall), and in the east Kildare containing slightly more than Dublin (3.7 ha in Kildare, compared to just 1.6 ha in Dublin).

Of the drier habitats, GS3 was considerably more predominant within Kildare (60.6% of the county's grassland) than within Sligo (8.6%), Donegal (8.5%) or Dublin (8.2%); this high percentage is due almost entirely to just two sites, both surveyed in the Curragh, which led to Kildare accounting for almost two-thirds of the total amount of GS3 habitat surveyed in 2010. Significantly, almost 85% of all GS1 recorded in 2010 occurred in the northwest: 290.4 ha (42.4% of all GS1) in Sligo and 287.6 ha (42.1%) in Donegal. GS1 made up a fifth of the grassland surveyed in Donegal, and a slightly smaller proportion (18.8%) of grassland in Sligo. Of the eastern counties, Dublin contained a slightly higher proportion of GS1 (10.8% of grassland surveyed in the county) than Kildare (3%). In contrast, Dublin recorded by far the highest proportion by area of GS2 (58.6% of grassland surveyed in the county), this habitat accounting for between 1.4% and 5.1% of the remaining three counties; in fact, 81.4% (439.4 ha) of all GS2 surveyed in 2010 was found in Dublin.

Areas of GA1 (improved agricultural grassland) or GA2 (amenity grassland) which had a sufficient quantity of semi-natural grassland species to be of interest to the survey were included within the GS_i (semi-improved grassland) category used throughout this survey. The only county in which GA2 was sufficiently diverse to be included in the survey was Dublin (site 1315 Phoenix Park). Of the area of grassland surveyed in each county, Donegal and Sligo had the greatest proportion of semi-improved GA1 (21.5% and 20.0% respectively), with Dublin and Kildare having only 12.6% and 11.5% cover of semi-improved grassland respectively.

In terms of frequency (i.e., occurrence of grassland habitats on sites, without regard to the area covered), GS4 occurred at 82.3% of sites, and was the most frequently occurring grassland habitat (Table 3.3). The next most frequently occurring semi-natural grassland habitat was GS1 (40.9% of sites) followed by GS3 (28.6% of sites) and GS2 (25.6%). Despite having a much lower frequency than GS1 overall, the average area of GS3 per site across the four counties was considerably larger

(13.0 ha, as opposed to 8.2 ha for GS1), due largely to the influence of the two Curragh sites, 1400 Curragh and 1401 Little Curragh. Semi-improved GA1/2 occurred at 62.1% of all sites and occurred at a greater proportion of sites in Sligo (76.9%) and Donegal (65.0%) than the eastern counties of Dublin (38.5%) and Kildare (36.4%). Sligo also had the highest frequency of GS4 (94.2%), GS1 (63.5%), GS3 (40.4%) and GM1 (15.4%), while Dublin had by the far the highest frequency of GS2 (73.1%).

For details of grassland habitats for individual sites, see Appendix 4

NPWS conservation sites

A total of 112 sites were found to overlap with an NPWS conservation site. Any overlap of less than 0.3 ha was visually inspected in order to decide if the overlap was more than merely two boundaries fringing. In 14 cases it was decided that there was no meaningful overlap and these sites were excluded from the following analysis. In 98 cases (48.2% of sites surveyed in ISGS 2010), sites included land within an NHA/pNHA, SAC or SPA, with 76 sites coinciding with an SAC (Table 3.4). Both NHAs/pNHAs and SACs were found within 60 sites, while SPAs coincided with NHAs/pNHAs on 22 sites and with SACs on 18 sites. NHAs/pNHAs, SACs and SPAs all occurred together on 17 sites.

Table 3.4 also shows the percentage of the total area surveyed in Donegal, Dublin, Kildare and Sligo coinciding with an NHA/pNHA, SAC or SPA. Over all four counties, 52.8% of the total area surveyed was within at least one type of NPWS conservation site, whether NHA/pNHA, SAC or SPA; 31.3% of the area surveyed was located within an NHA/pNHA, and 15.0% of the area was within an SAC, with just 6.5% within an SPA. The NPWS conservation sites of Sligo and Donegal contributed the greatest area of surveyed grassland (20.8% and 16.3% of the total area surveyed respectively), followed by Kildare (12.4%) and Dublin (3.3%). Of the four counties, Kildare and Sligo were found to have the highest proportion of surveyed grassland in NPWS conservation sites, with 68.9% of the total surveyed area of Kildare occurring within an NPWS conservation site, followed by 61.3% of the land in Sligo.

The semi-natural grassland habitat with the largest area within NHAs/pNHAs was GS3 (506.4 ha), due primarily to the two large sites in pNHA 000392, Curragh (Kildare), followed by GS4 (424.4 ha) (Table 3.5). This is followed in decreasing order by GS1, semi-improved GA1/2, GS2 and GM1. The overall proportion of each grassland habitat surveyed that occurred within NHAs/pNHAs varied, with, for example, only a small proportion (7.6%) of the GS2 surveyed occurring within an NHA/pNHA, compared to over two-thirds (67.1%) of GS3.

The occurrence of the habitats within SACs followed a different pattern (Table 3.5): GS4 was the habitat with the largest area in SACs (308.0 ha), followed by GS1 (239.5 ha), and then, in decreasing order, semi-improved GA1/2, GS2, GS3 and GM1. There was a large overlap between the area covered by NHAs/pNHAs and SACs, with 87.4% of the surveyed area of SAC also coinciding with an NHA/pNHA.

GS4 covered by far the largest area surveyed in SPAs (157.7 ha), followed by GS1 (54.7 ha) and semi-improved GA1/2 (38.9 ha) (Table 3.5). GS3, GS2 and GM1 accounted for a relatively small proportion of the area of SPAs surveyed.

Table 3.4 Occurrence of NPWS conservation sites (pNHA/NHA, SAC and SPA) within the survey.

		NHA/pNHA	SAC	SPA	Any designation
Donegal	No. of sites	12	46	15	50
	% of sites	5.9	22.7	7.4	24.6
	Area (ha)	292.7	261.6	187.2	740.6
	% survey area	6.4	5.7	4.1	16.3
Sligo	No. of sites	26	21	5	28
	% of sites	12.8	10.3	2.5	13.8
	Area (ha)	489.4	359.1	98.7	947.1
	% survey area	10.7	7.9	2.2	20.8
Dublin	No. of sites	12	8	5	14
	% of sites	5.9	3.9	2.5	6.9
	Area (ha)	86.8	53.4	10.1	150.0
	% survey area	1.9	1.2	0.2	3.3
Kildare	No. of sites	5	1	0	6
	% of sites	2.5	0.5	0.0	3.0
	Area (ha)	555.7	8.4	0.0	564.1
	% survey area	12.2	0.2	0.0	12.4
Overall	No. of sites	55	76	25	98
	% of sites	27.1	37.4	12.3	48.3
	Area (ha)	1424.5	682.5	295.9	2401.9
	% survey area	31.3	15.0	6.5	52.8

Table 3.5 Area in hectares of different grassland habitats surveyed within NPWS conservation sites.

County	Designation	GS1	GS2	GS3	GS4	GM1	GA1/2
Donegal	NHA/pNHA	112.3	1.9	12.3	140.5	12.8	12.9
	SAC	111.0	0.9	12.5	101.6	14.2	21.4
	SPA	37.3	1.8	9.7	102.5	9.0	26.9
Sligo	NHA/pNHA	179.1	6.6	38.5	221.9	2.0	41.2
	SAC	123.0	4.8	7.2	181.8	2.5	39.8
	SPA	17.4	0.0	14.1	55.2	0.0	12.1
Dublin	NHA/pNHA	6.7	32.0	0.0	37.8	1.6	8.8
	SAC	5.5	24.3	0.2	16.7	0.0	6.7
	SPA	0.1	10.0	0.0	0.0	0.0	0.0
Kildare	NHA/pNHA	1.0	0.5	455.5	24.2	1.8	72.7
	SAC	0.0	0.0	0.0	7.9	0.0	0.5
	SPA	0.0	0.0	0.0	0.0	0.0	0.0
Total	NHA/pNHA	299.1	41.0	506.4	424.4	18.1	135.5
	SAC	239.5	29.9	20.0	308.0	16.7	68.4
	SPA	54.7	11.8	23.7	157.7	9.0	38.9

Annex I grassland habitats

The area of land covered by Annex I grassland habitats in Donegal, Sligo, Dublin and Kildare is shown in Table 3.6, together with the number of areas of each recorded. In total, 593.3 ha of Annex I

grassland habitat were recorded from 72 areas during the survey, which equates to 13% of the total area surveyed. The greatest amount of this occurred in Kildare, where 323.0 ha were mapped as Annex I grassland habitat, representing 39.4% of the total area of grassland surveyed in that county. In Donegal, 142.3 ha of the total area surveyed were mapped as an Annex I grassland habitat (just under 10% of the grassland surveyed in the county), while 116.8 ha were surveyed in Sligo (7.6% of the area surveyed in Sligo). Only 1.5% (11.2 ha) of the area surveyed in Dublin was Annex I grassland.

Table 3.6 Area in hectares (number of areas) of Annex I grassland habitats recorded in Donegal, Sligo, Dublin and Kildare.

County	Festuco-Brometalia 6210	Nardus grassland 6230	Molinia meadows 6410	Hydrophilous tall herb communities 6430	Lowland hay meadows 6510	Total area (no. of areas)	No. of sites*
Donegal	88.8 (7)	1.8 (3)	45.0 (14)	0 (0)	6.7 (2)	142.3 (26)	22
Sligo	72.0 (13)	8.0 (2)	32.4 (13)	0.6 (1)	3.7 (3)	116.8 (32)	29
Dublin	2.6 (4)	1.9 (1)	2.2 (1)	0.0 (0)	4.5 (1)	11.2 (7)	5
Kildare	1.7 (2)	283.6 (2)	37.6 (3)	0.0 (0)	0.0 (0)	323.0 (7)	6
Total	165.1 (26)	295.4 (8)	117.3 (31)	0.6 (1)	14.9 (6)	593.3 (72)	62

* Two or more Annex I grassland habitats found in nine sites

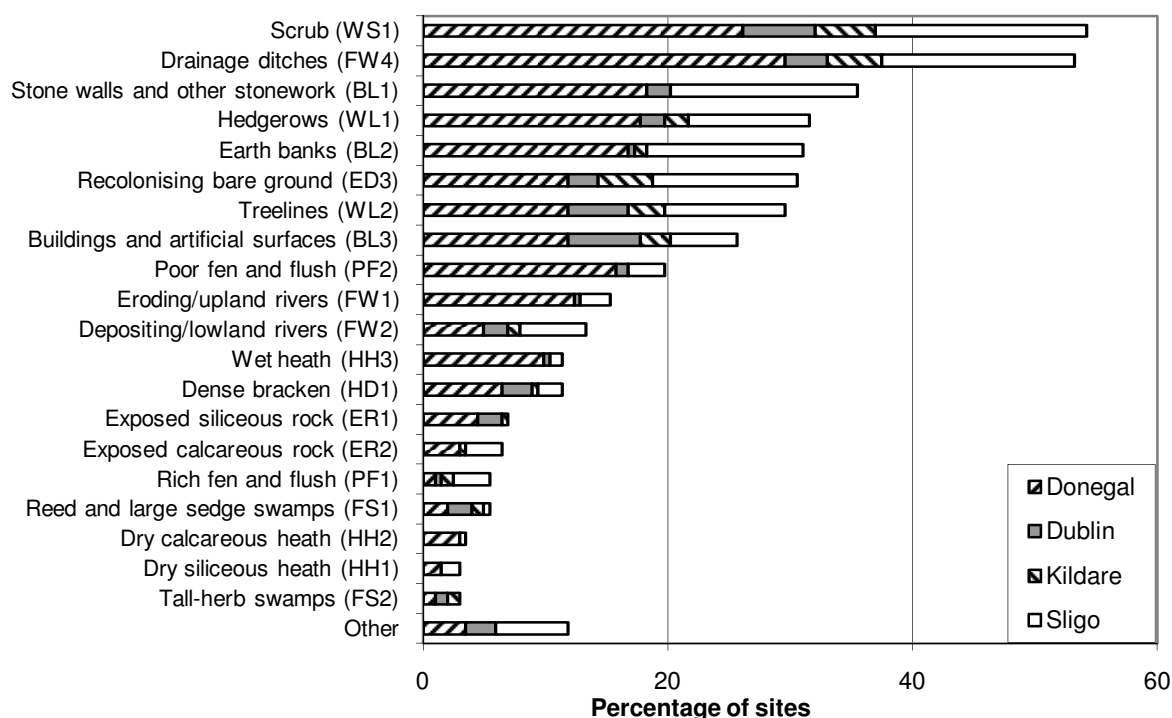
The Annex I grassland habitat with the greatest cover in all four counties was *Nardus grassland* (6230), with 295.4 ha in total. This is largely due to a single site in Kildare, the Curragh (site 1400), in which 261.5 ha of 6230 grassland were recorded and assessed. This is followed by Festuco-Brometalia (6210), which had a total cover of 165.1 ha, over 97% of which occurred in the two northwest counties, and by *Molinia* meadows (6410) with a total cover of 117.3 ha, which had a more even distribution throughout the four counties, although still with a higher incidence, just under 60%, in the northwest. Other Annex I grassland habitats found include Lowland hay meadows (6510), with a total cover of 14.9 ha across Donegal, Dublin and Sligo, and also a small area (0.6 ha) of Hydrophilous tall herb communities (6430) in Sligo. Despite having such a high proportion, over four-fifths, of all GS2 recorded in 2010, Dublin had a relatively small area of Annex I 6510 habitat, just 4.5 ha, although this was the most significant Annex I grassland habitat in the county and accounted for over 30% of all 6510 recorded in 2010.

A total of 81 areas of Annex I grassland habitat were recorded in 2010. However, eight of these, including one possible area of Calaminarian grassland, were below the minimum mapping area for the project and were therefore not assessed, while one area of 6510 in Donegal was large enough to be mapped but no assessment was carried out at the time of survey; these will not be considered further in this report. The remaining 72 assessed areas of Annex I grassland habitat occurred at 62 surveyed sites, or 30.5% of all sites surveyed. Of these, 29 were in Sligo (55.8% of Sligo sites), 22 sites were in Donegal (21.4% of sites in Donegal), six were in Kildare (27.3% of sites in Kildare) and five were in Dublin (19.2% of Dublin sites).

Table 3.6 also shows the number of areas of each Annex I grassland habitat type assessed. The Annex I grassland habitat *Molinia* meadows (6410) was the most frequently recorded habitat (31 areas), with Festuco-Brometalia (6210) the next most frequent, recorded from 26 sites. Despite covering the greatest area of any of the Annex I grassland sites, *Nardus* grassland (6230) was recorded less frequently than 6410 and 6210, being recorded from only eight sites. Lowland hay meadows (6510) were recorded and mapped at only six sites (none in Kildare), and there is only a single record of Hydrophilous tall herb communities (6430), found in Sligo. The Annex I habitat with the largest average area per site where it occurred was 6230, with an average area of 36.9 ha, this high figure due almost entirely to larger of the two sites in the Curragh, Co. Kildare. This was followed by 6210, with an average Annex I area of 6.1 ha per site. Smaller average sizes were recorded for 6410 (3.8 ha) and 6510 (2.5 ha), with only one small area (0.6 ha) of 6430 recorded. At four sites in Donegal, three sites in Sligo and one in Kildare, two separate Annex I grassland habitats were recorded, while three separate Annex I grassland habitats were recorded from one Dublin site, Glenasmole Valley (site 1300).

Internal habitats

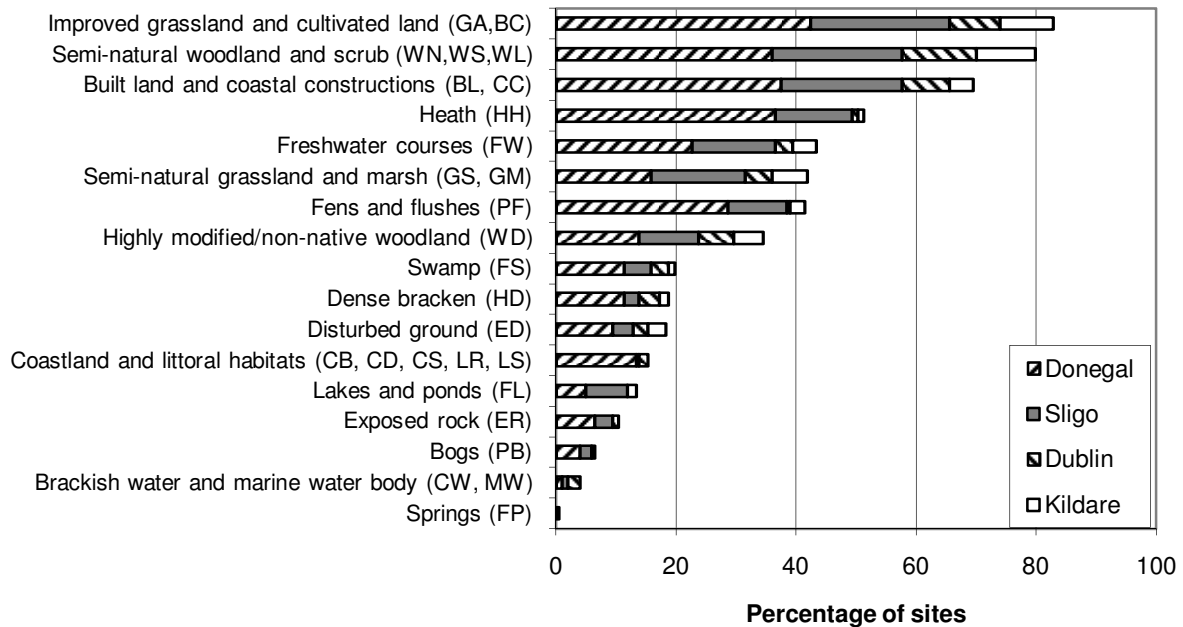
Non-grassland internal habitats recorded during the 2010 survey of Donegal, Sligo, Dublin and Kildare are shown in Fig. 3.1. Scrub was present at 54.2% of all sites in 2010 and was the most frequently occurring non-grassland internal habitat at sites across all counties, save for Donegal where drainage ditches were slightly more frequent than scrub. Overall, drainage ditches were the next most frequent internal habitat and occurred at 53.2% of sites, followed by stone walls and other stonework (35.5% of sites), hedgerows (31.5% of sites) and earth banks (31.0% of sites). The “Other” category includes habitats which occurred at less than 3% of sites in the survey, including upper salt marsh, cutover bog, shingle and gravel banks, spoil and bare ground, and refuse and other waste.

Figure 3.1 Frequency of non-grassland Fossitt (2000) habitats within all surveyed sites, differentiated by county.**Adjacent habitats**

Frequency of habitats which occurred adjacent to sites is shown in Fig. 3.2. Improved grassland and cultivated land together formed the main land use adjacent to sites in the survey, and were recorded from 82.8% of sites. The bulk of this figure can be attributed to improved grassland, which was recorded adjacent to 81.8% of sites, ranging from 65.4% of sites in Dublin to 90.4% of sites in Sligo. Cultivated land was relatively rare (adjacent to 5.4% of sites, none of them in Sligo), although proportionately higher in Kildare (13.6% of sites in the county) and Dublin (11.5% of sites in Dublin). Semi-natural woodland and scrub was the next most frequent category, being recorded adjacent to 79.8% of sites. This category includes linear features and scrub, but excludes highly modified woodland. Most of this figure can be attributed to scrub/transitional wood, adjacent to 65.5% of sites, with the highest proportion in Kildare (72.7% of sites in the county); and hedgerows and treelines, adjacent to 44.3% of sites, the highest proportion of these recorded in Dublin (73.1% of sites in Dublin). Other habitats frequently recorded adjacent to sites included heath, adjacent to 51.2% of sites, most of these in Donegal (71.8% of sites in the county), contrasting greatly with Dublin, in which only 7.7% of sites were recorded adjacent to heath; freshwater courses (adjacent to 43.3% of sites, the highest proportion of them in Sligo and Donegal); and semi-natural grassland and marsh. Marsh was only recorded adjacent to sites in Sligo (5.8% of sites in the county). Semi-natural grassland was recorded as an adjacent habitat to just under 42% of sites overall, with the highest proportion in Sligo (61.5% of sites in the county) and the lowest in Donegal (31.1% of Donegal sites). Built land, including roads and some coastal constructions, occurred next to 69.5% of sites, the highest

proportion again in Sligo and the lowest in Kildare. Multiple adjacent habitats were recorded at all sites, with a median of six habitats occurring at sites across the four counties.

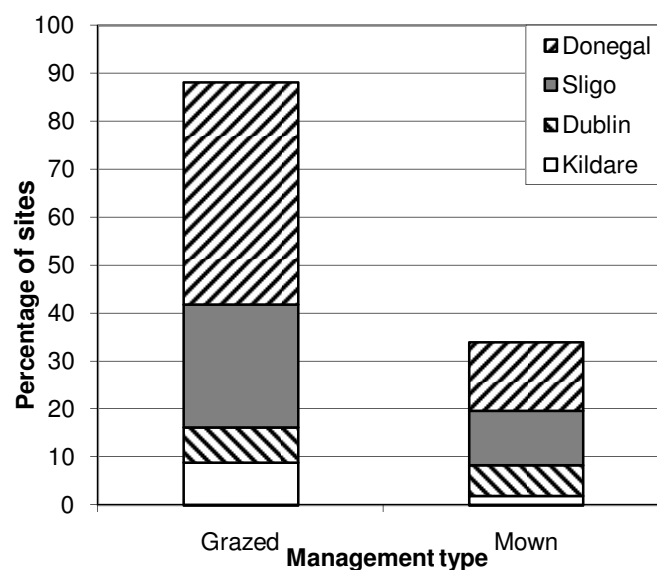
Figure 3.2 Frequency of habitats occurring adjacent to surveyed sites, differentiated by county.



Management

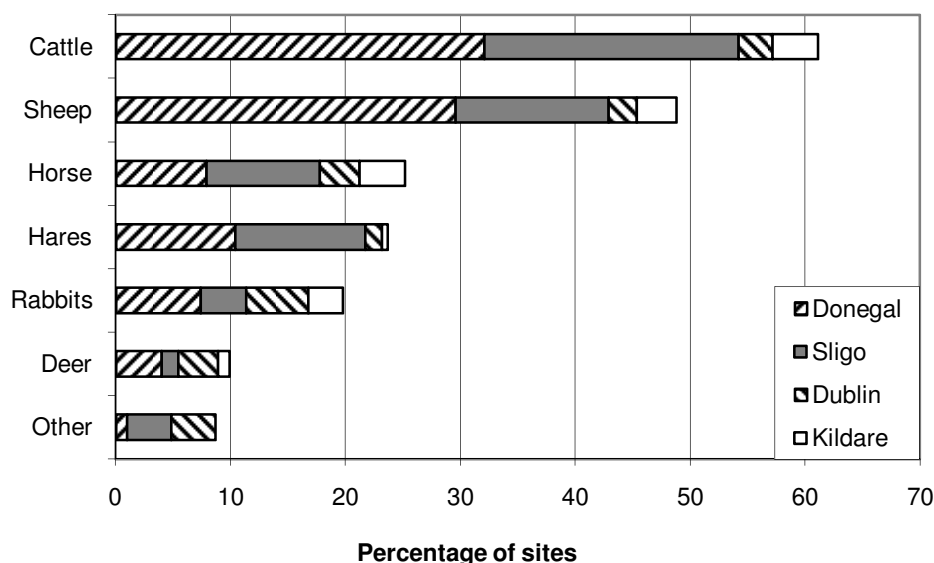
The majority of sites surveyed during 2010 were grazed (88.2% of sites) while 34.0% were mown (Fig. 3.3). A total of 29.1% of sites were managed through a combination of both grazing and mowing, while only 6.9% of the sites had no evidence of mowing or grazing recorded. There was a higher proportion of grazed sites within Sligo (100.0%) and Donegal (91.3%) than within Kildare (81.8%) or Dublin (57.7%), while Dublin had the highest proportion of mown sites (50.0% of the sites within the county), followed by Sligo (44.2% of the sites within the county).

Figure 3.3 Frequency of different management regimes at sites, differentiated by county.



More than one grazing type was frequently encountered on a site. Cattle were the most frequently occurring grazing animal recorded in the 2010 survey area, and were recorded on 61.1% of sites (Fig. 3.4). Sheep and horses were encountered at 48.8% and 25.1% of sites respectively. The only other domestic grazer recorded was donkeys. Wild and feral grazers were also recorded, and these included deer, goats, rabbits and hares. Most common of these were hares, recorded at 25.1% of sites.

Figure 3.4 Frequency of grazing animals at sites, differentiated by county.



The most frequently recorded damaging activity in 2010 was drainage (42.9% of sites), followed by adjacent afforestation (25.6% of sites) and dumping (11.8% of sites; Fig. 3.5). Herbicide spraying (1.0% of sites) was also recorded. Other damaging activities that occurred at no more than one site included quarrying, pond excavation, land reclamation and lighting of campfires.

Figure 3.5 Frequency of occurrence of different types of damaging activity at sites, differentiated by county.

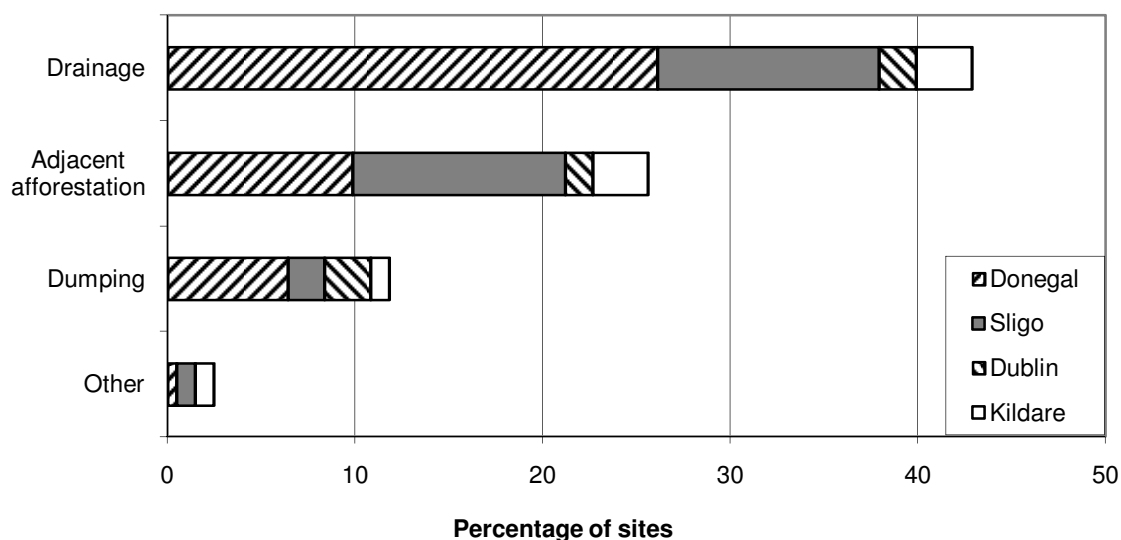
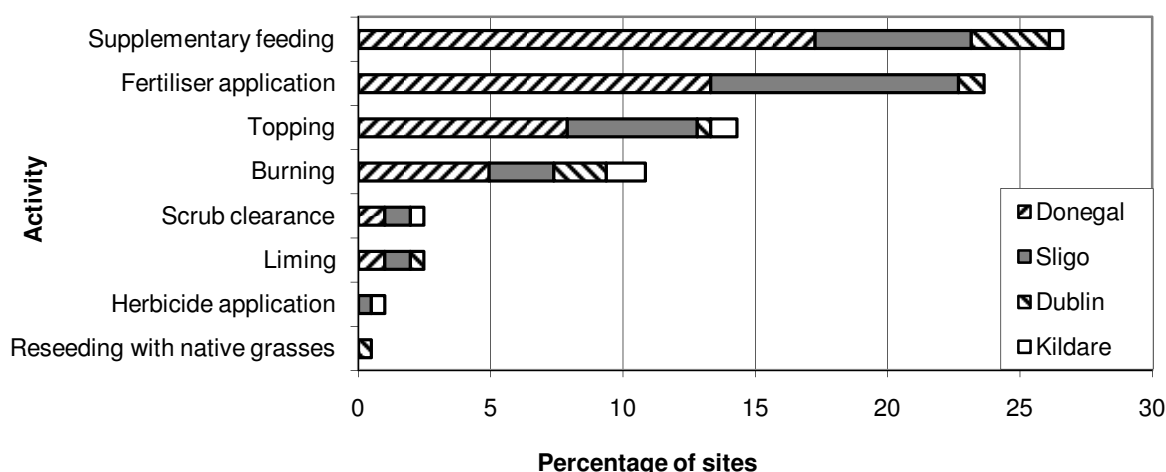


Fig. 3.6 indicates the frequency of agricultural activities in Donegal, Sligo, Dublin and Kildare. The most frequent method of improvement observed during 2010 was the provision of supplementary feeding (26.6% of sites), which was relatively more frequent within Donegal (34.0% of Donegal sites), compared to the other counties, with Kildare recorded as having the lowest provision of supplementary feeding (4.5% of Kildare sites). Fertiliser application (recorded in 23.6% of all sites) and topping (14.3% of all sites) were the next most frequent agricultural activities recorded. Both of these activities were highest within Sligo (36.5% and 19.2% of Sligo sites respectively) and Donegal (26.2% and 15.5% of Donegal sites respectively). No evidence of fertiliser application was recorded from any Kildare site, while topping was least frequent in Dublin (3.8% of Dublin sites). Conversely, burning which is the next most frequent agricultural activity, recorded from 10.8% of all sites, was most frequent in Dublin (15.4% of Dublin sites) and Kildare (13.6% of Kildare sites). Other activities such as scrub clearance, liming and herbicide application were recorded in much fewer semi-natural grassland sites, with reseeded with native grasses occurring in only one site (in Dublin).

Figure 3.6 Frequency of agricultural activities recorded, differentiated by county.

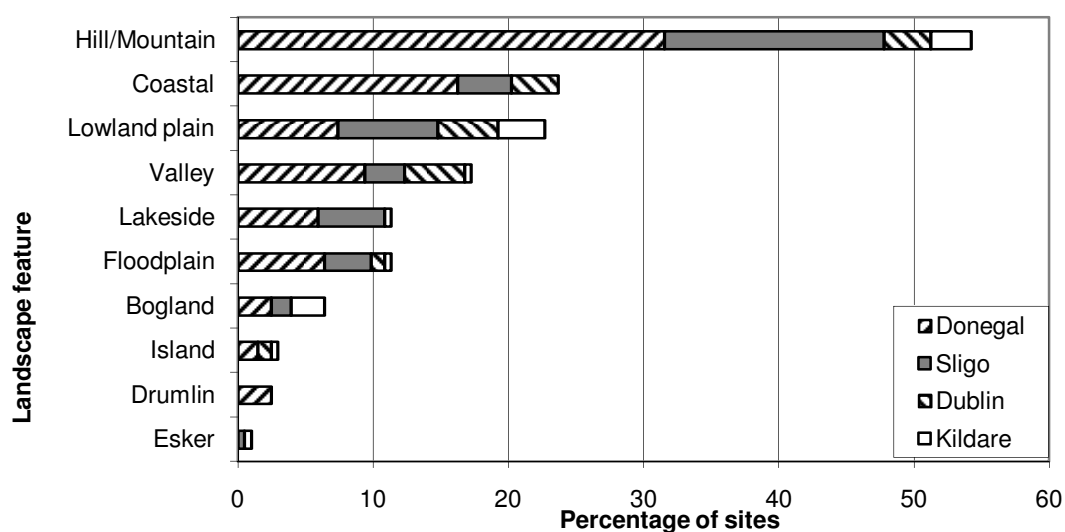


Landscape features

Fig. 3.7 indicates the landscape features associated with sites included in the survey. The landscape feature most frequently recorded in association with sites was Hill/Mountain, occurring in almost 55% of sites. Sligo and Donegal were the counties with the highest proportion of sites on hills or mountains (63.5% and 62.1% of sites in each county respectively), while Kildare and Dublin had similarly low incidences of sites on hills (27.3% and 26.9% of sites in each county respectively). Coastal landscape features were the next most frequently recorded, despite their absence from Kildare, and were noted at 23.6% of all sites surveyed, highest within Donegal (32.0% of sites in the county) followed by Dublin (26.9% of Dublin sites). Lowland plain was the most frequent landscape feature in Dublin and Kildare, recorded in association with 34.6% and 31.8% of sites in each county respectively, whereas Donegal recorded the lowest incidence (14.6% of Donegal sites). Sites occurred less frequently in valleys than on hillsides (nearly one-fifth, compared to over half of sites on hillsides), with many sites associated with hills occurring on isolated hills or not extending to the valley floor. Sites with valleys occurred most frequently in Dublin (34.6% of Dublin sites), but were virtually

absent from Kildare (just one site, or 4.5% of Kildare sites surveyed). The only other features of significance were lakesides and floodplains which were each present in 11.3% of sites, and were both most frequent in Sligo (19.2% and 13.5% of sites in Sligo respectively) and Donegal (11.7% and 12.6% of sites in the county respectively). No sites in Dublin were associated with lakes, while Kildare had just a single site located on a floodplain. Eskers were only recorded on two sites: one in Kildare and one in Sligo. None supported Annex I quality habitats and both had been semi-improved to some extent and had been partially quarried in the past.

Figure 3.7 Frequency of different geographical features associated with sites, differentiated by county.



Species richness

Mean species richness varied greatly between sites and counties. The mean number of species per site was highest in Sligo, at 117.4 species. Donegal sites were the next most species rich, at 83.1, followed by Kildare (75.5 species) and Dublin (68.1 species).

Species frequency

The frequencies of the 25 most common species recorded in 2010 grassland surveys in the northwest (Donegal and Sligo), and east (Dublin and Kildare) are shown in Table 3.7. Woody species have been excluded from the list as being non-grassland species. As is seen in this table, more than half of the 25 most common species are shared between both regions, these being generally ubiquitous grassland species such as *Holcus lanatus*, *Agrostis* spp., *Plantago lanceolata* and *Cerastium fontanum*, which are found in both wet and dry grassland and have a wide pH range. Although the two regions also share a number of species characteristic of semi-improved grassland, such as *Trifolium repens* and *Lolium perenne*, it is notable that the Dublin/Kildare region has a higher predominance of such species, including *Cirsium arvense*, *Urtica dioica* and *Senecio jacobaea*. Conversely, it is notable that, of the species present at 75% or more of sites in Donegal and Sligo, six are indicators of high quality habitat, while among the species present at 75% or more of the sites in Dublin and Kildare, only one is an indicator of high quality habitat. If this is extended to species

present in 50% or more of sites in each region, those in Donegal and Sligo include 15 indicators of high quality habitat, as opposed to only eight in Dublin and Kildare. This indicates a higher quality grassland habitat in the Donegal and Sligo region.

Table 3.7 Frequency of the 25 most common species recorded in Donegal and Sligo, and in Dublin and Kildare in 2010. Species considered as indicators of high quality habitat are marked with an asterisk.

Donegal and Sligo (155 sites)		Dublin and Kildare (48 sites)	
Name	% of sites	Name	% of sites
<i>Holcus lanatus</i>	99.4	<i>Holcus lanatus</i>	100.0
<i>Anthoxanthum odoratum</i>	98.7	<i>Festuca rubra</i>	95.8
<i>Trifolium repens</i>	98.1	<i>Trifolium repens</i>	93.8
<i>Rumex acetosa</i>	97.4	<i>Plantago lanceolata</i>	91.7
<i>Rhytiadelphus squarrosus</i>	97.4	<i>Ranunculus repens</i>	91.7
<i>Cerastium fontanum</i>	96.1	<i>Rumex acetosa</i>	91.7
<i>Juncus effusus</i>	95.5	<i>Taraxacum officinale</i> agg.	91.7
<i>Agrostis stolonifera</i>	94.2	<i>Agrostis stolonifera</i>	89.6
<i>Ranunculus repens</i>	94.2	<i>Cirsium arvense</i>	89.6
<i>Festuca rubra</i>	92.9	<i>Dactylis glomerata</i>	89.6
<i>Cynosurus cristatus</i>	91.6	<i>Anthoxanthum odoratum</i>	87.5
<i>Potentilla erecta</i> *	91.0	<i>Trifolium pratense</i>	87.5
<i>Plantago lanceolata</i>	90.3	<i>Agrostis capillaris</i>	85.4
<i>Prunella vulgaris</i> *	90.3	<i>Cerastium fontanum</i>	83.3
<i>Ranunculus acris</i>	89.0	<i>Ranunculus acris</i>	81.3
<i>Calliergonella cuspidata</i>	87.7	<i>Urtica dioica</i>	79.2
<i>Hypochaeris radicata</i> *	87.1	<i>Lotus corniculatus</i> *	79.2
<i>Agrostis capillaris</i>	86.5	<i>Lolium perenne</i>	77.1
<i>Cirsium palustre</i>	85.2	<i>Calliergonella cuspidata</i>	75.0
<i>Succisa pratensis</i> *	83.9	<i>Arrhenatherum elatius</i>	75.0
<i>Cardamine pratensis</i> *	83.2	<i>Stellaria graminea</i>	70.8
<i>Scleropodium purum</i>	81.3	<i>Carex flacca</i>	68.8
<i>Lolium perenne</i>	80.0	<i>Centaurea nigra</i> *	68.8
<i>Trifolium pratense</i>	78.1	<i>Senecio jacobaea</i>	68.8
<i>Juncus acutiflorus</i>	76.8	<i>Cynosurus cristatus</i>	66.7

The greater frequency in Dublin/Kildare of species that are more typical of neutral to calcareous habitats, such as *Lotus corniculatus* and *Carex flacca*, and especially of species typical of dry meadows, such as *Dactylis glomerata*, *Stellaria graminea* and *Centaurea nigra*, indicate the drier nature of this region. By contrast, among the most frequent species in the Donegal/Sligo region are many species typical of wet habitats, including *Juncus effusus*, *Cirsium palustre*, *Cardamine pratensis* and *Juncus acutiflorus*, indicating the predominance of wetter grassland habitats in this region.

At the other end of the frequency scale, a large number of species occurred in only a small number of sites. Table 3.8 shows an abbreviated list of these which excludes bryophytes and non-grassland species; it also excludes species that were recorded from more than three sites in 2010. The list is confined to those species whose recording in 2010 represents a new 10 km square record, or a re-

finding of an old record, based on species distributions in Preston *et al.* (2002). In some instances, the site extended over more than one 10 km square and, as the species was not recorded in a relev , it was not possible to determine with certainty in which 10 km square the record was made; this uncertainty is indicated in the table.

Table 3.8 Species recorded from three grassland sites or fewer in Donegal, Sligo, Dublin and Kildare whose recording in ISGS 2010 is a new or re-found 10 km square record.

(a) New 10 km square record

Name	10 km square(s)	Name	10 km square(s)
<i>Bromopsis ramosa</i>	G54	<i>Hypericum elodes</i>	G58, G78
<i>Bromus commutatus</i>	N70, B84	<i>Lycopus europaeus</i>	C12
<i>Bromus racemosus</i>	O24/5*	<i>Lysimachia vulgaris</i>	N60
<i>Carex acuta</i>	N90, N60, N61/2*	<i>Oenanthe lachenalii</i>	G33
<i>Carex diandra</i>	G43	<i>Ophioglossum azoricum</i>	C35
<i>Carex laevigata</i>	G78, N92/O02**	<i>Ophioglossum vulgatum</i>	G58
<i>Carex riparia</i>	N60, N61/2*, G62	<i>Phleum bertolonii</i>	N82
<i>Carum verticillatum</i>	B90	<i>Pyrola rotundifolia</i>	N62
<i>Catabrosa aquatica</i>	G43	<i>Radiola linoides</i>	C35
<i>Dactylorhiza purpurella</i>	G78	<i>Ranunculus circinatus</i>	O25
<i>Eleocharis acicularis</i>	N61/2*	<i>Sagina apetala</i>	G87
<i>Epipactis palustris</i>	N62, S69, N61/71/72***	<i>Sanguisorba minor</i>	O02
<i>Gentianella amarella</i>	G73/4*, G74	<i>Scutellaria galericulata</i>	C12, C22
<i>Geranium lucidum</i>	G51	<i>Sedum album</i>	B61

* Site extended over two 10 km squares; record would be new for N62; pre-1976 record already exists for N61

** Site extended over two 10 km squares; record would be new for N92; recent record already exists for O02

*** Site extended over three 10 km squares; record would be new for any of them

(b) Re-finding of old 10 km square record (pre-1976)

Name	10 km square	Name	10 km square
<i>Carex laevigata</i>	G72	<i>Lycopus europaeus</i>	C22
<i>Equisetum pratense</i>	C54	<i>Sanguisorba minor</i>	N63
		<i>Thalictrum flavum</i>	N60

3.2 Assessment of Annex I grassland

Sixty-two of the sites surveyed during 2010 contained an area of Annex I grassland habitat greater than the minimum mapping area of 400 m². Of these, the majority were in counties Sligo (29 sites) and Donegal (22 sites; Table 3.9). The majority of the Annex I grassland areas are outside SACs, with only 20 of the 72 Annex I areas overlapping with an SAC. The data presented below summarise the extent, structure and functions and future prospects for the 72 areas of Annex I grassland habitat recorded within the 62 sites.

Table 3.9 The 72 sites surveyed in 2010 containing areas assessed as Annex I grassland habitat.

Site no.	Annex I habitat	County	SAC*	Site no.	Annex I habitat	County	SAC*
1142	6410	Donegal	002287	1402	6410	Kildare	000625
1147	6410	Donegal		1417	6410	Kildare	
1152	6410	Donegal		1422	6410	Kildare	
1157	6410	Donegal		1423	6210	Kildare	
1161	6230	Donegal	000190	1500	6210	Sligo	001656
1203	6410	Donegal		1501	6210	Sligo	
1232	6410	Donegal		1502	6210	Sligo	
1243	6230	Donegal		1502	6230	Sligo	
1248	6410	Donegal	000138	1507	6410	Sligo	001898
1248	6510	Donegal	000138	1509	6410	Sligo	
1249	6230	Donegal		1510	6410	Sligo	
1249	6410	Donegal		1513	6210	Sligo	
1250	6210	Donegal	000191	1518	6410	Sligo	000627
1250	6410	Donegal	000191	1519	6210	Sligo	
1252	6410	Donegal	000115	1525	6430	Sligo	
1257	6410	Donegal		1527	6210	Sligo	
1266	6210	Donegal		1529	6210	Sligo	
1267	6410	Donegal		1530	6410	Sligo	000636
1270	6210	Donegal	001209	1531	6210	Sligo	
1270	6410	Donegal		1532	6210	Sligo	
1272	6210	Donegal		1537	6410	Sligo	
1275	6410	Donegal		1537	6510	Sligo	001898
1282	6510	Donegal	001209	1538	6210	Sligo	
1283	6210	Donegal		1541	6210	Sligo	
1284	6210	Donegal		1541	6410	Sligo	
1285	6210	Donegal	001976	1545	6410	Sligo	001656
1300	6210	Dublin		1546	6410	Sligo	
1300	6410	Dublin		1548	6230	Sligo	
1300	6510	Dublin		1549	6410	Sligo	
1305	6230	Dublin	001209	1556	6210	Sligo	001898
1315	6210	Dublin		1561	6210	Sligo	
1324	6210	Dublin		1566	6510	Sligo	
1327	6210	Dublin		1568	6410	Sligo	
1400	6230	Kildare	001209	1572	6510	Sligo	001898
1401	6210	Kildare		1575	6410	Sligo	
1401	6230	Kildare		1576	6410	Sligo	

* SAC code only shown if Annex I grassland habitat occurs within the SAC

Area assessment

Of the 72 areas of Annex I grassland habitat assessed during 2010, 16 had increased in extent, one had decreased in extent and the remaining 55 were unchanged (Table 3.10), based on an area comparison between aerial photographs of 2000 and areas mapped during the 2010 survey. Therefore all Annex I grassland areas were scored as *Favourable* for area assessment except site 1556, which was assessed as *Unfavourable – Inadequate*.

Table 3.10 Annual percentage change in area between the years 2000 and 2010 of each of the 72 Annex I grassland habitat areas assessed in 2010.

Site no.	Annex I habitat	Original area (ha)	% change per yr	Site no.	Annex I habitat	Original area (ha)	% change per yr
1142	6410	1.6	0	1402	6410	1.5	0
1147	6410	11.6	0	1417	6410	25.0	0
1152	6410	0.3	0	1422	6410	11.2	+0.92
1157	6410	1.0	0	1423	6210	1.2	0
1161	6230	0.3	0	1500	6210	13.0	0
1203	6410	0.2	0	1501	6210	15.6	0
1232	6410	0.6	0	1502	6210	6.5	0
1243	6230	0.3	0	1502	6230	5.5	0
1248	6410	7.3	0	1507	6410	0.7	0
1248	6510	2.1	0	1509	6410	2.8	0
1249	6230	1.3	+0.3	1510	6410	1.9	0
1249	6410	1.0	0	1513	6210	3.9	0
1250	6210	16.7	0	1518	6410	0.7	0
1250	6410	13.6	+0.02	1519	6210	3.1	0
1252	6410	1.4	0	1525	6430	0.6	+3.0
1257	6410	5.8	0	1527	6210	3.4	0
1266	6210	18.1	0	1529	6210	3.7	0
1267	6410	0.1	0	1530	6410	0.7	0
1270	6210	0.4	0	1531	6210	0.9	0
1270	6410	0.4	0	1532	6210	2.2	0
1272	6210	33.7	+0.02	1537	6410	2.1	0
1275	6410	0.1	+2.02	1537	6510	1.1	0
1282	6510	4.1	0	1538	6210	2.0	0
1283	6210	1.6	0	1541	6210	2.2	0
1284	6210	4.9	0	1541	6410	10.0	0
1285	6210	13.4	0	1545	6410	0.6	0
1300	6210	0.3	0	1546	6410	1.8	+0.11
1300	6410	2.2	0	1548	6230	2.5	+0.15
1300	6510	4.5	+0.22	1549	6410	0.4	0
1305	6230	1.9	+0.05	1556	6210	7.8	-0.1
1315	6210	0.2	0	1561	6210	7.6	+0.06
1324	6210	1.3	+0.47	1566	6510	0.1	0
1327	6210	0.7	0	1568	6410	8.4	0
1400	6230	261.5	+0.05	1572	6510	2.5	+0.03
1401	6210	0.4	+0.05	1575	6410	0.2	0
1401	6230	22.2	+<0.01	1576	6410	2.2	0

Structure and functions assessment

During 2010, 52% of monitoring stops recorded (165 of 317) passed the assessment for structure and functions (Table 3.11; see also Appendix 6). Of the nine individual criteria assessed at each monitoring stop, forb:graminoid ratio and litter cover had the lowest pass rate across all Annex I grassland habitats, particularly for *Nardus* grassland (6230) and *Molinia* meadows (6410). However, the pass rate for non-high quality positive indicator species in Lowland hay meadows (6510) was noticeably low, only 44%. Thus, despite the presence of sufficient high quality positive indicator species at all 6510 monitoring stops assessed, the problem identified was insufficient generalist positive indicator species. The pass rate for the monitoring stops was lower across all Annex I habitats than for the individual criteria because a failure in any one of the criteria resulted in a failure

for the monitoring stop overall. The highest percentage of passes at individual monitoring stops was achieved by Festuco-Brometalia (6210), with a pass rate of 70%. This was considerably higher than the next best pass rate (44%), shared by 6410 and 6510. The pass rate for 6230 habitat assessed in 2010 was particularly low, just 33% of monitoring stops passing on all structure and functions criteria.

Table 3.11 Percentage pass rate for individual criteria used to assess structure and functions for each Annex I grassland habitat surveyed in 2010*.

Assessment Criteria	% of monitoring stops that passed on each criterion				Overall
	Festuco-Brometalia (6210)	Nardus grassland (6230)	Molinia meadows (6410)	Lowland hay meadows (6510)	
Positive indicator species (HQ**)	98	76	94	100	93
Positive indicator species (Non-HQ)	85	98	92	44	86
Negative indicator species	93	82	96	88	92
Forb : graminoid ratio	89	67	76	100	81
Encroachment	100	98	98	100	99
Sward height	97	98	98	100	97
Litter cover	99	76	66	100	82
Bare ground cover	96	100	99	100	98
Grazing & disturbance	98	100	100	100	99
Pass rate for monitoring stops	70	33	44	44	52

* Annex I grassland habitats Calaminarian grassland (6130) and Hydrophilous tall herb communities (6430) were not presented in this table as so few monitoring stops were recorded in each (6130: $n = 0$; 6430: $n = 4$).

** HQ = High Quality positive indicator species (see section 2.4).

While Table 3.11 shows the pass rates for the individual criteria and monitoring stops, Table 3.12 summarises the results of the structure and functions assessment for each of the areas of Annex I grassland. From Table 3.12 it can be seen that areas of 6210 habitat scored the best, with seven areas out of 26 (27% of 6210 areas assessed) receiving an assessment of *Favourable* and fewer than half of the areas (12 out of 26) receiving an assessment of *Unfavourable – Bad*. The next most favourably assessed habitat was 6410, with four out of 31 areas (12.9%) assessed as *Favourable*, five areas (16.1%) *Unfavourable – Inadequate* and 22 out of 31 areas (71%) assessed as *Unfavourable – Bad*. These two habitats were also the two with the highest number of monitoring stops. The habitat with the fewest number of stops, Hydrophilous tall herb communities (6430), was the Annex I habitat with the worst assessment results, all four stops failing and thus the area as a whole receiving an overall assessment of *Unfavourable – Bad*. It should be noted, however, that having so few monitoring stops increases the effect that one stop failure has on the overall assessment result.

Table 3.12 Structure and functions assessment for the five Annex I grassland habitats recorded during 2010.

Annex I habitat	Number of areas scored as <i>Favourable</i>	Number of areas scored as <i>Unfavourable – Inadequate</i>	Number of areas scored as <i>Unfavourable – Bad</i>	<i>Annex I habitat total</i>
6210	7	7	12	26
6230	0	1	7	8
6410	4	5	22	31
6430	0	0	1	1
6510	1	0	5	6
<i>Total</i>	<i>12</i>	<i>13</i>	<i>47</i>	<i>72</i>

For results of individual structure and functions criteria within monitoring stops, see Appendix 6

Future prospects assessment

Assessment of the future prospects parameter for each of the Annex I grassland areas identified was carried out according to the scoring system outlined in Tables 2.1 and 2.3, with a score of 0 assessed as *Favourable*, -1 to -3 as *Unfavourable – Inadequate* and less than -3 as *Unfavourable – Bad*. In total, 46 out of 72 (64%) Annex I grassland habitat areas assessed during 2010 were scored as *Favourable* (i.e. with the effects of positive and negative impacts balanced in favour of the positive) (Table 3.13; see also Appendix 8). The Annex I habitat with the best overall future prospects was 6510, with all six assessed meadows scored as having *Favourable* future prospects. The next most favourably rated was 6210, with just under 70% of its assessed areas (18 out of 26 areas) receiving a *Favourable* score and only two 6210 areas out of 26 (8% of 6210 areas assessed) receiving the lowest rating of *Unfavourable – Bad*.

Table 3.13 Future prospects for each of the 72 assessed areas of Annex I grassland habitat surveyed during 2010.

Annex I habitat	Number of areas scored as <i>Favourable overall</i>	Number of areas scored as <i>Unfavourable – Inadequate overall</i>	Number of areas scored as <i>Unfavourable – Bad overall</i>	<i>Annex I habitat total</i>
6210	18	6	2	26
6230	4	4	-	8
6410	18	8	5	31
6430	-	1	-	1
6510	6	-	-	6
<i>Total</i>	<i>46</i>	<i>19</i>	<i>7</i>	<i>72</i>

In terms of the impacts recorded, 22 negative impacts were recorded on Annex I grassland habitats, with ten positive and 11 neutral impacts also noted (Table 3.14). The most frequent negative impact recorded was problematic native species, generally bracken encroachment, which occurred at ten areas. Application of fertiliser was also recorded as a negative pressure, occurring at eight Annex I areas, while abandonment was identified as a problem at ten areas (six being due to lack of grazing,

four to lack of mowing), causing a tendency to rankness and high litter cover. The top five positive impacts were all related to control of sward through either grazing or mowing. Collectively, grazing was identified as the most frequent positive impact, noted at 39 areas of Annex I grassland habitat, with cattle the most frequent grazing animal, recorded at 21 areas. Mowing was a positive feature at 11 areas, with intensive mowing (mowing more than once a year) identified as a positive impact at two of these. Note that grazing was identified in some sites as a positive effect and at others as a negative impact, as well as occurring with a neutral effect (neither positive nor negative) in 14 areas. For example, grazing was generally recorded as having a negative impact in areas where it was insufficient to control scrub encroachment or sward rankness, or where negative impacts due to trampling or enrichment outweighed any other positive effect that grazing might achieve; but cattle grazing was recorded as having a positive effect where it successfully controlled sward rankness and scrub encroachment and more than cancelled out any of the negative effects of grazing. This was a highly context-sensitive assessment, requiring a weighing up of all of the individual impacts seen at a site.

For future prospects results of assessed Annex I grassland habitat areas, see Appendix 8

Table 3.14 Impacts recorded for each of the Annex I grassland habitats assessed in counties Donegal, Dublin, Kildare and Sligo, showing the number of areas each impact occurred at for each Annex I habitat.

(a) Negative impacts

Impact code	Description	Annex I grassland habitat					Total
		6210	6230	6410	6430	6510	
I02	Problematic native species (e.g. bracken)	6	1	3	-	-	10
A08	Fertilisation	5	-	1	-	2	8
A04.03	Abandonment of pastoral systems, lack of grazing	-	-	5	1	-	6
G01.02	Walking, horse-riding and non-motorised vehicles	3	2	-	-	-	5
A03.03	Abandonment/ lack of mowing	-	-	4	-	-	4
A04.01.01	Intensive cattle grazing	3	-	1	-	-	4
J02.07.01	Water extraction (drainage ditches)	-	-	4	-	-	4
A04.02.01	Non intensive cattle grazing	1	-	2	-	-	3
D01.01	Paths, tracks, cycling tracks	-	1	2	-	-	3
A02.01	Agricultural intensification	-	-	1	-	1	2
A04.01.02	Intensive sheep grazing	-	2	-	-	-	2
B02	Forest and Plantation management & use	-	1	1	-	-	2
G05.01	Trampling, overuse	2	-	-	-	-	2
A02.03	Grassland removal	-	-	-	-	1	1
A04.01.03	Intensive horse grazing	1	-	-	-	-	1
A04.02.03	Non intensive horse grazing	-	-	1	-	-	1
A04.02.05	Non intensive mixed animal grazing	1	-	-	-	-	1
D01	Roads, paths and railroads	-	1	-	-	-	1
D01.03	Car parks and parking areas	-	-	-	-	1	1
G01.03	Motorised vehicles	-	-	1	-	-	1
H05.01	Garbage and solid waste	1	-	-	-	-	1
J02.09.01	Saltwater intrusion	-	-	1	-	-	1

(b) Positive impacts

Impact code	Description	Annex I grassland habitat				Total
		6210	6230	6410	6510	
A04.02.01	Non intensive cattle grazing	7	-	12	2	21
A04.02.02	Non intensive sheep grazing	7	4	2	-	13
A03.02	Non intensive mowing	2	-	3	4	9
A04.02.03	Non intensive horse grazing	-	-	4	1	5
A03.01	Intensive mowing	-	-	-	2	2
A10.01	Removal of hedges or scrub	-	2	-	-	2
J02.07.01	Water extraction (drainage ditches)	-	-	1	1	2
A04.01.02	Intensive sheep grazing	-	1	-	-	1
A04.01.05	Intensive mixed animal grazing	1	-	-	-	1
J01.01	Burning down	-	-	1	-	1

(c) Neutral impacts

Impact code	Description	Annex I grassland habitat				Total
		6210	6230	6410	6510	
A04.02.01	Non intensive cattle grazing	5	-	5	-	10
A04.02.02	Non intensive sheep grazing	1	2	-	-	3
A02.01	Agricultural intensification	-	1	-	-	1
A03.02	Non intensive mowing	-	-	1	-	1
A03.03	Abandonment/ lack of mowing	-	-	1	-	1
A04.02.03	Non intensive horse grazing	-	-	-	1	1
A10.01	Removal of hedges or scrub	1	-	-	-	1
B01	Forest planting on open ground	-	-	1	-	1
D02.01	Electricity and phone lines	1	-	-	-	1
E04.02	Military constructions	-	1	-	-	1
F03.01	Hunting	-	-	1	-	1

Overall condition assessment for the 2010 dataset

The condition assessment scores for the 72 areas of Annex I grassland habitat assessed in 2010 were derived as outlined in section 2.4. Examining each of the assessment parameters separately (area, structure and functions, future prospects), the highest number of *Favourable* assessments were within area assessment (Table 3.15; see also Appendix 9), and the lowest were within structure and functions. The highest number of *Unfavourable – Bad* assessments occurred within structure and functions, while the lowest were within area assessment.

In terms of the overall condition assessment (i.e., combining all three assessment parameters with reference to the matrix presented in Table 2.1) for each of the 72 areas of Annex I grassland habitat, nine areas received an overall assessment of *Favourable* (Table 3.16). The most frequent overall assessment score was *Unfavourable – Bad*, scored at 51 of the 72 areas of Annex I grassland habitat recorded in 2010.

For overall condition assessments of assessed Annex I grassland habitat areas, see Appendix 9

Table 3.15 Summary of results of assessment parameters for the 72 areas of Annex I grassland habitat surveyed during 2010.

	Number of areas scored as <i>Favourable</i>	Number of areas scored as <i>Unfavourable – Inadequate</i>	Number of areas scored as <i>Unfavourable – Bad</i>
Area Assessment	71	1	0
Structure and Functions Assessment	12	13	47
Future Prospects Assessment	46	19	7

Table 3.16 Summary of condition assessment results for the five types of Annex I grassland habitat recorded during 2010.

Annex I habitat	Number of areas scored as <i>Favourable</i> overall	Number of areas scored as <i>Unfavourable – Inadequate</i> overall	Number of areas scored as <i>Unfavourable – Bad</i> overall	Areas of Annex I habitat
6210	5	7	14	26
6230	0	1	7	8
6410	3	4	24	31
6430	0	0	1	1
6510	1	0	5	6
<i>Total</i>	9	12	51	72

Primary areas of Annex I grassland habitat

During 2010, 72 areas of Annex I grassland habitat greater than the minimum mapping area located at 62 sites (nine sites contained more than one Annex I grassland habitat) were surveyed. Many of these areas of Annex I grassland habitat are either small (less than 1 ha) or have unfavourable structure and functions. Following the proposal in Martin *et al.* (2008) that a list of premium quality sites containing Annex I grassland habitats above a minimum size and of adequate structure and functions be produced, Table 3.17 shows the list of such sites compiled from the Annex I grassland habitats assessed during 2010. The 24 areas of Annex I grassland listed are hereafter referred to as **primary areas** of Annex I grassland and represent the best examples of Annex I grassland habitat recorded during 2010. They are judged to be of primary importance due to a combination of the area they cover (at least 1 ha) and their structure and functions, and should provide a focus for monitoring and conservation efforts in the future. Eight of the 14 areas that received a *Favourable* structure and functions assessment were included in the list of primary areas, the other six being too small. Fourteen of the 24 primary areas were recorded in Sligo, with the remainder located within Donegal and Dublin. No areas of primary Annex I grassland habitat were recorded in Kildare.

Fourteen of the areas of primary Annex I habitat were located within NPWS conservation sites; for ten of these, between 90% and 100% of the Annex I habitat was located within an SAC or pNHA.

Table 3.17 List of the primary areas of Annex I grassland habitat surveyed during ISGS 2010. The sites are ordered by Annex I habitat type and then site number within each type. The % within NPWS site refers to the % of the Annex I habitat located in an SAC or pNHA.

Site No.	County	Annex habitat	Area (ha)	Structure and functions	% in NPWS site	NPWS site no.
1250	Donegal	6210	16.7	75% pass = <i>Unfavourable-Inadequate</i>	100%	SAC 191
1272	Donegal	6210	33.7	90% pass = <i>Unfavourable-Inadequate</i>	4%	pNHA 2068
1324	Dublin	6210	1.4	50% pass = <i>Unfavourable-Bad</i>	0%	-
1501	Sligo	6210	15.6	67% pass = <i>Unfavourable-Bad</i>	99%	pNHA 1670
1513	Sligo	6210	3.9	100% pass = <i>Favourable</i>	0%	-
1527	Sligo	6210	3.4	100% pass = <i>Favourable</i>	100%	pNHA 2435
1529	Sligo	6210	3.7	75% pass = <i>Unfavourable-Inadequate</i>	74%	SAC 627
1532	Sligo	6210	2.2	75% pass = <i>Favourable</i>	0%	-
1538	Sligo	6210	2.4	75% pass = <i>Unfavourable-Inadequate</i>	0%	-
1541	Sligo	6210	2.3	75% pass = <i>Favourable</i>	97%	SAC 1898
1556	Sligo	6210	7.8	100% pass = <i>Favourable</i>	99%	SAC 1976
1561	Sligo	6210	7.6	100% pass = <i>Favourable</i>	100%	SAC 1656
1305	Dublin	6230	1.9	75% pass = <i>Unfavourable-Inadequate</i>	0%	-
1502	Sligo	6230	5.5	67% pass = <i>Unfavourable-Bad</i>	79%	pNHA 1435
1142	Donegal	6410	1.6	75% pass = <i>Unfavourable-Inadequate</i>	0%	-
1147	Donegal	6410	11.6	62% pass = <i>Unfavourable-Bad</i>	100%	SAC 2287
1248	Donegal	6410	7.3	50% pass = <i>Unfavourable-Bad</i>	<1%	SAC 138
1250	Donegal	6410	13.6	50% pass = <i>Unfavourable-Bad</i>	100%	SAC 191
1541	Sligo	6410	10.0	67% pass = <i>Unfavourable-Bad</i>	100%	SAC 1898
1546	Sligo	6410	1.8	75% pass = <i>Unfavourable-Inadequate</i>	0%	-
1568	Sligo	6410	8.4	100% pass = <i>Favourable</i>	0%	-
1576	Sligo	6410	2.2	75% pass = <i>Unfavourable-Inadequate</i>	0%	-
1248	Donegal	6510	2.9	50% pass = <i>Unfavourable-Bad</i>	0%	-
1300	Dublin	6510	4.5	100% pass = <i>Favourable</i>	90%	SAC 1209

3.3 Ranking of sites using conservation and threat evaluations

Conservation and threat scores were calculated as described in section 2.5. Conservation and threat scores for all sites surveyed in 2010 are presented in Appendices 10 and 11.

Conservation scores

The 32 sites of highest conservation value surveyed in 2010 are presented in Table 3.18. All of these sites scored 40% or over in the conservation assessment. Nineteen of the top 32 sites are in Sligo, seven are in Donegal, four in Dublin and two in Kildare. Twenty-two of the sites occur at least partly within an NPWS conservation site. All ten of the top ranking sites that are not within an NPWS conservation site also contain an Annex I grassland habitat. Twenty-eight of the highest ranking sites received the top score for high quality indicator species, and 17 were over 40 ha. Thirty of the 32 sites contain at least one Annex I habitat.

Table 3.18 The 32 highest ranking grassland sites according to their conservation evaluation surveyed in 2010. Rankings shared by two or more sites are indicated by “=”.

Site No.	Site Name	County	NHA/pNHA	SAC	% score	Rank
1300	Glenasmole Valley	Dublin	1209	1209	58.9	1
1248	Rossnowlagh Lower	Donegal	-	138	56.8	=2
1502	Edenbaum	Sligo	2435	-	56.8	=2
1250	St. John's Point	Donegal	191	191	54.7	=4
1541	Cloonmacduff	Sligo	1898	1898	54.7	=4
1324	Newbridge Demesne	Dublin	-	-	50.5	6
1272	Garvanagh	Donegal	2068	-	49.5	7
1401	Little Curragh	Kildare	392	-	48.4	8
1532	Formoyle	Sligo	-	-	46.3	9
1315	Phoenix Park	Dublin	-	-	44.2	=10
1512	Portinch	Sligo	636	636	44.2	=10
1529	Rosses Point	Sligo	627	627	44.2	=10
1305	Ballybrack	Dublin	-	-	43.2	=13
1501	Knocknarea	Sligo	1670	-	43.2	=13
1527	Castlegal	Sligo	2435	-	43.2	=13
1546	Culdaly	Sligo	-	-	43.2	=13
1270	Cashelard	Donegal	-	-	42.1	=17
1525	Ardkeeran	Sligo	1898	1898	42.1	=17
1537	Cloonaleigha	Sligo	636	636	42.1	=17
1556	Clogher Beg	Sligo	1976	1976	42.1	=17
1400	Curragh	Kildare	392	-	41.1	=21
1232	Cloghboy	Donegal	190	190	41.1	=21
1561	Carrickhawna	Sligo	1656	1656	41.1	=21
1147	Inch Level	Donegal	166	2287	40.0	=24
1249	Drumhome	Donegal	138	138	40.0	=24
1509	Derrybeg	Sligo	587	-	40.0	=24
1510	Carrownabinna	Sligo	-	-	40.0	=24
1517	Doonaveeragh	Sligo	1656	1656	40.0	=24
1519	Greenan	Sligo	1656	1656	40.0	=24
1531	Knocknashee	Sligo	-	-	40.0	=24
1538	Primrosegrange	Sligo	-	-	40.0	=24
1576	Carrowmacbryan	Sligo	-	-	40.0	=24

Threat scores

The 13 most threatened sites are presented in Table 3.19, representing all sites that scored over 50% in the threat evaluation. None of these sites are located in Kildare, while eight of the sites occur in Sligo, four in Donegal and one in Dublin. The three most threatened sites (Portinch, Sligo (1512); Cloghboy, Donegal (1232); Rossnowlagh Lower, Donegal (1248)) also appear on the list of the sites of greatest conservation value, highlighting the vulnerable nature of these three important grassland sites. Eight of these sites occur at least partly within NPWS conservation sites, and these include the three most threatened sites.

Table 3.19 The 13 highest ranking semi-natural grassland sites according to their threat evaluation surveyed in 2010. Rankings shared by two or more sites are indicated by “=”.

Site No.	Site Name	County	NHA/pNHA	SAC	% score	Rank
1512	Portinch	Sligo	636	636	76.9	1
1232	Cloghboy	Donegal	190	190	61.5	=2
1248	Rossnowlagh Lower	Donegal	-	138	61.5	=2
1306	Kilmashogue	Dublin	-	-	61.5	=2
1523	Annagh Beg	Sligo	-	1898	61.5	=2
1134	Breaghy Head	Donegal	-	-	53.8	=6
1165	Tory Island	Donegal	193	2259	53.8	=6
1509	Derrybeg	Sligo	587	-	53.8	=6
1511	Tawnatruffan	Sligo	-	-	53.8	=6
1515	Eskragh	Sligo	-	-	53.8	=6
1516	Carrownyclovan	Sligo	-	-	53.8	=6
1518	Treanmacmurtagh	Sligo	1656	1656	53.8	=6
1549	Curry	Sligo	-	2298	53.8	=6

3.4 Cluster analysis

The results of the cluster analysis were examined manually and using expert judgement it was decided to cut the dendrogram at the five cluster level. The five **grassland groups** resulting from this represented combinations of two strong environmental gradients, acidic-basic and wet-dry, with a fifth group representing semi-improved grassland. Groups were named using the two best indicator species as identified by ISA. For each of the five subsets of data, cluster analysis was rerun and the resulting dendrograms were again examined manually to identify the level of clustering with the best ecological integrity. Hence each grassland group was divided into a number of **vegetation types**, with 34 types identified in total. Indicator species analysis (ISA) was run for each of the five groups of vegetation types. The characterisation, composition and nomenclature of groups and types inevitably differs from that presented in previous phases and comparisons cannot usefully be made between this classification and those presented in previous reports. Confusion tables showing how Annex I and Fossitt habitats relate to the groups are presented as Tables 3.20 and 3.21 respectively. An overview of the classification showing all five vegetation groups and 34 vegetation types is shown in Table 3.22. The classification is presented in full in Chapter 4.

The majority of the relevés from the Annex I habitats Calaminarian grassland (6130), Lowland hay meadows (6510) and Festuco-Brometalia (6210) were classified under group 1, while the majority of *Nardus* grassland (6230) samples were included in group 2. All Hydrophilous tall herb (6430) relevés were assigned to group 3 except for one, which was assigned to group 5. Relevés from *Molinia* meadows (6410) were present in all groups, but the majority of them were split among groups 3, 2 and 4. The group with the largest proportion of non-Annex I habitat relevés was group 5, closely followed by group 3.

Table 3.20 Confusion table comparing grassland group assignment of relevés using cluster analysis with assignment of relevés to Annex I grassland habitat types.

Vegetation group	6130	6210	6230	6410	6430	6510	Non-Annex	Total
1 <i>Festuca rubra</i> - <i>Plantago lanceolata</i>	10	163	7	18	0	44	305	547
2 <i>Anthoxanthum odoratum</i> - <i>Rhytidiadelphus squarrosus</i>	0	17	120	93	0	3	489	722
3 <i>Agrostis stolonifera</i> - <i>Juncus effusus</i>	0	2	2	112	16	5	953	1090
4 <i>Molinia caerulea</i> - <i>Cirsium dissectum</i>	0	1	4	81	0	0	56	142
5 <i>Lolium perenne</i> - <i>Trifolium repens</i>	1	26	15	2	1	19	459	523
Total	11	209	148	306	17	71	2262	3024

GS1 relevés were chiefly assigned to group 1, although a sizable minority were also located in group 5. Group 1 also contains the majority of GS2 relevés, but some GS2 relevés were also assigned to groups 5, 3 and 2. All of the FS2 relevés and the vast majority of GM1 relevés were assigned to group 3. Group 3 also contains over half of all GS4 relevés (the habitat with the most relevés in the analysis), and group 2 over a quarter of GS4 relevés. GS4 relevés are also present to a lesser degree in each of the remaining three groups. Although most GS3 relevés were assigned to group 2, GS3 relevés were assigned to every other group, most notably groups 5 and 1. The majority of GA1/2 relevés were assigned to group 5, with a further 25% assigned to Group 3. A small number were assigned to groups 1 and 2, but none were assigned to group 4.

Table 3.21 Confusion table comparing grassland group assignment of relevés using cluster analysis with *a priori* classification of relevés using Fossitt (2000).

Vegetation group	GS1	GS2	GS3	GS4	GM1	GA1/2	FS2	Total
1 <i>Festuca rubra</i> - <i>Plantago lanceolata</i>	278	143	43	58	5	20	0	547
2 <i>Anthoxanthum odoratum</i> - <i>Rhytidiadelphus squarrosus</i>	56	10	214	409	9	24	0	722
3 <i>Agrostis stolonifera</i> - <i>Juncus effusus</i>	25	49	10	823	103	68	12	1090
4 <i>Molinia caerulea</i> - <i>Cirsium dissectum</i>	4	0	9	129	0	0	0	142
5 <i>Lolium perenne</i> - <i>Trifolium repens</i>	144	55	60	104	1	159	0	523
Total	507	257	336	1523	118	271	12	3024

Table 3.22 List of vegetation types with summary environmental data and affinities

	Vegetation type	Main Fossitt affinity	Main Annex affinity	Main NVC affinity	No. of relevés	No. of spp.	Forb ht. (cm)	Graminoid ht. (cm)	Forb prop. (%)	Slope (°)	Light	Wetness	pH	Fertility
1	<i>Festuca rubra</i> – <i>Plantago lanceolata</i> group	-	-	-	547	26	-	-	-	9	-	-	-	-
1a	<i>Carex flacca</i> – <i>Thymus polytrichus</i> type	GS1	6210	CG10	128	41	7	11	46	19	7.3	5.4	5.7	3.2
1b	<i>Carex flacca</i> – <i>Briza media</i> type	GS1	6210	CG6	51	27	12	19	40	15	7.4	5.2	5.9	3.4
1c	<i>Trifolium pratense</i> – <i>Rhinanthus minor</i> type	GS2	6510	MG5	48	23	23	26	60	4	7.2	5.2	5.7	4.3
1d	<i>Trifolium pratense</i> – <i>Cynosurus cristatus</i> type	GS1/GS2	6210 /6510	MG5	38	26	23	31	51	5	7.2	5.1	6.1	4.6
1e	<i>Agrostis stolonifera</i> – <i>Festuca rubra</i> type	GS2/GS4	6410 /6510	MG9	74	23	22	28	39	4	7.2	5.6	6.0	4.8
1f	<i>Dactylis glomerata</i> – <i>Holcus lanatus</i> type	GS1/GS2	6210	MG9	40	18	24	37	28	8	7.1	5.3	6.4	5.3
1g	<i>Arrhenatherum elatius</i> – <i>Festuca rubra</i> type	GS2	-	MG9	24	12	37	58	18	3	7.2	5.3	6.7	6.1
1h	<i>Festuca rubra</i> – <i>Lotus corniculatus</i> type	GS1/GS4	6210	MC9	116	20	17	23	33	6	7.6	5.4	5.8	4.4
1i	<i>Plantago coronopus</i> – <i>Armeria maritima</i> type	GS1/GS3	6130	MC10	23	17	3	6	63	9	7.8	6.1	5.6	4.2
1j	<i>Elytrigia repens</i> – <i>Holcus lanatus</i> type	GS4	-	S28	5	5	33	42	8	0	7.2	5.0	6.8	6.6
2	<i>Anthoxanthum odoratum</i> – <i>Rhytiadelphus squarrosus</i> group	-	-	-	722	22	-	-	-	8	-	-	-	-
2a	<i>Nardus stricta</i> – <i>Hylocomium splendens</i> type	GS3	6230	U5	112	23	8	16	24	15	7.3	6.7	4.2	2.8
2b	<i>Anthoxanthum odoratum</i> – <i>Potentilla erecta</i> type	GS1/GS3	6210 /6230	U4	99	22	11	20	28	12	7.2	6.1	4.6	3.4
2c	<i>Festuca ovina</i> – <i>Galium saxatile</i> type	GS3	6230	U4	52	19	5	13	22	11	7.0	5.8	4.1	2.7
2d	<i>Agrostis capillaris</i> – <i>Plantago lanceolata</i> type	GS1/GS3/GS4	-	MG6	44	23	10	18	30	9	7.5	6.2	4.7	3.5
2e	<i>Anthoxanthum odoratum</i> – <i>Succisa pratensis</i> type	GS4	6410	M25	60	23	25	38	40	5	7.5	7.1	4.4	2.8
2f	<i>Rhytiadelphus squarrosus</i> – <i>Juncus</i> spp. type	GS4	-	M25	69	21	13	33	26	5	7.8	7.4	4.0	2.6
2g	<i>Juncus acutiflorus/articulatus</i> – <i>Holcus lanatus</i> type	GS4	6410	M23	238	23	27	46	28	4	7.4	6.9	4.7	3.4
2h	<i>Agrostis canina/vinealis</i> – <i>Juncus</i> spp. type	GS4	-	M23	42	21	15	35	19	3	7.4	6.9	4.2	3.3

Table 3.22 List of vegetation types with summary environmental data and affinities (ctd.)

Type	Main Fossitt affinity	Main Annex affinity	Main NVC affinity	No. of relevés	No. of spp.	Forb ht. (cm)	Graminoid ht. (cm)	Forb prop. (%)	Slope (°)	Light	Wetness	pH	Fertility
3 <i>Agrostis stolonifera</i> – <i>Juncus effusus</i> group	-	-	-	1090	19	-	-	-	2	-	-	-	-
3a <i>Juncus effusus</i> – <i>Holcus lanatus</i> type	GS4	-	M23	353	17	31	64	20	2	7.1	6.6	5.1	4.5
3b <i>Carex disticha</i> – <i>Filipendula ulmaria</i> type	GS4	-	M23	23	18	45	57	34	0	7.1	7.2	5.9	4.4
3c <i>Calliergonella cuspidata</i> – <i>Juncus</i> spp. type	GS4	6410	M23	140	26	16	31	33	2	7.4	6.4	5.7	4.6
3d <i>Molinia caerulea</i> – <i>Calliergonella cuspidata</i> type	GS4	6410	M24	83	27	24	32	38	3	7.4	6.7	5.0	3.3
3e <i>Filipendula ulmaria</i> – <i>Ranunculus repens</i> type	GS4/GM1	-	M27	65	16	59	57	54	1	7.1	7.1	5.8	4.8
3f <i>Agrostis stolonifera</i> – <i>Potentilla anserina</i> type	GS4	6410	MG9	71	19	32	47	38	1	7.2	6.5	5.7	4.7
3g <i>Agrostis stolonifera</i> – <i>Holcus lanatus</i> type	GS4	-	MG10	222	16	26	33	29	2	7.0	6.2	6.0	5.2
3h <i>Alopecurus pratensis</i> – <i>Ranunculus repens</i> type	GS4/GA1	-	MG10	45	16	18	31	35	2	6.8	5.9	5.7	5.7
3i <i>Agrostis stolonifera</i> – <i>Equisetum fluviatile</i> type	GS4/GM1	-	MG10	86	16	40	45	40	0	7.1	7.4	5.9	5.2
4 <i>Molinia caerulea</i> – <i>Cirsium dissectum</i>	-	-	-	142	21	-	-	-	4	-	-	-	-
4a <i>Molinia caerulea</i> – <i>Potentilla erecta</i> type	GS4	6410	M25	91	18	35	55	27	2	7.2	7.4	3.9	2.5
4b <i>Molinia caerulea</i> – <i>Cirsium dissectum</i> type	GS4	6410	M25	51	23	24	40	25	6	7.3	7.0	4.5	3.0
5 <i>Lolium perenne</i> – <i>Trifolium repens</i> group	-	-	-	523	21	-	-	-	7	-	-	-	-
5a <i>Lolium perenne</i> – <i>Trifolium repens</i> type	GA1	-	MG6	143	19	10	16	35	6	7.2	5.5	5.8	5.2
5b <i>Cynosurus cristatus</i> – <i>Trifolium repens</i> type	GS1	6210	MG5	100	30	9	14	39	6	7.2	5.3	5.6	4.1
5c <i>Festuca rubra</i> – <i>Trifolium repens</i> type	GS1/GA1	-	MG6	30	22	16	29	29	9	7.2	5.4	5.7	4.7
5d <i>Holcus lanatus</i> – <i>Agrostis stolonifera</i> type	GS4	-	MG10	88	14	27	39	19	3	7.0	6.0	5.7	4.9
5e <i>Agrostis capillaris</i> – <i>Trifolium repens</i> type	GS1/GS2/GS3	-	MG6	162	20	14	20	27	8	6.8	5.5	4.9	4.1

4: VEGETATION CLASSIFICATION

Dataset

The 3,078 relevés available for analysis were recorded from 12 counties over the four years of the ISGS, including the pilot survey in 2007. A total of 54 relevés were unsuitable for inclusion in the analysis, as detailed in section 2.6, leaving 3,024 relevés to go through to the final analysis and produce a classification of five grassland groups and 34 vegetation types.

Grassland groups

For each of the five grassland groups, a list of ten key indicator species is presented, together with distribution maps, on pages 56 to 58. These **group indicators** help distinguish between plant communities in the different groups. The figures indicate the value of the species as indicators in percent, where 100% would represent the perfect indicator that was only ever found within that group, within all its samples and at maximum abundance. **Note that it is certainly possible that samples may lack either or both of the title species of their group.**

Vegetation type accounts

For each vegetation type, a description is given of the typical floristic composition and the edaphic and topographic situations in which it occurs. A small number of example sites which contain the vegetation type are then listed, together with their site codes. The examples listed tend to consist of sites that are already known, such as NPWS conservation sites, and sites at which vegetation types are represented by multiple relevés.

The affinities that each of the vegetation types has to previously described classifications are detailed:

- Under **Fossitt**, comparisons are made to the habitat categories from the Heritage Council's *Guide to Habitats in Ireland* (Fossitt 2000). The percentage of relevés of that vegetation type ascribed to each grassland habitat category is given. Correlations less than 10% are omitted.
- Under **Annex I**, categories from Annex I of the EU Habitats Directive are listed where more than 10% of relevés for that vegetation type have been deemed relevant.
- Under **W & D**, subjective comparisons are made with associations and sub-associations of the Central European phytosociology tradition following the catalogue of White and Doyle (1982). (In previous ISGS reports, e.g. Martin *et al.* 2008, this was listed under **CEP**.)
- Under **NVC**, comparison with the British NVC is presented, utilising the MAVIS Plot Analyser v1.00 (Centre for Ecology and Hydrology, Lancaster). This program makes comparisons of groups of plots with the NVC based solely on the frequency of species within those groups; it does not take abundance into account. For each vegetation type, only species from the synoptic table with 20% or greater frequency within that vegetation type were entered into MAVIS. The best three matches with NVC communities or sub-communities are presented.

- Under **EUN**, the top NVC match has been translated into EUNIS Habitat Classification 200711 using the database at <http://eunis.eea.europa.eu/habitats-code.jsp>.

A distribution map is given for each vegetation type indicating its occurrence in the 12 counties surveyed by the ISGS so far. These records are indicated on a hectad (10 km x 10 km square) basis. Two photographs give examples of swards and sites. Note that vegetation types may contain far more variation than it is possible to show in just two pictures and they should be used in conjunction with the description and the synoptic table.

Synoptic tables

A synoptic table is presented for each vegetation type displaying a summary of the floristic and environmental data. The 22 most frequent species are listed. Frequency and abundance data are given for each species. **Frequency** here refers to the percentage of relevés in which that species occurs, irrespective of how much is present, and is indicated by Roman numerals, where I = 0.1 – 20.0%, II = 20.1 – 40.0%, III = 40.1 – 60.0%, IV = 60.1 – 80.0% and V = 80.1 – 100%. **Abundance** refers to the mean cover that species provides within the samples, irrespective of frequency, and is in percent. Species identified by within-group ISA as good indicators for a particular vegetation type are marked by a number of dots. These **type indicators** help differentiate only between the vegetation types within that group and should not be used to make comparisons with vegetation types from other groups. The number of dots denotes the value of the species as an indicator such that: • = 10 – 20.0%, •• = 20.1 – 40.0%, ••• = 40.1 – 60.0%, •••• = 60.1 – 80.0% and ••••• = 80.1 – 100%.

Alongside the synoptic table, summary environmental data are presented for each vegetation type. Species richness simply indicates the mean number of species per relevé. For soil parameters (pH, organic content and total P), altitude and slope, median values are given. MAVIS was used to calculate mean cover-weighted Ellenberg scores for light, wetness, pH and fertility based on the British and Irish calibrations (Hill *et al.* 1999).

Table 4.1 Table of Contents for the main grassland groups and their vegetation types

1	<i>Festuca rubra</i> – <i>Plantago lanceolata</i> group	60
1a	<i>Carex flacca</i> – <i>Thymus polytrichus</i> vegetation type	60
1b	<i>Carex flacca</i> – <i>Briza media</i> vegetation type	62
1c	<i>Trifolium pratense</i> – <i>Rhinanthus minor</i> vegetation type	64
1d	<i>Trifolium pratense</i> – <i>Cynsosurus cristatus</i> vegetation type	66
1e	<i>Agrostis stolonifera</i> – <i>Festuca rubra</i> vegetation type	68
1f	<i>Dactylis glomerata</i> – <i>Holcus lanatus</i> vegetation type	70
1g	<i>Arrhenatherum elatius</i> – <i>Festuca rubra</i> vegetation type	72
1h	<i>Festuca rubra</i> – <i>Lotus corniculatus</i> vegetation type	74
1i	<i>Plantago coronopus</i> – <i>Armeria maritima</i> vegetation type	76
1j	<i>Elytrigia repens</i> – <i>Holcus lanatus</i> vegetation type	78
2	<i>Anthoxanthum odoratum</i> – <i>Rhytidiadelphus squarrosus</i> group	80
2a	<i>Nardus stricta</i> – <i>Hylocomium splendens</i> vegetation type	80
2b	<i>Anthoxanthum odoratum</i> – <i>Potentilla erecta</i> vegetation type	82
2c	<i>Festuca ovina</i> – <i>Galium saxatile</i> vegetation type	84
2d	<i>Agrostis capillaris</i> – <i>Plantago lanceolata</i> vegetation type	86
2e	<i>Anthoxanthum odoratum</i> – <i>Succisa pratensis</i> vegetation type	88
2f	<i>Rhytidiadelphus squarrosus</i> – <i>Juncus</i> spp. vegetation type	90
2g	<i>Juncus acutiflorus/articulatus</i> – <i>Holcus lanatus</i> vegetation type	92
2h	<i>Agrostis canina/vinealis</i> – <i>Juncus</i> spp. vegetation type	94
3	<i>Agrostis stolonifera</i> – <i>Juncus effusus</i> group	96
3a	<i>Juncus effusus</i> – <i>Holcus lanatus</i> vegetation type	96
3b	<i>Carex disticha</i> – <i>Filipendula ulmaria</i> vegetation type	98
3c	<i>Calliergonella cuspidata</i> – <i>Juncus</i> spp. vegetation type	100
3d	<i>Molinia caerulea</i> – <i>Calliergonella cuspidata</i> vegetation type	102
3e	<i>Filipendula ulmaria</i> – <i>Ranunculus repens</i> vegetation type	104
3f	<i>Agrostis stolonifera</i> – <i>Potentilla anserina</i> vegetation type	106
3g	<i>Agrostis stolonifera</i> – <i>Holcus lanatus</i> vegetation type	108
3h	<i>Alopecurus pratensis</i> – <i>Ranunculus repens</i> vegetation type	110
3i	<i>Agrostis stolonifera</i> – <i>Equisetum fluviatile</i> vegetation type	112
4	<i>Molinia caerulea</i> – <i>Cirsium dissectum</i> group	114
4a	<i>Molinia caerulea</i> – <i>Potentilla erecta</i> vegetation type	114
4b	<i>Molinia caerulea</i> – <i>Cirsium dissectum</i> vegetation type	116
5	<i>Lolium perenne</i> – <i>Trifolium repens</i> group	118
5a	<i>Lolium perenne</i> – <i>Trifolium repens</i> vegetation type	118
5b	<i>Cynosurus cristatus</i> – <i>Trifolium repens</i> vegetation type	120
5c	<i>Festuca rubra</i> – <i>Trifolium repens</i> vegetation type	122
5d	<i>Holcus lanatus</i> – <i>Agrostis stolonifera</i> vegetation type	124
5e	<i>Agrostis capillaris</i> – <i>Trifolium repens</i> vegetation type	126

Main groups: indicator species and maps

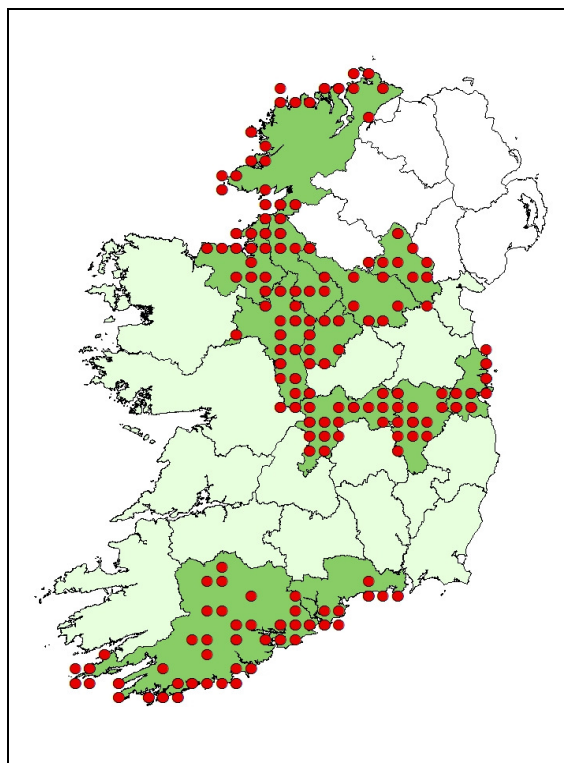
The top ten indicator species are listed for each group. Percentage figures indicate value of each species as indicator for that group.

1. *Festuca rubra* – *Plantago lanceolata* grassland group

547 relevés, 10 vegetation types

<i>Plantago lanceolata</i>	43%
<i>Festuca rubra</i>	41%
<i>Dactylis glomerata</i>	32%
<i>Lotus corniculatus</i>	32%
<i>Trifolium pratense</i>	30%
<i>Galium verum</i>	26%
<i>Thymus polytrichus</i>	22%
<i>Centaurea nigra</i>	21%
<i>Carex flacca</i>	20%
<i>Euphrasia officinalis</i> agg.	19%

Dry neutral or calcareous grassland including semi-improved swards.

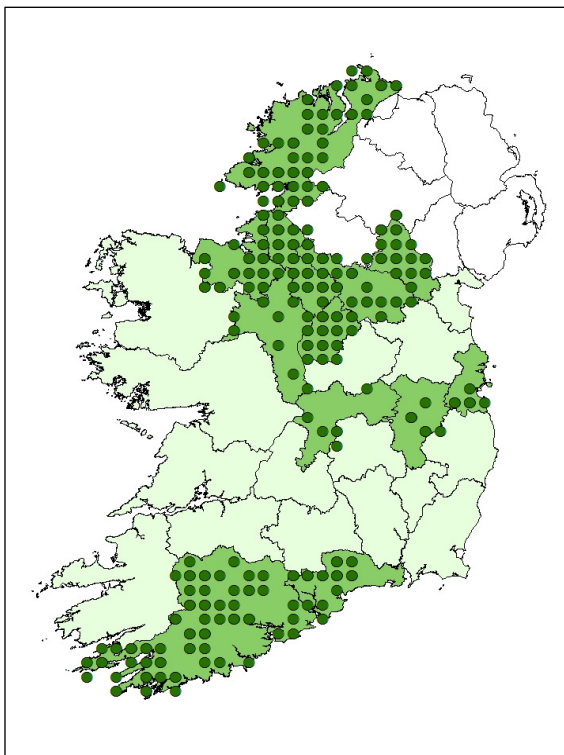


2. *Anthoxanthum odoratum* – *Rhytiadelphus squarrosus* grassland group

722 relevés, 8 vegetation types

<i>Rhytiadelphus squarrosus</i>	56%
<i>Anthoxanthum odoratum</i>	39%
<i>Juncus acutiflorus/articulatus</i>	34%
<i>Agrostis canina/vinealis</i>	26%
<i>Hylocomium splendens</i>	26%
<i>Galium saxatile</i>	20%
<i>Nardus stricta</i>	20%
<i>Luzula multiflora</i>	20%
<i>Carex echinata</i>	14%
<i>Scleropodium purum</i>	14%

Upland acid grassland, acidic rushy pastures and *Molinia* meadows

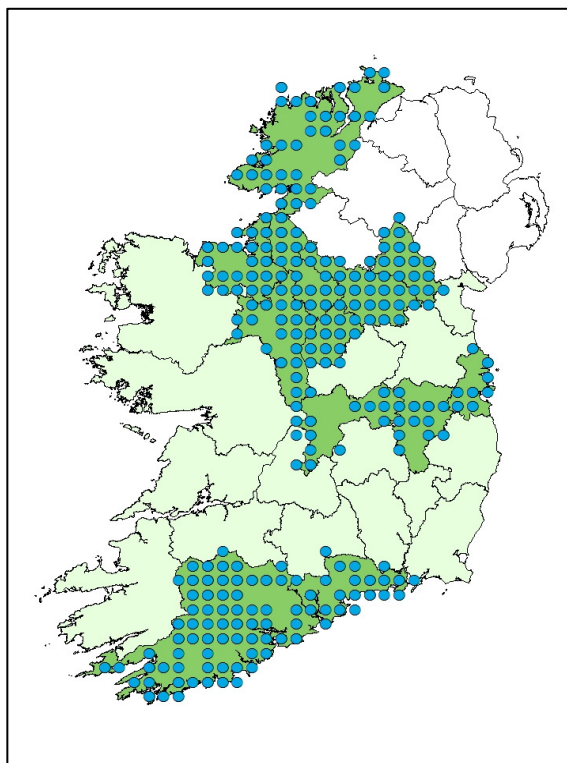


3. *Agrostis stolonifera* – *Juncus effusus* grassland / marsh group

1,090 relevés, 9 vegetation types

<i>Juncus effusus</i>	44%
<i>Agrostis stolonifera</i>	38%
<i>Ranunculus repens</i>	30%
<i>Calliergonella cuspidata</i>	25%
<i>Galium palustre</i>	25%
<i>Filipendula ulmaria</i>	22%
<i>Cardamine pratensis</i>	21%
<i>Carex nigra</i>	14%
<i>Equisetum fluviatile</i>	14%
<i>Ranunculus flammula</i>	13%

Neutral wet, rushy grassland, marsh and tall herb communities

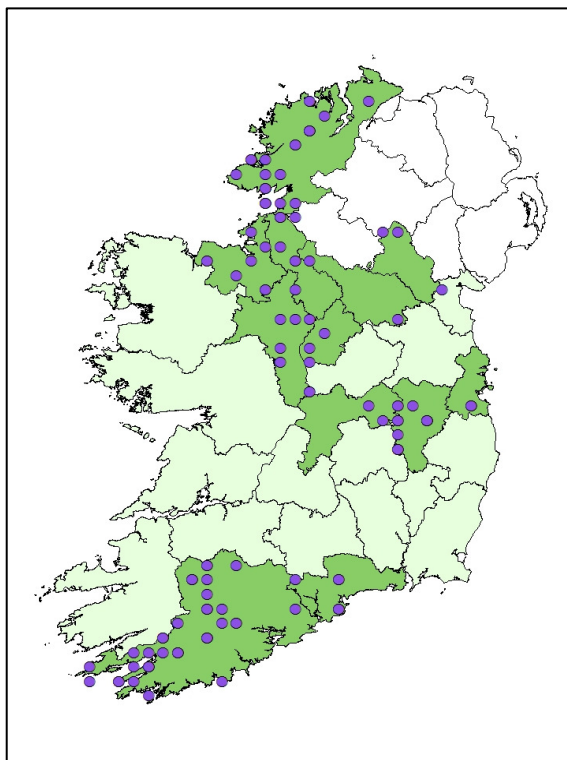


4. *Molinia caerulea* – *Cirsium dissectum* grassland group

142 relevés, 2 vegetation types

<i>Molinia caerulea</i>	91%
<i>Potentilla erecta</i>	33%
<i>Cirsium dissectum</i>	27%
<i>Carex panicea</i>	23%
<i>Succisa pratensis</i>	21%
<i>Carex pulicaris</i>	14%
<i>Juncus conglomeratus</i>	8%
<i>Lophocolea bidentata</i>	7%
<i>Sphagnum palustre</i>	5%
<i>Dactylorhiza fuchsii</i>	5%

Molinia meadows and related communities

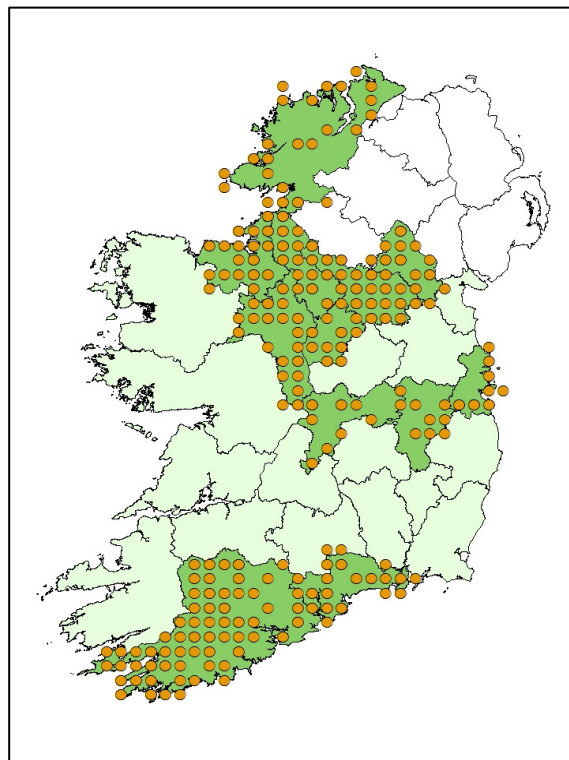


5. *Lolium perenne* – *Trifolium repens* grassland group

523 relevés, 5 vegetation types

<i>Trifolium repens</i>	44%
<i>Lolium perenne</i>	41%
<i>Holcus lanatus</i>	38%
<i>Agrostis capillaris</i>	35%
<i>Cynosurus cristatus</i>	30%
<i>Cerastium fontanum</i>	26%
<i>Rumex acetosa</i>	18%
<i>Senecio jacobaea</i>	13%
<i>Brachythecium rutabulum</i>	11%
<i>Taraxacum</i> spp.	8%

Semi-improved grassland and
Cynosurus swards



1. *Festuca rubra* – *Plantago lanceolata* grassland group**1a. *Carex flacca* – *Thymus polytrichus* vegetation type****Description**

This type is mainly associated with unimproved pasture. It is exceptionally species-rich with a short sward and a high proportion of broadleaved herbs, and is frequently found on land with a steep slope. The flora is typical of well-drained neutral to base-rich soils. *Carex flacca*, *Prunella vulgaris*, *Lotus corniculatus* and *Linum catharticum* show a high degree of constancy and differentiate this vegetation type from others in the group. Other indicator species include the mosses *Scleropodium purum* and *Rhytiadelphus squarrosus*. It is one of the most natural types of grassland identified in this survey, and is the vegetation type with the highest affinity with the Annex I habitat 6210 Festuco-Brometalia (76%).

Example sites: Knocknarea, Sligo (1501); St. John's Point, Donegal (1250).

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (88%)

Annex I: 6210 Festuco-Brometalia (76%)

W & D: Centaureo – Cynosuretum galietosum sub-association

Antennarietum hibernicae association

EUN: E1.26 Sub-Atlantic semi-dry calcareous grassland

NVC: CG10 *Festuca ovina* – *Agrostis capillaris* – *Thymus praecox* grassland (59%)

SD8e *Festuca rubra* – *Galium verum* fixed dune grassland

Prunella vulgaris sub-community (57%)

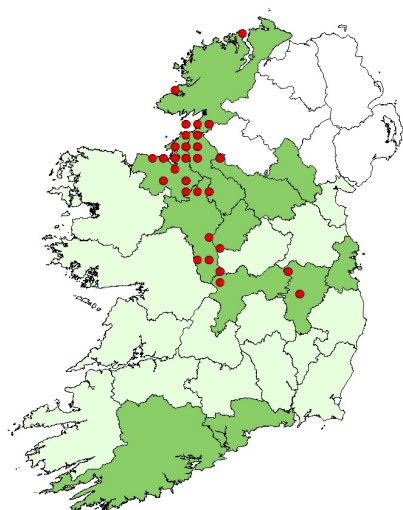
CG10a *Festuca ovina* – *Agrostis capillaris* – *Thymus praecox* grassland

Trifolium repens – *Luzula campestris* sub-community (57%)

Summary data

Number of relevés:	128
Species richness:	41
Forb height:	7 cm
Graminoid height:	11 cm
Forb proportion:	46%
Altitude:	110 m
Slope:	19°
Soil pH:	6.14
Soil organic content:	23%
Soil P:	0.11 mg/g
Ellenberg Light:	7.3
Ellenberg Wetness:	5.4
Ellenberg pH:	5.7
Ellenberg Fertility:	3.2

Species	Freq	Abu	Ind
<i>Carex flacca</i>	V	10.2	••
<i>Plantago lanceolata</i>	V	5.3	
<i>Prunella vulgaris</i>	V	2.0	••
<i>Lotus corniculatus</i>	V	4.4	
<i>Scleropodium purum</i>	V	3.0	•••
<i>Cynosurus cristatus</i>	V	6.3	
<i>Festuca rubra</i>	V	13.8	
<i>Rhytiadelphus squarrosus</i>	V	2.4	••
<i>Linum catharticum</i>	V	0.8	•••
<i>Potentilla erecta</i>	IV	2.1	••
<i>Anthoxanthum odoratum</i>	IV	4.7	
<i>Thymus polytrichus</i>	IV	7.9	••••
<i>Trifolium repens</i>	IV	1.5	
<i>Pilosella officinarum</i>	IV	2.4	•••
<i>Hypochaeris radicata</i>	IV	2.1	
<i>Galium verum</i>	IV	2.1	••
<i>Succisa pratensis</i>	IV	11.8	••
<i>Trifolium pratense</i>	IV	1.7	
<i>Agrostis capillaris</i>	IV	6.0	•
<i>Ctenidium molluscum</i>	IV	2.2	•••
<i>Koeleria macrantha</i>	IV	2.2	•••
<i>Euphrasia officinalis</i> agg.	IV	0.7	



Distribution

The distribution of this grassland community is centred around Sligo, north Leitrim and south Donegal. It was not recorded from counties Cork, Waterford, Monaghan or Dublin.



Grassland at St John's Point, Donegal with *Carex flacca*, *Campanula rotundifolia*, *Lotus corniculatus* and *Pilosella officinarum*.



Dry grassland with *Galium verum*, *Festuca rubra* and *Carex flacca* on shallow, rocky soil at St John's Point, Donegal.

1. *Festuca rubra* – *Plantago lanceolata* grassland group1b. *Carex flacca* – *Briza media* vegetation type**Description**

In many ways this is similar to type 1a, with flora typical of well-drained neutral to calcareous soils, frequently occurring on steep slopes and with a high broadleaved herb component. Again, the community occurs mainly in pastures displaying a high degree of naturalness and showing little or no sign of improvement, although meadows also occur within this group. However, the sward is taller than that of type 1a and, although still species-rich, it is far less so than type 1a. The only significant indicator species is *Briza media* which, along with *Dactylis glomerata*, differentiates it from type 1a. Annex I habitat 6210 Festuco-Brometalia is well represented in this vegetation type.

Example sites: Glenasmole Valley, Dublin (1300); Newbridge Demesne, Dublin (1324).

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (82%)

Annex I: 6210 Festuco-Brometalia (64%)

W & D: Centaureo – Cynosuretum galietosum sub-association

EUN: E1.26 Sub-Atlantic semi-dry calcareous grassland

NVC: CG6 *Avenula pubescens* grassland (62%)

MG5b *Cynosurus cristatus* – *Centaurea nigra* grassland

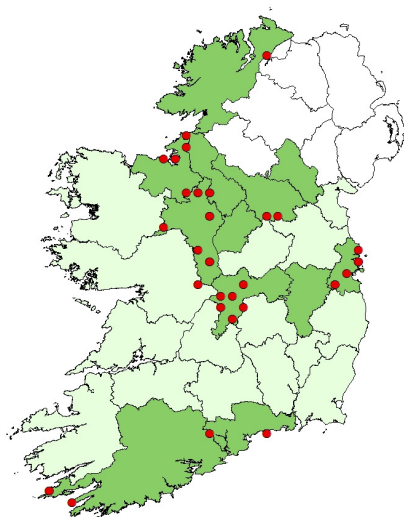
Galium verum sub-community (61%)

MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland (60%)

Summary data

Number of relevés:	51
Species richness:	27
Forb height:	12 cm
Graminoid height:	19 cm
Forb proportion:	41%
Altitude:	80 m
Slope:	15°
Soil pH:	7.19
Soil organic content:	9.8%
Soil P:	0.09 mg/g
Ellenberg Light:	7.4
Ellenberg Wetness:	5.2
Ellenberg pH:	5.9
Ellenberg Fertility:	3.4

Species	Freq	Abu	Ind
<i>Festuca rubra</i>	V	8.1	
<i>Plantago lanceolata</i>	IV	4.4	
<i>Briza media</i>	IV	8.7	••
<i>Carex flacca</i>	IV	6.1	
<i>Scleropodium purum</i>	IV	1.6	
<i>Rhynchospora squarrosa</i>	IV	2.2	
<i>Anthoxanthum odoratum</i>	IV	3.1	
<i>Dactylis glomerata</i>	IV	1.9	
<i>Lotus corniculatus</i>	III	3.7	
<i>Prunella vulgaris</i>	III	0.9	
<i>Centaurea nigra</i>	III	1.6	
<i>Holcus lanatus</i>	III	1.2	
<i>Trifolium pratense</i>	III	2.1	
<i>Galium verum</i>	III	1.4	
<i>Cynosurus cristatus</i>	III	5.4	
<i>Calligonella cuspidata</i>	III	0.5	
<i>Pilosella officinarum</i>	III	0.9	
<i>Hypochaeris radicata</i>	III	1.2	
<i>Agrostis stolonifera</i>	III	3.2	
<i>Linum catharticum</i>	III	0.3	
<i>Achillea millefolium</i>	III	0.6	
<i>Euphrasia officinalis</i> agg.	II	0.6	



Distribution

This widespread but infrequent sward type is in nine of the twelve counties surveyed to date. It is most frequent in counties Sligo, Roscommon, Offaly and Dublin.



Festuca rubra, *Plantago lanceolata* and *Briza media* in grassland at Newbridge Demesne, Dublin.



Meadow grassland with *Festuca rubra*, *Briza media* and *Hypochaeris radicata* at Newbridge Demesne, Dublin.

1. *Festuca rubra* – *Plantago lanceolata* grassland group**1c. *Trifolium pratense* – *Rhinanthus minor* vegetation type****Description**

Unimproved meadows are frequent in this grassland type, which is moderately species-rich and has a very high broadleaved herb content. It primarily occurs on well-drained neutral to calcareous soils on flat or gently sloping land. High cover of *Plantago lanceolata* and high frequency of *Trifolium pratense* and *Rhinanthus minor* characterise the vegetation type. The sward is moderately tall, and this is the group which contains the highest proportion of Annex I habitat 6510 Lowland hay meadows (42%).

Example sites: Rossnowlagh Lower, Donegal (1248); Garvanagh, Donegal (1272).

Affinities

Fossitt: GS2 Dry meadows and grassy verges (69%);
GA1 Improved agricultural grassland (13%);
GS1 Dry calcareous and neutral grassland (10%)
Annex I: 6510 Lowland hay meadows (42%)
W & D: Centaureo – Cynosuretum typical sub-association
EUN: E2.11 Unbroken pastures
NVC: MG5a *Cynosurus cristatus* – *Centaurea nigra* grassland
Lathyrus pratensis sub-community (73%)
MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland (71%)
MG6b *Lolium perenne* – *Cynosurus cristatus* grassland
Anthoxanthum odoratum sub-community (68%)

Summary data

Number of relevés: 48
Species richness: 23

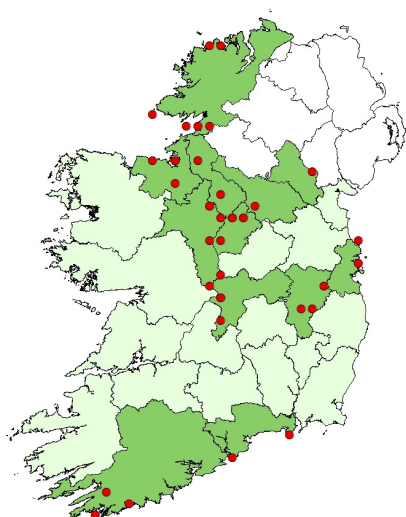
Forb height: 23 cm
Graminoid height: 26 cm
Forb proportion: 60%

Altitude: 45 m
Slope: 4°

Soil pH: 5.56
Soil organic content: 16%
Soil P: 0.12 mg/g

Ellenberg Light: 7.2
Ellenberg Wetness: 5.2
Ellenberg pH: 5.7
Ellenberg Fertility: 4.3

Species	Freq	Abu	Ind
<i>Plantago lanceolata</i>	V	38.4	•••
<i>Festuca rubra</i>	V	28.8	
<i>Anthoxanthum odoratum</i>	V	15.0	••
<i>Trifolium pratense</i>	V	10.2	
<i>Holcus lanatus</i>	V	4.8	
<i>Trifolium repens</i>	IV	4.1	
<i>Ranunculus acris</i>	IV	3.5	
<i>Rhinanthus minor</i>	IV	7.3	••
<i>Rumex acetosa</i>	IV	1.5	
<i>Cynosurus cristatus</i>	III	2.3	
<i>Calliergonella cuspidata</i>	III	1.1	
<i>Hypochaeris radicata</i>	III	2.9	
<i>Cerastium fontanum</i>	III	0.3	
<i>Agrostis capillaris</i>	III	5.6	
<i>Lotus corniculatus</i>	III	3.4	
<i>Centaurea nigra</i>	III	3.9	
<i>Lolium perenne</i>	III	3.4	
<i>Dactylis glomerata</i>	III	1.8	
<i>Ranunculus repens</i>	III	1.3	
<i>Rhytidadelphus squarrosus</i>	II	2.4	
<i>Prunella vulgaris</i>	II	1.3	
<i>Agrostis stolonifera</i>	II	2.3	



Distribution

This sward type was recorded at sites scattered widely over the entire survey area, though largely absent from Cavan and Monaghan.



Dry meadow grassland with *Plantago lanceolata*, *Trifolium repens* and *Rhinanthus minor* at Rossnowlagh Lower, Donegal.



Dry meadows at Garvanagh, Donegal, with abundant *Rhinanthus minor* and *Plantago lanceolata*.

1. *Festuca rubra* – *Plantago lanceolata* grassland group1d. *Trifolium pratense* – *Cynosurus cristatus* vegetation type**Description**

Well-drained mesotrophic grasslands including both meadows and pastures on flat or gently sloping land are typical of this type. Although it is species-rich and contains a high cover of broadleaved herbs, the main indicator species (*Trifolium pratense*, *Cynosurus cristatus*, *Cerastium fontanum*, *Lolium perenne*, *Ranunculus repens* and *Ranunculus acris*) indicate a sward that has experienced some degree of improvement. However, the overall character of the sward is fairly natural, and 45% of the relevés in this vegetation type are composed of Annex I habitats 6210 Festuco-Brometalia or 6510 Lowland hay meadows.

Example sites: Glenasmole Valley, Dublin (1300); Phoenix Park, Dublin (1315).

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (45%);
GS2 Dry meadows and grassy verges (39%)

Annex I: 6210 Festuco-Brometalia (29%);
6510 Lowland hay meadows (16%)

W & D: Centaureo – Cynosuretum typical sub-association

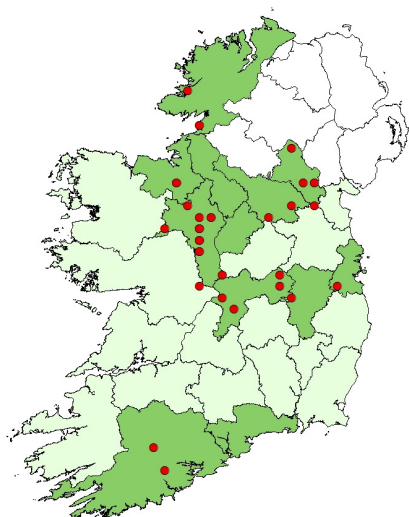
EUN: E2.11 Unbroken pastures

NVC: MG5a *Cynosurus cristatus* – *Centaurea nigra* grassland
Lathyrus pratensis sub-community (74%)
MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland (74%)
MG5b *Cynosurus cristatus* – *Centaurea nigra* grassland
Galium verum sub-community (72%)

Summary data

Number of relevés:	38
Species richness:	26
Forb height:	23 cm
Graminoid height:	31 cm
Forb proportion:	51%
Altitude:	80 m
Slope:	5°
Soil pH:	6.28
Soil organic content:	11.9%
Soil P:	0.16 mg/g
Ellenberg Light:	7.2
Ellenberg Wetness:	5.1
Ellenberg pH:	6.1
Ellenberg Fertility:	4.6

Species	Freq	Abu	Ind
<i>Trifolium pratense</i>	V	15.9	••
<i>Cynosurus cristatus</i>	V	16.0	•••
<i>Plantago lanceolata</i>	V	13.4	
<i>Cerastium fontanum</i>	V	1.7	•••
<i>Lolium perenne</i>	V	8.0	••
<i>Anthoxanthum odoratum</i>	IV	5.2	
<i>Holcus lanatus</i>	IV	4.7	
<i>Festuca rubra</i>	IV	7.8	
<i>Rumex acetosa</i>	IV	1.3	
<i>Dactylis glomerata</i>	IV	3.8	
<i>Trifolium repens</i>	III	6.1	
<i>Ranunculus acris</i>	III	3.7	•
<i>Agrostis stolonifera</i>	III	3.5	
<i>Prunella vulgaris</i>	III	0.9	
<i>Calliergonella cuspidata</i>	III	1.2	
<i>Ranunculus repens</i>	III	4.4	••
<i>Achillea millefolium</i>	III	2.1	
<i>Centaurea nigra</i>	III	3.8	
<i>Bellis perennis</i>	II	0.5	
<i>Rhinanthus minor</i>	II	6.9	
<i>Leucanthemum vulgare</i>	II	2.0	
<i>Lotus corniculatus</i>	II	3.0	



Distribution

This is a widely distributed vegetation type which occurs in nine out of the twelve counties surveyed to date. It is absent from Leitrim, Longford and Waterford.



Grassland with *Cynosurus cristatus*, *Trifolium repens* and *Lolium perenne* at Legaltan, Donegal.



Grassland with *Alopecurus pratensis*, *Cynosurus cristatus* and *Ranunculus repens* at Doonmeegin, Sligo.

1. *Festuca rubra* – *Plantago lanceolata* grassland group**1e. *Agrostis stolonifera* – *Festuca rubra* vegetation type****Description**

Occurring in meadows and pastures on flat or gently sloping land with dry to somewhat humid soil, this type of grassland is characterised by a moderately tall sward, moderate species richness and moderate to high broadleaved herb component. As well as *Agrostis stolonifera*, *Filipendula ulmaria* and the moss *Calliergonella cuspidata* are indicator species. The frequency of *Lolium perenne* and *Trifolium repens* indicates that some improvement has taken place, but the grassland type is sufficiently natural to include some relevés composed of Annex I habitats 6510 Lowland hay meadows (19%) and 6410 *Molinia* meadows (12%).

Example sites: Waterstone Park, Dublin (1320).

Affinities

Fossitt: GS2 Dry meadows and grassy verges (45%);

GS4 Wet grassland (25%);

GS1 Dry calcareous and neutral grassland (19%)

Annex I: 6510 Lowland hay meadows (19%);

6410 *Molinia* meadows (12%)

W & D: Centaureo – Cynosuretum typical sub-association

EUN: E3.41 Atlantic and sub-Atlantic humid meadows

NVC: MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland

Poa trivialis sub-community (67%)

MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland (65%)

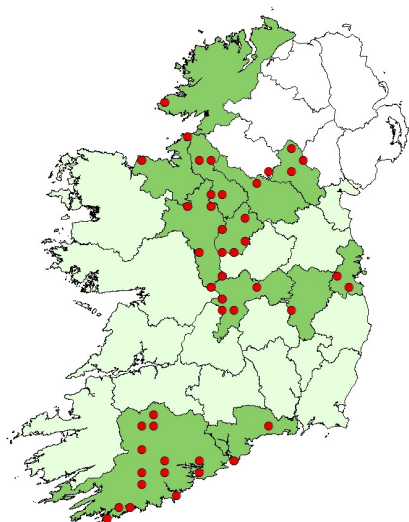
MG5a *Cynosurus cristatus* – *Centaurea nigra* grassland

Lathyrus pratensis sub-community (65%)

Summary data

Number of relevés:	74
Species richness:	23
Forb height:	22 cm
Graminoid height:	28 cm
Forb proportion:	39%
Altitude:	40 m
Slope:	4°
Soil pH:	5.97
Soil organic content:	16%
Soil P:	0.15 mg/g
Ellenberg Light:	7.2
Ellenberg Wetness:	5.6
Ellenberg pH:	6.0
Ellenberg Fertility:	4.8

Species	Freq	Abu	Ind
<i>Agrostis stolonifera</i>	V	24.2	•••
<i>Festuca rubra</i>	V	17.8	
<i>Plantago lanceolata</i>	V	15.3	
<i>Holcus lanatus</i>	IV	11.1	
<i>Anthoxanthum odoratum</i>	IV	8.0	
<i>Trifolium repens</i>	IV	3.7	
<i>Ranunculus acris</i>	III	2.3	
<i>Trifolium pratense</i>	III	4.5	
<i>Cerastium fontanum</i>	III	0.4	
<i>Calliergonella cuspidata</i>	III	3.1	••
<i>Rumex acetosa</i>	III	0.6	
<i>Ranunculus repens</i>	III	2.7	
<i>Filipendula ulmaria</i>	III	4.3	•
<i>Centaurea nigra</i>	II	2.2	
<i>Cynosurus cristatus</i>	II	2.1	
<i>Lotus corniculatus</i>	II	1.9	
<i>Lolium perenne</i>	II	1.5	
<i>Dactylis glomerata</i>	II	1.9	
<i>Carex flacca</i>	II	2.5	
<i>Prunella vulgaris</i>	II	0.7	
<i>Brachythecium rutabulum</i>	II	0.5	
<i>Lathyrus pratensis</i>	II	0.8	



Distribution

This grassland type is present throughout the survey area but is rare in the extreme northwest.



Agrostis stolonifera-dominated sward at Clooncunny, Sligo.



Damp grassland with *Agrostis stolonifera*, *Festuca rubra* and *Juncus articulatus* at Carrowmacbryan, Sligo.

1. *Festuca rubra* – *Plantago lanceolata* grassland group1f. *Dactylis glomerata* – *Holcus lanatus* vegetation type**Description**

The dry meadows and pastures which compose this vegetation type contain grassland which is taller, poorer in species and more dominated by graminoid species than that of the preceding types. The frequent presence of *Lolium perenne* and *Trifolium repens* are indicative of some improvement, but those species are not abundant. The main indicator species are *Dactylis glomerata*, *Holcus lanatus*, *Taraxacum* spp. and *Heracleum sphondylium*. Some relevés composed of the Annex I habitat 6210 Festuco-Brometalia occur here.

Example sites: Glenasmole Valley, Dublin (1300); Phoenix Park, Dublin (1315).

Affinities

Fossitt: GS2 Dry meadows and grassy verges (45%);

GS1 Dry calcareous and neutral grassland (43%)

Annex I: 6210 Festuco-Brometalia (18%)

W & D: Centaureo – Cynosuretum typical sub-association

EUN: E3.41 Atlantic and sub-Atlantic humid meadows

NVC: MG9b *Holcus lanatus* – *Deschampsia cespitosa* grassland

Arrhenatherum elatius sub-community (68%)

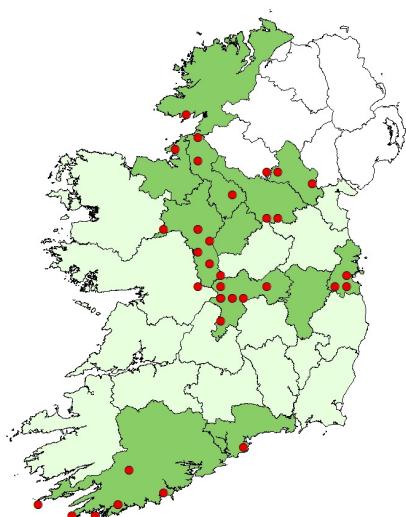
MG6 *Lolium perenne* – *Cynosurus cristatus* grassland (67%)

MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland (66%)

Summary data

Number of relevés:	40
Species richness:	18
Forb height:	24 cm
Graminoid height:	37 cm
Forb proportion:	28%
Altitude:	60 m
Slope:	8°
Soil pH:	6.20
Soil organic content:	13.5%
Soil P:	0.48 mg/g
Ellenberg Light:	7.1
Ellenberg Wetness:	5.3
Ellenberg pH:	6.4
Ellenberg Fertility:	5.3

Species	Freq	Abu	Ind
<i>Dactylis glomerata</i>	V	28.6	•••
<i>Holcus lanatus</i>	V	10.6	••
<i>Festuca rubra</i>	IV	11.1	
<i>Plantago lanceolata</i>	IV	3.8	
<i>Cerastium fontanum</i>	IV	0.6	
<i>Agrostis stolonifera</i>	IV	8.9	
<i>Anthoxanthum odoratum</i>	III	3.2	
<i>Trifolium pratense</i>	III	5.1	
<i>Lolium perenne</i>	III	1.3	
<i>Centaurea nigra</i>	III	1.9	
<i>Trifolium repens</i>	III	1.5	
<i>Achillea millefolium</i>	II	0.7	
<i>Rumex acetosa</i>	II	0.7	
<i>Agrostis capillaris</i>	II	2.6	
<i>Lotus corniculatus</i>	II	1.7	
<i>Ranunculus repens</i>	II	0.9	
<i>Taraxacum</i> spp.	II	1.9	•
<i>Arrhenatherum elatius</i>	II	3.1	
<i>Cirsium arvense</i>	II	1.0	
<i>Heracleum sphondylium</i>	II	1.5	•
<i>Ranunculus acris</i>	II	0.6	
<i>Cynosurus cristatus</i>	II	1.9	



Distribution

This grassland type is present throughout the survey area with the exception of Kildare.



Holcus lanatus dominates in this sward at Glenasmole Valley, Dublin.



Holcus lanatus and *Festuca rubra* in meadow grassland at the Phoenix Park, Dublin.

1. *Festuca rubra* – *Plantago lanceolata* grassland group**1g. *Arrhenatherum elatius* – *Festuca rubra* vegetation type****Description**

Dry, species-poor meadows with abundant *Arrhenatherum elatius*, a very tall sward and a low broadleaved herb component typify this community. Other significant indicator species include *Lathyrus pratensis*, *Potentilla reptans* and *Potentilla anserina*. The type is not associated with any Annex I habitat.

Example sites: Howth Head, Dublin (1301); Newbridge Demesne, Dublin (1324).

Affinities

Fossitt: GS2 Dry meadows and grassy verges (88%)

Annex I: No significant correlation

W & D: *Arrhenatherum elatius* association

EUN: E3.41 Atlantic and sub-Atlantic humid meadows

NVC: MG9b *Holcus lanatus* – *Deschampsia cespitosa* grassland
Arrhenatherum elatius sub-community (68%)

MG1c *Arrhenatherum elatius* grassland

Filipendula ulmaria sub-community (62%)

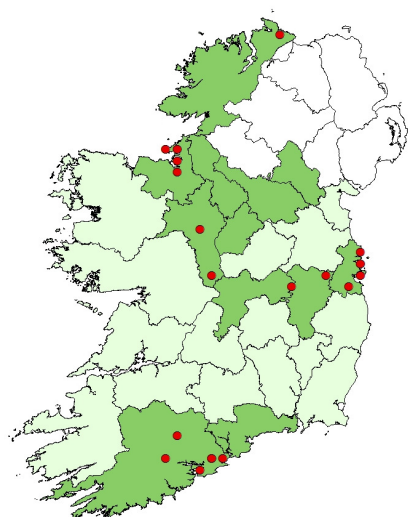
MG1a *Arrhenatherum elatius* grassland

Festuca rubra sub-community (60%)

Summary data

Number of relevés:	24
Species richness:	12
Forb height:	37 cm
Graminoid height:	58 cm
Forb proportion:	18%
Altitude:	20 m
Slope:	3°
Soil pH:	6.31
Soil organic content:	12%
Soil P:	0.11 mg/g
Ellenberg Light:	7.2
Ellenberg Wetness:	5.3
Ellenberg pH:	6.7
Ellenberg Fertility:	6.1

Species	Freq	Abu	Ind
<i>Arrhenatherum elatius</i>	V	45.9	•••••
<i>Dactylis glomerata</i>	V	6.5	
<i>Holcus lanatus</i>	IV	4.4	
<i>Festuca rubra</i>	IV	16.6	
<i>Agrostis stolonifera</i>	IV	7.6	
<i>Lathyrus pratensis</i>	III	1.4	•
<i>Plantago lanceolata</i>	III	3.3	
<i>Vicia cracca</i>	II	1.0	
<i>Anthoxanthum odoratum</i>	II	1.3	
<i>Ranunculus repens</i>	II	0.3	
<i>Trifolium repens</i>	II	0.6	
<i>Heracleum sphondylium</i>	II	0.5	
<i>Vicia sepium</i>	II	0.6	
<i>Potentilla reptans</i>	II	1.1	•
<i>Potentilla anserina</i>	II	2.7	•
<i>Trifolium pratense</i>	II	1.3	
<i>Rumex acetosa</i>	II	1.0	
<i>Filipendula ulmaria</i>	II	1.0	
<i>Cirsium arvense</i>	II	0.3	
<i>Elytrigia repens</i>	II	1.7	
<i>Centaurea nigra</i>	I	0.6	
<i>Lotus corniculatus</i>	I	0.9	



Distribution

This is an uncommon vegetation type which is absent from Leitrim, Longford, Cavan, Monaghan and Waterford.



A tall sward with *Arrhenatherum elatius* and *Vicia cracca* at Rosses Point, Sligo.



Arrhenatherum elatius-dominated grassland at Rosses Point, Sligo.

1. *Festuca rubra* – *Plantago lanceolata* grassland group**1h. *Festuca rubra* – *Lotus corniculatus* vegetation type****Description**

The constancy and high cover of *Festuca rubra* are defining properties of this type of grassland. It is most frequently found on flat to gently sloping ground with well-drained soils, but has also been found on gley and peat. It can be divided into two main variants. The first occurs in coastal areas and the presence of *Plantago maritima*, *Plantago coronopus* and/or *Armeria maritima* indicate some maritime influence. The second variant is found inland and *Plantago maritima*, *Plantago coronopus* and *Armeria maritima* do not occur. There is a low affinity to the Annex I habitat 6210 Festuco-Brometalia.

Example sites: Tory Island, Donegal (1165); St John's Point, Donegal; Glenasmole Valley, Dublin (1300).

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (52%);
GS4 Wet grassland (22%);
GS2 Dry meadows and grassy verges (16%);

Annex I: 6210 Festuco-Brometalia (13%)

W & D: Centaureo – Cynosuretum galietosum typical sub-association
Festuco – Armerietum rupestris association

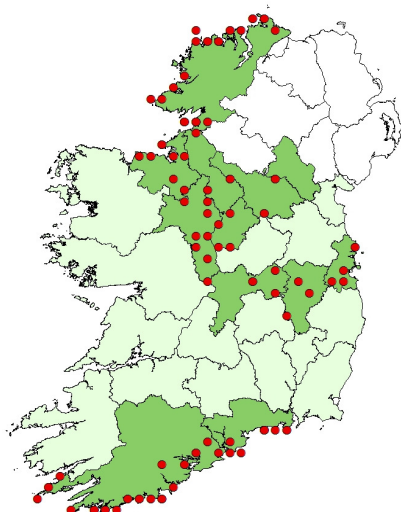
EUN: B3.31 Atlantic sea-cliff communities

NVC: MC9a *Festuca rubra* – *Holcus lanatus* maritime grassland
Plantago maritima sub-community (68%)
MC9 *Festuca rubra* – *Holcus lanatus* maritime grassland (67%)
MC9c *Festuca rubra* – *Holcus lanatus* maritime grassland
Achillea millefolium sub-community (66%)

Summary data

Number of relevés:	116
Species richness:	20
Forb height:	17 cm
Graminoid height:	23 cm
Forb proportion:	33%
Altitude:	30 m
Slope:	6°
Soil pH:	5.77
Soil organic content:	18%
Soil P:	0.16 mg/g
Ellenberg Light:	7.6
Ellenberg Wetness:	5.4
Ellenberg pH:	5.8
Ellenberg Fertility:	4.4

Species	Freq	Abu	Ind
<i>Festuca rubra</i>	V	50.5	••
<i>Plantago lanceolata</i>	IV	3.2	
<i>Lotus corniculatus</i>	IV	5.1	
<i>Holcus lanatus</i>	IV	3.6	
<i>Trifolium repens</i>	IV	3.4	
<i>Agrostis stolonifera</i>	IV	4.1	
<i>Anthoxanthum odoratum</i>	III	5.9	
<i>Carex flacca</i>	II	1.6	
<i>Potentilla erecta</i>	II	1.6	
<i>Trifolium pratense</i>	II	1.1	
<i>Hypochaeris radicata</i>	II	1.0	
<i>Cerastium fontanum</i>	II	0.2	
<i>Dactylis glomerata</i>	II	1.4	
<i>Centaurea nigra</i>	II	2.9	
<i>Rhynchospora squarrosa</i>	II	0.7	
<i>Ranunculus acris</i>	II	0.8	
<i>Cynosurus cristatus</i>	II	1.3	
<i>Rumex acetosa</i>	II	1.0	
<i>Agrostis capillaris</i>	II	1.0	
<i>Plantago maritima</i>	II	1.9	
<i>Calliergonella cuspidata</i>	II	0.4	
<i>Galium verum</i>	II	0.9	



Distribution

This grassland community was recorded in every county in the survey area except Monaghan. Although it is frequent inland, there is a distinct coastal distribution in counties Donegal, Cork and Waterford.



The maritime variant of the *Festuca rubra* – *Lotus corniculatus* vegetation type at St John's Point, Donegal.



The inland variant of the *Festuca rubra* – *Lotus corniculatus* vegetation type at Glenasmole Valley, Dublin.

1. *Festuca rubra* – *Plantago lanceolata* grassland group1i. *Plantago coronopus* – *Armeria maritima* vegetation type**Description**

Occurring on dry to moist soils on moderate slopes, this grassland type is associated with coastal areas. *Festuca rubra* is constant, and the most important indicator species are *Plantago coronopus*, *Plantago maritima* and *Armeria maritima*. The sward is typically very closely grazed and there is a very high proportion of broadleaved herbs. Examples of the Annex I habitat 6130 Calaminarian grassland occur within this group, but the general character of the group is not similar to that of Calaminarian grassland, which has a very distinct suite of species and soil type.

Example sites: Arranmore Island, Donegal (1150); Knockfolia, Donegal (1109).

Affinities

Fossitt: GS3 Dry-humid acid grassland (52%);

GS1 Dry calcareous and neutral grassland (48%)

Annex I: 6130 Calaminarian grassland (13%)

W & D: Festuco – Armerietum rupestris association

Sileno – Armerietum maritimae metallicolae association

EUN: B3.31 Atlantic sea-cliff communities

NVC: MC10a *Festuca rubra* – *Plantago* spp. maritime grassland

Armeria maritima sub-community (66%)

MC10 *Festuca rubra* – *Plantago* spp. maritime grassland (66%)

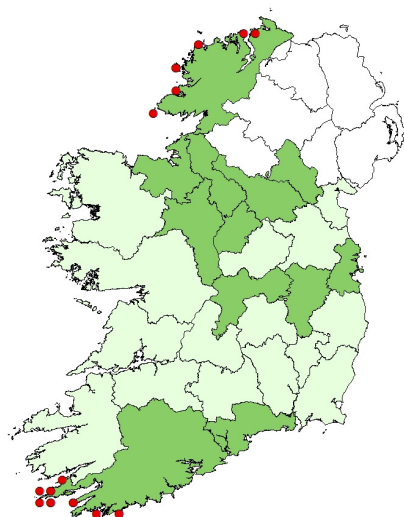
MC9a *Festuca rubra* – *Holcus lanatus* maritime grassland

Plantago maritima sub-community (64%)

Summary data

Number of relevés:	23
Species richness:	17
Forb height:	3 cm
Graminoid height:	5 cm
Forb proportion:	63%
Altitude:	40 m
Slope:	9°
Soil pH:	5.12
Soil organic content:	24%
Soil P:	0.33 mg/g
Ellenberg Light:	7.8
Ellenberg Wetness:	6.1
Ellenberg pH:	5.6
Ellenberg Fertility:	4.2

Species	Freq	Abu	Ind
<i>Festuca rubra</i>	V	19.6	
<i>Plantago coronopus</i>	V	16.3	•••••
<i>Plantago maritima</i>	IV	27.0	••••
<i>Armeria maritima</i>	IV	10.5	•••••
<i>Agrostis capillaris</i>	IV	2.9	
<i>Plantago lanceolata</i>	IV	3.8	
<i>Trifolium repens</i>	III	0.9	
<i>Hypochaeris radicata</i>	III	1.0	
<i>Lotus corniculatus</i>	III	1.5	
<i>Carex viridula</i>	III	2.0	•••
<i>Holcus lanatus</i>	III	2.1	
<i>Agrostis stolonifera</i>	II	2.4	
<i>Potentilla erecta</i>	II	1.5	
<i>Danthonia decumbens</i>	II	1.3	
<i>Cerastium fontanum</i>	II	0.1	
<i>Anagallis tenella</i>	II	0.9	••
<i>Bellis perennis</i>	II	0.5	
<i>Euphorbia officinalis</i> agg.	II	0.4	
<i>Carex panicea</i>	II	0.7	
<i>Kindbergia praelonga</i>	II	0.2	
<i>Koeleria macrantha</i>	II	0.4	
<i>Carex flacca</i>	II	1.2	

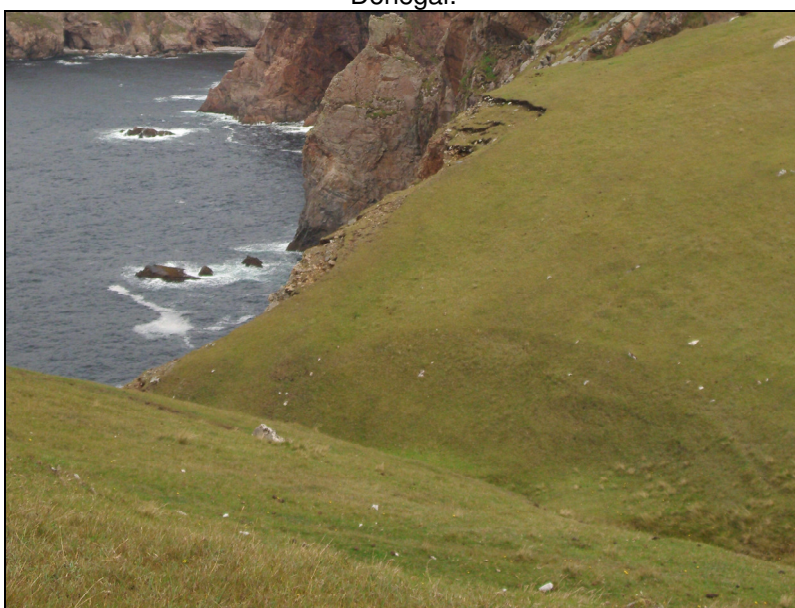


Distribution

This sward type has only been recorded in exposed locations with a strong maritime influence in counties Cork and Donegal.



Plantago coronopus, *Plantago maritima* and *Festuca rubra* in maritime grassland at Malin Beg, Donegal.



A tightly grazed maritime grassland sward with *Festuca rubra* and *Lotus corniculatus* at Arranmore Island, Donegal.

1. *Festuca rubra* – *Plantago lanceolata* grassland group**1j. *Elytrigia repens* – *Holcus lanatus* vegetation type****Description**

The least diverse vegetation type in the group, this comprises ruderal grasslands dominated by *Elytrigia repens*. It is characterised by a tall sward and very low cover of broadleaved herbs. As well as *Elytrigia repens*, *Rumex obtusifolius*, *Phalaris arundinacea*, *Urtica dioica*, *Vicia sepium* and *Persicaria amphibia* are significant indicator species. The type is composed of species which are found in areas with base-rich soils and high fertility. Recorded from only five relevés, this is the least frequently occurring grassland type recorded in the survey to date.

Example sites: Curraghbinny (413), Waterford; Waterstone Park, Dublin (1320).

Affinities

Fossitt: GS4 Wet grassland (80%);
GS2 Dry meadows and grassy verges (20%)
Annex I: No significant correlation
W & D: Urtico – Aegopodietum association
EUN: C3.26 *Phalaris arundinacea* beds
NVC: S28c *Phalaris arundinacea* tall-herb fen
Elymus repens – *Holcus lanatus* sub-community (38%)
OV27 *Epilobium angustifolium* community (37%)
SM28 *Elymus repens* salt-marsh community (32%)

Summary data

Number of relevés: 5
Species richness: 5

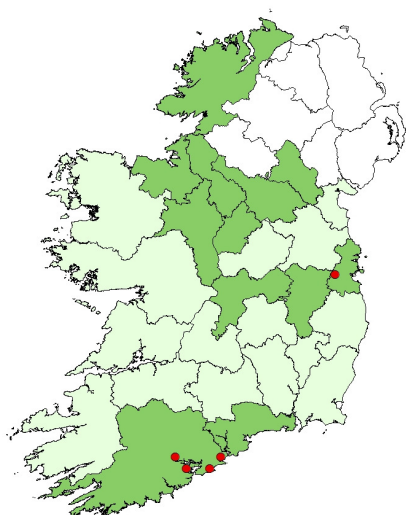
Forb height: 33 cm
Graminoid height: 42 cm
Forb proportion: 8%

Altitude: 10 m
Slope: 0°

Soil pH: 6.23
Soil organic content: 9%
Soil P: 0.51 mg/g

Ellenberg Light: 7.2
Ellenberg Wetness: 5.0
Ellenberg pH: 6.8
Ellenberg Fertility: 6.6

Species	Freq	Abu	Ind
<i>Elytrigia repens</i>	V	67.0	•••••
<i>Holcus lanatus</i>	III	1.9	
<i>Festuca rubra</i>	II	12.7	
<i>Lathyrus pratensis</i>	II	0.3	
<i>Dactylis glomerata</i>	I	0.6	
<i>Agrostis stolonifera</i>	I	1.6	
<i>Poa trivialis</i>	I	0.1	
<i>Carex hirta</i>	I	1.6	
<i>Arrhenatherum elatius</i>	I	0.1	
<i>Juncus inflexus</i>	I	0.1	
<i>Rumex obtusifolius</i>	I	0.6	•
<i>Phalaris arundinacea</i>	I	0.6	•
<i>Potentilla reptans</i>	I	0.6	
<i>Urtica dioica</i>	I	1.6	•
<i>Vicia sepium</i>	I	1.6	•
<i>Persicaria amphibia</i>	I	1.6	•
<i>Lotus pedunculatus</i>	I	3.6	
<i>Vicia sativa</i>	I	0.0	



Distribution

This is the least common of the vegetation types in vegetation group 1. The five relevés recorded were located in Dublin and Cork.



Elytrigia repens and *Rumex obtusifolius* in rank grassland at Shanakill, Cork.



Rank, *Elytrigia repens*-dominated grassland at Waterstone Park, Dublin.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group**2a. *Nardus stricta* – *Hylocomium splendens* vegetation type****Description**

Often a low grassy sward occurring on steeply sloping sites with acidic gley soils. *Nardus stricta* is a common component and *Danthonia decumbens*, *Juncus squarrosus* and *Carex binervis* are indicative of the vegetation type. Bryophytes such as *Hylocomium splendens*, *Thuidium tamariscinum*, and *Rhytidiadelphus loreus* are also indicative. There is a high affinity with dry-humid acid grassland (87%) and the Annex I habitat 6230 Species-rich *Nardus* grassland (55%).

Example sites: Curragh, Kildare (1400); Edenbaum, Sligo (1502); Gleniff, Sligo (1577).

Affinities

Fossitt: GS3 Dry-humid acid grassland (87%);

GS4 Wet grassland (12%)

Annex I: 6230 Species-rich *Nardus* grassland (55%)

W & D: Nardo – Caricetum binervis association

EUN: E1.71 *Nardus stricta* swards

NVC: U5c *Nardus stricta* – *Galium saxatile* grassland

Carex panicea – *Viola riviniana* sub-community (69%)

U4d *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland

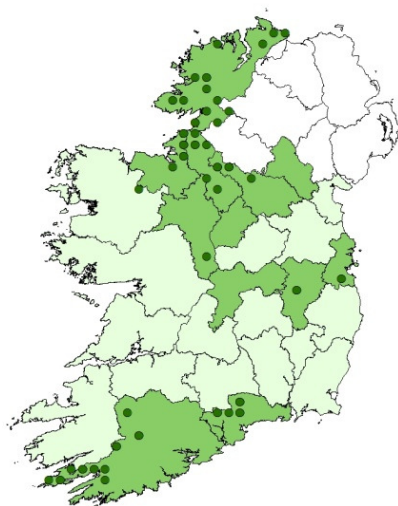
Luzula multiflora – *Rhytidiadelphus loreus* sub-community (66%)

U5 *Nardus stricta* – *Galium saxatile* grassland (61%)

Summary data

Number of relevés:	112
Species richness:	23
Forb height:	8 cm
Graminoid height:	16 cm
Forb proportion:	24%
Altitude:	220 m
Slope:	15°
Soil pH:	4.47
Soil organic content:	25%
Soil P:	0.17 mg/g
Ellenberg Light:	7.3
Ellenberg Wetness:	6.7
Ellenberg pH:	4.2
Ellenberg Fertility:	2.8

Species	Freq	Abu	Ind
<i>Rhytidiadelphus squarrosus</i>	V	11.3	
<i>Potentilla erecta</i>	V	11.7	
<i>Hylocomium splendens</i>	V	22.6	••
<i>Agrostis capillaris</i>	V	20.1	
<i>Anthoxanthum odoratum</i>	V	9.5	
<i>Nardus stricta</i>	IV	15.1	•••
<i>Galium saxatile</i>	IV	4.4	
<i>Holcus lanatus</i>	IV	3.3	
<i>Scleropodium purum</i>	IV	1.9	
<i>Carex panicea</i>	III	1.9	
<i>Luzula multiflora</i>	III	0.8	
<i>Danthonia decumbens</i>	III	2.4	••
<i>Thuidium tamariscinum</i>	III	1.7	••
<i>Festuca rubra</i>	III	5.0	
<i>Carex binervis</i>	II	2.1	•
<i>Trifolium repens</i>	II	1.7	
<i>Juncus squarrosus</i>	II	3.5	••
<i>Festuca ovina</i>	II	3.7	
<i>Rhytidiadelphus loreus</i>	II	2.3	•
<i>Agrostis canina/vinealis</i>	II	3.5	
<i>Cirsium palustre</i>	II	1.1	
<i>Carex flacca</i>	II	11.3	



Distribution

This sward type is commonest in the northwest and southwest of the survey area. Outside these areas it has been recorded in the Dublin Mountains and the Curragh, Kildare.



A lightly grazed *Nardus stricta* and *Juncus squarrosus* sward at Ballybrack, Dublin.



Heavily grazed low sward of *Nardus stricta*, *Festuca ovina* and *Hylocomium splendens* at the Curragh, Kildare.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group**2b. *Anthoxanthum odoratum* – *Potentilla erecta* vegetation type****Description**

Located on sloping ground with well-drained mineral soils. *Anthoxanthum odoratum* is recorded in the majority of plots and often with abundant cover; it is also the most important indicator species. Calcareous species such as *Lotus corniculatus* are listed amongst the characteristic species and this grassland type has an affinity with both dry-humid grassland (41%) and dry calcareous grassland (32%). There is also an equal affinity of 13% for the two Annex I grassland habitats 6210 Festuco-Brometalia and 6230 Species-rich *Nardus* grassland.

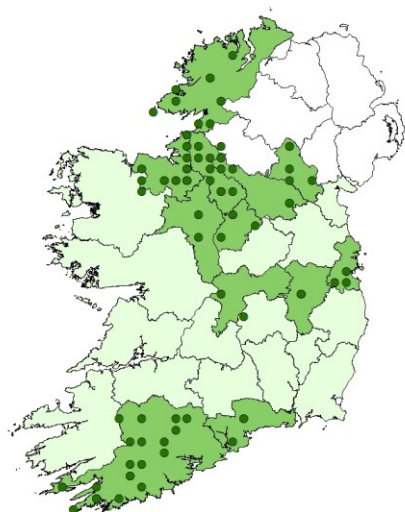
Example sites: Mount Gabriel, Cork (485); Ardinawark, Donegal (1247); Mullaghmore, Sligo (1500).

Affinities

- Fossitt:** GS3 Dry-humid acid grassland (41%);
GS1 Dry calcareous and neutral grassland (32%);
GS4 Wet grassland (13%)
- Annex I:** 6210 Festuco-Brometalia (13%)
6230 Species-rich *Nardus* grassland (13%)
- W & D:** Achilleo – Festucetum tenuifoliae association
Centaureo – Cynosuretum typical subassociation
- EUN:** E1.72 *Agrostis* – *Festuca* grassland
- NVC:** U4b *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland
Holcus lanatus – *Trifolium repens* sub-community (69%)
U4a *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland
typical sub-community (60%)
U4 *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland (60%)

Summary data

		Species	Freq	Abu	Ind
Number of relevés:	99	<i>Anthoxanthum odoratum</i>	V	39.4	••
Species richness:	22	<i>Rhytidiadelphus squarrosus</i>	V	8.9	
		<i>Holcus lanatus</i>	IV	8.6	
Forb height:	11 cm	<i>Trifolium repens</i>	IV	4.7	
Graminoid height:	20 cm	<i>Potentilla erecta</i>	IV	4.6	
Forb proportion:	29%	<i>Agrostis capillaris</i>	IV	10.1	
		<i>Festuca rubra</i>	IV	9.7	
Altitude:	90 m	<i>Hylocomium splendens</i>	III	7.7	
Slope:	12°	<i>Scleropodium purum</i>	III	2.0	
		<i>Cerastium fontanum</i>	III	0.3	•
Soil pH:	5.26	<i>Plantago lanceolata</i>	III	2.9	
Soil organic content:	22%	<i>Rumex acetosa</i>	III	1.1	
Soil P:	0.18 mg/g	<i>Luzula campestris</i>	III	1.4	
		<i>Cynosurus cristatus</i>	II	1.9	
Ellenberg Light:	7.2	<i>Hypochaeris radicata</i>	II	1.6	
Ellenberg Wetness:	6.1	<i>Galium saxatile</i>	II	3.1	
Ellenberg pH:	4.6	<i>Succisa pratensis</i>	II	2.9	
Ellenberg Fertility:	3.4	<i>Ranunculus repens</i>	II	1.4	
		<i>Luzula multiflora</i>	II	0.6	
		<i>Calliergonella cuspidata</i>	II	0.7	
		<i>Agrostis stolonifera</i>	II	1.5	
		<i>Lotus corniculatus</i>	II	1.1	



Distribution

Centred around Cork and Leitrim, this vegetation type is less common in the centre and east of the country but occurs scattered throughout the survey area.



Grassland with abundant *Anthoxanthum odoratum*, *Festuca rubra* and the bryophyte *Hylocomium splendens* at Ardinawark, Donegal.



A species-rich example of the *Anthoxanthum odoratum*-*Potentilla erecta* grassland type at Mullaghmore, Sligo.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group

2c. *Festuca ovina* – *Galium saxatile* vegetation type

Description

A species poor grassy sward on sloping ground on well-drained acidic mineral soils. *Festuca ovina* is the most characteristic species and together with *Agrostis capillaris* is a common component of this vegetation type. *Galium saxatile*, *Carex caryophyllaea* and *Lotus corniculatus* are also characteristic species. There is a high affinity with dry-humid acid grassland (86%) and 6230 Species-rich *Nardus* grassland (71%).

Example sites: Glenpatrick, Waterford (354); Curraheen, Waterford (360); Curragh, Kildare (1400).

Affinities

Fossitt: GS3 Dry-humid acid grassland (86%);

GS1 Dry calcareous and neutral grassland (12%)

Annex I: 6230 Species-rich *Nardus* grassland (71%)

W & D: Achilleo – Festucetum tenuifoliae association

EUN: E1.72 *Agrostis* – *Festuca* grassland

NVC: U4a *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland
typical sub-community (67%)

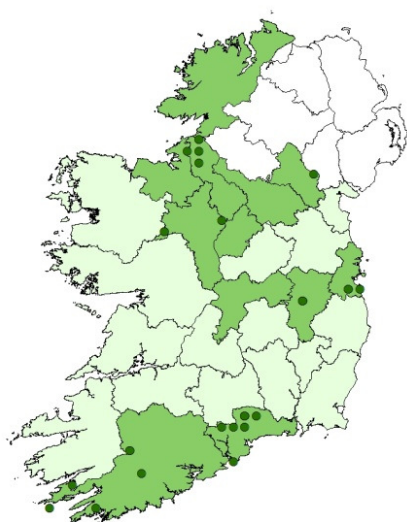
U4 *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland (65%)

U5 *Nardus stricta* – *Galium saxatile* grassland (64%)

Summary data

Number of relevés:	52
Species richness:	19
Forb height:	5 cm
Graminoid height:	13 cm
Forb proportion:	22%
Altitude:	120 m
Slope:	11 °
Soil pH:	4.89
Soil organic content:	15%
Soil P:	0.13 mg/g
Ellenberg Light:	7.0
Ellenberg Wetness:	5.8
Ellenberg pH:	4.1
Ellenberg Fertility:	2.7

Species	Freq	Abu	Ind
<i>Festuca ovina</i>	V	30.3	••••
<i>Agrostis capillaris</i>	V	23.8	
<i>Potentilla erecta</i>	V	5.4	
<i>Rhytidiadelphus squarrosus</i>	V	8.3	
<i>Galium saxatile</i>	V	7.1	••
<i>Anthoxanthum odoratum</i>	IV	14.1	
<i>Hylocomium splendens</i>	IV	5.1	
<i>Nardus stricta</i>	IV	3.7	
<i>Scleropodium purum</i>	III	0.6	
<i>Trifolium repens</i>	II	1.1	
<i>Carex binervis</i>	II	2.0	
<i>Luzula campestris</i>	II	1.6	
<i>Lotus corniculatus</i>	II	1.8	•
<i>Carex caryophyllaea</i>	II	2.6	••
<i>Holcus lanatus</i>	II	1.0	
<i>Danthonia decumbens</i>	II	0.7	
<i>Thuidium tamariscinum</i>	II	1.1	
<i>Achillea millefolium</i>	II	0.7	
<i>Calluna vulgaris</i>	II	0.6	
<i>Luzula multiflora</i>	II	0.5	
<i>Rhytidiadelphus loreus</i>	II	2.0	
<i>Carex pilulifera</i>	II	0.5	



Distribution

An uncommon type of grassland only recorded in the Curragh, Kildare and Dublin during 2010. It has not been recorded in Donegal, Sligo, Cavan, Longford or Offaly.



A species-poor plot, *Festuca ovina* the most abundant vascular plant and the bryophyte *Rhytidiadelphus squarrosus* abundant in the ground layer. The Curragh, Kildare.



A sheep-grazed, species-poor *Festuca ovina* sward in the Curragh, Kildare.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group**2d. *Agrostis capillaris* – *Plantago lanceolata* vegetation type****Description**

A vegetation type associated with gleys and well-drained mineral soils on moderately sloping sites. Within the group this represents a more mesotrophic community with more fertile, drier, pH-neutral soils. *Agrostis capillaris*, *Festuca rubra*, *Cynosurus cristatus* and *Plantago lanceolata* are the most characteristic species in the sward. The moss *Rhytidiadelphus squarrosus* is common and can often cover large areas within plots. There is almost an equal affinity to dry calcareous and neutral grassland (30%), dry-humid acid grassland (23%) and wet grassland (27%). There is no significant correlation with an Annex I habitat.

Example sites: Letterfine, Leitrim (850); Drumhome, Donegal (1249).

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (30%);
GS4 Wet grassland (27%);
GS3 Dry-humid acid grassland (23%);
GA1 Improved agricultural grassland (16%)

Annex I: Non significant correlation

W & D: Achilleo – Festucetum tenuifoliae association
Centaureo – Cynosuretum typical subassociation

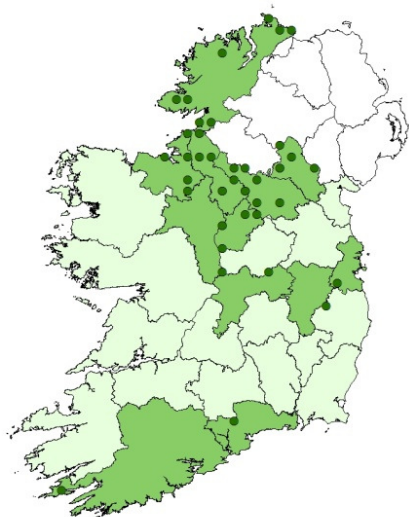
EUN: E2.11 Unbroken pastures

NVC: MG6b *Lolium perenne* – *Cynosurus cristatus* grassland
Anthoxanthum odoratum sub-community (65%)
U4b *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland
Holcus lanatus – *Trifolium repens* sub-community (64%)
MG5c *Cynosurus cristatus* – *Centaurea nigra* grassland
Danthonia decumbens sub-community (60%)

Summary data

Number of relevés:	44
Species richness:	23
Forb height:	10 cm
Graminoid height:	18 cm
Forb proportion:	30%
Altitude:	250 m
Slope:	9°
Soil pH:	4.67
Soil organic content:	20%
Soil P:	0.59 mg/g
Ellenberg Light:	7.5
Ellenberg Wetness:	6.2
Ellenberg pH:	4.7
Ellenberg Fertility:	3.5

Species	Freq	Abu	Ind
<i>Rhytidiadelphus squarrosus</i>	V	38.3	
<i>Anthoxanthum odoratum</i>	V	16.4	
<i>Agrostis capillaris</i>	V	24.8	••
<i>Trifolium repens</i>	V	7.5	•
<i>Holcus lanatus</i>	V	11.1	
<i>Festuca rubra</i>	V	21.0	••
<i>Calliergonella cuspidata</i>	IV	2.3	
<i>Scleropodium purum</i>	IV	2.6	
<i>Plantago lanceolata</i>	III	5.3	••
<i>Cynosurus cristatus</i>	III	4.7	••
<i>Ranunculus acris</i>	III	1.6	
<i>Luzula campestris</i>	III	1.5	•
<i>Rumex acetosa</i>	III	1.4	•
<i>Ranunculus repens</i>	III	1.3	
<i>Cirsium palustre</i>	III	1.2	
<i>Cerastium fontanum</i>	III	0.2	
<i>Prunella vulgaris</i>	III	0.5	
<i>Hypochaeris radicata</i>	III	2.6	
<i>Potentilla erecta</i>	III	3.9	
<i>Trifolium pratense</i>	II	1.6	•
<i>Juncus acutiflorus/articulatus</i>	II	2.5	
<i>Hylocomium splendens</i>	II	3.0	



Distribution

This sward type has a northern distribution, only recorded in one hectad in Cork and Waterford and four in Dublin, Kildare and Offaly.



Grassland plot with abundant *Festuca rubra* and frequent *Agrostis capillaris*, *Trifolium repens* and *Plantago lanceolata*. Drumhome, Donegal.



View across the *Agrostis capillaris*-*Festuca rubra* grassland type at Carricknamoghil, Donegal.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group**2e. *Anthoxanthum odoratum* – *Succisa pratensis* vegetation type****Description**

Generally located on gently sloping and flat gley soils, this herb-rich wet grassland type can also occur on peats. *Potentilla erecta*, *Anthoxanthum odoratum* and *Holcus lanatus* are the most commonly occurring species. *Potentilla erecta* and *Succisa pratensis* are the most characteristic species together with the bryophyte *Scleropodium purum*. There is a high affinity with wet grassland and with the Annex I habitat 6410 *Molinia* meadows (40%).

Example sites: Gubalaun, Leitrim (804); Roes, Donegal (1252); Clogher Beg, Sligo (1556).

Affinities

Fossitt: GS4 Wet grassland (87%);
GS1 Dry calcareous and neutral grassland (10%)
Annex I: 6410 *Molinia* meadows (40%)
W & D: *Junco acutiflori* – *Molinietum* association
Cirsio – *Molinietum* association
EUN: E3.51 *Molinia caerulea* meadows and related communities
NVC: M25b *Molinia caerulea* – *Potentilla erecta* mire
Anthoxanthum odoratum sub-community (57%)
U5c *Nardus stricta* – *Galium saxatile* grassland
Carex panicea – *Viola riviniana* sub-community (53%)
M26b *Molinia caerulea* – *Crepis paludosa* mire
Festuca rubra sub-community (53%)

Summary data

Number of relevés: 60
Species richness: 23

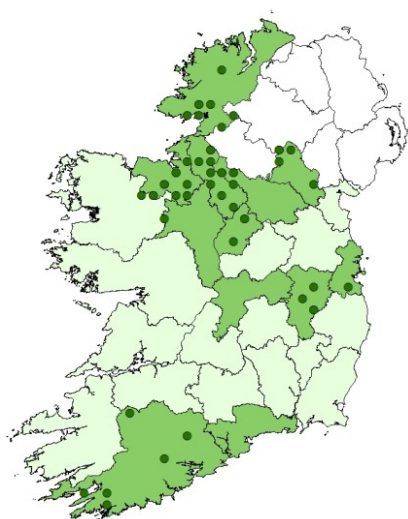
Forb height: 25 cm
Graminoid height: 38 cm
Forb proportion: 40%

Altitude: 95 m
Slope: 5°

Soil pH: 4.70
Soil organic content: 19.5%
Soil P: 0.06 mg/g

Ellenberg Light: 7.5
Ellenberg Wetness: 7.1
Ellenberg pH: 4.4
Ellenberg Fertility: 2.8

Species	Freq	Abu	Ind
<i>Potentilla erecta</i>	V	18.6	••
<i>Anthoxanthum odoratum</i>	V	13.4	
<i>Rhytidiadelphus squarrosus</i>	V	16.6	
<i>Holcus lanatus</i>	V	6.1	
<i>Scleropodium purum</i>	IV	4.2	••
<i>Juncus acutiflorus/articulatus</i>	IV	9.3	
<i>Hylocomium splendens</i>	IV	16.4	
<i>Succisa pratensis</i>	IV	13.0	••
<i>Carex panicea</i>	IV	4.1	•
<i>Luzula multiflora</i>	III	0.7	•
<i>Festuca rubra</i>	III	4.7	
<i>Agrostis stolonifera</i>	III	5.6	
<i>Carex nigra</i>	III	3.2	
<i>Ranunculus acris</i>	III	1.5	
<i>Trifolium repens</i>	III	1.3	
<i>Juncus effusus</i>	III	5.3	
<i>Carex echinata</i>	III	2.6	
<i>Agrostis canina/vinealis</i>	III	5.3	
<i>Molinia caerulea</i>	III	8.4	•
<i>Agrostis capillaris</i>	II	2.2	
<i>Calliergonella cuspidata</i>	II	1.0	
<i>Carex flacca</i>	II	1.0	



Distribution

Centred around Leitrim, Sligo and south Donegal, this vegetation type is uncommon throughout the rest of the survey area.



Herb-rich sward with *Potentilla erecta* and *Carex nigra* abundant; *Succisa pratensis* and *Cirsium dissectum* are common. Corsallagh, Sligo.



View across the *Anthoxanthum odoratum*-*Succisa pratensis* vegetation type. Curry, Sligo.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group2f. *Rhytidiadelphus squarrosus* – *Juncus* spp. vegetation type**Description**

This grassland type is located on the wettest, most acidic and least fertile soils in Group 2. Gley is the most common soil type. *Juncus effusus* and *Carex nigra* are characteristic species as is the bryophyte *Rhytidiadelphus squarrosus*, which is also a frequent species that often dominates the ground layer. There is a high affinity with wet grassland and no significant correlation with an Annex I habitat.

Example sites: Moneensauran, Cavan (1008); Cark, Donegal (1212).

Affinities

Fossitt: GS4 Wet grassland (80%)

Annex I: No significant correlation

W & D: *Juncus acutiflorus* – *Molinietum* association

EUN: E3.51 *Molinia caerulea* meadows and related communities

NVC: M25b *Molinia caerulea* – *Potentilla erecta* mire

Anthoxanthum odoratum sub-community (58%)

M23a *Juncus effusus/acuteiflorus* – *Galium palustre* rush-pasture

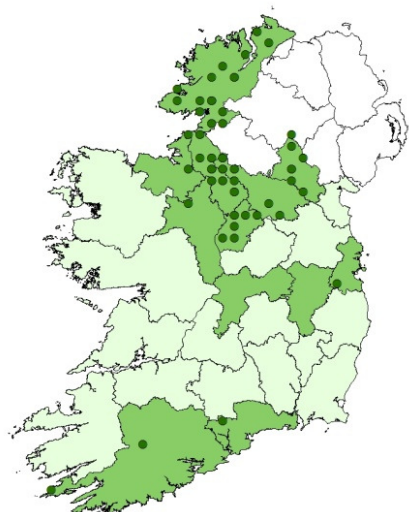
Juncus acutiflorus sub-community (56%)

M23 *Juncus effusus/acuteiflorus* – *Galium palustre* rush-pasture (53%)

Summary data

Number of relevés:	69
Species richness:	21
Forb height:	13 cm
Graminoid height:	33 cm
Forb proportion:	26%
Altitude:	80 m
Slope:	5°
Soil pH:	4.83
Soil organic content:	31%
Soil P:	0.12 mg/g
Ellenberg Light:	7.8
Ellenberg Wetness:	7.4
Ellenberg pH:	4.0
Ellenberg Fertility:	2.6

Species	Freq	Abu	Ind
<i>Rhytidiadelphus squarrosus</i>	V	67.7	••
<i>Anthoxanthum odoratum</i>	V	15.1	
<i>Holcus lanatus</i>	V	7.1	
<i>Juncus acutiflorus/articulatus</i>	IV	11.1	
<i>Trifolium repens</i>	IV	6.9	
<i>Agrostis canina/vinealis</i>	IV	15.1	
<i>Juncus effusus</i>	IV	13.4	••
<i>Potentilla erecta</i>	IV	4.1	
<i>Carex nigra</i>	III	3.4	•
<i>Scleropodium purum</i>	III	1.2	
<i>Agrostis stolonifera</i>	III	5.8	
<i>Calliergonella cuspidata</i>	III	1.5	
<i>Agrostis capillaris</i>	III	3.1	
<i>Ranunculus repens</i>	III	2.0	
<i>Luzula multiflora</i>	III	0.4	
<i>Ranunculus acris</i>	III	2.1	
<i>Hypochaeris radicata</i>	III	1.6	
<i>Hylocomium splendens</i>	III	1.1	
<i>Carex echinata</i>	III	2.3	
<i>Rumex acetosa</i>	II	0.6	
<i>Festuca rubra</i>	II	2.2	
<i>Cirsium palustre</i>	II	0.9	



Distribution

This vegetation type has a northern distribution with no records in Offaly and Kildare and only found in four hectads in the southern half of the country.



A sward of *Agrostis capillaris* and *Anthoxanthum odoratum* with *Rhynchospora squarrosa* dominating the ground layer at Drumanaught, Donegal.



An overview of the wet acid grassland with scattered *Juncus effusus* at Friary, Donegal.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group**2g. *Juncus acutiflorus/articulatus* - *Holcus lanatus* vegetation type****Description**

The tallest sward in this group that occurs on gently sloping or flat acidic gley soils. *Juncus acutiflorus* or *Juncus articulatus*, *Holcus lanatus* and *Anthoxanthum odoratum* are the most frequent species with the two *Juncus* species also the most indicative species for this type of vegetation. Most of the plots are wet grassland (87%) and the vegetation type has an affinity to the Annex I habitat 6410 *Molinia* meadows (24%).

Example sites: Rossnowlagh Lower, Donegal (1248); Glenasmole Valley, Dublin (1300); Mullaghmore, Sligo (1500).

Affinities

Fossitt: GS4 Wet grassland (94%)

Annex I: 6410 *Molinia* meadows (24%)

W & D: *Juncus acutiflorus* – *Molinietum* association

EUN: E3.42 *Juncus acutiflorus* meadows

NVC: M23a *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture
Juncus acutiflorus sub-community (70%)

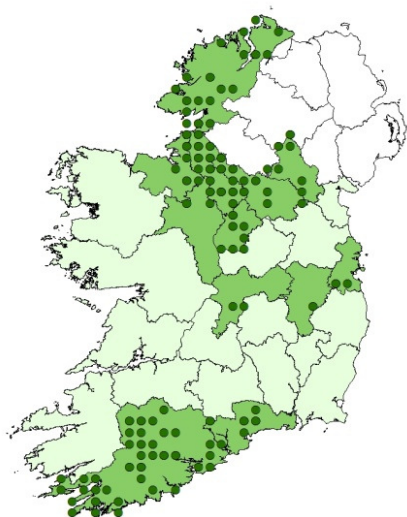
M23 *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture (65%)

M23b *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture
Juncus effusus sub-community (63%)

Summary data

Number of relevés:	238
Species richness:	23
Forb height:	27 cm
Graminoid height:	46 cm
Forb proportion:	28%
Altitude:	110 m
Slope:	4°
Soil pH:	4.75
Soil organic content:	16.5%
Soil P:	0.1 mg/g
Ellenberg Light:	7.4
Ellenberg Wetness:	6.9
Ellenberg pH:	4.7
Ellenberg Fertility:	3.4

Species	Freq	Abu	Ind
<i>Juncus acutiflorus/articulatus</i>	V	37.5	•••
<i>Holcus lanatus</i>	V	12.0	•
<i>Anthoxanthum odoratum</i>	V	14.6	
<i>Rhytidiadelphus squarrosus</i>	IV	6.2	
<i>Calliergonella cuspidata</i>	IV	3.3	•
<i>Ranunculus acris</i>	IV	2.5	•
<i>Agrostis stolonifera</i>	IV	5.6	•
<i>Festuca rubra</i>	III	5.2	
<i>Trifolium repens</i>	III	2.2	
<i>Ranunculus repens</i>	III	1.8	
<i>Potentilla erecta</i>	III	3.1	
<i>Juncus effusus</i>	III	3.9	
<i>Rumex acetosa</i>	III	1.3	
<i>Cirsium palustre</i>	III	0.8	
<i>Galium palustre</i>	II	0.4	
<i>Plantago lanceolata</i>	II	1.0	
<i>Carex nigra</i>	II	1.4	
<i>Ranunculus flammula</i>	II	0.6	•
<i>Succisa pratensis</i>	II	2.5	
<i>Agrostis capillaris</i>	II	2.9	
<i>Filipendula ulmaria</i>	II	3.3	•
<i>Lotus pedunculatus</i>	II	3.3	•



Distribution

The most common vegetation type in this group, it is found throughout much of the survey area. It is less common in the drier east of the country.



Juncus acutiflorus acidic humid grassland at Treanmacmurtagh, Sligo.



Juncus articulatus abundant and *Anthoxanthum odoratum* frequent in a humid acid grassland at Rosstown, Donegal.

2. *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus* grassland group**2h. *Agrostis canina/vinealis* – *Juncus* spp. vegetation type****Description**

An acidic wet grassland found on flat sites with gley soils. *Agrostis canina* and *Agrostis vinealis* are the most commonly occurring, most abundant and most characteristic species for this vegetation type. *Holcus lanatus*, *Anthoxanthum odoratum*, *Juncus acutiflorus* and *Juncus articulatus* also frequently occur in the sward at reasonable abundance levels, as does the bryophyte *Rhytidiadelphus squarrosus*. It should be noted that this is a grassy sward that has a lower forb proportion than others in this group. There is a high affinity with wet grassland and no affinity to an Annex I habitat.

Example sites: Sranagarvanagh, Leitrim (840); Friary, Donegal (1251).

Affinities

Fossitt: GS4 Wet grassland (83%)

Annex I: No significant correlation

W & D: *Juncus acutiflorus* – Molinietum association

EUN: E3.42 *Juncus acutiflorus* meadows

NVC: M23a *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture
Juncus acutiflorus sub-community (62%)

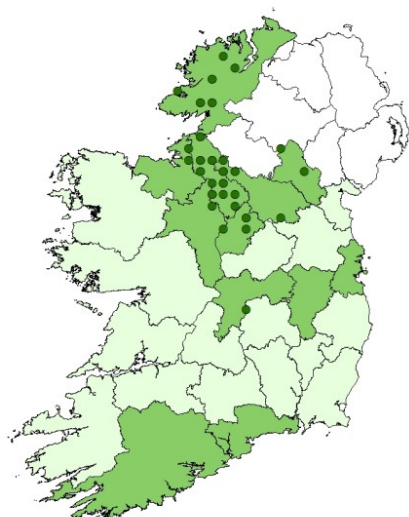
M23 *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture (59%)

M23b *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture
Juncus effusus sub-community (59%)

Summary data

Number of relevés:	48
Species richness:	21
Forb height:	15 cm
Graminoid height:	35 cm
Forb proportion:	19%
Altitude:	100 m
Slope:	3°
Soil pH:	4.53
Soil organic content:	32%
Soil P:	0.1 mg/g
Ellenberg Light:	7.4
Ellenberg Wetness:	6.9
Ellenberg pH:	4.2
Ellenberg Fertility:	3.3

Species	Freq	Abu	Ind
<i>Agrostis canina/vinealis</i>	V	36.6	•••
<i>Holcus lanatus</i>	V	10.2	
<i>Rhytidiadelphus squarrosus</i>	V	17.7	
<i>Anthoxanthum odoratum</i>	V	12.1	
<i>Juncus acutiflorus/articulatus</i>	V	12.9	
<i>Trifolium repens</i>	IV	7.5	
<i>Calliergonella cuspidata</i>	IV	3.1	
<i>Juncus effusus</i>	IV	10.3	
<i>Agrostis stolonifera</i>	III	3.0	
<i>Ranunculus flammula</i>	III	0.4	
<i>Carex echinata</i>	III	2.7	•
<i>Potentilla erecta</i>	III	1.8	
<i>Rumex acetosa</i>	III	0.5	
<i>Agrostis capillaris</i>	III	1.6	
<i>Ranunculus acris</i>	II	1.4	
<i>Cirsium palustre</i>	II	0.6	
<i>Cardamine pratensis</i>	II	0.3	
<i>Galium palustre</i>	II	0.4	•
<i>Carex nigra</i>	II	1.6	
<i>Carex leporina</i>	II	0.7	
<i>Ranunculus repens</i>	II	1.3	
<i>Scleropodium purum</i>	II	0.8	



Distribution

This vegetation type is almost exclusively confined to the northwest and Leitrim in particular.



A plot dominated by *Agrostis canina*, *Juncus acutiflorus* and *Trifolium repens* at Roes, Donegal.



A view across a grassland with *Agrostis canina*, *Anthoxanthum odoratum*, *Hypochaeris radicata* and *Juncus acutiflorus* at Friary, Donegal.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3a. *Juncus effusus* – *Holcus lanatus* vegetation type****Description**

This species-poor grassland type has the highest sward height and the lowest broadleaf herb component in the group. It is extremely frequent throughout the country and has the highest number of relevés of all the grassland types. It is typically found on flat, mildly acidic, gley soils. *Juncus effusus* is one of the most frequent and abundant species and is the most important indicator species. *Rumex acetosa*, *Holcus lanatus* and *Epilobium obscurum* are characteristic and differentiate this grassland type from the others in this group. The moss *Kindbergia praelonga* is also characteristic. It has a high affinity with wet grassland (95%) and has no significant correlation to any Annex I grassland habitats.

Example sites: Drumhome, Donegal (1249); Curragh, Kildare (1400); Cloonmacduff, Sligo (1541).

Affinities

Fossitt: GS4 Wet grassland (95%)

Annex I: No significant correlation

W & D: *Junco acutiflori* – Molinietum association

EUN: E3.42 *Juncus acutiflorus* meadows

NVC: M23b *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture
Juncus effusus sub-community (64%)

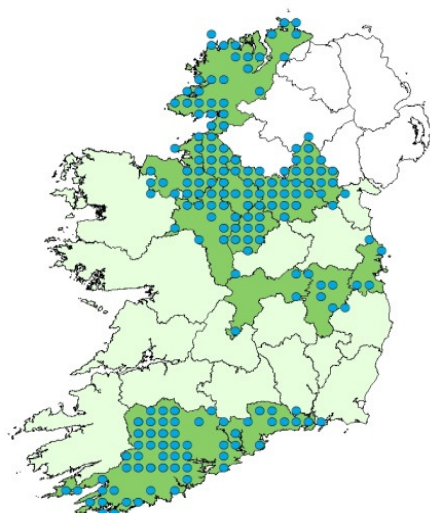
M23 *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture (62%)

MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture
typical sub-community (61%)

Summary data

Number of relevés:	353
Species richness:	17
Forb height:	31 cm
Graminoid height:	64 cm
Forb proportion:	20%
Altitude:	80 m
Slope:	2°
Soil pH:	5.19
Soil organic content:	20.5%
Soil P:	0.16 mg/g
Ellenberg Light:	7.1
Ellenberg Wetness:	6.6
Ellenberg pH:	5.1
Ellenberg Fertility:	4.5

Species	Freq	Abu	Ind
<i>Juncus effusus</i>	V	43.0	•••
<i>Agrostis stolonifera</i>	V	14.4	
<i>Holcus lanatus</i>	V	14.1	•
<i>Anthoxanthum odoratum</i>	IV	5.9	
<i>Rumex acetosa</i>	III	2.0	•
<i>Ranunculus repens</i>	III	3.6	
<i>Juncus acutiflorus/articulatus</i>	III	3.2	
<i>Calliergonella cuspidata</i>	III	2.4	
<i>Trifolium repens</i>	III	1.7	
<i>Ranunculus acris</i>	III	1.4	
<i>Cardamine pratensis</i>	III	0.5	
<i>Rhytiadelphus squarrosus</i>	II	2.2	
<i>Filipendula ulmaria</i>	II	3.4	
<i>Galium palustre</i>	II	0.6	
<i>Kindbergia praelonga</i>	II	0.8	•
<i>Festuca rubra</i>	II	3.5	
<i>Brachythecium rutabulum</i>	II	0.6	
<i>Cirsium palustre</i>	II	0.7	
<i>Epilobium obscurum</i>	II	0.2	•
<i>Cerastium fontanum</i>	II	0.2	
<i>Agrostis stolonifera</i>	II	3.0	
<i>Ranunculus flammula</i>	II	0.6	



Distribution

This sward type is frequent throughout the northern and southern counties and is more scarce in the midlands, namely Dublin, Kildare, Offaly and south Roscommon.



Species-poor wet grassland dominated by *Juncus effusus*. *Lotus pedunculatus*, *Anthoxanthum odoratum* and *Hypochaeris radicata* are also present at Coolboy Big, Donegal.



Juncus effusus-dominated wet grassland with a high sward height and low species richness in Clooneymore, Donegal.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3b. *Carex disticha* – *Filipendula ulmaria* vegetation type****Description**

This tall sward occurs on flat, relatively neutral, gley soils. *Carex disticha* and *Agrostis stolonifera* are the most frequent species, with *Carex disticha* also the most indicative species for this grassland type. Other characteristic species include *Galium palustre*, *Lathyrus pratensis* and *Mentha aquatica*. The majority of the plots are wet grassland (70%), however there is also some affinity with freshwater marsh (17%) and dry meadows and grassy verges (13%).

Example sites: Corglass, Leitrim (892); Ashtown Royal Canal, Dublin (1321); Ballyconnell South, Sligo (1573).

Affinities

Fossitt: GS4 Wet grassland (70%);
GM1 Freshwater marsh (17%);
GS2 Dry meadows and grassy verges (13%)

Annex I: No significant correlation

W & D: Filipendulo – Iridetum pseudacori association

EUN: E3.42 *Juncus acutiflorus* meadows (relates to M23 rather than SD17)

NVC: SD17 *Potentilla anserina* – *Carex nigra* dune-slack community (59%)

M23a *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture

Juncus acutiflorus sub-community (59%)

M23 *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture (56%)

Summary data

Number of relevés: 23
Species richness: 18

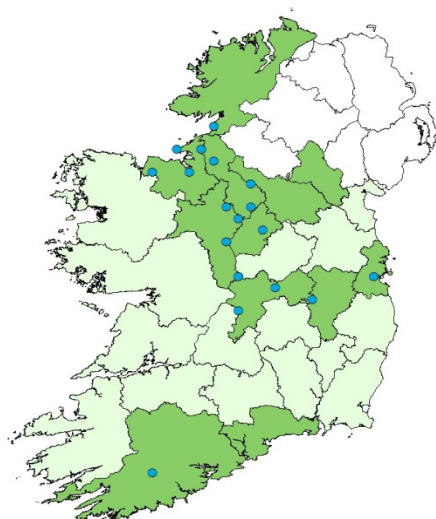
Forb height: 45 cm
Graminoid height: 57 cm
Forb proportion: 34%

Altitude: 50 m
Slope: 0°

Soil pH: 5.98
Soil organic content: 24%
Soil P: 0.17 mg/g

Ellenberg Light: 7.1
Ellenberg Wetness: 7.2
Ellenberg pH: 5.9
Ellenberg Fertility: 4.4

Species	Freq	Abu	Ind
<i>Carex disticha</i>	V	42.6	••••
<i>Agrostis stolonifera</i>	V	8.1	
<i>Filipendula ulmaria</i>	IV	11.8	
<i>Holcus lanatus</i>	IV	6.7	
<i>Galium palustre</i>	IV	2.5	•
<i>Juncus acutiflorus/articulatus</i>	III	10.4	
<i>Anthoxanthum odoratum</i>	III	5.4	
<i>Calliergonella cuspidata</i>	III	0.9	
<i>Lathyrus pratensis</i>	III	3.4	••
<i>Ranunculus repens</i>	III	2.8	
<i>Mentha aquatica</i>	III	4.3	•
<i>Festuca rubra</i>	II	1.1	
<i>Cardamine pratensis</i>	II	0.2	
<i>Juncus effusus</i>	II	1.1	
<i>Trifolium repens</i>	II	1.8	
<i>Ranunculus acris</i>	II	1.8	
<i>Poa trivialis</i>	II	1.6	
<i>Phleum pratense</i>	II	2.1	
<i>Equisetum palustre</i>	II	0.6	
<i>Carex flacca</i>	II	1.0	
<i>Rumex acetosa</i>	II	1.6	
<i>Ranunculus flammula</i>	II	0.5	



Distribution

This sward type is relatively scarce. It was not recorded in Monaghan, Cavan or Waterford. Donegal, Longford, Kildare, Dublin and Cork have only one hectad each where it was recorded, and other counties had only a few scattered occurrences.



Herb-rich sward containing an abundance of *Carex disticha*, *Filipendula ulmaria*, *Potentilla erecta* and *Anthoxanthum odoratum* at Carns, Sligo.



Wet grassland containing *Carex disticha*, *Filipendula ulmaria*, *Equisetum* species and *Lathyrus pratensis* at Ashtown Royal Canal, Dublin.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3c. *Calliergonella cuspidata* – *Juncus* spp. vegetation type****Description**

This species-rich sward is typical of flat areas where the main underlying soils are gleys and basin peats. The sward height is one of the lowest within the group and the vegetation is quite open. The moss *Calliergonella cuspidata* is the most abundant and frequent species and is the main indicator species for this grassland group. Other frequently occurring indicator species include *Juncus acutiflorus* or *J. articulatus*, *Cardamine pratensis* and *Carex nigra*. There is a high affinity to wet grassland (81%) and lower affinities to freshwater marsh and the Annex I habitat 6410 *Molinia* meadows (both 13%).

Example sites: Tory Island, Donegal (1165); Rossnowlagh Lower, Donegal (1248); Derrybeg, Sligo (1509).

Affinities

Fossitt: GS4 Wet grassland (81%);

GM1 Freshwater marsh (13%)

Annex I: 6410 *Molinia* meadows (13%)

W & D: *Juncus acutiflorus* – Molinietum association

EUN: E3.42 *Juncus acutiflorus* meadows

NVC: M23a *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture

Juncus acutiflorus sub-community (67%)

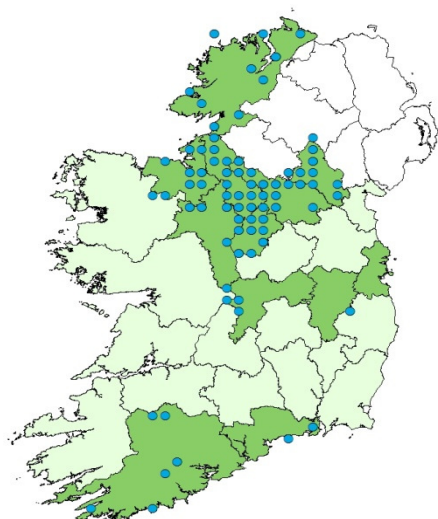
M23 *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture (62%)

SD17 *Potentilla anserina* – *Carex nigra* dune-slack community (62%)

Summary data

Number of relevés:	140
Species richness:	26
Forb height:	16 cm
Graminoid height:	31 cm
Forb proportion:	33%
Altitude:	40 m
Slope:	2°
Soil pH:	6.22
Soil organic content:	24%
Soil P:	0.13 mg/g
Ellenberg Light:	7.4
Ellenberg Wetness:	6.4
Ellenberg pH:	5.7
Ellenberg Fertility:	4.6

Species	Freq	Abu	Ind
<i>Calliergonella cuspidata</i>	V	38.0	••••
<i>Juncus acutiflorus/articulatus</i>	IV	13.6	••
<i>Agrostis stolonifera</i>	IV	10.7	
<i>Trifolium repens</i>	IV	3.8	
<i>Holcus lanatus</i>	IV	6.2	
<i>Cardamine pratensis</i>	IV	0.9	•
<i>Ranunculus repens</i>	IV	3.6	
<i>Carex nigra</i>	IV	12.2	••
<i>Galium palustre</i>	IV	0.9	
<i>Filipendula ulmaria</i>	III	3.8	
<i>Anthoxanthum odoratum</i>	III	4.3	
<i>Ranunculus acris</i>	III	1.5	
<i>Festuca rubra</i>	III	5.8	
<i>Ranunculus flammula</i>	III	1.1	•
<i>Juncus effusus</i>	III	5.2	
<i>Rhynchospora squarrosa</i>	III	2.8	
<i>Carex panicea</i>	III	4.3	
<i>Carex flacca</i>	III	2.7	
<i>Mentha aquatica</i>	II	1.3	
<i>Senecio aquaticus</i>	II	0.7	
<i>Cirsium palustre</i>	II	0.6	
<i>Lychnis flos-cuculi</i>	II	0.6	•



Distribution

This sward type was recorded frequently in Monaghan, Cavan, Leitrim, Longford and Sligo but was absent from Dublin and was present in only a few scattered sites in the remaining counties.



Herb-rich *Molinia* meadow containing *Lychnis flos-cuculi*, *Cardamine pratensis*, *Filipendula ulmaria* and *Myosotis laxa* at Inch Level, Donegal.



Low, open sward dominated by the moss *Calliergonella cuspidata*. *Juncus effusus* and *J. acutiflorus* are frequent. Meentadun, Donegal.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3d. *Molinia caerulea* – *Calliergonella cuspidata* vegetation type****Description**

This species-rich wet grassland is found on flat to very gentle slopes overlying gleys and basin peats. It is the least fertile grassland type within this group and, being mildly acidic, has the lowest pH. Broadleaf herb component is moderately high. Frequent, characteristic species include *Potentilla erecta*, *Carex panicea*, *Succisa pratensis*, *Carex flacca* and *Molinia caerulea*. The mosses *Rhytidiadelphus squarrosus* and *Scleropodium purum* are also indicative. It has a high affinity to wet grassland (80%) and to the Annex I habitat 6410 *Molinia* meadows (64%).

Example sites: Rossnowlagh Lower, Donegal (1248); Carrownabinna, Sligo (1510); Carrowmacbyran, Sligo (1576).

Affinities

Fossitt: GS4 Wet grassland (80%);

Annex I: 6410 *Molinia* meadows (64%)

W & D: *Cirsio* – *Molinietum* association

EUN: E3.51 *Molinia caerulea* meadows and related communities

NVC: M24c *Molinia caerulea* – *Cirsium dissectum* fen-meadow
Juncus acutiflorus – *Erica tetralix* sub-community (57%)

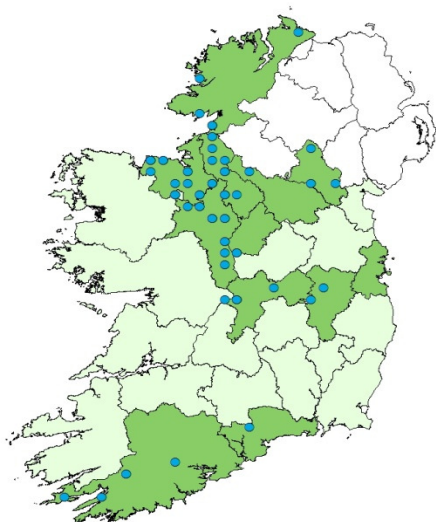
M24 *Molinia caerulea* – *Cirsium dissectum* fen-meadow (55%)

M26b *Molinia caerulea* – *Crepis paludosa* mire
Festuca rubra sub-community (55%)

Summary data

Number of relevés:	83
Species richness:	27
Forb height:	24 cm
Graminoid height:	32 cm
Forb proportion:	38%
Altitude:	62.5 m
Slope:	3°
Soil pH:	5.51
Soil organic content:	16%
Soil P:	0.36 mg/g
Ellenberg Light:	7.4
Ellenberg Wetness:	6.7
Ellenberg pH:	5.0
Ellenberg Fertility:	3.3

Species	Freq	Abu	Ind
<i>Calliergonella cuspidata</i>	IV	4.2	
<i>Potentilla erecta</i>	IV	2.8	••
<i>Anthoxanthum odoratum</i>	IV	5.3	
<i>Carex panicea</i>	IV	6.9	••
<i>Juncus acutiflorus/articulatus</i>	IV	5.7	
<i>Succisa pratensis</i>	IV	4.8	••
<i>Holcus lanatus</i>	IV	3.9	
<i>Carex flacca</i>	IV	9.2	••
<i>Trifolium repens</i>	IV	1.5	
<i>Molinia caerulea</i>	IV	10.9	••
<i>Festuca rubra</i>	III	7.5	•
<i>Plantago lanceolata</i>	III	1.6	•
<i>Ranunculus acris</i>	III	1.0	
<i>Rhytidiadelphus squarrosus</i>	III	2.7	•
<i>Scleropodium purum</i>	III	2.6	••
<i>Agrostis stolonifera</i>	III	3.7	
<i>Filipendula ulmaria</i>	III	4.5	
<i>Prunella vulgaris</i>	III	0.9	•
<i>Mentha aquatica</i>	III	2.0	
<i>Cirsium dissectum</i>	III	10.0	••
<i>Cynosurus cristatus</i>	II	1.6	
<i>Carex nigra</i>	II	3.5	



Distribution

This sward type has a somewhat northwesterly distribution, with the majority of sites in Leitrim, Sligo and Roscommon. It is scattered infrequently throughout the other counties, apart from Dublin where it was not recorded.



Herb-rich *Molinia* meadow with an abundance of *Cirsium dissectum*, *Filipendula ulmaria*, *Mentha aquatica* and *Carex nigra*. Curry, Sligo.



Wet grassland on flat ground, with *Succisa pratensis*, *Cirsium dissectum* and *Carex flacca* frequent. Carrowmacbryan, Sligo.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3e. *Filipendula ulmaria* – *Ranunculus repens* vegetation type****Description**

With the highest proportion of broadleaved herbs in the group, this tall sward tends to occur on flat ground overlying gley soils and, to a lesser extent, basin peats. It is one of the wetter grassland types and has an affinity for both freshwater marsh (42%) and wet grassland (34%). Species richness is poor and characteristic species are few, with only *Filipendula ulmaria* and *Phleum pratense* indicative. There is no significant correlation with any Annex I grassland habitats.

Example sites: Inch Level, Donegal (1147); Portinch, Sligo (1512); Ardkeeran, Sligo (1525).

Affinities

Fossitt: GM1 Freshwater marsh (42%);

GS4 Wet grassland (34%)

Annex I: No significant correlation

W & D: Filipendulo – Iridetum pseudacori association

EUN: E3.45 Recently abandoned hay meadows

E5.42 Tall-herb communities of humid meadows

NVC: M27c *Filipendula ulmaria* – *Angelica sylvestris* mire (61%)

Juncus effusus – *Holcus lanatus* sub-community

MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture

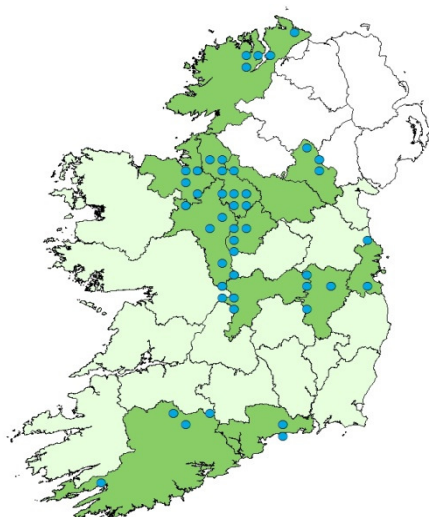
typical sub-community (61%)

M27 *Filipendula ulmaria* – *Angelica sylvestris* mire (59%)

Summary data

Number of relevés:	65
Species richness:	16
Forb height:	59 cm
Graminoid height:	57 cm
Forb proportion:	54%
Altitude:	60 m
Slope:	1°
Soil pH:	5.75
Soil organic content:	33.4%
Soil P:	0.13 mg/g
Ellenberg Light:	7.1
Ellenberg Wetness:	7.1
Ellenberg pH:	5.8
Ellenberg Fertility:	4.8

Species	Freq	Abu	Ind
<i>Filipendula ulmaria</i>	V	41.0	...
<i>Agrostis stolonifera</i>	IV	6.8	
<i>Holcus lanatus</i>	III	6.4	
<i>Galium palustre</i>	III	1.3	
<i>Ranunculus repens</i>	III	5.2	
<i>Festuca rubra</i>	II	3.5	
<i>Rumex acetosa</i>	II	1.6	
<i>Lathyrus pratensis</i>	II	1.3	
<i>Juncus acutiflorus/articulatus</i>	II	5.2	
<i>Juncus effusus</i>	II	2.3	
<i>Cardamine pratensis</i>	II	0.3	
<i>Carex nigra</i>	II	5.9	
<i>Anthoxanthum odoratum</i>	II	1.8	
<i>Calliergonella cuspidata</i>	II	1.5	
<i>Trifolium repens</i>	II	0.7	
<i>Ranunculus acris</i>	II	1.8	
<i>Equisetum fluviatile</i>	II	1.3	
<i>Phleum pratense</i>	II	5.4	•
<i>Mentha aquatica</i>	II	1.4	
<i>Carex disticha</i>	II	2.7	
<i>Vicia cracca</i>	II	0.9	
<i>Poa trivialis</i>	II	1.3	



Distribution

The distribution of this type roughly follows the path of the River Shannon for counties Leitrim, Cavan, Roscommon, Longford and Offaly. It has a northerly distribution for Donegal, Monaghan and most of Cork and is scattered infrequently throughout the other counties.



Filipendula ulmaria-dominated tall sward, with *Equisetum fluviatile*, *Anthoxanthum odoratum* and *Arrhenatherum elatius* also present at Ardkeeran, Sligo.



Freshwater marsh dominated by *Filipendula ulmaria*, with abundant *Lythrum salicaria* at Blacktrench, Kildare.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3f. *Agrostis stolonifera* – *Potentilla anserina* vegetation type****Description**

This species-poor grassy sward has a moderately high broadleaf herb component, where *Holcus lanatus*, *Agrostis stolonifera* and *Anthoxanthum odoratum* have a high constancy and *Potentilla anserina* and *Deschampsia cespitosa* are characteristic. It is found on flat gleying to well-drained mineral soils that are relatively neutral. There is a high affinity to wet grassland (89%) and also a weak affinity to the Annex I grassland habitat 6410 *Molinia* meadows (13%).

Example sites: Ashtown Royal Canal, Dublin (1321); Newbridge Demesne, Dublin (1324); Dunshane Common, Kildare (1417).

Affinities

Fossitt: GS4 Wet grassland (89%);

Annex I: 6410 *Molinia* meadows (13%)

W & D: Senecioni – Juncetum acutiflori association

EUN: E3.41 Atlantic and sub-Atlantic humid meadows

NVC: MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland
Poa trivialis sub-community (63%)

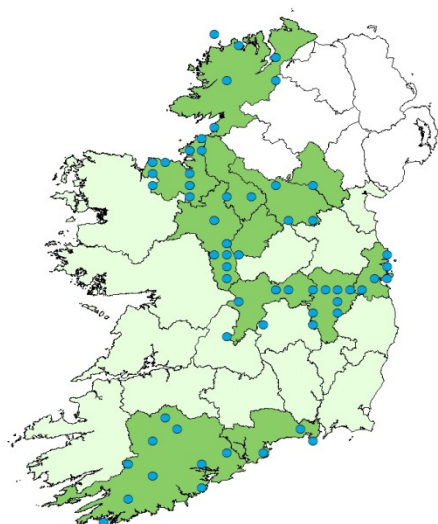
MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland (62%)

MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture
typical sub-community (60%)

Summary data

Number of relevés:	71
Species richness:	19
Forb height:	32 cm
Graminoid height:	47 cm
Forb proportion:	38%
Altitude:	70 m
Slope:	1°
Soil pH:	5.22
Soil organic content:	16%
Soil P:	0.14 mg/g
Ellenberg Light:	7.2
Ellenberg Wetness:	6.5
Ellenberg pH:	5.7
Ellenberg Fertility:	4.7

Species	Freq	Abu	Ind
<i>Holcus lanatus</i>	IV	8.1	
<i>Agrostis stolonifera</i>	IV	8.7	
<i>Anthoxanthum odoratum</i>	IV	8.6	
<i>Juncus effusus</i>	III	7.6	
<i>Festuca rubra</i>	III	4.7	
<i>Potentilla anserina</i>	III	17.0	••
<i>Rumex acetosa</i>	III	1.3	
<i>Ranunculus repens</i>	III	2.2	
<i>Trifolium repens</i>	III	1.7	
<i>Filipendula ulmaria</i>	III	3.5	
<i>Juncus acutiflorus/articulatus</i>	III	2.8	
<i>Calliergonella cuspidata</i>	II	1.8	
<i>Cerastium fontanum</i>	II	0.2	
<i>Ranunculus acris</i>	II	1.2	
<i>Plantago lanceolata</i>	II	2.5	
<i>Carex nigra</i>	II	2.7	
<i>Galium palustre</i>	II	0.6	
<i>Trifolium pratense</i>	II	0.8	
<i>Cirsium palustre</i>	II	0.6	
<i>Mentha aquatica</i>	II	1.6	
<i>Deschampsia cespitosa</i>	II	7.8	•
<i>Cynosurus cristatus</i>	II	1.6	



Distribution

This sward type is scattered throughout all the counties surveyed, with a higher frequency in Dublin, Kildare, south Roscommon and Sligo. It was only recorded in one hectad for both Longford and Monaghan.



Potentilla anserina-dominated sward, with frequent *Agrostis stolonifera* and *Anthoxanthum odoratum*. Breaghy Head, Donegal.



Species-poor low grassy sward dominated by *Potentilla anserina*. Tory Island, Donegal.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3g. *Agrostis stolonifera* – *Holcus lanatus* vegetation type****Description**

This grassland type represents a more mesotrophic community with more fertile, drier and pH neutral soils. The underlying soils range from gleys to well-drained mineral soils, and again, the topography is flat. *Agrostis stolonifera* is the only characteristic species and shows a high degree of constancy. *Holcus lanatus*, *Ranunculus repens* and *Juncus effusus* are abundant, while the presence of *Lolium perenne* is indicative of the more improved nature of this grassland type. Species richness is low and the broadleaved herb component is the second lowest within the group. There is a higher affinity to wet grassland (65%) than to improved agricultural grassland (13%), and no significant correlation to any Annex I grassland habitat.

Example sites: Carrickabraghy, Donegal (1105); Bog of Ring, Dublin (1318); Knocknarea, Sligo (1501).

Affinities

Fossitt: GS4 Wet grassland (65%);
GA1 Improved agricultural grassland (13%)
Annex I: No significant correlation
W & D: Senecioni – Juncetum acutiflori association
EUN: E3.44 Flood swards and related communities
NVC: MG10a *Holcus lanatus* – *Juncus effusus* grassland sub-community
typical sub-community (70%)
MG10 *Holcus lanatus* – *Juncus effusus* grassland sub-community (64%)
MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland
Poa trivialis sub-community (63%)

Summary data

Number of relevés: 222
Species richness: 16

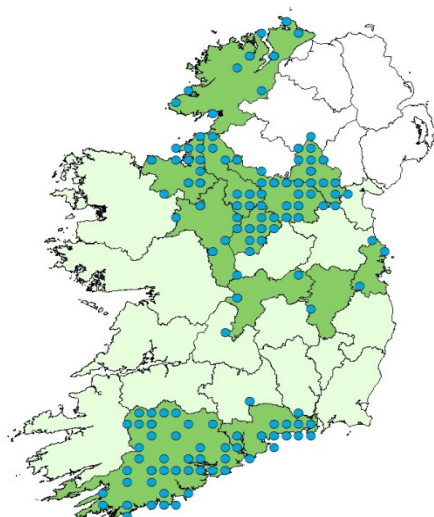
Forb height: 26 cm
Graminoid height: 33 cm
Forb proportion: 29%

Altitude: 60 m
Slope: 2°

Soil pH: 5.64
Soil organic content: 20.7%
Soil P: 0.07 mg/g

Ellenberg Light: 7.0
Ellenberg Wetness: 6.2
Ellenberg pH: 6.0
Ellenberg Fertility: 5.2

Species	Freq	Abu	Ind
<i>Agrostis stolonifera</i>	V	42.8	••
<i>Holcus lanatus</i>	IV	14.0	
<i>Ranunculus repens</i>	IV	8.6	
<i>Trifolium repens</i>	III	1.9	
<i>Juncus effusus</i>	III	7.0	
<i>Anthoxanthum odoratum</i>	III	5.5	
<i>Rumex acetosa</i>	III	1.3	
<i>Cerastium fontanum</i>	II	0.4	
<i>Juncus acutiflorus/articulatus</i>	II	3.3	
<i>Calliergonella cuspidata</i>	II	1.4	
<i>Ranunculus acris</i>	II	0.9	
<i>Cardamine pratensis</i>	II	0.5	
<i>Festuca rubra</i>	II	2.3	
<i>Lolium perenne</i>	II	1.7	
<i>Poa trivialis</i>	II	1.5	
<i>Galium palustre</i>	II	0.7	
<i>Brachythecium rutabulum</i>	II	0.7	
<i>Filipendula ulmaria</i>	II	2.6	
<i>Lotus pedunculatus</i>	II	4.2	
<i>Plantago lanceolata</i>	II	0.9	
<i>Rhynchospora squarrosus</i>	II	1.9	
<i>Senecio aquaticus</i>	V	0.8	



Distribution

This sward type was regularly recorded throughout the survey area, with the exceptions of Dublin, Kildare and Offaly from where it was only occasionally recorded.



Agrostis stolonifera-dominated sward also containing *Senecio aquaticus*, *Juncus effusus*, *Lotus pedunculatus* and *Anthoxanthum odoratum* at Clooneymore, Donegal.



Wet grassy sward containing an abundance of *Agrostis stolonifera*, *Senecio aquaticus*, *Mentha aquatica* and *Potentilla anserina* at Inch Level, Donegal.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3h. *Alopecurus pratensis* – *Ranunculus repens* vegetation type****Description**

This mesotrophic community is the driest, most fertile grassland type within this group, where species richness is poor and sward height is quite low. Soil pH is relatively neutral. A number of the indicator species such as *Ranunculus repens*, *Trifolium repens*, *Lolium perenne* and *Cerastium fontanum* indicate the sward has received some improvement. The major underlying soil is a gley (69%), however this grassland type is also found on well-drained mineral soils (20%). Topography is flat. The main affinities for this sward include wet grassland (44%) and improved agricultural grassland (40%).

Example sites: Cloghboy, Donegal (1232); Bog of Ring, Dublin (1318); Newbridge Demesne, Dublin (1324).

Affinities

Fossitt: GS4 Wet grassland (44%);
GA1 Improved agricultural grassland (40%)
Annex I: No significant correlation
W & D: Senecioni – Juncetum acutiflori association
EUN: E3.44 Flood swards and related communities
NVC: MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture
typical sub-community (67%)
MG7c *Lolium perenne* – *Alopecurus pratensis* – *Festuca pratensis* grassland (65%)
MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland
Poa trivialis sub-community (65%)

Summary data

Number of relevés: 45
Species richness: 16

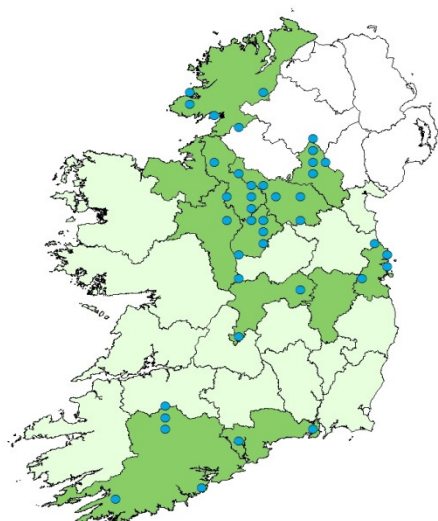
Forb height: 18 cm
Graminoid height: 31 cm
Forb proportion: 35%

Altitude: 60 m
Slope: 2°

Soil pH: 5.70
Soil organic content: 21%
Soil P: 0.14 mg/g

Ellenberg Light: 6.8
Ellenberg Wetness: 5.9
Ellenberg pH: 5.7
Ellenberg Fertility: 5.7

Species	Freq	Abu	Ind
<i>Holcus lanatus</i>	V	11.5	
<i>Ranunculus repens</i>	V	28.4	•••
<i>Alopecurus pratensis</i>	IV	23.0	•••
<i>Trifolium repens</i>	IV	6.0	••
<i>Agrostis stolonifera</i>	IV	6.0	
<i>Ranunculus acris</i>	III	2.3	
<i>Rumex acetosa</i>	III	1.3	
<i>Anthoxanthum odoratum</i>	III	7.9	
<i>Lolium perenne</i>	III	5.1	••
<i>Cerastium fontanum</i>	III	0.8	••
<i>Brachythecium rutabulum</i>	III	2.0	••
<i>Cardamine pratensis</i>	II	0.9	
<i>Agrostis capillaris</i>	II	6.4	••
<i>Festuca rubra</i>	II	3.1	
<i>Poa trivialis</i>	II	2.0	
<i>Juncus effusus</i>	II	1.8	
<i>Juncus acutiflorus/articulatus</i>	II	2.7	
<i>Kindbergia praelonga</i>	II	0.3	
<i>Rhytidadelphus squarrosus</i>	II	0.9	
<i>Calliergonella cuspidata</i>	II	0.8	
<i>Taraxacum</i> spp.	II	0.3	
<i>Cynosurus cristatus</i>	II	0.8	



Distribution

This sward type is rather infrequent and is scattered throughout most counties, with the exceptions of Kildare and Sligo, from which it is absent.



Low mesotrophic sward containing an abundance of *Ranunculus repens* and frequent *Trifolium repens*, *Anthoxanthum odoratum* and *Cardamine pratensis* at Crowlar, Donegal.



Species-poor, mesotrophic grassland containing *Alopecurus pratensis*, *Cerastium fontanum*, *Agrostis stolonifera* and *Festuca rubra* at Waterstone Park, Dublin.

3. *Agrostis stolonifera* – *Juncus effusus* grassland group**3i. *Agrostis stolonifera* – *Equisetum fluviatile* vegetation type****Description**

This is another species-poor grassy sward with a high broadleaf herb component. It is found on flat, relatively neutral and fertile gleys and basin peats. It is the wettest grassland type within the group, and one of the wettest overall. The grasses *Agrostis stolonifera* and *Holcus lanatus* are frequent, while *Poa trivialis* and *Glyceria fluitans* are characteristic. *Equisetum fluviatile* and *Iris pseudacorus* are also indicative of this type. There are affinities to wet grassland (47%), freshwater marsh (32%) and tall herb swamp (10%).

Example sites: Inch Level, Donegal (1147); Carrownabinna, Sligo (1510); Ardkeeran, Sligo (1525).

Affinities

Fossitt: GS4 Wet grassland (47%);
GM1 Freshwater marsh (32%)
FS2 Tall herb swamp (10%)

Annex I: No significant correlation

W & D: Filipendulo – Iridetum pseudacori association

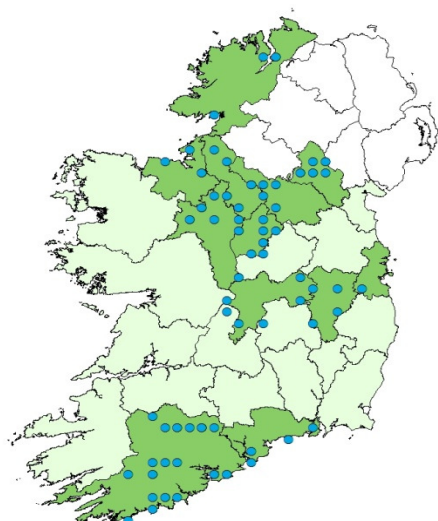
EUN: E3.44 Flood swards and related communities

NVC: MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture
typical sub-community (60%)
M23b *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture
Juncus effusus sub-community (59%)
M23 *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture (58%)

Summary data

Number of relevés:	86
Species richness:	16
Forb height:	40 cm
Graminoid height:	45 cm
Forb proportion:	40%
Altitude:	60 m
Slope:	0°
Soil pH:	5.87
Soil organic content:	27%
Soil P:	0.57 mg/g
Ellenberg Light:	7.1
Ellenberg Wetness:	7.4
Ellenberg pH:	5.9
Ellenberg Fertility:	5.2

Species	Freq	Abu	Ind
<i>Agrostis stolonifera</i>	V	13.8	
<i>Holcus lanatus</i>	IV	9.1	
<i>Ranunculus repens</i>	III	4.6	
<i>Galium palustre</i>	III	1.9	
<i>Equisetum fluviatile</i>	III	7.9	••
<i>Poa trivialis</i>	III	8.5	••
<i>Juncus effusus</i>	III	3.8	
<i>Calliergonella cuspidata</i>	III	4.1	
<i>Cardamine pratensis</i>	III	0.6	
<i>Filipendula ulmaria</i>	II	4.5	
<i>Trifolium repens</i>	II	1.3	
<i>Juncus acutiflorus/articulatus</i>	II	2.7	
<i>Mentha aquatica</i>	II	1.6	
<i>Ranunculus flammula</i>	II	0.7	
<i>Iris pseudacorus</i>	II	6.7	••
<i>Glyceria fluitans</i>	II	8.3	••
<i>Ranunculus acris</i>	II	0.8	
<i>Anthoxanthum odoratum</i>	II	1.4	
<i>Rumex acetosa</i>	II	0.4	
<i>Carex nigra</i>	II	2.1	
<i>Senecio aquaticus</i>	I	0.4	
<i>Potentilla anserina</i>	I	0.7	



Distribution

This sward type is scattered through all the counties surveyed with varying degrees of frequency. Dublin, Donegal, Sligo and Kildare have few occurrences, while Cork, Longford, Leitrim and Cavan have reasonably high occurrences.



Freshwater marsh dominated by the broadleaf herbs *Filipendula ulmaria* and *Iris pseudacorus* at Dunlavin Marshes, Kildare.



Equisetum fluviatile-dominated sward in Ardkeeran, Sligo.

4. *Molinia caerulea* – *Cirsium dissectum* grassland group4a. *Molinia caerulea* – *Potentilla erecta* vegetation type**Description**

This vegetation type tends to comprise tall, rank, species-poor swards primarily found on level ground overlying either gleyed soil or basin peats. The cover of herbs is generally low to moderate. The main sward components are *Molinia caerulea*, *Juncus acutiflorus/articulatus*, *Potentilla erecta* and a mixture of grasses such as *Anthoxanthum odoratum*, *Holcus lanatus* and *Festuca rubra*. Out of all the vegetation types this is not only the wettest but also the most acidic and the least fertile. It can be differentiated from the other vegetation type in the group by the higher cover of *Holcus lanatus* and the mosses *Rhytidiadelphus squarrosus* and *Calliergonella cuspidata*, and also by the absence or low cover of *Cirsium dissectum*. The group has a total affinity to wet grassland (100%). There is also a high affinity to the Annex I habitat 6410 *Molinia* meadows (71%).

Example sites: Dunshane Common, Kildare (1417).

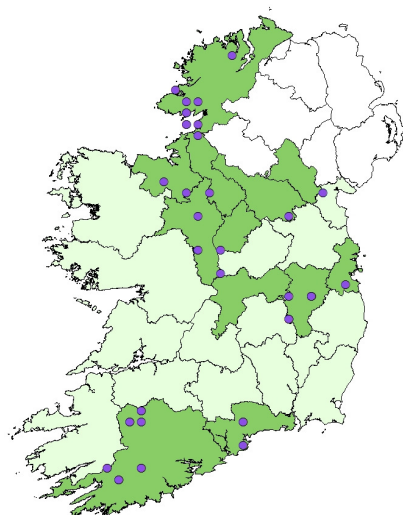
Affinities

Fossitt: GS4 Wet grassland (100%)
Annex I: 6410 *Molinia* meadows (71%)
W & D: *Cirsio* – *Molinietum* association
EUN: E3.51 *Molinia caerulea* meadows and related communities
NVC: M25b *Molinia caerulea* – *Potentilla erecta* mire
 Anthoxanthum odoratum sub-community (61%)
 M25 *Molinia caerulea* – *Potentilla erecta* mire (56%)
 M24c *Molinia caerulea* – *Cirsium dissectum* mire
 Juncus acutiflorus – *Erica tetralix* sub-community (54%)

Summary data

Number of relevés: 91
 Species richness: 18
 Forb height: 35 cm
 Graminoid height: 55 cm
 Forb proportion: 27%
 Altitude: 125 m
 Slope: 2°
 Soil pH: 5.41
 Soil organic content: 42%
 Soil P: 0.18 mg/g
 Ellenberg Light: 7.2
 Ellenberg Wetness: 7.4
 Ellenberg pH: 3.9
 Ellenberg Fertility: 2.5

Species	Freq	Abu	Ind
<i>Molinia caerulea</i>	V	36.1	
<i>Potentilla erecta</i>	V	4.9	
<i>Anthoxanthum odoratum</i>	IV	5.3	
<i>Juncus acutiflorus/articulatus</i>	IV	7.9	
<i>Holcus lanatus</i>	IV	5.5	•••
<i>Rhytidiadelphus squarrosus</i>	IV	2.4	•••
<i>Festuca rubra</i>	III	6.9	
<i>Calliergonella cuspidata</i>	III	4.0	•••
<i>Succisa pratensis</i>	III	5.1	
<i>Carex panicea</i>	III	3.5	
<i>Agrostis stolonifera</i>	III	5.1	
<i>Cirsium palustre</i>	III	0.7	••
<i>Carex flacca</i>	III	2.6	
<i>Plantago lanceolata</i>	II	1.3	••
<i>Trifolium repens</i>	II	1.2	
<i>Agrostis capillaris</i>	II	3.1	
<i>Hylocomium splendens</i>	II	3.9	
<i>Scleropodium purum</i>	II	1.1	
<i>Ranunculus acris</i>	II	0.6	
<i>Prunella vulgaris</i>	II	0.6	••
<i>Luzula multiflora</i>	II	0.3	
<i>Ranunculus repens</i>	II	0.3	



Distribution

This sward type has a sparsely scattered distribution with a small concentration in southern Donegal. It is largely absent from the north Midlands.



Molinia caerulea and *Anthoxanthum odoratum* with some *Potentilla erecta* and *Cirsium dissectum* in a sward at Dunshane Common, Kildare.



View over *Molinia caerulea* and *Festuca rubra*-dominated grassland at Dunshane Common, Kildare.

4. *Molinia caerulea* – *Cirsium dissectum* grassland group**4b. *Molinia caerulea* – *Cirsium dissectum* vegetation type****Description**

This vegetation type primarily consists of *Molinia*-dominated swards on gently sloping ground overlying either gleyed soil or basin peats. Swards within this type are moderately species rich and, besides *Molinia caerulea*, species typically found include *Cirsium dissectum*, *Potentilla erecta*, *Succisa pratensis*, *Juncus acutiflorus/articulatus* and grasses such as *Anthoxanthum odoratum* and *Festuca rubra*. It is differentiated from the other type in the group by the clear domination by *Molinia caerulea* and the greater frequency and cover of *Cirsium dissectum* and the moss *Scleropodium purum*. This group is typified by high wetness, low pH and low fertility, albeit somewhat less than pronounced than the other type in this group. The cover of herbs is typically low to moderate. There is a high affinity to wet grassland (86%) and a moderate affinity to the Annex I habitat 6410 *Molinia* meadows (49%).

Example sites: Ardachrin, Donegal (1142); St. John's Point, Donegal (1250).

Affinities

Fossitt: GS4 Wet grassland (86%)

Annex I: 6410 *Molinia* meadows (49%)

W & D: Cirsio – Molinietum association

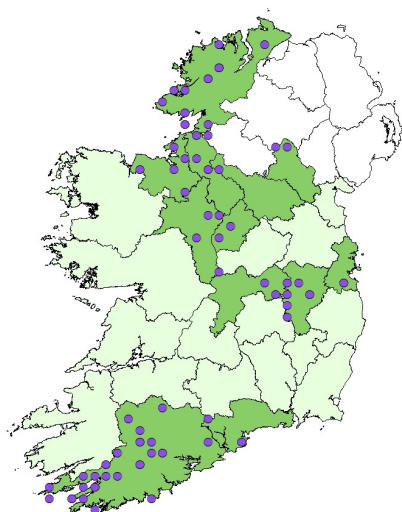
EUN: E3.51 *Molinia caerulea* meadows and related communities

NVC: M25b *Molinia caerulea* – *Potentilla erecta* mire
 Anthoxanthum odoratum sub-community (61%)
 M25 *Molinia caerulea* – *Potentilla erecta* mire (59%)
 M24c *Molinia caerulea* – *Cirsium dissectum* mire
 Juncus acutiflorus – *Erica tetralix* sub-community (58%)

Summary data

Number of relevés:	51
Species richness:	23
Forb height:	24 cm
Graminoid height:	40 cm
Forb proportion:	25%
Altitude:	90 m
Slope:	6°
Soil pH:	5.27
Soil organic content:	27%
Soil P:	0.18 mg/g
Ellenberg Light:	7.3
Ellenberg Wetness:	7.0
Ellenberg pH:	4.5
Ellenberg Fertility:	3.0

Species	Freq	Abu	Ind
<i>Molinia caerulea</i>	V	62.7	••••
<i>Potentilla erecta</i>	V	6.0	
<i>Juncus acutiflorus/articulatus</i>	V	4.3	
<i>Anthoxanthum odoratum</i>	IV	4.3	
<i>Succisa pratensis</i>	IV	3.5	
<i>Carex flacca</i>	IV	2.3	
<i>Festuca rubra</i>	IV	5.5	
<i>Cirsium dissectum</i>	IV	12.5	•••
<i>Carex panicea</i>	III	2.3	
<i>Holcus lanatus</i>	III	2.2	
<i>Scleropodium purum</i>	III	2.7	••
<i>Ranunculus acris</i>	III	0.4	
<i>Agrostis stolonifera</i>	III	2.5	
<i>Rhytidiadelphus squarrosus</i>	III	0.7	
<i>Calliergonella cuspidata</i>	II	0.9	
<i>Luzula multiflora</i>	II	0.1	
<i>Filipendula ulmaria</i>	II	2.5	
<i>Hylocomium splendens</i>	II	1.7	
<i>Carex pulicaris</i>	II	1.5	
<i>Centaurea nigra</i>	II	1.1	
<i>Trifolium repens</i>	II	0.3	
<i>Cirsium palustre</i>	II	0.1	



Distribution

This vegetation type has a scattered distribution with apparent concentrations in the northwest and in west Cork. It is rare in Cavan, Monaghan and Waterford.



Molinia caerulea, *Succisa pratensis* and *Cirsium dissectum* in a sward at St John's Point, Donegal.



Upland grassland at Ardachrin, Donegal, with *Molinia caerulea*, *Succisa pratensis*, *Juncus articulatus* and *Carex panicea*.

5. *Lolium perenne* – *Trifolium repens* grassland group**5a. *Lolium perenne* – *Trifolium repens* vegetation type****Description**

This vegetation type includes rather species-poor, semi-improved swards on well-drained mineral soils and gleys typically dominated by *Lolium perenne* and *Trifolium repens*, with the grasses *Holcus lanatus* and *Agrostis stolonifera* generally also being obvious in the sward. Herb cover is moderate and the main herbaceous elements comprise ruderal species such as *Ranunculus repens*, *Cerastium fontanum*, *Rumex acetosa* and *Taraxacum* agg. Sward height is generally low due to fairly intensive management practices. The prominence of *Lolium perenne* and *Trifolium repens* suggests that these fields have been reseeded and fairly heavily fertilised; indeed, it has the highest score for fertility and pH within this group.

Example sites: Shanganagh Park, Dublin (1316).

Affinities

Fossitt: GA1 Improved agricultural grassland (63%);

GS4 Wet grassland (16%);

GS1 Dry calcareous and neutral grassland (15%)

Annex I: No significant correlation

W & D: Lolio – Cynosuretum association

EUN: E2.11 Unbroken pastures

NVC: MG6b *Lolium perenne* – *Cynosurus cristatus* grassland

Anthoxanthum odoratum sub-community (75%)

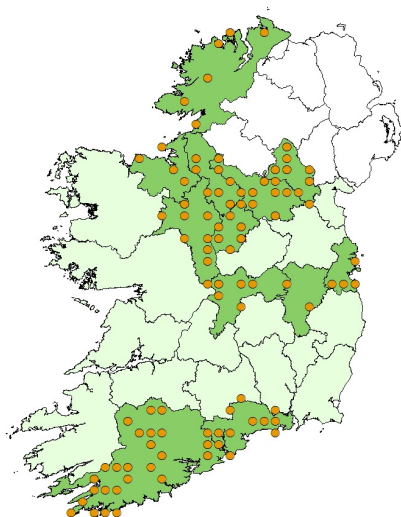
MG6a *Lolium perenne* – *Cynosurus cristatus* grassland

typical sub-community (74%)

MG6 *Lolium perenne* – *Cynosurus cristatus* grassland (72%)

Summary data

Number of relevés:	143	Species	Freq	Abu	Ind
Species richness:	19	<i>Trifolium repens</i>	V	21.9	•••
Forb height:	10 cm	<i>Holcus lanatus</i>	V	12.6	
Graminoid height:	16 cm	<i>Lolium perenne</i>	V	23.4	••••
Forb proportion:	35%	<i>Cerastium fontanum</i>	IV	0.8	••
Altitude:	70 m	<i>Ranunculus repens</i>	IV	4.7	••
Slope:	6°	<i>Agrostis stolonifera</i>	IV	12.8	••
Soil pH:	5.40	<i>Anthoxanthum odoratum</i>	III	6.5	
Soil organic content:	15%	<i>Rumex acetosa</i>	III	1.5	
Soil P:	0.19 mg/g	<i>Cynosurus cristatus</i>	III	6.0	
Ellenberg Light:	7.2	<i>Plantago lanceolata</i>	III	2.5	
Ellenberg Wetness:	5.5	<i>Festuca rubra</i>	II	4.5	
Ellenberg pH:	5.8	<i>Brachythecium rutabulum</i>	II	1.7	•
Ellenberg Fertility:	5.2	<i>Taraxacum</i> spp.	II	0.9	••
		<i>Ranunculus acris</i>	II	1.4	
		<i>Agrostis capillaris</i>	II	6.0	
		<i>Calliergonella cuspidata</i>	II	1.5	
		<i>Rhytidadelphus squarrosus</i>	II	1.5	
		<i>Cirsium palustre</i>	II	0.6	
		<i>Poa trivialis</i>	II	2.0	•
		<i>Juncus effusus</i>	II	2.0	
		<i>Kindbergia praelonga</i>	II	0.2	
		<i>Dactylis glomerata</i>	II	1.3	



Distribution

This sward type is frequent and widespread, although there are few examples recorded within Donegal and Kildare.



Holcus lanatus, *Trifolium repens* and *Lolium perenne* in a sward at Shanganagh Park, Dublin.



Agrostis stolonifera, *Holcus lanatus* and *Lolium perenne* with *Trifolium repens* and *Plantago lanceolata* in lowland grassland at Shanganagh Park, Dublin.

5. *Lolium perenne* – *Trifolium repens* grassland group**5b. *Cynosurus cristatus* – *Trifolium repens* vegetation type****Description**

This vegetation type has the highest species richness within this group and is the only type within the group to be associated with an Annex I grassland habitat. Swards are typically short and occur predominantly on gently sloping, well-drained mineral soils with some occurrence on gleyed soils also. The main grasses are *Cynosurus cristatus*, *Agrostis capillaris* and *Holcus lanatus*, with *Cynosurus cristatus* being the main indicator for the group. Herb cover is the highest within the group. The herbs that typify this type include *Plantago lanceolata*, *Prunella vulgaris*, *Trifolium pratense*, *Hypochaeris radicata* and *Lotus corniculatus*. *Trifolium repens* and *Cerastium fontanum* also frequently occur.

Example sites: Glenasmole Valley, Dublin (1300)

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (62%);

GA1 Improved agricultural grassland (18%)

Annex I: 6210 Festuco-Brometalia (18%)

W & D: Centaureo – *Cynosuretum* typical sub-association

EUN: E2.11 Unbroken pastures

NVC: MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland (68%)

MG5a *Cynosurus cristatus* – *Centaurea nigra* grassland (68%)

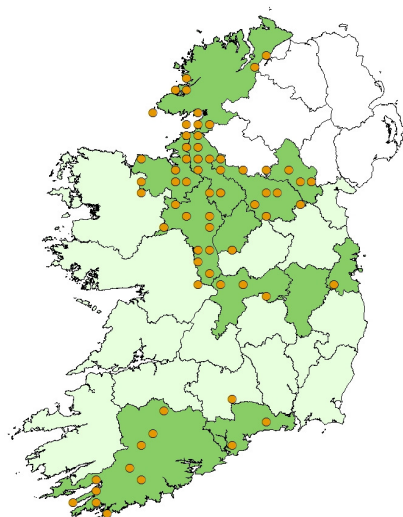
Lathyrus pratensis sub-community (68%)

MG5b *Cynosurus cristatus* – *Centaurea nigra* grassland (68%)

Galium verum sub-community (68%)

Summary data

		Species	Freq	Abu	Ind
Number of relevés:	100	<i>Cynosurus cristatus</i>	V	28.1	••••
		<i>Trifolium repens</i>	V	10.0	
Species richness:	30	<i>Holcus lanatus</i>	V	6.9	
		<i>Agrostis capillaris</i>	V	11.5	
Forb height:	9 cm	<i>Plantago lanceolata</i>	V	9.4	••
Graminoid height:	14 cm	<i>Prunella vulgaris</i>	V	2.5	••
Forb proportion:	39%	<i>Cerastium fontanum</i>	V	0.6	
		<i>Festuca rubra</i>	IV	11.2	
Altitude:	105 m	<i>Rhytidiadelphus squarrosus</i>	IV	3.9	
Slope:	6°	<i>Anthoxanthum odoratum</i>	IV	6.9	
		<i>Trifolium pratense</i>	IV	3.7	••
Soil pH:	5.50	<i>Hypochaeris radicata</i>	IV	3.0	••
Soil organic content:	15%	<i>Lolium perenne</i>	IV	3.5	
Soil P:	0.13 mg/g	<i>Lotus corniculatus</i>	III	2.5	••
		<i>Bellis perennis</i>	III	1.5	••
Ellenberg Light:	7.2	<i>Calliergonella cuspidata</i>	III	0.9	
Ellenberg Wetness:	5.3	<i>Scleropodium purum</i>	III	1.5	••
Ellenberg pH:	5.6	<i>Ranunculus repens</i>	III	1.1	
Ellenberg Fertility:	4.1	<i>Rumex acetosa</i>	III	0.6	
		<i>Achillea millefolium</i>	III	1.1	•
		<i>Centaurea nigra</i>	III	2.2	
		<i>Cirsium palustre</i>	III	1.1	•



Distribution

Although this sward type has a widespread distribution, it is most frequent in the northwest region, especially in north Leitrim.



Festuca rubra, *Cynosurus cristatus* and *Agrostis capillaris* with *Hypochaeris radicata* and *Plantago lanceolata* in a sward at Glenasmole Valley, Dublin.



Agrostis capillaris and *Cynosurus cristatus* sward at Glenasmole Valley, Dublin.

5. *Lolium perenne* – *Trifolium repens* grassland group**5c. *Festuca rubra* – *Trifolium repens* vegetation type****Description**

This vegetation type mainly comprises neutral grasslands with moderate species richness. *Holcus lanatus*, *Festuca rubra* and *Agrostis capillaris* are the main grasses. Herb cover is moderate and includes *Trifolium repens*, *Plantago lanceolata*, *Rumex acetosa* and *Cerastium fontanum*, indicating that this type is somewhat influenced by agricultural improvement. Such grasslands occur on gently sloping ground and predominantly overlie well-drained mineral soils and occasionally gleyed soils. This vegetation type is typified by a high cover of *Festuca rubra*, with other indicators for this type including *Dactylis glomerata* and *Centaurea nigra*.

Example sites: Ballyconnell, Sligo (1503); Clogher Beg, Sligo (1556)

Affinities

Fossitt: GS1 Dry calcareous and neutral grassland (47%);

GA1 Improved agricultural grassland (33%)

Annex I: No significant correlation

W & D: Centaureo – Cynosuretum typical sub-association

Lolio – Cynosuretum association

EUN: E2.11 Unbroken pastures

NVC: MG6b *Lolium perenne* – *Cynosurus cristatus* grassland

Anthoxanthum odoratum sub-community (73%)

U4b *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland

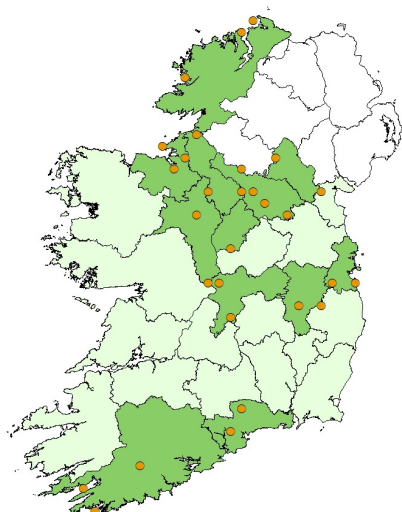
Holcus lanatus – *Trifolium repens* sub-community (70%)

MG6 *Lolium perenne* – *Cynosurus cristatus* grassland (68%)

Summary data

Number of relevés:	30
Species richness:	22
Forb height:	16 cm
Graminoid height:	29 cm
Forb proportion:	29%
Altitude:	55 m
Slope:	9°
Soil pH:	5.37
Soil organic content:	12%
Soil P:	0.12 mg/g
Ellenberg Light:	7.2
Ellenberg Wetness:	5.4
Ellenberg pH:	5.7
Ellenberg Fertility:	4.7

Species	Freq	Abu	Ind
<i>Holcus lanatus</i>	V	31.7	
<i>Festuca rubra</i>	V	32.9	•••
<i>Trifolium repens</i>	IV	8.9	
<i>Agrostis capillaris</i>	IV	10.9	
<i>Plantago lanceolata</i>	IV	4.8	
<i>Cerastium fontanum</i>	IV	0.5	
<i>Rumex acetosa</i>	IV	1.9	
<i>Anthoxanthum odoratum</i>	III	4.1	
<i>Cynosurus cristatus</i>	III	7.1	
<i>Trifolium pratense</i>	III	3.6	
<i>Rhynchospora squarrosus</i>	III	2.4	
<i>Dactylis glomerata</i>	III	4.1	••
<i>Lolium perenne</i>	III	1.9	
<i>Ranunculus acris</i>	III	1.2	
<i>Calligonella cuspidata</i>	II	1.4	
<i>Centaurea nigra</i>	II	2.6	•
<i>Luzula campestris</i>	II	0.3	
<i>Prunella vulgaris</i>	II	1.2	
<i>Lotus corniculatus</i>	II	0.8	
<i>Ranunculus repens</i>	II	0.9	
<i>Agrostis stolonifera</i>	II	2.0	
<i>Potentilla erecta</i>	II	0.6	



Distribution

This grassland type is infrequent throughout the surveyed area but shows a widespread distribution.



Festuca rubra-dominated sward with *Leontodon saxatilis* and *Centaurea nigra* at Ballyconnell, Sligo.



Agrostis capillaris, *Festuca rubra* and *Cynosurus cristatus* sward with *Trifolium* spp. and *Plantago lanceolata* at Clogher Beg, Sligo.

5. *Lolium perenne* – *Trifolium repens* grassland group**5d. *Holcus lanatus* – *Agrostis stolonifera* vegetation type****Description**

This is the wettest and least species-rich vegetation type within this group. It typically occurs on level ground overlying gleyed soils, and occasionally on well-drained mineral soils. The sward is generally tall and is usually dominated by *Holcus lanatus*. Other indicators for the group include some large *Juncus* spp. and *Potentilla anserina*, which all tend to have a low cover. Other grass species that frequently occur include *Agrostis stolonifera* and *Anthoxanthum odoratum*. This vegetation type has the lowest herb cover of this group, generally comprising a small cover of ruderal herbs such as *Ranunculus repens*, *Trifolium repens* and *Rumex acetosa*.

Example sites: Tullyhorky, Donegal (1267); Garvanagh, Donegal (1272).

Affinities

Fossitt: GS4 Wet grassland (56%);
GA1 Improved semi-natural grassland (18%);
GS2 Dry meadows and grassy verges (15%)

Annex I: No significant correlation

W & D: Centaureo – Cynosuretum juncetosum subassociation

EUN: E3.44 Flood swards and related communities

NVC: MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture
typical sub-community (69%)
MG10a *Holcus lanatus* – *Juncus effusus* rush-pasture (63%)
MG9a *Holcus lanatus* – *Deschampsia cespitosa* grassland
Poa trivialis sub-community (59%)

Summary data

Number of relevés: 88
Species richness: 14

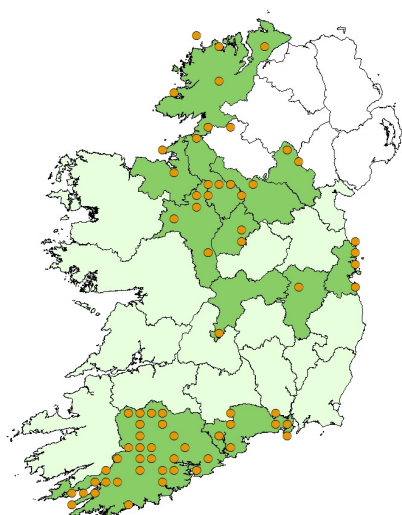
Forb height: 27 cm
Graminoid height: 39 cm
Forb proportion: 19%

Altitude: 75 m
Slope: 3°

Soil pH: 5.50
Soil organic content: 13%
Soil P: 0.63 mg/g

Ellenberg Light: 7.0
Ellenberg Wetness: 6.0
Ellenberg pH: 5.7
Ellenberg Fertility: 4.9

Species	Freq	Abu	Ind
<i>Holcus lanatus</i>	V	57.0	•••
<i>Agrostis stolonifera</i>	IV	11.0	
<i>Ranunculus repens</i>	IV	4.5	
<i>Anthoxanthum odoratum</i>	III	5.6	
<i>Juncus effusus</i>	III	6.2	••
<i>Trifolium repens</i>	III	2.4	
<i>Rumex acetosa</i>	III	1.8	
<i>Cerastium fontanum</i>	II	0.5	
<i>Lolium perenne</i>	II	2.1	
<i>Juncus acutiflorus/articulatus</i>	II	2.4	•
<i>Festuca rubra</i>	II	2.2	
<i>Ranunculus acris</i>	II	1.0	
<i>Rhytidadelphus squarrosus</i>	II	1.0	
<i>Calliergonella cuspidata</i>	II	1.3	
<i>Agrostis capillaris</i>	II	2.9	
<i>Plantago lanceolata</i>	II	0.6	
<i>Cirsium palustre</i>	II	0.2	
<i>Cynosurus cristatus</i>	I	1.2	
<i>Poa trivialis</i>	I	0.6	
<i>Brachythecium rutabulum</i>	I	0.2	
<i>Cardamine pratensis</i>	I	0.1	
<i>Potentilla anserina</i>	I	1.5	•



Distribution

This sward type is scattered and widespread but is seen to be frequent across Cork and in parts of Roscommon and Leitrim.



Holcus lanatus and *Juncus acutiflorus* sward with intermixed *Ranunculus acris*, *Angelica sylvestris* and *Potentilla anserina* at Tullyhorky, Donegal.



Holcus lanatus-dominated grassland with *Potentilla anserina* at Muntermellan, Donegal.

5. *Lolium perenne* – *Trifolium repens* grassland group**5e. *Agrostis capillaris* – *Trifolium repens* vegetation type****Description**

This is a rather poorly-defined sward type with moderate species richness found on base-poor soils, generally occurring on well-drained minerals but also occasionally found on gleyed soils. The main indicators are *Agrostis capillaris*, which generally dominates, and *Anthoxanthum odoratum*. Other grasses such as *Holcus lanatus* and *Festuca rubra* should also be evident. The sward presents a moderate herb cover with such species as *Trifolium repens*, *Plantago lanceolata* and *Ranunculus repens*. *Potentilla erecta* may also occur and is indicative of the type, as is the moss *Rhytidiadelphus squarrosus*.

Example sites: Hell Fire Club, Dublin (1328); Cupidstownhill, Kildare (1420).

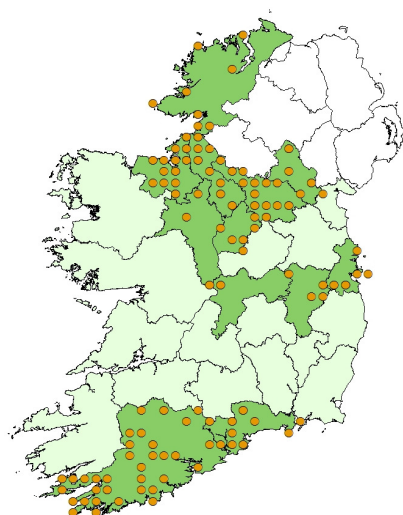
Affinities

- Fossitt:** GS3 Dry-humid acid grassland (27%);
 GS1 Dry calcareous and neutral grassland (25%);
 GS2 Dry meadows and grassy verges (18%);
 GS4 Wet grassland (15%);
 GA1 Improved agricultural grassland (15%)
- Annex I:** No significant correlation
- W & D:** Achilleo – Festucetum tenuifoliae association
- EUN:** E2.11 Unbroken pastures
- NVC:** MG6b *Lolium perenne* – *Cynosurus cristatus* grassland
Anthoxanthum odoratum sub-community (72%)
 U4b *Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland
Holcus lanatus – *Trifolium repens* sub-community (71%)
 MG6 *Lolium perenne* – *Cynosurus cristatus* grassland (63%)

Summary data

Number of relevés:	30
Species richness:	20
Forb height:	14 cm
Graminoid height:	20 cm
Forb proportion:	27%
Altitude:	102.5 m
Slope:	8°
Soil pH:	5.02
Soil organic content:	15%
Soil P:	0.17 mg/g
Ellenberg Light:	6.8
Ellenberg Wetness:	5.5
Ellenberg pH:	4.9
Ellenberg Fertility:	4.1

Species	Freq	Abu	Ind
<i>Agrostis capillaris</i>	V	42.2	•••
<i>Holcus lanatus</i>	V	11.9	
<i>Anthoxanthum odoratum</i>	V	10.8	••
<i>Trifolium repens</i>	V	5.4	
<i>Rhytidiadelphus squarrosus</i>	IV	5.1	••
<i>Festuca rubra</i>	IV	9.0	
<i>Plantago lanceolata</i>	III	5.8	
<i>Rumex acetosa</i>	III	1.6	
<i>Cerastium fontanum</i>	III	0.4	
<i>Ranunculus repens</i>	III	1.3	
<i>Cynosurus cristatus</i>	III	2.0	
<i>Potentilla erecta</i>	III	2.2	••
<i>Trifolium pratense</i>	II	1.6	
<i>Lotus corniculatus</i>	II	2.0	
<i>Scleropodium purum</i>	II	0.6	
<i>Cirsium palustre</i>	II	0.6	
<i>Hypochaeris radicata</i>	II	1.4	
<i>Dactylis glomerata</i>	II	2.0	
<i>Lolium perenne</i>	II	1.9	
<i>Centaurea nigra</i>	II	2.0	
<i>Ranunculus acris</i>	II	0.6	
<i>Calliergonella cuspidata</i>	II	0.9	



Distribution

This sward type is very frequent in Cavan, Leitrim, Sligo and west Cork. It is scattered across the remainder of the surveyed area.



Anthoxanthum odoratum, *Agrostis capillaris* and *Festuca rubra* sward with a high cover of *Potentilla erecta* at Cupidstownhill, Kildare.



Anthoxanthum odoratum and *Agrostis capillaris*-dominated grassland at the Hell Fire Club, Dublin.

5: DISCUSSION

5.1 Summary data and the ranking of all surveyed sites

In this discussion the data collected in counties Donegal, Sligo, Dublin and Kildare during ISGS 2010 will be compared with the 2009 data collected in Cavan, Leitrim, Longford and Monaghan, the 2008 data collected in the first year of the Irish Semi-natural Grasslands Survey (ISGS) in Cork and Waterford and the 2007 data recorded in Roscommon and Offaly in the pilot study.

Table 5.1 gives a summary of the 12 counties surveyed over the four years of the ISGS 2007-2010. In 2010, the overall median site area decreased from that recorded in 2009, with the 2010 median area of 13.5 ha considerably lower than the 24.1 ha recorded in 2009. The range of areas in 2010, however, was extremely wide, ranging from 0.5 ha for one site in Donegal, Glenveagh Bridge (site 1151) to 385.9 ha for the Curragh in Kildare (site 1400). Donegal sites overall tended to be smaller than the other three counties surveyed in 2010, with a median of only 8.8 ha, compared to Sligo's median site area of 24.8 ha. In fact, this area of 8.8 ha is only slightly higher than the median site size recorded in 2008 in Cork and Waterford, both of which had the smallest median site sizes of any of the counties recorded thus far in ISGS, just over 7 ha.

Table 5.1 Summary of sites surveyed to date during ISGS 2007-2010.

County	Year	Hectares surveyed	No. of sites	Median site area (ha)	No. of relevés	Sites in SAC	Sites in NHA/pNHA	Areas of Annex I grassland
Waterford	2008	708.0	58	7.1	185	18	22	13
Cork	2008	1,866.9	192	7.2	600	42	43	35
Donegal	2010	1437.7	103	8.8	384	46	12	26
Offaly	2007	1,289.7	40	12.1	122	9	20	16
Dublin	2010	749.6	26	12.7	98	8	12	7
Kildare	2010	818.9	22	13.6	108	1	5	7
Monaghan	2009	893.4	47	14.0	191	1	12	5
Cavan	2009	1,841.5	66	17.6	278	18	21	19
Roscommon	2007	1,431.9	51	21.6	183	10	19	22
Longford	2009	1,305.8	49	23.1	193	12	16	3
Sligo	2010	1545.9	52	24.8	322	21	26	32
Leitrim	2009	3,924.9	77	40.6	391	19	29	22
TOTAL		17,814.2	783	13.1	3055	205	237	207

The median site area for the counties gives some indication of the overall quality of the grassland present. In common with Cork and Waterford, Donegal semi-natural grasslands tended to be fragmented habitats, often present in a landscape of improved agricultural grassland, or adjacent to heath and flush. Over three-quarters of sites in Donegal were adjacent to improved agricultural land; almost as many were adjacent to heath and flush.

Agricultural improvement and intensification seems to have been proceeding rapidly in Donegal in recent years, perhaps as a result of financial aid to farmers, with many field systems having changed radically in the five years since the aerial photographs were taken through drainage, reseeding and hedgerow removal, and other areas actively being improved while the survey was on-going. Some parts of Donegal, such as the east of the county near the Tyrone border, have been more intensively managed for some time, and this is evidenced by older farm statistics which reveal, for example, that higher gross margins were achieved by farms in that region compared to most of the rest of the county from at least the early 1990s (Lafferty *et al.* 1999). Sligo's grasslands, on the other hand, were ecologically of a better quality, with larger areas of semi-natural grassland present in the county and less frequent agricultural intensification noted.

Dublin and Kildare site sizes tended to fall in the middle of these two extremes, although the four largest sites recorded in 2010, all greater than 100 ha, were found in Kildare and Dublin. Both counties have experienced much agricultural improvement, particularly north Co. Dublin and parts of north and south Co. Kildare. However, both also have large areas of semi-natural grassland, such as the Phoenix Park (1315), Newbridge Demesne (1324) and the Curragh (1400), some of them formerly associated with old demesnes and many of them now owned by public bodies. Many such areas are being actively managed for conservation by the implementation of specific mowing and grazing regimes. The dominance of GS2 habitat (dry meadows and grassy verges) in Dublin grasslands – over 58% of all grassland surveyed in the county – is notable, while almost two-thirds of the GS3 (dry-humid acid grassland) surveyed in 2010 was recorded from two sites in the Curragh of Kildare: the Curragh (1400) and Little Curragh (1401).

Fragmentation of habitats is indicated partly by size, but also by the frequency with which semi-natural grassland and marsh were recorded as adjacent habitats. Only 31% of Donegal sites were recorded as having further unsurveyed semi-natural grassland adjacent to them, while Dublin had the next lowest proportion, at 35% of sites in the county. This shows that, for a large number of sites in both counties, much of the semi-natural grassland existed as discrete and often relatively small pockets of habitat. Dublin sites are somewhat fragmented, as might have been expected given the widespread urbanisation of the county, but the median size of sites in Dublin was larger than in Donegal, and two of the three largest sites in the survey were located there: Phoenix Park (1315) at 213.6 ha and Baldonnell (1325) at 195.3 ha. Many sites in Dublin had the added advantage of being actively managed for conservation, for example by mowing, and their future is therefore more assured than sites in Donegal, many of which had recently been reseeded or drained at the time of survey. Sligo and Kildare sites in 2010, from an examination of the occurrence of semi-natural grassland and marsh as adjacent habitats, appear to be less fragmented in that over half of the sites surveyed in both counties (increasing to around two-thirds in Sligo) were adjacent to further

grassland habitats, indicating expanses of grassland more extensive, and hence less fragmented, than the actual areas surveyed. Sligo sites tended, on the whole, to be the largest of the four counties surveyed in 2010, and were most likely to be adjacent to further unsurveyed areas of semi-natural grassland. They therefore appear to be the least fragmented.

The situation in Donegal – small, isolated grassland sites – is similar to that prevailing in Cork and Waterford (Martin *et al.* 2008), and contrasts markedly with the 2009 survey area, in particular Leitrim, a county which had some very large sites situated in a greater landscape of semi-natural grassland that it was not possible to survey completely within the resources of the project. However, Donegal differs from the southern counties in that the isolation of semi-natural grasslands may be due as much to the unsuitability of the land for the development of grassland vegetation (for example, due to the prevalence of semi-natural non-grassland habitats such as upland heath and flush) as to the widespread occurrence of agricultural improvement, the latter tending to be the main reason for grassland fragmentation in Cork and Waterford.

Coastal grassland sites tended to be small in the 2010 survey due to the presence of adjacent non-grassland coastal habitats such as dunes and machair. Identification and elimination of the latter in particular was problematic, due to the many similarities between it and calcareous grassland.

One of the differences to note between this year's survey and last year's is the overall decrease in dominance of GS4 (wet grassland) habitat in 2010, when it only made up less than 38% of the total area surveyed. This contrasts strongly with 2009, in which GS4 made up over 70% of the total area surveyed, most of it in Leitrim. The difference this year is at least partly due to the inclusion of the two eastern counties in the survey, both of which tend to have a drier climate than the northwest. Most of the wet habitats, both GS4 and GM1 (marsh), were found in Donegal and Sligo, with drier habitats tending to dominate in Dublin and Kildare. Climate tells only part of the story, however. GS1 (dry calcareous and neutral grassland) was more extensive as a proportion of the 2010 survey area (15%) than it was in the two previous years of the survey (10% in 2008 and just 5% in 2009), and in fact GS1 made up a higher proportion of grassland recorded in Donegal and Sligo (about one-fifth) than in either Dublin (just over one-tenth) or Kildare (3%). This was due to the presence of calcareous bedrock, outcropping rock and shallow calcareous soils in many of the northwest sites, which proved a suitable substrate for calcareous grassland, some of it extensive and much of it species-rich and of Annex I quality. Two eskers supporting GS1 grassland were also recorded in 2010, one in Kildare and one in Sligo. These two eskers are in addition to those recorded by Bleasdale (1998).

Conservation scores were calculated in 2010 on the same basis as in 2009. Table 5.2 shows the top 17 sites by conservation score over the four years of the ISGS. All of the sites in the table have a conservation score of over 50% and scored highly on all of the parameters tested. Six of the 12 counties surveyed to date have sites in this table. Leitrim has the highest number of sites in the top rankings, with seven sites, including the site ranked in second place overall, Larganavaddoge (site 811). There are two sites from Offaly, one of these the top-ranked site overall, Moystown Demesne and Bullock Island (site 109). This is a large site in the Shannon Callows with two types of Annex I grassland habitat, both of which passed most of their assessment stops. Cavan, Donegal, Dublin and Sligo also each have two sites in the table. It is interesting to note that, although Dublin suffers from the disadvantages of urbanisation and, to a certain degree, fragmentation of grassland habitats, the highest ranking site surveyed in 2010 was in Dublin: Glenasmole Valley (site 1300). It was the only site in the overall top rankings to have three Annex I grassland habitats: Festuco-Brometalia (6210), *Molinia* meadows (6410) and Lowland hay meadows (6510).

The high-scoring sites in Leitrim and Cavan that are not within a designated area (Table 5.2) have already been discussed in last year's report (O'Neill *et al.* 2009). The 2010 sites that should be highlighted in this regard are Newbridge Demesne, Dublin (site 1324, ranked in sixth place in 2010), Formoyle, Sligo (site 1532, ranked in ninth place), Phoenix Park, Dublin (joint tenth place), Ballynabrack, Dublin (site 1305, joint 13th place), Culdaly, Sligo (site 1546, joint 13th place) and Cashelard, Donegal (site 1270, joint 17th place). None of these is within an NPWS conservation site, despite all having Annex I grassland habitats, being of reasonable size and scoring highly in terms of species diversity and species quality. Newbridge Demesne scored highest for notable species as it had one Flora (Protection) Order species, *Hordeum secalinum*, and one Red Data Book (Curtis and McGough 1988) species, *Bromus racemosus*. This site in particular would seem to be a good candidate to be designated a Statutory Nature Reserve as it is a suitable size, is in Local Authority ownership and contains a range of grassland habitats, some of them of Annex I quality. Designation of the other sites listed should also be considered, either by creating a new designation or by extending the boundary of an existing designated site nearby.

Threat scores were also calculated for all sites in 2010. Threat scores are of maximum benefit when viewed in conjunction with conservation scores, particularly for sites that have a high conservation score. A number of sites with high conservation scores in 2010 received high threat scores also. The three most threatened sites (Portinch, Sligo (1512), Cloghboy, Donegal (1232) and Rossnowlagh Lower, Donegal (1248)) also appear on the list of the sites of greatest conservation value, and all three are in NPWS conservation sites. This highlights the fact that designation does not necessarily decrease the threats to a site. Most of the threats scored are associated with activities relating to agricultural improvements. Buffer zones around areas of special conservation value might help to mitigate unwanted effects

from agriculture such as weedy species encroachment and damaging activities such as drainage and fertiliser application.

Table 5.2 Top 17 sites ranked by conservation score, surveyed during ISGS 2007-2010.
For Conservation score criteria see Table 2.4.

Site no.	Site name	County	Area (ha)	SAC	NHA	pNHA	Annex I grassland habitat	Conservn. Score (%)
109	Moystown Demesne and Bullock Island	Offaly	235.2	000216	-	000216	6410/6510	67.4
811	Larganavaddoge	Leitrim	76.3	000623	-	000623	6230	66.3
1067	Manragh Upper	Cavan	87.9	-	-	-	6210/6230	63.2
850	Letterfine	Leitrim	121.1	-	-	-	6510	60.0
18	Little Brosna Callows	Offaly	332.1	000216 / 000566	000564	000216 / 000566	6410	59.0
1300	Glenasmole Valley	Dublin	45.0	001209	-	001209	6210/6410/6510	58.9
1248	Rossnowlagh Lower	Donegal	45.2	000138	-	-	6410/6510	56.8
1502	Edenbaum	Sligo	45.3	-	-	002435	6210/6230	56.8
815	Sheemore	Leitrim	131.9	-	-	001421	6210	55.8
1004	Moneen	Cavan	208.0	002032	-	-	6410	54.7
1250	St. John's Point	Donegal	70.1	000191	-	000191	6210/6410	54.7
1541	Cloonmacduff	Sligo	74.8	001898	-	001898	6210/6410	54.7
813	Aghalateeve	Leitrim	69.8	000623 / 001919	-	000623 / 001919	-	53.7
825	Ballynaboll	Leitrim	178.8	-	-	-	6210	52.6
808	Keeloges	Leitrim	115.7	001403	-	001403	-	51.6
818	Lugnafeaghery	Leitrim	95.7	000623	002435	-	-	50.5
1324	Newbridge Demesne	Dublin	40.2	-	-	-	6210/6510	50.5

5.2 Condition assessment of Annex I grassland

The number of sites in 2010 recorded as having Annex I grassland was higher than in previous years, with the presence of Annex I grassland noted at 81 sites, although not all of these areas were large enough to map. A total of 72 areas of Annex I grassland were assessed in terms of their change in extent since 2000, structure and functions and future prospects. A number of sites had added value in having other non-grassland Annex I habitats present. For example, some areas of 6210 grassland were closely associated with the Annex I habitats Juniper scrub (5130), calcareous heath (4030) or limestone pavement (8240). In 2010, ten Annex I grassland areas (13.9% of areas assessed) received an overall assessment of *Favourable*.

Area assessment

Change in area (extent) was noted in the methodology in section 2 as being slightly biased towards the area boundaries visible on the 2005 aerial photographs. This fact is being mentioned specifically in this report as the series of aerial photographs used as base mapping for the digitisation of sites in 2010, including Annex I grassland areas, is five years old and is

therefore likely to be less representative of the 2010 site boundary than in previous years of this survey due to the greater time elapsed since the photographs were taken in 2005. While GPS points were used to map grassland habitat boundaries that were not visible on the photograph (such as a transition from 6210 calcareous grassland to non-Annex I quality calcareous grassland), existing features on the aerial photograph, such as hedgerows or patches of scrub, were used where present on the ground in 2010. Slight differences in features such as thickness of hedges or extent of scrub encroachment may not have been seen on the ground to be significantly different from the photograph, and may therefore not have been mapped in the field. Many such changes are likely to have been smaller than the minimum mapping area; there may, however, have been some area changes that were above the minimum mapping area but not identified when mapping in the field. This may potentially have impacted slightly on the results for Area assessment, most of the Annex I areas having been recorded as having undergone no decrease in area. However, several of the sites underwent a slight increase in area due to scrub clearance or path recolonisation, and this is likely to have cancelled out or exceeded any area decreases due to non-grassland habitat expansion. The situation will be much improved when a new series of aerial photographs becomes available, and also when the surveys switch from baseline to monitoring.

Structure and functions assessment

The structure and functions criteria applied in 2010 were the same as those used in 2009. However, there is a case for amending the Species-rich *Nardus* grassland (6230) structure and functions assessment criteria used in future studies to ensure that only species-rich examples of this vegetation type are assessed as the Annex I habitat. Some relevés assessed in 2010 as Species-rich *Nardus* grassland were not species-rich, one in Kildare's Little Curragh (1401) containing as few as 10 species. It therefore seems appropriate to include a parameter for "minimum number of relevé species" within the assessment of structure and functions for 6230 grassland. Several of the relevés in the two Curragh sites (1400 and 1401) would have failed a species-richness parameter even if the minimum number of species were to be set at only a moderate level, such as 20 species.

Large areas of potential 6230 grassland habitat surveyed in Kildare in the two Curragh sites failed assessments on several criteria, most notably on a lack of high quality species. It was noted that in the main Curragh site (site 1400), the sedge species occurring most frequently was the calcicole *Carex caryophyllea*, rather than the more calcifuge *C. binervis* or *C. pilulifera* which are currently on the list of high quality indicator species for 6230 used throughout this survey. According to data collected from upland grassland habitats in 2009 and 2010 (P. Perrin pers. comm.), 6230 frequently includes calcicole species such as *Campanula rotundifolia* and *Thymus polytrichus*, reflecting the presence of calcareous flushes. The UK criteria for this Annex I grassland habitat also recognise calcareous flushed 6230 over siliceous rock as being of Annex I quality and generally having greater species

diversity (JNCC 2004, J. Denyer pers. comm.). Indications from the uplands study suggest that these two species, as well as *C. caryophyllea*, should also be included as high quality positive indicator species for 6230 in the future.

It should be noted that, even if such adjustments were to be made to the assessment criteria for 6230, many of the assessments recorded in the two Curragh sites (1400 and 1401) would have failed in any case, primarily due to insufficient cover of forbs and excessive litter cover. Thus, despite the size and cultural significance of the Curragh region as a whole, the area does not seem to conform to Annex I-quality habitat on the basis of several criteria.

The dominance of GS2 habitat in Dublin has already been mentioned above. Despite the relative abundance of this habitat in the county, however, only a small proportion of it was deemed to be Annex I Lowland hay meadow (6510). The failure of much of the GS2 habitat to achieve Annex I status was frequently due to the dominance of some of the larger, tussocky grasses such as *Arrhenatherum elatius* and *Dactylis glomerata*. These grasses, left unchecked, outcompete or prevent the establishment of positive indicator species and prevent forbs from reaching cover values consistent with 6510 habitat. Sites which were managed appropriately by mowing, such as Newbridge Demesne (1324) showed a greater evenness of species, as well as higher proportion of forbs in the sward. In some such cases, the habitat approached, but still did not quite attain, Annex I status due to a lack of positive indicator species.

Future prospects assessment

The assessment of this parameter utilised a new list of impacts given by Ssymank (2010). This attempts to list all the potential negative, positive and neutral practices that impact on Annex I habitats. The list of impacts recorded in 2010 and given in Table 3.14 highlights the fact that many of the Annex I meadows 6410 and 6510 are managed by grazing rather than by mowing. While positive effects may be obtained in the short term with appropriate grazing, the long-term effects may be less beneficial than mowing. Mowing removes litter and keeps nutrient input low, as well as giving a uniform sward structure, whereas grazing can increase nutrient inputs and, if carried out to excess, has additional undesirable effects of trampling and poaching, particularly in wet meadows. Some of the best meadows surveyed in the ISGS to date have been those that have been maintained by mowing rather than by grazing. These include meadows at Glenasmole, Dublin (1300), Rossnowlagh Lower, Donegal (1248), Kilcolman, Cork (618), Moystown Demesne and Bullock Island, Offaly (109) and Clonmacnoise, Offaly (107).

The future prospects parameter of Annex I habitat assessments is one that, Ellmauer (2010) stated, needs to be “sharpened and clarified”, and he recognised a need to develop a consistent method to assess it so that it can be comparable across member states of the EU.

Future prospects were scored consistently throughout 2010 according to the system outlined in draft reports by Ssymank (2009, 2010). Recommendations made by Ellmauer (2010) regarding the use of expert judgement to assess future prospects were also followed; however, the scoring system was the primary method by which future prospects were assessed, and expert judgement by the surveyors then used to verify the assessment.

The scoring system used in 2010 differs from that used in 2008 in that it uses a long array of possible impact criteria, both negative and positive. In 2008, very few future prospects criteria were accorded a positive score: presence of the Annex I habitat within an NHA/SAC or presence within the Annex I habitat of species listed in the Red Data Book (Curtis and McGough 1988) or on the Flora (Protection) Order (S.I. No. 94/1999). In 2010, the first year in which this list of impact criteria was used for a full field season, positive criteria such as non-intensive mowing were scored for the first time. This is a forward step, as credit can be given for management practices that benefit the Annex I habitat being assessed. However, it was found that some negative criteria, such as scrub, bracken or heath encroachment, were not explicitly listed among the impacts and could no longer be scored individually, or could potentially be scored in a number of ways, such as “Problematic native species” or by inference from another category; for example, encroachment could be scored through the negative impact “Abandonment / lack of mowing”, if the field was formerly mown, or “Abandonment of pastoral systems, lack of grazing” if formerly grazed. Following a review of the impact criteria, it is proposed next year to standardise the recording of encroachment by using the code “Species composition change (succession)” for encroachment by scrub or heath, with “Problematic native species” being reserved for the recording of bracken encroachment.

Ssymank’s system requires the recording of the intensity of the impact, the percentage of the Annex I habitat affected, and the source of the impact, whether from outside or within the habitat. The interpretation of “intensity” (high, medium or low) as given in Ssymank’s report is somewhat ambiguous as it appears possible to equate an impact that has “great direct or immediate influence” with one which is “acting over large areas”. As the scoring system already takes into account the percentage of the Annex I area affected, this seems likely to cause inconsistencies in how the scores are applied. For reasons of consistency, therefore, our interpretation of Ssymank’s scoring system was to equate “high intensity” with “great direct or immediate influence”, and “low intensity” with “low direct or immediate influence”, with the area of Annex I habitat affected being scored separately. The final score calculated for each Annex I habitat’s future prospects was a measure of the overall balance of the positive and negative pressures on the habitat.

A number of general site data were omitted from this year’s survey; these include encroachment from scrub, heath and bracken, as well as recording the levels of grazing noted

on site. These were not carried forward as it was found that the data were not gathered at a fine enough resolution to be useful for analysis. For example, all three grazing levels (appropriate, overgrazing and undergrazing) were found in previous years to be present at many sites. Similarly, the presence of even a small amount of encroachment would be sufficient for it to be recorded for the site, even if the site was very large. Such data, while not gathered for sites without Annex I habitat, were still collected for sites containing Annex I grassland habitat, both in the structure and functions data and in the future prospects criteria. Scrub, heath and bracken encroachment were scored for future prospects as explained above. Over- or undergrazing were also scored through the future prospects list of criteria: overgrazing scored through the “intensive grazing” criterion, and undergrazing through the “abandonment/lack of grazing” or “non-intensive grazing” criteria, all scored as negative impacts. Appropriate grazing was scored as a neutral or positive impact, depending on the situation at the site.

The presence of the Annex I habitat within an NPWS conservation site is not included in the assessment of site future prospects. There are instances, contrary to expectation, where the location of grassland habitats within a conservation site can lead to a deterioration of the condition of the habitat due to poor management or, indeed, a complete lack of management. This may stem, at least partly, from a lack of understanding on the part of the landowner of what management actions are notifiable to NPWS. Some landowners spoken due over the past few years of the survey have decided to err on the side of caution and have chosen not to graze or mow certain fields any more rather than do something which they later find is on a list of notifiable actions. This situation could lead to a loss of diversity in grassland habitats, particularly in meadow habitats, both wet and dry, which quickly become rank as a result of lack of management. As meadows, and in particular dry meadows, appear to be a dwindling habitat, especially in parts of the northwest, all good examples of the habitat – and perhaps even less good, poorly managed ones – should be identified and targeted for discussions with landowners regarding remedial management before loss of diversity becomes irreversible. One site in Donegal with potential Annex I Lowland hay meadow appears to have become unmanaged in recent years, perhaps due to a change of ownership, and there is anecdotal evidence that the condition of the habitat may be suffering as a result (R. Sheppard pers. comm.). The positive effect that appropriate management is having on meadows in Dublin is testament to the fact that good management is the key, not only to maintaining these habitats but to improving them.

Primary areas of Annex I grassland habitat 2010

Martin *et al.* (2008) proposed the compilation of a list of Annex I grassland areas that were of exceptionally good quality in terms of their structure and functions and overall area. Such a list would act as a focus for grassland conservation efforts in the future. This list was compiled in O'Neill *et al.* (2009) for the eight counties that had been surveyed up to 2009 and

incorporated a number of sites surveyed by Dwyer *et al.* (2007). A further 24 areas have been added to that list following the 2010 survey.

Of the counties surveyed in 2010, Sligo has the highest number of sites included in the primary areas list, with a total of 14 sites from the county listed as being of sufficient area and having good structure and functions. Seven sites are located in Donegal, while three are in Dublin. Six of the Sligo sites and two each of the Donegal and Dublin primary areas are not within an NPWS conservation site, and a further two Donegal areas have only a small proportion (4% or less) within an NPWS conservation site. Several other sites exist only partially within an NPWS conservation site. Those sites may be prime candidates for including within a designated area through the extension of an existing conservation site boundary. Sites that fall completely outside an NPWS conservation site boundary should be examined with a view to designating them for the grassland habitats they support.

Table 5.3 The overall quality of each of the six Annex I grassland habitats within the 74 primary areas of habitat recorded between 2006* and 2010. Any criteria where more than 25% of sites were scored as *Unfavourable – Bad* were assigned an overall score of *Unfavourable – Bad*; for a criterion to be scored as *Favourable* all sites had to be in a *Favourable* condition; all other combinations were scored as *Unfavourable – Inadequate*.

Annex I habitat	No. of areas	Total area (ha)	Area	Structure & functions	Future prospects	Overall
Calaminarian grassland (6130)	4	0.4	Favourable	Unfavourable – Bad	Unfavourable – Bad	<i>Unfavourable – Bad</i>
Festuco-Brometalia (6210)	24*	173.6	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Inadequate	<i>Unfavourable – Bad</i>
<i>Nardus</i> grassland (6230)	11	133.8	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Bad	<i>Unfavourable – Bad</i>
<i>Molinia</i> meadows (6410)	22	181.3	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Bad	<i>Unfavourable – Bad</i>
Hydrophilous tall herb communities (6430)	4	7.6	Favourable	Unfavourable – Bad	Unfavourable – Inadequate	<i>Unfavourable – Bad</i>
Lowland hay meadows (6510)	9	63.0	Unfavourable – Inadequate	Unfavourable – Bad	Unfavourable – Inadequate	<i>Unfavourable – Bad</i>

*3 Offaly & Roscommon sites from Dwyer *et al.* (2007) incorporated with ISGS 2007-2010.

Each of the primary Annex I grassland habitats has an overall assessment of *Unfavourable – Bad*, with none of the six habitat types having adequate structure and functions. Festuco-Brometalia (6210) is the most frequent of the primary Annex I grassland areas, although there is a slightly larger area of *Molinia* meadows (6410). Calaminarian grassland (6130) and Hydrophilous tall herb communities (6430) occur much less frequently within the study area than the other four Annex I grassland habitats. Although each of the six Annex I habitats received an overall assessment of *Unfavourable – Bad*, it would be possible to bring this

rating up with appropriate management. These sites are already recognised as being of good quality, with favourable results achieved in a good proportion of the relevés in each, indicating that parameters such as positive indicator species are present in sufficient amounts in some, if not all, parts of the site. Some relevés failed on less critical aspects of structure and functions, such as litter cover or bare soil; proper management procedures should be sufficient to address these. Any future monitoring of Annex I habitats should focus on these primary areas.

5.3 Vegetation classification

The vegetation classification that is carried out for the reports of the ISGS (Martin *et al.* 2007, 2008, O'Neill *et al.* 2009) analyses an annually increasing dataset of relevés. In 2010, an additional 935 relevés (912 relevés recorded in Donegal, Dublin, Kildare and Sligo, 23 relevés recorded in Offaly) were added to the dataset, to give a potential dataset of 3,078 relevés, of which 3,024 were used in the analysis. The more data become available for analysis, the better defined the vegetation groups are likely to become. However, as noted in last year's report, the addition of extra relevés also means that there will inevitably be a redistribution of relevés between groups, and this frequently leads to further vegetation types being classified. That has occurred again this year, with the number of vegetation types increasing from 21 to 34. Each classification proposed in the ISGS reports must therefore be regarded as interim until the final classification is produced at the end of the project.

This year, the 3,024 relevés analysed were divided into five groups, broadly corresponding to dry calcareous, dry-humid acidic, wet neutral, wet acidic, and dry neutral grassland. This is one group more than was identified in last year's analysis. The drier groups are *Festuca rubra* – *Plantago lanceolata* (calcareous), *Anthoxanthum odoratum* – *Rhytiadelphus squarrosus* (acidic) and *Lolium perenne* – *Trifolium repens* (neutral). The wet groups are *Agrostis stolonifera* – *Juncus effusus* (neutral) and *Molinia caerulea* – *Cirsium dissectum* (acidic). The dry neutral group is a new group that was not isolated in previous classifications but the relevés were largely located within the dry calcareous-neutral group (*Plantago lanceolata* – *Festuca rubra* group) in the classification presented in O'Neill *et al.* (2009). It includes some of the more improved examples of all four Fossitt (2000) grassland (GS) habitats but also contains some Annex I 6210 relevés.

Group 1, the dry calcareous group, contains the highest proportion of three Annex I grassland habitats: Festuco-Brometalia (6210), Lowland hay meadows (6510) and Calaminarian grassland (6310). It also contains the highest number of Annex I relevés overall. In terms of conservation value, therefore, this can be regarded as the most important group. Group 2, the dry-humid acidic group, contains the highest proportion of Species-rich *Nardus* grassland (6230) relevés. *Molinia* meadows (6410) relevés appear strongly in all of the acidic groups, both wet and dry, although those in Group 4 generally have a lower proportion of herbs and

more of a tendency towards rankness. Despite the inclusion of *Cirsium dissectum* within the name of Group 4, many of the better quality 6410 relevés are actually found within Group 3. The Hydrophilous tall herb community (6430) relevés fall almost entirely within Group 3.

A detailed one-to-one relationship between the classification of 2010 and that presented in 2009 is not possible due to the substantial amount of redistribution caused by the addition of the 2010 relevés. A number of vegetation types remain fairly constant, such as the *Plantago coronopus* – *Armeria maritima* type of 2010, which is virtually the same as the *Armeria maritima* – *Plantago coronopus* type of 2009 and has been strengthened by the addition of some new relevés in 2010. The dry acidic type *Nardus stricta* – *Hylocomium splendens* identified in 2010 appears to be an amalgam of a number of types identified in 2009, such as the *Nardus stricta* – *Carex panicea* and *Anthoxanthum odoratum* – *Hylocomium splendens* types, as well as including some relevés also from the *Agrostis capillaris* – *Galium saxatile* types. However, attempting a one-to-one correlation of the individual types and groups is not worthwhile as the addition of new relevés largely makes the previous classification redundant.

Environmental data

Environmental data for the groups reflect differences in soil characteristics, including soil type, pH, moisture and fertility, as well as characteristics relating to the habitat including slope and light. Group 2 (*Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus*), and Group 4 (*Molinia caerulea* – *Cirsium dissectum*), are strikingly more acidic than the other groups, with median pH values for the types ranging from 4.0 to 4.7 for the former, and from 3.9 to 4.5 for the latter. This contrasts strongly with the dry calcareous group, Group 1 (*Festuca rubra* – *Plantago lanceolata*), which has median pH values for its types ranging from 5.6 to 6.7. Values for wetness (derived from the species' Ellenberg values) show the lowest figures occur within Group 1, indicating drier soils in these relevés. Soil fertility values reflect differences between some types within the various groups. For example, the more rank grassland sites in Group 1, such as the *Arrhenatherum elatius* – *Festuca rubra* and *Elytrigia repens* – *Holcus lanatus* types, have higher soil fertility values than the other members of the group. Similarly, the *Lolium perenne* – *Trifolium repens* type within Group 4, *Lolium perenne* – *Trifolium repens*, has the highest soil fertility value within the group, indicating that relevés within this type generally tend to have more fertile soils.

The steepest slopes are found in relevés within the dry calcareous Group 1 and the dry-humid acidic Group 2. However, only a few types within each of these two groups have these steeper slopes. These include the dry calcareous types *Carex flacca* – *Thymus polytrichus* and *Carex flacca* – *Briza media* within Group 1; and the upland acidic groups *Nardus stricta* – *Hylocomium splendens*, *Anthoxanthum odoratum* – *Potentilla erecta* and *Festuca ovina* – *Galium saxatile* within Group 2 which tended to be found on higher ground.

Sward heights within the groups tend to vary greatly among the types within them. The three drier groups – Groups 1, 2 and 5 – tended to have lower sward heights than the two wetter groups, Groups 3 and 4, with the exception of the rather more rank *Arrhenatherum elatius* – *Festuca rubra* type, which had a median forb height of 37 cm and median graminoid height of 58 cm. The type with the lowest sward height was the coastal type *Plantago coronopus* – *Armeria maritima*, with a median forb height of 3 cm and median graminoid height of 6 cm, exposure playing a key role in maintaining a low sward height. The tallest swards tended to be within the marshy type *Filipendula ulmaria* – *Ranunculus repens* vegetation type in Group 3 which, as its name suggests, is dominated by tall herbs; relevés of the *Juncus effusus* – *Holcus lanatus* type, also in Group 3, also tended to have a tall sward, particularly graminoids, with tall rushes generally abundant or dominant.

5.4 Utilisation of the dataset

The GIS package which accompanies this report contains the habitat map for each of the 203 sites surveyed in 2010. To this has been added a data layer entitled 'Relevé'. This contains the co-ordinates of all 912 relevés, together with the classification (made by the survey team in the field) of each relevé according to Fossitt (2000) and the vegetation type assigned by the analysis presented in this report. Any information collected at the relevé scale can be added to this data layer.

The GIS component of this project will assist semi-natural grassland conservation at a regional level by providing spatial information on the occurrence of the different grassland habitats within the landscape. In particular, it could assist environmental managers in the establishment of extensive networks of high conservation value semi-natural grassland, or in the monitoring of a particular Annex I grassland habitat within a county or region. The vegetation classification methodology used can contribute to a more accurate classification of Ireland's semi-natural grassland habitats. The conservation and threat evaluation criteria provide a baseline for monitoring semi-natural grassland sites, and the Annex I grassland habitats assessment relevé data provide important baseline information, especially for refining the positive indicator species lists for certain Annex I grassland habitats and for assessing structure and functions and future prospects for the habitats.

5.5 Concluding remarks

This survey of 203 semi-natural grassland sites in Donegal, Dublin, Kildare and Sligo, representing Year 3 of the second phase of the Irish Semi-natural Grasslands Survey, has further refined the methodology that will be used to study the range of different semi-natural grassland habitats within a region, to identify and assess Annex I grassland habitats, and to accurately map and store all survey data using a combination of GIS, a Turboveg database and an Access database.

This report has presented a hierarchical vegetation classification for semi-natural grasslands in twelve counties: Cavan, Cork, Donegal, Dublin, Kildare, Leitrim, Longford, Monaghan, Offaly, Roscommon, Sligo and Waterford. Five main grassland groups were identified, namely *Festuca rubra* – *Plantago lanceolata*, *Anthoxanthum odoratum* – *Rhytidiadelphus squarrosus*, *Agrostis stolonifera* – *Juncus effusus*, *Molinia caerulea* – *Cirsium dissectum* and *Lolium perenne* – *Trifolium repens*, and 34 vegetation types. The five groups broadly correspond to dry calcareous, dry-humid acidic, wet neutral, wet acidic and dry neutral grassland.

The data showed that semi-natural grassland sites in Donegal, Dublin, Kildare and Sligo tended overall to be somewhat smaller than Cavan, Leitrim, Longford and Monaghan and Roscommon and Offaly, though significantly larger than sites in Cork and Waterford. However, these overall results mask large differences between the counties surveyed in 2010, with Donegal sites significantly smaller than the other counties and Sligo sites the largest. Most of the sites surveyed in 2010 that were ranked as having a high conservation value were found in Sligo, and most highly-ranked sites were associated with an NPWS conservation site, including 14 of the 24 primary areas of Annex I grassland habitat identified..

The disjunct nature of the survey area in 2010 has brought up some interesting contrasts between northwest and eastern Ireland, not least the disparity in terms of the amount of wet grassland in the two areas. Of interest also are the differences that exist between counties located in close proximity to each other: Sligo grasslands were found to be more extensive and less fragmented than those in Donegal; Dublin recorded the greatest proportion of dry meadows, while Kildare's acid grasslands were its main habitat type.

A detailed habitat map has been produced for each site, showing the Fossitt (2000) and Annex I grassland habitats, the position of all relevés and the location of any associated NPWS conservation sites (NHAs/pNHAs and SACs). These habitat maps are available as a digitised GIS layer which can be overlaid onto the aerial photographs and viewed or printed at any scale.

The criteria for the evaluation of the conservation status of grassland sites have remained unchanged. For the assessment of Annex I grassland habitats, a refinement of the future prospects criteria should provide more accurate data on the likelihood of the habitats remaining in good condition for the foreseeable future. Suggestions for additions to the positive indicator species list for Species-rich *Nardus* grassland (6230) have been made based on data from this and other surveys. The list of primary areas of Annex I grassland habitat has been extended, adding further to the list of the best quality Annex I grassland habitat so far recorded during the four years of the ISGS (2007 to 2010). This practice will be continued in future years of the ISGS to build up a complete picture of grasslands of high conservation value throughout Ireland.

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Appendix 1: Maps showing the location of the 203 sites surveyed in 2010

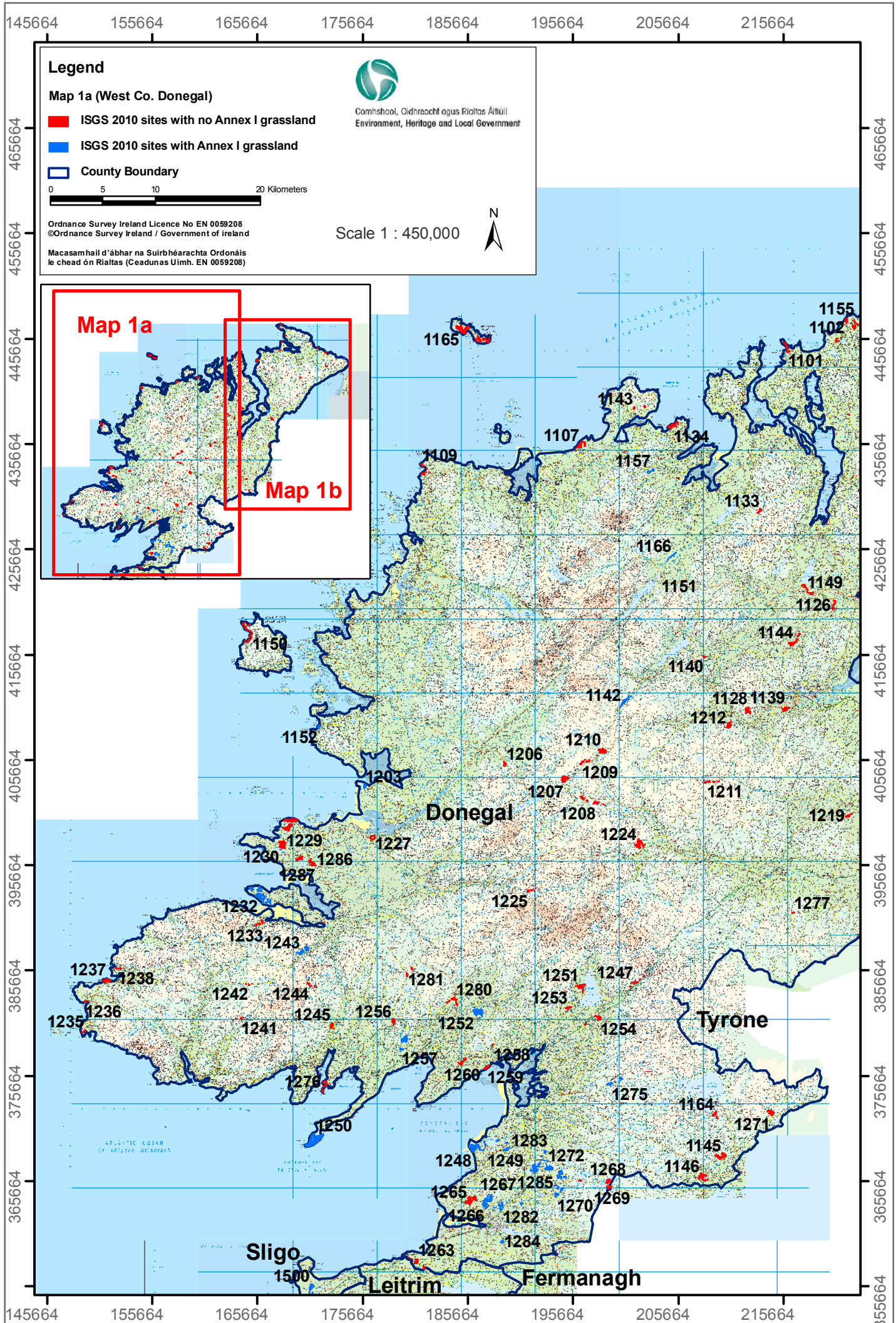
Map 1a: Location of sites in West Co. Donegal (scale 1:450 000)

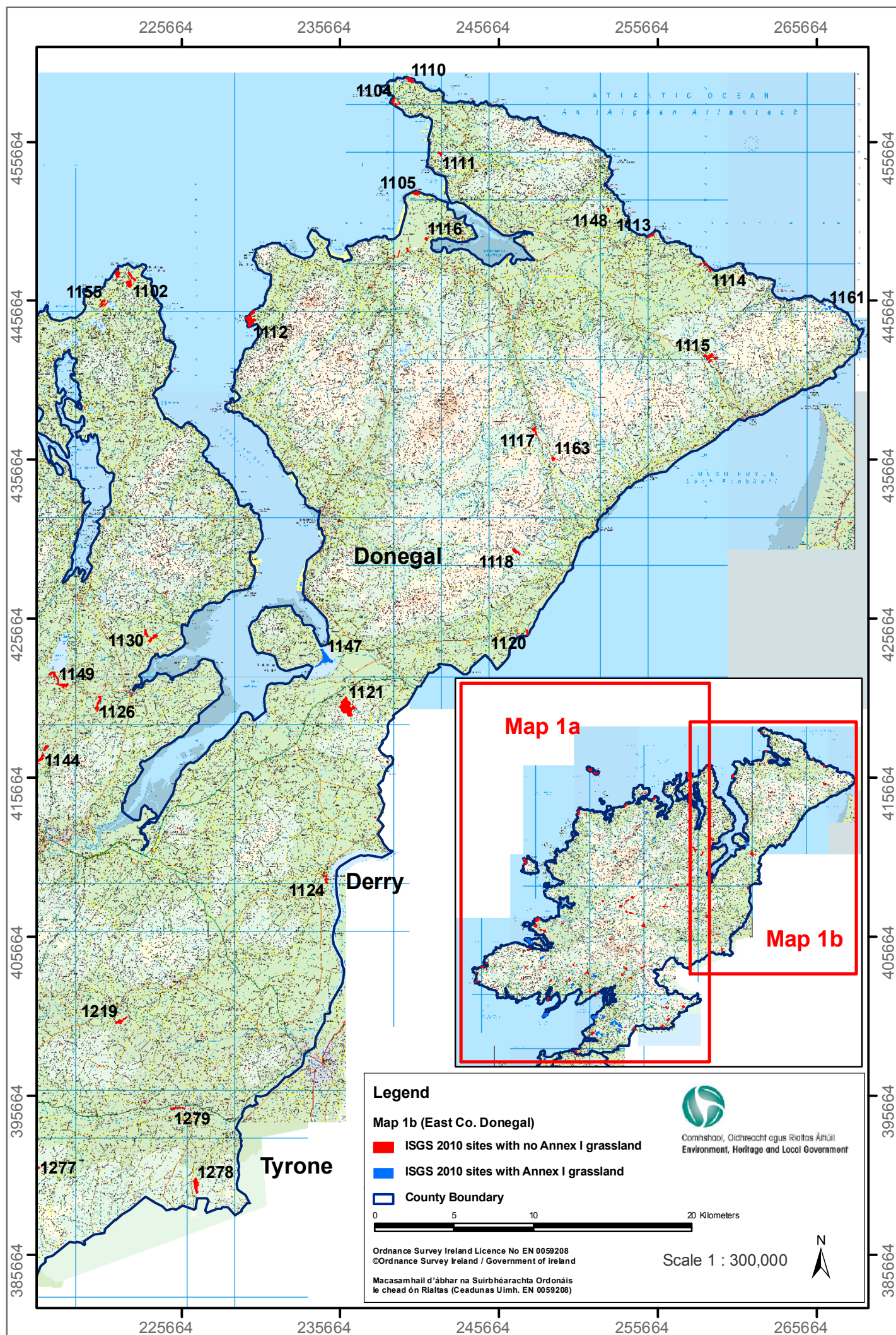
Map 1b: Location of sites in East Co. Donegal (scale 1:300 000)

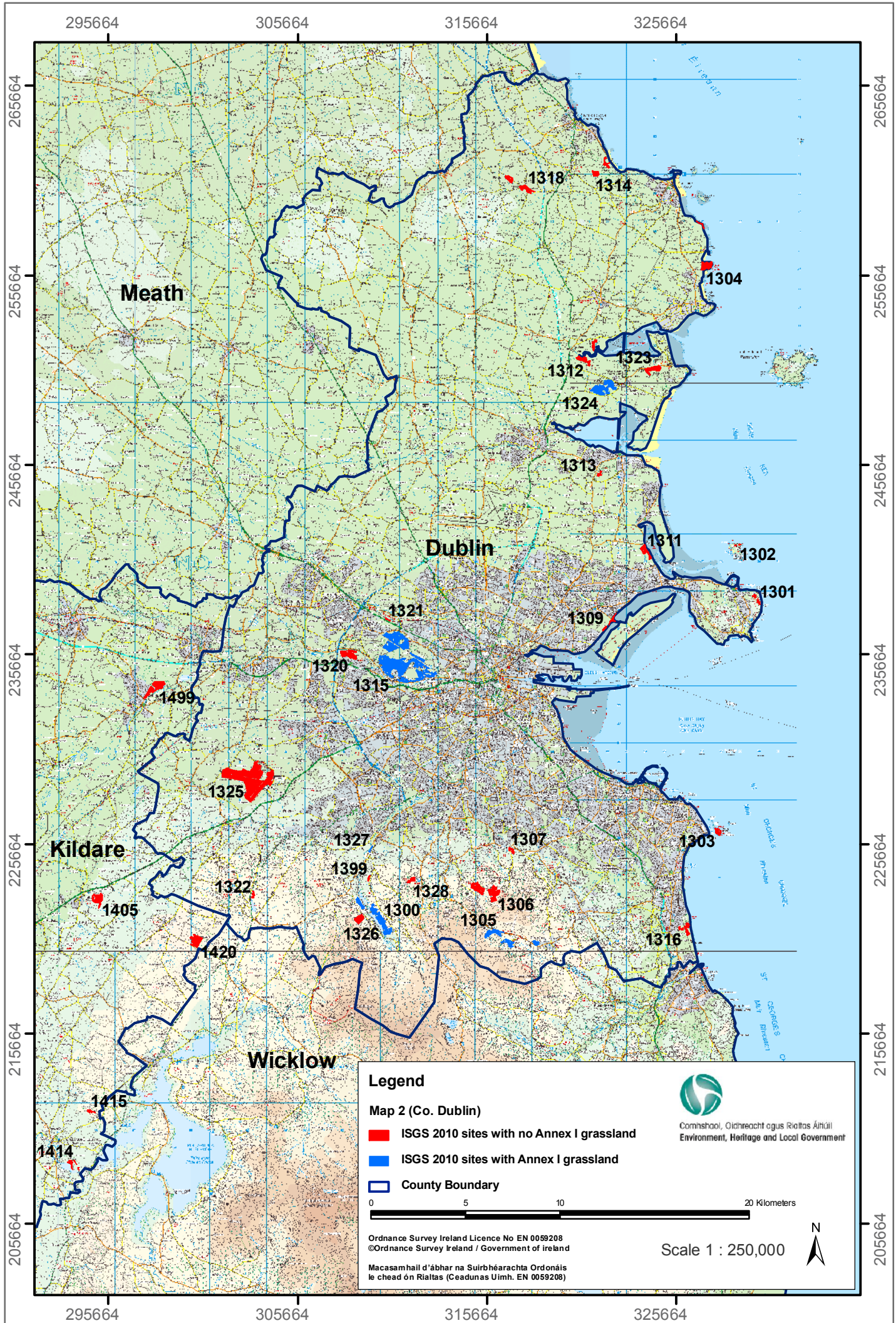
Map 2: Location of sites in Co. Dublin (scale 1:250 000)

Map 3: Location of sites in Co. Kildare (scale 1:300 000)

Map 4: Location of sites in Co. Sligo (scale 1:350 000)







Legend

Map 2 (Co. Dublin)

- ISGS 2010 sites with no Annex I grassland
- ISGS 2010 sites with Annex I grassland
- ▬ County Boundary



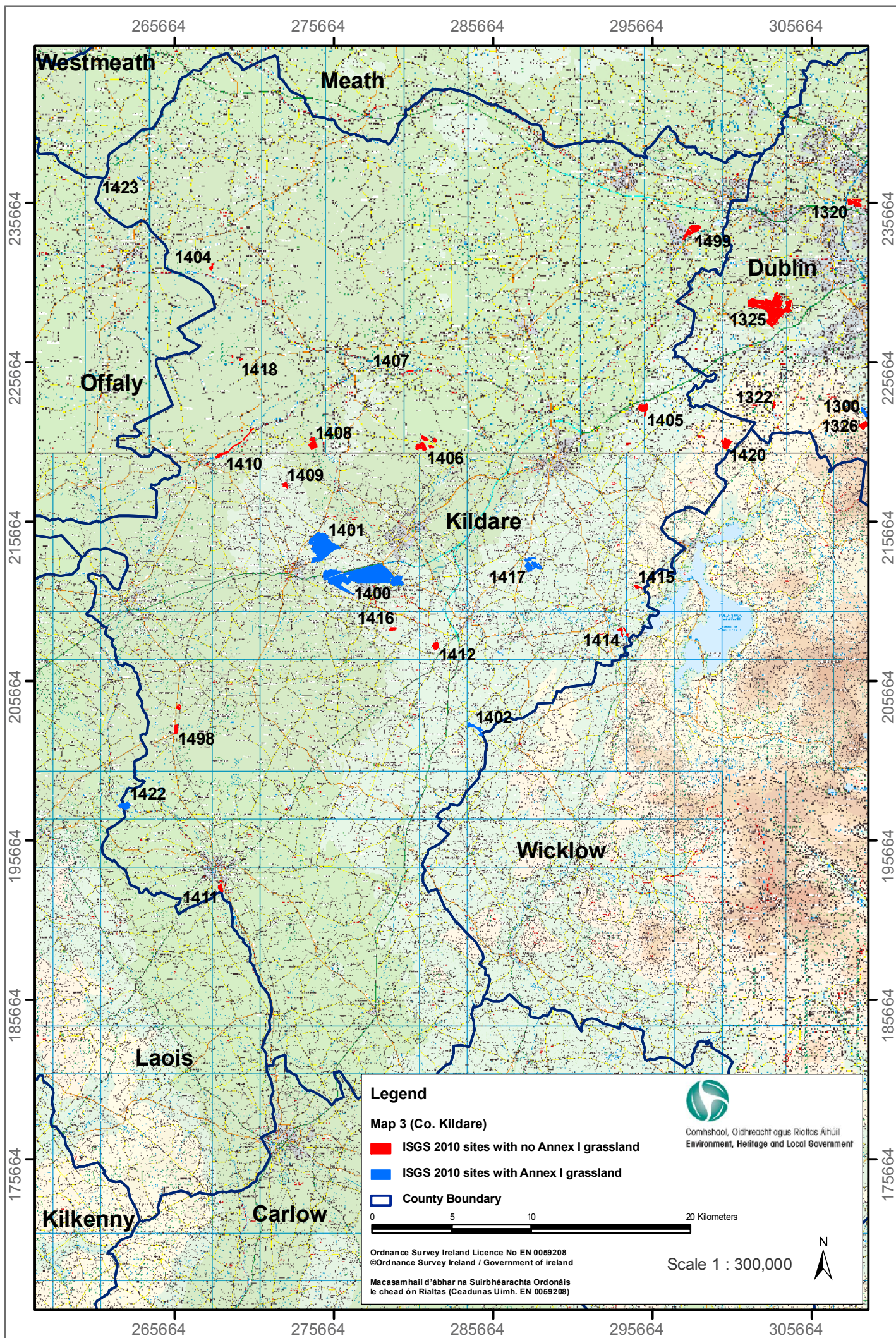
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le chead ón Rialtas (Ceadúnas Uimh. EN 0059208)

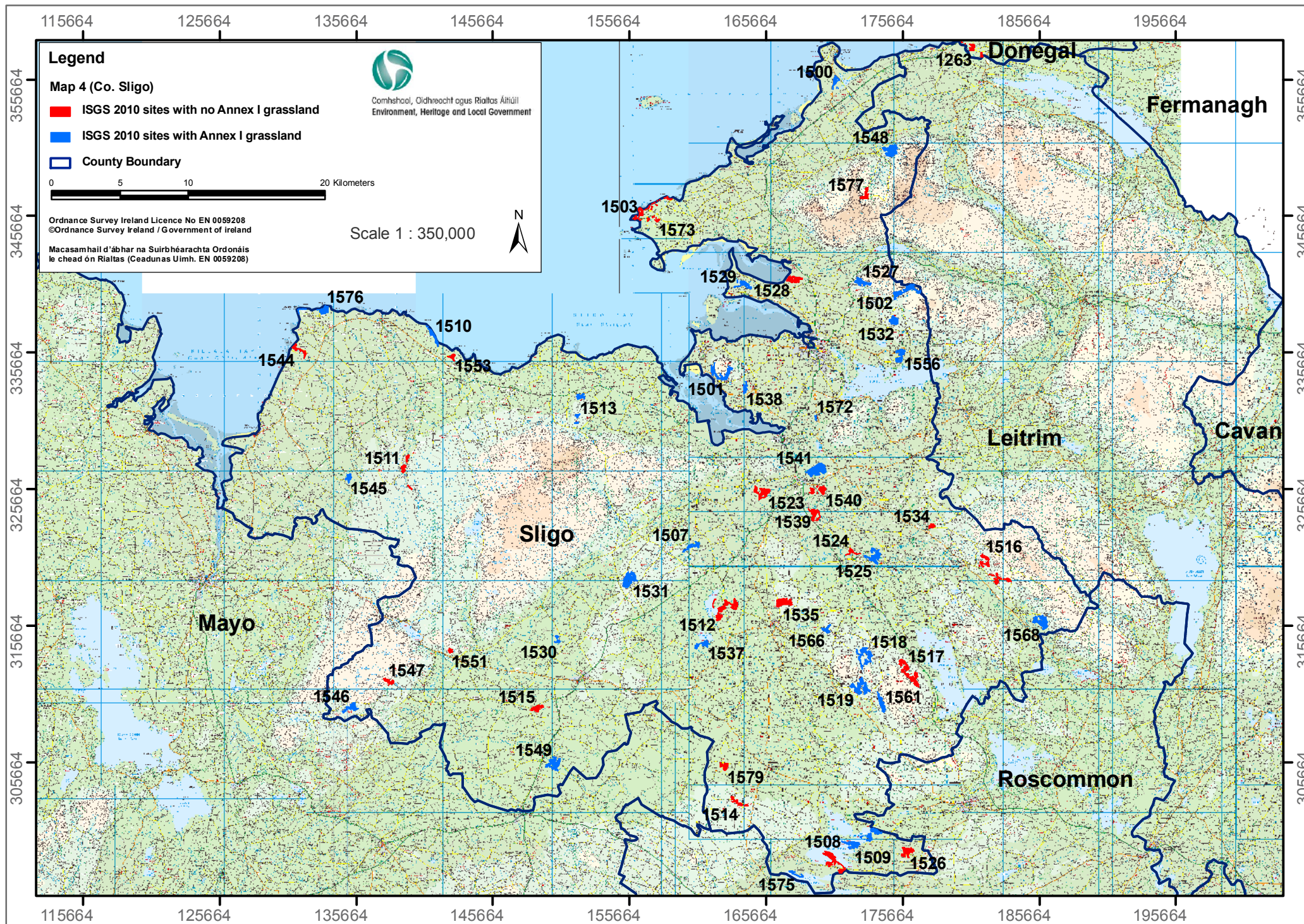


Comhshaoil, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government

Scale 1 : 250,000







Appendix 2: Summary information for each of the 203 sites surveyed in 2010

This appendix contains the following information on each site:

- Site ID
- Site Name
- Townland Name
- County
- Site Area (ha)
- Grid Reference
- NHA (Natural Heritage Area) / pNHA (proposed Natural Heritage Area)
- SAC (Special Area of Conservation)
- Parent material
- Soil ID
- Conservation score
- Threat score

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1101	Ballyhoorisky	Ballyhoorisky	Donegal	7.8	C 16090 44453	1975	1975	Bedrock at surface-Non calcareous, Blanket peat, Granite till	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	13%	31%
1102	Ballymichael	Arryhearnabin, Balloor, Ballymichael	Donegal	23.38	C 21627 47334	1975	1975	Bedrock at surface-Non calcareous, Blanket peat, Granite till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	15%	31%
1104	Ardmalin	Ardmalin	Donegal	3.94	C 38948 58230	2012	2012	Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	11%	38%
1105	Carrickabraghy	Carrickabraghy	Donegal	4.95	C 40450 52457	2012	2012	Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	11%	38%
1107	Errarooley More	Errarooley More	Donegal	19.88	B 96759 35635	1090	1090	Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	17%	46%
1109	Knockfolia	Knockfolia, Brinlack	Donegal	8.05	B 81273 33657			Bedrock at surface-Non calcareous, Blanket peat, Granite till, Raised beach sands and gravels	Beach sand and gravels, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	38%
1110	Bamba's Crown	Ardmalin	Donegal	6.56	C 40092 59489	2012	2012	Bedrock at surface-Non calcareous, Metamorphic till, Raised beach sands and gravels	Beach sand and gravels, Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	8%	31%
1111	Culoort	Culoort	Donegal	2.44	C 41925 54940			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	6%	23%
1112	Lenan	Lenan	Donegal	18.08	C 30089 44310	2012	2012	Bedrock at surface-Non calcareous, Granite till, Quartzite till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	31%
1113	Redford Glebe	Redford Glebe, Culdaff Glebe	Donegal	2.01	C 55290 49801	2012	2012	Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	11%	38%
1114	Ballycharry	Ballycharry	Donegal	2.8	C 58945 47543	2012	2012	Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	15%	38%
1115	Bredagh Glen	Bredagh Glen, Tiryone	Donegal	11.9	C 58974 42209			Alluvium undifferentiated, Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Lithosols/Regosols, Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	13%	46%
1116	Ballymacmoriarty	Ballyliffin, Ballymacmoriarty, Tullynabrattilly	Donegal	5.53	C 41066 49556	2012	2012	Alluvium undifferentiated, Metamorphic till	Acid Brown Earths/Brown Podzolics, Mineral alluvium, Surface water Gleys/Groundwater Gleys	11%	38%
1117	Glentogher	Carrowmore or Glentogher	Donegal	4.67	C 47813 37621			Alluvium undifferentiated, Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	10%	31%
1118	Ture	Ture	Donegal	5.02	C 46638 29940			Metamorphic till	Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	5%	38%
1120	Kilderry House	Ardmore	Donegal	2.3	C 47422 24793			Alluvium undifferentiated	Mineral alluvium	6%	15%
1121	Greenan Mountain	Speenoge, Moness (ED Burt), Toulett	Donegal	55.81	C 35973 20142			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	12%	38%
1124	Tullyowen	St Johnstown, Tullyowen	Donegal	4.95	C 34770 09175	2067	2301	Alluvium undifferentiated, Metamorphic till	Acid Brown Earths/Brown Podzolics, Mineral alluvium, Surface water Gleys/Groundwater Gleys	7%	31%
1126	Claragh	Claragh, Ards Big	Donegal	7.68	C 20341 20059	1162	2176	Alluvium undifferentiated, Metamorphic till	Mineral alluvium, Surface water Gleys/Groundwater Gleys	8%	23%
1128	Doon Glebe	Doon Glebe, Tullygay	Donegal	16.47	C 12317 10343			Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	7%	31%
1130	Ballyconnelly	Ballyconnelly (ED Glenalla), Longhill (ED Glenalla), Carn High (ED Rathmelton), Ardnaee	Donegal	12.33	C 23990 24572			Blanket peat, Metamorphic till	Blanket Peats, Surface water Gleys/Groundwater Gleys	12%	31%

Appendix 2: Summary information for each of the 203 sites surveyed in 2010

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1133	Meenformal	Meenformal	Donegal	6.74	C 13482 29427			Bedrock at surface-Non calcareous, Blanket peat, Granite till	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	13%	38%
1134	Breaghy Head	Breaghy (ED Ards)	Donegal	17.52	C 05170 37345			Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	54%
1139	Creeve	Creeve Glebe, Creeve (Smith)	Donegal	13.8	C 15885 10527			Alluvium undifferentiated, Metamorphic till	Mineral alluvium, Surface water Gleys/Groundwater Gleys	7%	31%
1140	Roshin	Keeloges (ED Church Hill)	Donegal	3.22	C 08095 15450			Metamorphic till	Surface water Gleys/Groundwater Gleys	7%	23%
1142	Ardachrin	Drumnasharragh, Ardachrin	Donegal	10.86	C 00707 11285			Alluvium undifferentiated, Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Mineral alluvium, Surface water Gleys/Groundwater Gleys	19%	38%
1143	Muntermellán	Muntermellán	Donegal	5.48	C 01454 39071			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	31%
1144	Coolboy Big	Coolboy Big, Bellanascaddan, Coolboy Little, Ellistrin Little	Donegal	21.16	C 16430 16675			Alluvium undifferentiated, Metamorphic till	Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	16%	38%
1145	Drumnaskea	Kimmid, Corlea (ED Pettigoe), Carrickrory, Drumnaskea (ED Pettigoe)	Donegal	22.09	H 09569 67893			Alluvium undifferentiated, Cutover peat, Metamorphic till	Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	13%	38%
1146	Carntressy	Carntressy, Fincashel, Bannus, Mulnagoad	Donegal	23.43	H 07844 66089			Cutover peat, Metamorphic till, Water	Cutaway/cutover peat, Lake (including reservoirs), Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	12%	38%
1147	Inch Level	Inch Level (ED Inch Island)	Donegal	24.9	C 34714 23335	166	2287	Estuarine sediments (silts/clays), Metamorphic till, Water	Acid Brown Earths/Brown Podzolics, Lake (including reservoirs), Marine/ Estuarine sediments, Surface water Gleys/Groundwater Gleys	19%	23%
1148	Carthage	Carthage	Donegal	1.85	C 52530 51317			Metamorphic till	Acid Brown Earths/Brown Podzolics, Surface water Gleys/Groundwater Gleys	10%	23%
1149	Clooneymore	Aghawoney, Grovehall or Newtowngrove, Clooney More	Donegal	15.74	C 17589 22185	1162	2176	Alluvium undifferentiated, Metamorphic till	Mineral alluvium, Surface water Gleys/Groundwater Gleys	15%	31%
1150	Arranmore Island	Sheep Park, Lighthouse Lot, Plughoge And Leabrannagh Mountain North, Illion	Donegal	20.26	B 64358 18385	111	111	Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	13%	15%
1151	Glenveagh Bridge	Derrylahan (ED Cross Roads)	Donegal	0.53	C 04040 23043	2047	2047	Blanket peat	Blanket Peats	7%	8%
1152	Maghera Glebe	Maghera Glebe	Donegal	4.81	B 71482 08821			Bedrock at surface-Non calcareous, Metamorphic till	Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	15%	23%
1155	Cooladerry	Cooladerry (ED Fanad North)	Donegal	2.08	C 20658 45613	1975	1975	Bedrock at surface-Non calcareous, Granite till	Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	9%	23%
1157	Swillybrin	Carrownamaddy (ED Greenasmear), Swillybrin, Kildarragh	Donegal	5.55	C 03118 33107			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	15%	23%
1161	Stroove North	Stroove	Donegal	2.96	C 66080 45425	2012	2012	Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Podzols (Peaty)/Lithosols/Peats	9%	23%
1163	Carrowmore	Carrowmore or Glentogher	Donegal	3.27	C 49045 35740			Blanket peat, Metamorphic till	Blanket Peats, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	11%	31%
1164	Carn	Carn (ED Pettigoe)	Donegal	7.5	H 09074 71990			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	10%	31%
1165	Tory Island	Tory Island	Donegal	67.82	B 84992 46535	193	2259	Bedrock at surface-Non calcareous, Granite till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	16%	54%
1166	Greenary	Greenary	Donegal	6.11	C 05062 25044			Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Lithosols/Regosols	15%	31%
1203	Dooley	Dooley (ED Lettermacaward)	Donegal	7.5	B 75819 03179			Beach sand, Bedrock at surface-Non calcareous, Granite till	Beach sand and gravels, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	12%	23%

Appendix 2: Summary information for each of the 203 sites surveyed in 2010

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1206	Drumaneany	Drumaneany	Donegal	5.52	B 89193 05189			Bedrock at surface-Non calcareous, Blanket peat, Granite till	Blanket Peats, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	10%	46%
1207	Meenmore East	Meenmore East	Donegal	23.12	B 94713 03708			Blanket peat	Blanket Peats	9%	46%
1208	Meenagolan	Bellamore, Montymeane, Meenagolan (ED Fintown), Glashagh More	Donegal	14.23	B 97795 01581		2301	Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	16%	38%
1209	Kingarrow	Kingarrow, Meenadoan	Donegal	7.89	B 96372 05276			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	15%	31%
1210	Meenatinny	Meenatinny	Donegal	16.43	B 98249 06479			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	38%
1211	Cark	Cark, Meentycat, Culliagh	Donegal	7.74	C 08407 03568			Alluvium undifferentiated, Blanket peat, Metamorphic till	Blanket Peats, Mineral alluvium, Surface water Gleys/Groundwater Gleys	6%	46%
1212	Drumanaught	Drumanaught, Killymasny	Donegal	13.62	C 10424 08883			Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	8%	31%
1219	Carrickbrack	Carrickbrack (Raphoe South By), Findrum	Donegal	6.1	C 21715 00341			Metamorphic till	Acid Brown Earths/Brown Podzolics, Surface water Gleys/Groundwater Gleys	6%	31%
1224	Garvan	Garvan, Kilrean	Donegal	25.3	H 01802 97423			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	9%	38%
1225	Croaghubrid	Croaghubrid	Donegal	2.92	G 91353 93112			Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Podzols (Peaty)/Lithosols/Peats	7%	8%
1227	Maas	Maas	Donegal	7.35	G 76416 98340			Bedrock at surface-Non calcareous, Granite till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	11%	31%
1229	Lackagh	Lackagh	Donegal	41.66	G 68611 99279	197	197	Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	16%	38%
1230	Drumboghill	Drumboghill	Donegal	33.01	G 68025 97597	197	197	Bedrock at surface-Non calcareous, Blanket peat, Water	Blanket Peats, Lake (including reservoirs), Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	14%	31%
1232	Cloghboy	Drumirrin, Cloghboy	Donegal	51.9	G 65735 92757	190	190	Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	20%	62%
1233	Maghera	Maghera	Donegal	7.78	G 65531 89967	190	190	Alluvium undifferentiated, Metamorphic till	Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	13%	31%
1235	Malin Beg	Malin Beg	Donegal	3.19	G 49166 79933	189	189	Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	12%	46%
1236	Malinmore	Malinmore	Donegal	0.66	G 49239 82703	189	189	Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	10%	23%
1237	Doonalt	Doonalt	Donegal	14.43	G 51113 84675	190	190	Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	23%
1238	Beefan	Beefan, Ballard	Donegal	2.44	G 52251 85825			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Podzols (Peaty)/Lithosols/Peats	13%	38%
1241	Crowkeeragh	Crowkeeragh, Coguish	Donegal	1.99	G 64073 81102	1938		Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Lithosols/Regosols	8%	8%
1242	Crowlar	Crowlar	Donegal	1.4	G 64797 84358			Blanket peat, Metamorphic till	Blanket Peats, Surface water Gleys/Groundwater Gleys	11%	46%
1243	Glengesh	Glengesh	Donegal	19.98	G 69847 87417			Bedrock at surface-Non calcareous, Metamorphic till	Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	23%
1244	Meentadun	Roechrow (ED Tieveskeelta), Meentadun, Tieveskeelta	Donegal	3.43	G 70569 84389			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	11%	23%
1245	Carricknamoghil	Carricknamoghil	Donegal	7.87	G 72714 80524			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	11%	31%

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Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1247	Ardinawark	Tawnawully Mountains, Friarsbush, Ardinawark	Donegal	8.07	H 01444 84480			Granite till, Metamorphic till	Acid Brown Earths/Brown Podzolics, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	9%	38%
1248	Rossnowlagh Lower	Durnesh, Rossnowlagh Lower	Donegal	45.22	G 86231 68796		138	Alluvium undifferentiated, Beach sand, Blown sand, Sandstone and shales till (Devonian/Carboniferous), Tidal marsh	Acid Brown Earths/Brown Podzolics, Aeolian undifferentiated, Beach sand and gravels, Marine/ Estuarine sediments, Mineral alluvium, Peaty Gleys , Surface water Gleys/Groundwater Gleys	27%	62%
1249	Drumhome	Drumhome, Birra, Foyagh, Dromore (ED Ballintra), Glasbolie	Donegal	13.61	G 89306 68635	138	138	Alluvium undifferentiated, Cutover peat, Metamorphic till, Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium, Peaty Gleys , Surface water Gleys/Groundwater Gleys	19%	31%
1250	St. John's Point	Point (ED Dunkineely)	Donegal	70.08	G 71332 69859	191	191	Bedrock at surface-Calcareous, Bedrock at surface-Non calcareous, Cutover peat, Sandstone and shales till (Devonian/Carboniferous)	Cutaway/cutover peat, Lithosols/Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	26%	31%
1251	Friary	Friary, Lough Eske	Donegal	20.31	G 96279 84130	163	163	Bedrock at surface-Calcareous, Metamorphic till, Water	Acid Brown Earths/Brown Podzolics, Lake (including reservoirs), Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	13%	15%
1252	Roes	Roes, Edenamuck, Drumnaheark East, Drumnaheark West	Donegal	36.29	G 86532 81727			Blanket peat, Sandstone and shales till (Devonian/Carboniferous)	Blanket Peats, Peaty Gleys , Surface water Gleys/Groundwater Gleys	15%	15%
1253	Heneys	Heneys, Altlow, Loughesk Demesne	Donegal	5.9	G 95192 82127			Metamorphic till	Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	13%	23%
1254	Clogher	Corveen (ED Clogher), Drumnagahan, Finnabanes, Clogher, Birchhill	Donegal	12.73	G 98103 81223		163	Cutover peat, Metamorphic till	Cutaway/cutover peat, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	23%
1256	Rahanlacky	Rahanlacky, Crumlin (ED Inver), Tiededooly	Donegal	11.05	G 78577 80858			Alluvium undifferentiated, Blanket peat, Metamorphic till, Sandstone and shales till (Devonian/Carboniferous)	Blanket Peats, Mineral alluvium, Surface water Gleys/Groundwater Gleys	13%	8%
1257	Tawnygorm	Meenawullaghan, Tawnygorm, Carrakeel, Drummeenagh (ED Inver)	Donegal	23.92	G 79305 78179			Alluvium undifferentiated, Sandstone and shales till (Devonian/Carboniferous)	Mineral alluvium, Peaty Gleys , Surface water Gleys/Groundwater Gleys	16%	23%
1258	Glencoagh	Glencoagh	Donegal	1.34	G 88010 78576			Sandstone and shales till (Devonian/Carboniferous)	Surface water Gleys/Groundwater Gleys	10%	23%
1259	Hall Demesne	Hall Demesne	Donegal	11.82	G 87394 76486			Alluvium undifferentiated, Beach sand, Sandstone and shales till (Devonian/Carboniferous)	Beach sand and gravels, Mineral alluvium, Surface water Gleys/Groundwater Gleys	11%	38%
1260	Dromore	Drumgorman Barr, Dromore (ED Mountcharles), Drumcoe	Donegal	11.87	G 85107 76934			Cutover peat, Sandstone and shales till (Devonian/Carboniferous)	Cutaway/cutover peat, Peaty Gleys , Surface water Gleys/Groundwater Gleys	14%	31%
1263	Magheracar	Magheracar	Donegal	17.27	G 80798 58144	428	428	Alluvium undifferentiated, Cutover peat, Shales and sandstones till (Namurian/Carboniferous)	Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	16%	31%
1265	Creevy	Creevy, Ballymacaward	Donegal	35.49	G 85605 63649			Alluvium undifferentiated, Bedrock at surface-Calcareous, Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Peats, Lithosols/Regosols, Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	15%	38%
1266	Legaltan	Cashellackan, Legaltan, Cowpark, Abbeylands, Spaddan	Donegal	43.4	G 87282 63524			Bedrock at surface-Calcareous, Metamorphic till	Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	18%	31%
1267	Tullyhorky	Tullyhorky	Donegal	3.67	G 90728 63533			Metamorphic till	Surface water Gleys/Groundwater Gleys	13%	31%
1268	Cavangarden	Tober (ED Cavangarden), Carricknahorna	Donegal	19.96	G 99005 65679	1992	1992	Blanket peat, Metamorphic till, Water	Blanket Peats, Lake (including reservoirs), Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	9%	38%
1269	Carricknahorna	Carricknahorna	Donegal	1.66	G 96259 65674			Metamorphic till	Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	11%	15%
1270	Cashelard	Cashelard, Carricknahorna	Donegal	16.46	G 94029 64341			Bedrock at surface-Calcareous, Blanket peat, Cutover peat, Metamorphic till	Blanket Peats, Cutaway/cutover peat, Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	20%	46%

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1271	Tievemore	Tievemore	Donegal	12.75	H 14537 72102			Blanket peat, Metamorphic till	Blanket Peats, Surface water Gleys/Groundwater Gleys	11%	31%
1272	Garvanagh	Ballynacarrick (ED Ballintra), Garvanagh, Ballymagrorty Scotch	Donegal	49.04	G 93371 66911	2068		Bedrock at surface-Calcareous, Blanket peat, Cutover peat, Lake sediments undifferentiated, Limestone till (Carboniferous), Metamorphic till, Water	Blanket Peats, Cutaway/cutover peat, Lacustrine-type soils, Lake (including reservoirs), Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	24%	46%
1275	Meenavanaghan or Greaghs Barr	Meenacargagh or Raneany Barr, Meenavanaghan or Greaghs Barr, Ardbane or Laghy Barr	Donegal	8.87	G 99067 74861			Bedrock at surface-Non calcareous, Blanket peat, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	12%	23%
1276	Carntullagh	Carntullagh	Donegal	9.44	G 72186 74807			Bedrock at surface-Non calcareous, Metamorphic till	Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	12%	31%
1277	Sallywood	Sallywood	Donegal	2.38	H 16633 91141			Metamorphic till	Acid Brown Earths/Brown Podzolics, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	9%	23%
1278	Gortnagrace	Gortnagrace	Donegal	13.76	H 26534 90269			Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	9%	15%
1279	Donaghmore Glebe	Donaghmore Glebe, Grahamsland	Donegal	5.21	H 25135 94854		2301	Alluvium undifferentiated, Metamorphic till	Mineral alluvium, Surface water Gleys/Groundwater Gleys	6%	46%
1280	Meenagran	Meenagran, Ballymacahil, Killin (ED Bonnyglen), Tullycumber	Donegal	12.75	G 84496 82893			Alluvium undifferentiated, Blanket peat, Metamorphic till	Blanket Peats, Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	10%	23%
1281	Tamur	Meenabraddan, Tamur (ED Bonnyglen)	Donegal	5.9	G 79834 85268			Blanket peat, Metamorphic till	Blanket Peats, Surface water Gleys/Groundwater Gleys	8%	15%
1282	Coolcholly	Tullymore, Crockacapple, Coolcholly	Donegal	15.22	G 88779 62978			Alluvium undifferentiated, Cutover peat, Metamorphic till	Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	16%	31%
1283	Ballynacarrick	Ballynacarrick (ED Ballintra), Rockhill (ED Cavangarden)	Donegal	1.61	G 93072 68457	115	115	Bedrock at surface-Calcareous	Lithosols/Peats, Renzinas/Lithosols	14%	23%
1284	Drumnagroagh	Tully (ED Carrickboy), Drumnagroagh	Donegal	6.38	G 88947 59935			Bedrock at surface-Calcareous	Renzinas/Lithosols	14%	23%
1285	Tober	Tober (ED Cavangarden), Carricknahorna	Donegal	24.89	G 94376 66396			Bedrock at surface-Calcareous, Lake sediments undifferentiated, Metamorphic till	Lacustrine-type soils, Lithosols/Peats, Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	18%	31%
1286	Mullyvea	Mullyvea, Summy	Donegal	8.83	G 69464 96206	197	197	Bedrock at surface-Non calcareous, Metamorphic till, Water	Acid Brown Earths/Brown Podzolics, Lake (including reservoirs), Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	14%	23%
1287	Summy	Lackaweer, Sandfield	Donegal	9.24	G 70643 95937	197	197	Bedrock at surface-Non calcareous, Blanket peat	Blanket Peats, Podzols (Peaty)/Lithosols/Peats	14%	15%
1300	Glenasmole Valley	Allagour, Ballymorefinn, Glassamucky, Glassamucky Brakes, Glassavullaun, Cunard, Castlekelly	Dublin	45	O 08988 22462	1209	1209	Alluvium undifferentiated, Granite sands and gravels, Granite till, Limestone sands and gravels (Carboniferous), Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	28%	23%
1301	Howth Head	Howth	Dublin	2.95	O 29984 38464	202	202	Bedrock at surface-Non calcareous	Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	10%	15%
1302	Ireland's Eye		Dublin	0.55	O 28988 41467	203	2193	Bedrock at surface-Non calcareous	Lithosols/Regosols	8%	8%
1303	Dalkey Island	Dalkey Island	Dublin	5.7	O 27833 26319	1206		Bedrock at surface-Non calcareous	Lithosols/Regosols	6%	15%

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1304	Loughshinny Coast	Ballustree, Drumanagh, Rush, Lane	Dublin	19.59	O 27224 56171	2000		Bedrock at surface-Calcareous, Bedrock at surface-Non calcareous, Limestone till (Carboniferous), Sandstone and shale sands and gravels (Lower Palaeozoic), Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin	Acid Brown Earths/Brown Podzolics, Grey Brown Podzolics/Brown Earths, Lithosols/Regosols, Renzinas/Lithosols	11%	46%
1305	Ballybrack	Glendoo, Boranaraltry, Ballybrack (ED Glencullen), Tibbradden, Glencullen	Dublin	27.33	O 16176 21001			Alluvium undifferentiated, Bedrock at surface-Non calcareous, Granite sands and gravels, Granite till, Made ground	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Made/Built land, Mineral alluvium, Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	21%	38%
1306	Kilmashogue	Kilmashogue, Tiknock, Stackstown, Tibbradden	Dublin	47.68	O 16059 22931			Bedrock at surface-Non calcareous, Granite till, Limestone sands and gravels (Carboniferous)	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	14%	62%
1307	Balally	Kingstown	Dublin	4.09	O 16933 25351			Bedrock at surface-Non calcareous	Lithosols/Regosols	6%	31%
1309	St. Annes Park	Foxland, Bettyville, Heronstown	Dublin	5.48	O 21854 37028	206	206	Beach sand, Limestone till (Carboniferous)	Beach sand and gravels, Grey Brown Podzolics/Brown Earths, Surface water Gleys/Groundwater Gleys	7%	23%
1311	Baldoyle	Stapolin, Maynetown	Dublin	12.41	O 24017 41119	199	199	Blown sand, Estuarine sediments (silts/clays)	Aeolian undifferentiated, Marine/ Estuarine sediments	10%	23%
1312	Newhaggard	Turvey, Newhaggard, Balleally West	Dublin	17.13	O 20788 51230	208	208	Estuarine sediments (silts/clays), Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Marine/ Estuarine sediments	13%	38%
1313	Malahide Demesne	Mabestown, Malahide Demesne	Dublin	2.6	O 21528 45141			Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths	5%	23%
1314	Ardgillan Demesne	Ardgillan Demesne, Hampton Demesne	Dublin	13.18	O 21379 61029			Alluvium undifferentiated, Bedrock at surface-Non calcareous, Sandstone and shale till (Lower Palaeozoic), Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Mineral alluvium	7%	23%
1315	Phoenix Park	Castleknock, Chapelizod, St. James	Dublin	213.6	O 10417 35120			Alluvium undifferentiated, Bedrock at surface-Calcareous, Limestone sands and gravels (Carboniferous), Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	21%	23%
1316	Shanganagh Park	Shanganagh, Cork Little	Dublin	10.46	O 25889 21206			Limestone sands and gravels (Carboniferous), Made ground	Made/Built land, Renzinas/Lithosols	6%	23%
1318	Bog of Ring	Ring Commons (1st Division), Ring Commons, Haystown (ED Balcaddan)	Dublin	19.82	O 17783 60251	1204		Lake sediments undifferentiated, Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin	Lacustrine-type soils, Surface water Gleys/Groundwater Gleys	7%	38%
1320	Waterstone Park	Palmerston Lower	Dublin	21.76	O 08494 35618	128		Alluvium undifferentiated, Bedrock at surface-Calcareous, Limestone sands and gravels (Carboniferous), Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Mineral alluvium, Renzinas/Lithosols	10%	23%
1321	Ashtown Royal Canal	Ashtown	Dublin	1.12	O 10402 37499	2103		Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Surface water Gleys/Groundwater Gleys	11%	23%
1322	Slade of Saggart	Glenaraneen, Raheen	Dublin	2.49	O 03280 22998	211		Alluvium undifferentiated, Lake sediments undifferentiated, Limestone sands and gravels (Carboniferous)	Lacustrine-type soils, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow)	12%	15%
1323	Portraine	Portraine, Portraine Demesne	Dublin	18.6	O 24412 50707			Alluvium undifferentiated, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Mineral alluvium, Surface water Gleys/Groundwater Gleys	8%	23%
1324	Newbridge Demesne	Newbridge Demesne	Dublin	40.18	O 21619 49600			Alluvium undifferentiated, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Mineral alluvium, Surface water Gleys/Groundwater Gleys	24%	31%
1325	Baldonnel	Kilmactalway, Blundelstown, Kilbride, Baldonnel Upper, Brownsbarn, Moneen Alion, Collegeland	Dublin	195.27	O 02737 28932			Bedrock at surface-Calcareous, Limestone till (Carboniferous), Made ground	Grey Brown Podzolics/Brown Earths, Made/Built land, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	17%	46%

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1326	Ballymorefinn	Ballymorefinn	Dublin	13.08	O 08835 21645			Bedrock at surface-Non calcareous, Sandstone and shale till (Lower Palaeozoic), Scree	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Peaty Gleys , Scree, Surface water Gleys/Groundwater Gleys	12%	23%
1327	Bohernabreena	Bohernabreena	Dublin	0.73	O 09493 25376			Limestone sands and gravels (Carboniferous)	Renzinas/Lithosols	12%	31%
1328	Hell Fire Club	Mountpelier, Killakee	Dublin	7.18	O 11676 23793			Bedrock at surface-Non calcareous	Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	6%	15%
1399	Friarstown Meadow	Friarstown Upper, Corraheen	Dublin	1.65	O 09395 23834			Bedrock at surface-Non calcareous, Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols	6%	15%
1400	Curragh	Curragh(ED Kildare), Curragh(ED Ballysax East), Crotanstown, Curraghfarm	Kildare	385.89	N 77920 12314	392		Lake sediments undifferentiated, Limestone sands and gravels (Carboniferous), Made ground	Lacustrine-type soils, Made/Built land, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow)	20%	38%
1401	Little Curragh	Curragh(ED Kildare), Rathbride	Kildare	161.69	N 74845 14082	392		Limestone sands and gravels (Carboniferous), Sandstone till (Lower Palaeozoic/Devonian)	Acid Brown Earths/Brown Podzolics, Peaty Gleys (shallow), Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow)	23%	31%
1402	Dunlavin Marshes	Gilbinstown, Usk, Killinane	Kildare	15.26	N 84471 02786	1772		Alluvium undifferentiated, Basic Esker sands and gravels, Cutover peat, Limestone sands and gravels (Carboniferous), Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	18%	38%
1404	Ballyhagan	Clonkeen, Ballyhagan	Kildare	4.25	N 67963 31643			Cutover peat	Cutaway/cutover peat	9%	31%
1405	Killhill	Boherphilip, Killhill, Rathgorragh, Hartwell Lower	Kildare	21.48	N 95101 22766			Alluvium undifferentiated, Bedrock at surface-Non calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Lithosols/Regosols, Mineral alluvium	13%	46%
1406	Blacktrench	Lattensbog, Blacktrench, Clongorey, Newhall(ED Oldconnell), Derreens	Kildare	33.22	N 80922 20372			Cutover peat, Limestone till (Carboniferous)	Cutaway/cutover peat, Peaty Gleys, Surface water Gleys/Groundwater Gleys	14%	46%
1407	Moods	Moods, Mylerstown(Connell By)	Kildare	1.88	N 80445 25122	2104		Cutover peat	Cutaway/cutover peat	10%	15%
1408	Punchers Grange	Punchersgrange, Christianstown, Pluckerstown(Offaly East By)	Kildare	22.55	N 74329 20561			Cutover peat, Limestone till (Carboniferous)	Cutaway/cutover peat, Peaty Gleys	15%	38%
1409	Grange Common	Grangecommon(Offaly East By), Grangecommon(Connell By), Punchersgrange	Kildare	6.2	N 72587 17963			Bedrock at surface-Non calcareous	Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	5%	15%
1410	Rathangan	Rathangan, Kilmoney North, Inchanearl, Drinnanstown North, Glenaree, Cloncurry(Offaly East By)	Kildare	14.26	N 68629 19895	2104		Alluvium undifferentiated, Cutover peat	Cutaway/cutover peat, Mineral alluvium	14%	31%
1411	Ardree	Ardree, Coneyburrow(Reban West)	Kildare	8.42	S 68520 92676		2162	Alluvium undifferentiated	Mineral alluvium	8%	15%
1412	Knockaulin	Knockaulin	Kildare	12.04	N 82046 07877			Bedrock at surface-Non calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Lithosols/Regosols	7%	23%
1414	Bishopslane	Bishopslane(Naas South By)	Kildare	4.31	N 93660 08798			Bedrock at surface-Non calcareous, Lake sediments undifferentiated, Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Lacustrine-type soils, Lithosols/Regosols	13%	23%
1415	Bishopshill Commons	Bishopshill Commons, Barretstown, Ballymore Eustace East	Kildare	2.78	N 94694 11560			Bedrock at surface-Non calcareous, Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Podzols (Peaty)/Lithosols/Peats	6%	23%
1416	Ballysax Great	Ballysax Great	Kildare	6	N 79360 08950			Basic Esker sands and gravels, Limestone sands and gravels (Carboniferous)	Peaty Gleys (shallow), Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow)	7%	31%
1417	Dunshane Common	Harristown Common, Mullacash South, Stephenstown South	Kildare	31.3	N 87873 12829			Limestone sands and gravels (Carboniferous), Limestone till (Carboniferous), Marl (Shell)	Grey Brown Podzolics/Brown Earths, Marl type soils, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	17%	23%
1418	Lullymore West	Lullymore West	Kildare	1.97	N 69804 25840			Cutover peat	Cutaway/cutover peat	16%	15%

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1420	Cupidstownhill	Cupidstownhill	Kildare	24.19	N 00301 20553			Bedrock at surface-Non calcareous, Limestone sands and gravels (Carboniferous), Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Peaty Gleys , Peaty Gleys (shallow), Podzols (Peaty)/Lithosols/Peats, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	9%	15%
1422	Crohane	Crohanree	Kildare	20.34	S 62655 97813			Alluvium undifferentiated, Cutover peat, Limestone till (Carboniferous)	Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	15%	23%
1423	Carrick Hill	Carrick(Carbury By)	Kildare	1.23	N 63433 37198			Bedrock at surface-Calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Renzinas/Lithosols	9%	23%
1498	Derryoughter East	Cush, Cloney, Derryoughter East	Kildare	13	N 65723 02532			Cutover peat	Cutaway/cutover peat	14%	23%
1499	Castletown House	Castletown	Kildare	31.08	N 98298 34046			Alluvium undifferentiated, Bedrock at surface-Calcareous, Limestone till (Carboniferous), Made ground	Grey Brown Podzolics/Brown Earths, Made/Built land, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	10%	15%
1500	Mullaghmore	Mullaghmore (Carbury Barony)	Sligo	15.05	G 70686 55515	625	625	Beach sand, Fen peat	Beach sand and gravels, Fen peat	15%	8%
1501	Knocknarea	Knocknarea South, Grange North, Rathcarrick, Culleenduff, Grange West, Knocknarea North, Cullenamore, Carrowbunnaun, Carrowdough	Sligo	38.32	G 62523 33857	1670		Bedrock at surface-Calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Lithosols/Peats, Renzinas/Lithosols	21%	23%
1502	Edenbaum	Edenbaun, Glackbaun	Sligo	45.32	G 75108 39768	2435		Bedrock at surface-Calcareous, Blanket peat, Scree, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Blanket Peats, Peaty Gleys , Renzinas/Lithosols, Scree, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	27%	23%
1503	Ballyconnell	Ballyconnell, Ballineden, Cloonagh (Carbury Barony)	Sligo	26.58	G 56146 45524	627	627	Beach sand, Bedrock at surface-Calcareous, Cutover peat, Lake sediments undifferentiated, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Beach sand and gravels, Cutaway/cutover peat, Lacustrine-type soils, Peaty Gleys , Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	15%	38%
1507	Rockfinlough	Carrownagleragh, Rockfinlough, Finlough, Rathgran	Sligo	19.1	G 60644 21651	1907		Alluvium undifferentiated, Cutover peat, Fen peat, Limestone till (Carboniferous), Shales and sandstones till (Namurian), Water	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Fen peat, Grey Brown Podzolics/Brown Earths, Lake (including reservoirs), Mineral alluvium, Surface water Gleys/Groundwater Gleys	18%	38%
1508	Clooncunny	Clooncunny (Coolavin Barony)	Sligo	45.39	M 70330 98733	587		Cutover peat, Sandstone till (Devonian), Water	Cutaway/cutover peat, Lake (including reservoirs), Peaty Gleys , Surface water Gleys/Groundwater Gleys	17%	46%
1509	Derrybeg	Derrybeg, Rathtinaun, Emlagh (Coolavin Barony), Lisselough	Sligo	58.79	G 73586 00639	587		Cutover peat, Sandstone till (Devonian), Water	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Lake (including reservoirs), Surface water Gleys/Groundwater Gleys	19%	54%
1510	Carrownabinna	Carrownabinna or Ballymeeny (Hillas), Doonaltan, Killeenduff (Tireragh Barony), Alternan Park	Sligo	19.65	G 41189 37119			Alluvium undifferentiated, Bedrock at surface-Calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	31%
1511	Tawnatruffan	Tawnamore, Letterunshin, Tawnatruffaun	Sligo	17.6	G 39126 27208			Alluvium undifferentiated, Blanket peat, Metamorphic till	Blanket Peats, Mineral alluvium, Peaty Gleys , Surface water Gleys/Groundwater Gleys	15%	54%
1512	Portinch	Portinch, Emlaghmaghtan, Kilbrattan, The Island, Cartron (Percival), Cartronroe (Corran Barony), Cartron (Phibbs)	Sligo	59.16	G 63424 17220	636	636	Cutover peat, Limestone till (Carboniferous), Water	Cutaway/cutover peat, Grey Brown Podzolics/Brown Earths, Lake (including reservoirs), Surface water Gleys/Groundwater Gleys	21%	77%
1513	Farranyharpy	Farranyharpy, Skreen More, Carrowculleen	Sligo	23.28	G 52195 32448			Bedrock at surface-Calcareous, Blanket peat, Limestone till (Carboniferous), Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Grey Brown Podzolics/Brown Earths, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	38%
1514	Doon	Annaghmore (Coolavin Barony), Doon, Monasterredan	Sligo	18.39	G 63776 02575			Acidic Esker sands and gravels, Cutover peat, Sandstone till (Devonian/Carboniferous)	Cutaway/cutover peat, Lithosols/Regosols, Surface water Gleys/Groundwater Gleys	14%	38%

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Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1515	Eskragh	Eskragh, Carrownagappul, Rue	Sligo	17.15	G 49037 09722			Basic Esker sands and gravels, Cutover peat, Limestone sands and gravels (Carboniferous), Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Renzinas/Lithosols	15%	54%
1516	Carrownyclovan	Carrownadargny, Tap, Carrownagilty, Carrownyclovan, Carrowmore (Tirerrill Barony)	Sligo	39.05	G 81683 20658			Bedrock at surface-Calcareous, Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	12%	54%
1517	Doonaveeragh	Carrowkeel (ED Templevanny), Cloghoge Lower, Mullaghfarna, Whitehill (ED Aghanagh), Doonaveeragh	Sligo	63.79	G 75679 13002	1656	1656	Bedrock at surface-Calcareous, Limestone till (Carboniferous), Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics, Grey Brown Podzolics/Brown Earths, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	38%
1518	Treanmacmurtagh	Lisdoogan, Treanmacmurtagh, Bricklieve, Drumcormick	Sligo	49.06	G 73253 13446	1656	1656	Alluvium undifferentiated, Bedrock at surface-Calcareous, Blanket peat, Cutover peat, Limestone sands and gravels (Carboniferous), Shales and sandstones till (Namurian), Water	Acid Brown Earths/Brown Podzolics, Blanket Peats, Cutaway/cutover peat, Lake (including reservoirs), Mineral alluvium, Peaty Gleys , Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	54%
1519	Greenan	Treanmore (Corran Barony), Murhy, Greenan, Treanmacmurtagh, Tully (Corran Barony)	Sligo	58.74	G 72269 10993	1656	1656	Alluvium undifferentiated, Bedrock at surface-Calcareous, Fen peat, Lake sediments undifferentiated, Limestone till (Carboniferous), Sandstone till (Devonian), Water	Acid Brown Earths/Brown Podzolics, Fen peat, Grey Brown Podzolics/Brown Earths, Lacustrine-type soils, Lake (including reservoirs), Mineral alluvium, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	15%
1523	Annagh Beg	Annagh Beg, Kilmananagh, Annagh Beg (Part Of)	Sligo	46.07	G 65520 25441		1898	Alluvium undifferentiated, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Mineral alluvium, Surface water Gleys/Groundwater Gleys	18%	62%
1524	Cooperhill	Cooperhill, Ardneaskan, Coolbock, Murillyroe	Sligo	11.07	G 71864 21045	1898	1898	Alluvium undifferentiated, Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium	15%	31%
1525	Ardkeeran	Cooperhill, Ardculmer, Ardkeeran (Tirerrill Barony)	Sligo	48.8	G 73591 20695	1898	1898	Alluvium undifferentiated, Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	20%	38%
1526	Reask	Reask, Lisgullaun, Ardmoyle	Sligo	36.32	M 76062 99129			Cutover peat, Limestone till (Carboniferous), Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Grey Brown Podzolics/Brown Earths, Surface water Gleys/Groundwater Gleys	11%	31%
1527	Castlegal	Castlegal (ED Glencar), Lugatober	Sligo	26.23	G 72387 40903	2435		Bedrock at surface-Calcareous, Bedrock at surface-Non calcareous, Blanket peat, Scree, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Peats, Lithosols/Regosols, Renzinas/Lithosols, Scree, Surface water Gleys/Groundwater Gleys	21%	23%
1528	Kintogher	Kintogher	Sligo	31.23	G 67718 41018	627	627	Alluvium undifferentiated, Bedrock at surface-Calcareous, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	14%	31%
1529	Rosses Point	Rosses Upper, Ballyweelin, Rosses Lower	Sligo	16.38	G 63541 40509	627	627	Bedrock at surface-Calcareous, Bedrock at surface-Non calcareous, Blown sand, Lake sediments undifferentiated, Limestone till (Carboniferous), Made ground, Metamorphic till, Water	Acid Brown Earths/Brown Podzolics, Aeolian undifferentiated, Grey Brown Podzolics/Brown Earths, Lacustrine-type soils, Lake (including reservoirs), Lithosols/Regosols, Made/Built land, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	21%	31%
1530	Corsallagh	Corsallagh, Doomore (Leyny Barony)	Sligo	10.28	G 50401 14496			Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Peaty Gleys , Surface water Gleys/Groundwater Gleys	16%	38%
1531	Knocknashee	Carrowmore (Leyny Barony), Knocknashee Common, Lavagh (Leyny Barony), Carrownaworan, Belra, Cashel North, Gortnadrass	Sligo	60.66	G 55518 18995			Bedrock at surface-Calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	23%

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Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1532	Formoyle	Formoyle	Sligo	24.42	G 74976 38057			Bedrock at surface-Calcareous, Blanket peat, Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Blanket Peats, Cutaway/cutover peat, Lithosols/Peats, Peaty Gleys , Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	22%	31%
1534	Rooghan	Ballynakill, Rooghan	Sligo	8.94	G 77722 22901			Blanket peat, Shales and sandstones till (Namurian)	Blanket Peats, Surface water Gleys/Groundwater Gleys	9%	38%
1535	Carrigans Upper	Carrigans Upper, Derroon	Sligo	49.23	G 66680 17396			Alluvium undifferentiated, Bedrock at surface-Calcareous, Shales and sandstones till (Namurian), Water	Acid Brown Earths/Brown Podzolics, Lake (including reservoirs), Mineral alluvium, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	17%	31%
1537	Cloonaleigha	Cloonaleigha, Church Hill, Knockalough	Sligo	21.15	G 60588 14152	636	636	Cutover peat, Limestone till (Carboniferous), Water	Cutaway/cutover peat, Grey Brown Podzolics/Brown Earths, Lake (including reservoirs), Surface water Gleys/Groundwater Gleys	20%	38%
1538	Primrosegrange	Grange East, Seafield	Sligo	12.36	G 64151 32944			Bedrock at surface-Calcareous, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	31%
1539	Markree Demesne South	Markree Demesne, Ardcurley, Doorly	Sligo	31.21	G 69192 23966	1898	1898	Alluvium undifferentiated, Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	16%	31%
1540	Markree Demesne North	Markree Demesne, Rathrippin, Ballygrania, Clooneenroe	Sligo	26.96	G 69787 25603	1898	1898	Alluvium undifferentiated, Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium, Surface water Gleys/Groundwater Gleys	15%	46%
1541	Cloonmacduff	Cloonmacduff, Union	Sligo	74.77	G 69466 27003	1898	1898	Alluvium undifferentiated, Bedrock at surface-Calcareous, Bedrock at surface-Non calcareous, Cutover peat, Metamorphic till, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Lithosols/Regosols, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	26%	31%
1544	Cabraghkeel	Cabragh (Tireragh Barony), Cabraghkeel	Sligo	19	G 31417 35919			Alluvium undifferentiated, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Mineral alluvium, Surface water Gleys/Groundwater Gleys	14%	46%
1545	Carns	Carns (Tireragh Barony)	Sligo	14.34	G 35116 26500			Blanket peat, Metamorphic sands and gravels, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Peaty Gleys , Surface water Gleys/Groundwater Gleys	17%	46%
1546	Culdaly	Culdaly	Sligo	25.25	G 35250 09630			Blanket peat, Granite till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Peaty Gleys , Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	21%	46%
1547	Carrowreagh	Kilmacteige, Carrowreagh (Leyny Barony)	Sligo	13.2	G 37981 11573			Blanket peat, Granite till, Metamorphic till	Acid Brown Earths/Brown Podzolics, Blanket Peats, Peaty Gleys , Podzols (Peaty)/Lithosols/Peats, Surface water Gleys/Groundwater Gleys	16%	38%
1548	Mullanfad	Shanrock, Mullanfad	Sligo	52.84	G 74768 50414	623	623	Bedrock at surface-Non calcareous, Blanket peat, Scree, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Blanket Peats, Lithosols/Regosols, Peaty Gleys , Podzols (Peaty)/Lithosols/Peats, Scree, Surface water Gleys/Groundwater Gleys	16%	38%
1549	Curry	Drumbaun, Curry	Sligo	47.79	G 50334 05613		2298	Alluvium undifferentiated, Bedrock at surface-Calcareous, Cutover peat, Sandstone and shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Mineral alluvium, Peaty Gleys , Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	54%
1551	Gortersluin	Gortersluin	Sligo	5.93	G 42534 13828			Bedrock at surface-Non calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Lithosols/Regosols, Surface water Gleys (shallow)/Groundwater Gleys (shallow), Surface water Gleys/Groundwater Gleys	8%	15%
1553	Carrowrush	Carrowrush (ED Easky East), Doonaltan, Carrowmably	Sligo	9.56	G 42619 35255			Bedrock at surface-Calcareous, Blanket peat, Limestone till (Carboniferous)	Blanket Peats, Grey Brown Podzolics/Brown Earths, Renzinas/Lithosols	15%	23%

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Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	Townland name	County	Site Area (ha)	Grid Ref.	NHA/ pNHA	SAC	Parent material	Soil ID	Conservation score	Threat score
1556	Clogher Beg	Clogher Beg, Clogherrevagh, Tully (ED Calry)	Sligo	32.69	G 75356 35757	1976	1976	Bedrock at surface-Calcareous, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	20%	31%
1561	Carrickhawna	Tully (Corran Barony), Carrickhawna, Templevanny	Sligo	22.71	G 74216 09883	1656	1656	Bedrock at surface-Calcareous, Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics, Renzinas/Lithosols	20%	23%
1566	Doonmeegin	Doonmeegin, Ballinvoher (Corran Barony)	Sligo	13.49	G 70228 15221			Bedrock at surface-Calcareous, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Renzinas/Lithosols	16%	31%
1568	Derrysallagh	Derrysallagh, Rover, Crawhill, Knockroe (ED Ballynashee)	Sligo	51.66	G 85851 15810			Alluvium undifferentiated, Shales and sandstones till (Namurian)	Mineral alluvium, Peaty Gleys , Surface water Gleys/Groundwater Gleys	19%	38%
1572	Drumaskibbole	Drumaskibbole	Sligo	2.86	G 69291 30972			Alluvium undifferentiated, Bedrock at surface-Calcareous, Metamorphic till	Acid Brown Earths/Brown Podzolics, Mineral alluvium, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	8%	31%
1573	Ballyconnell South	Ballyconnell, Ballineden	Sligo	6	G 57811 45366	627	627	Cutover peat, Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics, Cutaway/cutover peat, Surface water Gleys/Groundwater Gleys	14%	31%
1575	Annaghbeg	Annaghbeg or Monasterredan	Sligo	10.13	M 67623 97569	587		Cutover peat, Sandstone till (Devonian), Water	Cutaway/cutover peat, Lake (including reservoirs), Peaty Gleys , Surface water Gleys/Groundwater Gleys	17%	31%
1576	Carrowmacbryan	Carrownrush (ED Easkey West), Carrowmacbryan, Lenadon	Sligo	29.55	G 33228 38745			Bedrock at surface-Calcareous, Lake sediments undifferentiated, Limestone till (Carboniferous)	Grey Brown Podzolics/Brown Earths, Lacustrine-type soils, Renzinas/Lithosols, Surface water Gleys/Groundwater Gleys	19%	46%
1577	Gleniff	Gleniff, Oughtagorey	Sligo	19.69	G 73012 47120	623	623	Bedrock at surface-Calcareous, Blanket peat, Scree, Shales and sandstones till (Namurian)	Blanket Peats, Peaty Gleys , Renzinas/Lithosols, Scree, Surface water Gleys/Groundwater Gleys	15%	15%
1579	Cuilmore	Cuilmore	Sligo	18.94	G 62650 05356			Cutover peat, Sandstone till (Devonian/Carboniferous)	Cutaway/cutover peat, Surface water Gleys/Groundwater Gleys	14%	46%

Appendix 3: Field sheets

- General site survey sheet
- Site species sheet
- Relevé sheet
- EU Annex I habitat assessment field sheet for semi-natural grassland
- Negative and positive impacts on EU Annex I habitats

BEC Consultants – Grassland Survey 2010

Site ID:	Adjacent Habitats (✓)			Fossitt Grassland within Site ✓	No. relevés:
Ecologist ID:	FL		WN	GM1 Freshwater marsh	No. assessments:
Date:	FW		WD	GS1 Dry calcareous & neutral	General Site Notes
	FP		WS	GS2 Dry meadows & grass verges	
Site Geography ✓	FS		WL	GS3 Dry-humid grassland	
Seasonal flooding	GA		BC	GS4 Wet grassland	
Esker	GS		BL	GSi: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4	
Drumlin	GM		ER		
Hill	HH		ED	EU Annex I Habitats ✓	
Valley	HD		Limestone pavement	6130 Calaminarian grasslands	
Lakeside	PB		Other	6210 Festuco-Brometalia	
Bogland	PF			6230 Species-rich <i>Nardus</i> grassland	
Lowland plain				6410 <i>Molinia</i> meadows	
Floodplain	Site Management ✓			6430 Hydrophilous tall herb comm.	
Coastal	Cattle pasture			6510 Lowland hay meadows	
Island	Sheep pasture			None	
Other:	Horse pasture				
	Spring grazing: May-Jun			Other Fossitt Habitats in site ✓	
Notable features: ✓	Summer grazing: Jul-Aug			FW2 Lowland river	
Fauna	Autumn grazing: Sep-Nov			FW4 Drainage ditches	
Frogs	Winter grazing: Dec- Apr			HD1 Dense bracken	
Badgers	Mown: May-Jun			PB4 Cutover bog	
Deer	Mown: Jul-Oct			WL1 Hedgerows	
Foxes	Cut once or <1 per year			WL2 Treelines	
Hares	Cut >1 per year			WS1 Scrub	
Otters	Topping			ED3 Recolonising bare ground	
Rabbits	Liming			BL1 Stone walls	
Buzzard	Org. fertilizer application			BL2 Earth banks	
Chough	Non-org fertilizer app.			BL3 Buildings & artificial surfaces	
Corncrake	Unknown fertilizer app.			Other:	
Kestrel	Supplementary feeding				
Anthills	Burning			None	
Marsh fritillary	Other:				
Other:					
None	None				
Archaeological Features	Damaging Operations				
Earthworks	Drainage				
Lazy beds	Dumping				
Ringforts	Adjacent afforestation				
Ruined buildings	Other:				
Prehistoric tomb					
None	None				

Woody		Herbs		Herbs		Herbs		Sedges		Grasses		Mosses		Mosses			Site ID:
Acer pseu		Crep vesi		Odon vern		Succ prat		Care acui		Fest giga		Ambl serp		Spha cusp			
Betu pube		Dact fuch		Orch masc		Tara agg.		Care bine		Fest ovin		Atri undu		Spha palu			Date:
Betu pend		Dact macu		Orch mori		Teuc scor		Care cary		Fest prat		Brac riv		Tham alop			
Call vulg		Dauc caro		Orig vulg		Thal flav		Care dist		Fest rubr		Brac rut		Thui tama			Ecologist ID:
Crat mono		Digi purp		Pedi sylv		Thym poly		Care echi		Glyc flui		Call cord		Tort tort			
Eric cine		Epil hirs		Pers amph		Tori japo		Care elat		Heli pube		Call cusp					Additional species notes:
Eric tetr		Epil obsc		Pers macu		Trif camp		Care flac		Holc lana		Cirr pili		Liverworts			
Fall japo		Epil palu		Peta hybr		Trif dubi		Care hirt		Holc moll		Clim den		Cono coni			
Frax exce		Epil parv		Pilo offi		Trif prat		Care laev		Koel macr		Cryp hete		Loph bide			
Hede heli		Euph offi		Pimp saxi		Trif repe		Care nigr		Loli pere		Cten moll		Marc mach			
Loni peri		Fili ulma		Plan lanc		Trig palu		Care oval		Meli unif		Dicr maju		Metz frut			
Myri gale		Gali apar		Plan majo		Tuss farf		Care pane		Moli caer		Dicr scop		Metz furc			
Prun spin		Gali palu		Poly vulg		Urti dioi		Care pnlt		Nard stri		Eurh stri		Pell endi			
Rosa arve		Gali saxa		Pote angl		Vale offi		Care pend		Phal arun		Fiss adia		Pell epip			
Rosa cani		Gali ulig		Pote anse		Vero becc		Care puli		Phle prat		Fiss bryo		Plag aspl			
Rubu frut		Gali veru		Pote errec		Vero cham		Care remo		Phra aust		Fiss taxi		Plag pore			
Sola dulc		Gent amar		Pote palu		Vero mont		Care rost		Poa annu		Font anti		Scap grac			
Ulex euro		Gera robe		Pote rept		Vero offi		Care stri		Poa nemo		Homa lute		Scap nemo			
Ulex gali		Gymn cono		Pote ster		Vero serp		Care sylv		Poa prat		Homa seri		Scap undu			
Vacc myrt		Hydr vulg		Prim veri		Vici crac		Care vesi		Poa triv		Hook luce					
		Hera spho		Prim vulg		Vici sepi		Care viri		Sesl caer		Hylo brev		Other sp. (write names in full)		Other sp.	
		Hype perf		Prun vulg		Viol palu		Eleo palu		Tris flav		Hylo sple					
Herbs		Hype pulc		Ranu acris		Viol reic		Scho nigr				Hyoc armo					
Achi mill		Hype tetr		Ranu bulb		Viol rivi						Hypn cupr					
Achi ptar		Hypo radi		Ranu flam		Viol sp.						Hypn jutl					
Ajug rept		Iris pseu		Ranu repe				Grasses		Horsetails		Hypn lacu					
Anac pyra		Knau arve		Rhin mino				Agro cani		Equi arve		Isop eleg					
Anag arve		Laps comm		R. acetosa		Rushes		Agro capi		Equi fluv		Isot alop					
Ange sylv		Lath lini		R. acetose		Junc acut		Agro stol		Equi palu		Kind prae					
Anth sylv		Lath prat		Rume cris		Junc arti		Alop geni		Equi sylv		Leuc glau					
Anth vuln		Leon autu		Rume cong		Junc bufo		Alop prat		Equi telm		Mniu horn					
Bell pere		Leuc vulg		Rume obtu		Junc bulb		Anis ster				Oxyn hian					
Blac perf		Linu cath		Sagi proc		Junc cong		Anth odor				Pleu schr					
Calt palu		List ovat		Sang mino		Junc effu		Arrh elat		Ferns		Plth dent					
Camp rotu		Lotu corn		Scut gale		Junc infl		Brac pinn		Aspl tric		Plth undu					
Card flex		Lotu pedu		Sene aqua		Junc squa		Brac sylv		Athy fili		Pmni affi					
Card prat		Lych flos		Sene jaco		Luzu camp		Briz medi		Blec spic		Pmni elli					
Carl vulg		Lysi nemo		Sile dioi		Luzu pilo		Brom errec		Dryo aem		Pmni undu					
Cent nigr		Lysi numm		Sonc aspe		Luzu mult		Brom hord		Dryo affi		Poly comm					
Cera font		Lysi vulg		Sonc oler		Luzu sylv		Brom ramo		Dryo cart		Poly form					
Cirs arve		Lyth sali		Stac palu				Cyno cris		Dryo dila		Pseu puru					
Cirs diss		Medi lupu		Stac sylv				Dact glom		Dryo fili		Rhiz punc					
Cirs palu		Ment aqua		Stel gram				Dant decu		Ophi vulg		Rhyn ripa					
Cirs vulg		Meny trif		Stel holo				Desc cesp		Osmu rega		Rhyt lore					
Cono maju		Myos disc		Stel medi				Desc flex		Phly scol		Rhyt squa					
Crep capi		Myos laxa		Stel palu				Fest alti		Poly seti		Rhyt triq					
Crep palu		Myos scor		Stel ulig				Fest arun		Pter aqui		Spha capi					

Woody		Herbs		Herbs		Herbs		Sedges		Grasses		Mosses		Mosses		Site ID:	
Acer pseu		Crep vesi		Odon vern		Succ prat		Care acui		Fest giga		Ambl serp		Spha cusp		Relevé ID:	
Betu pube		Dact fuch		Orch masc		Tara agg.		Care bine		Fest ovin		Atri undu		Spha palu		Ecologist ID:	
Betu pend		Dact macu		Orch mori		Teuc scor		Care cary		Fest prat		Brac riv		Tham alop		Date:	
Call vulg		Dauc caro		Orig vulg		Thal flav		Care dist		Fest rubr		Brac rut		Thui tama		Grid Ref:	±
Crat mono		Digi purp		Pedi sylv		Thym poly		Care echi		Glyc flui		Call cord		Tort tort		Fossitt habitat:	
Eric cine		Epil hirs		Pers amph		Tori japo		Care elat		Heli pube		Call cusp				EU Annex I habitat:	
Eric tetr		Epil obsc		Pers macu		Trif camp		Care flac		Holc lana		Cirr pili		Liverworts		Annex I assessment stop no:	
Fall japo		Epil palu		Peta hybr		Trif dubi		Care hirt		Holc moll		Clim den		Cono coni			
Frax exce		Epil parv		Pilo offi		Trif prat		Care laev		Koel macr		Cryp hete		Loph bide		Topography:	
Hede heli		Euph offi		Pimp saxi		Trif repe		Care nigr		Loli pere		Cten moll		Marc mach		Aspect:	
Loni peri		Fili ulma		Plan lanc		Trig palu		Care oval		Meli unif		Trig maju		Metz frut		Slope:	
Myri gale		Gali apar		Plan majo		Tuss farf		Care pane		Moli caer		Dicr scop		Metz furc		Soil ID:	
Prun spin		Gali palu		Poly vulg		Urti dioi		Care pnlt		Nard stri		Eurh stri		Pell endi		Additional relevé notes:	
Rosa arve		Gali saxa		Pote angl		Vale offi		Care pend		Phal arun		Fiss adia		Pell epip			
Rosa cani		Gali ulig		Pote anse		Vero becc		Care puli		Phle prat		Fiss bryo		Plag aspl			
Rubu frut		Gali veru		Pote errec		Vero cham		Care remo		Phra aust		Fiss taxi		Plag pore			
Sola dulc		Gent amar		Pote palu		Vero mont		Care rost		Poa annu		Font anti		Scap grac			
Ulex euro		Gera robe		Pote rept		Vero offi		Care stri		Poa nemo		Homa lute		Scap nemo			
Ulex gali		Gymn cono		Pote ster		Vero serp		Care sylv		Poa prat		Homa seri		Scap undu			
Vacc myrt		Hydr vulg		Prim veri		Vici crac		Care vesi		Poa triv		Hook luce					
		Hera spho		Prim vulg		Vici sepi		Care viri		Sesl caer		Hylo brev		Other spp. (write names in full)		Other relevé data	
		Hype perf		Prun vulg		Viol palu		Eleo palu		Tris flav		Hylo sple				Cover score (DOMIN)	
Herbs		Hype pulc		Ranu acris		Viol reic		Scho nigr				Hyoc armo				Bare soil	
Achi mill		Hype tetr		Ranu bulb		Viol rivi						Hypn cupr				Bare rock	
Achi ptar		Hypo radi		Ranu flam		Viol sp.						Hypn jutl				Surface water	
Ajug rept		Iris pseu		Ranu repe				Grasses		Horsetails		Hypn lacu				Litter: incl. dead grass stems	
Anac pyra		Knau arve		Rhin mino				Agro cani		Equi arve		Isop eleg				Bryophyte layer	
Anag arve		Laps comm		R. acetosa		Rushes		Agro capi		Equi fluv		Isot alop				Field layer	
Ange sylv		Lath lini		R. acetose		Junc acut		Agro stol		Equi palu		Kind prae				Broadleaf herbs	
Anth sylv		Lath prat		Rume cris		Junc arti		Alop geni		Equi sylv		Leuc glau				Broadleaf herb:grass etc (%)	
Anth vuln		Leon autu		Rume cong		Junc bufo		Alop prat		Equi telm		Mniu horn				Median grass height (cm)	
Bell pere		Leuc vulg		Rume obtu		Junc bulb		Anis ster				Oxyr hian				Median herb height (cm)	
Blac perf		Linu cath		Sagi proc		Junc cong		Anth odor				Pleu schr					
Calt palu		List ovat		Sang mino		Junc effu		Arrh elat		Ferns		Plth dent					
Camp rotu		Lotu corn		Scut gale		Junc infl		Brac pinn		Aspl tric		Plth undu					
Card flex		Lotu pedu		Sene aqua		Junc squa		Brac sylv		Athy fili		Pmni affi					
Card prat		Lych flos		Sene jaco		Luzu camp		Briz medi		Blec spic		Pmni elli					
Carl vulg		Lysi nemo		Sile dioi		Luzu pilo		Brom errec		Dryo aem		Pmni undu					
Cent nigr		Lysi numm		Sonc aspe		Luzu mult		Brom hord		Dryo affi		Poly comm					
Cera font		Lysi vulg		Sonc oler		Luzu sylv		Brom ramo		Dryo cart		Poly form					
Cirs arve		Lyth sali		Stac palu				Cyno cris		Dryo dila		Pseu puru					
Cirs diss		Medi lupu		Stac sylv				Dact glom		Dryo fili		Rhiz punc					
Cirs palu		Ment aqua		Stel gram				Dant decu		Ophi vulg		Rhyn ripa					
Cirs vulg		Meny trif		Stel holo				Desc cesp		Osmu rega		Rhyt lore					
Cono maju		Myos disc		Stel medi				Desc flex		Phyl scol		Rhyt squa					
Crep capi		Myos laxa		Stel palu				Fest alti		Poly seti		Rhyt triq					
Crep palu		Myos scor		Stel ulig				Fest arun		Pter aqui		Spha capi					

EU Annex I habitat assessment field sheet for semi-natural grassland

Relevé ID	Date	Recorder ID	EU Annex I habitat

Each stop (2m x 2m)	STOP	
STOP NUMBER		
	PASS	FAIL
HQ +ve indicator species (record numbers)		
Non-HQ +ve indicator species (record numbers)		
Overall +ve indicator species (record numbers)		
-ve indicator species (record numbers)		
Broadleaf herb : grass etc ratio (%)		
Scrub/bracken encroachment (%)		
Median sward height (cm)		
Litter cover (%)		
Extent of bare ground (%)		
Grazing and disturbance levels		
Note presence of distinctive features e.g. orchid-rich areas or rare plants		
General stop notes (include habitat loss)		

NB: Rather than ticking the correct box record the figure for each category e.g. 6 Non-HQ +ve indicator species or 15% litter cover, in either the pass or fail box
HQ: High Quality positive indicator species as defined in the Annex I grassland habitats assessment information sheets (Appendix 5).

Negative & positive impacts on EU Annex I habitats

[illegible]

Appendix 4: Summary grassland habitat information for each of the 203 sites surveyed in 2010

This appendix contains the following information on each site:

- 1) Site ID
- 2) Site Name
- 3) County
- 4) SAC code
- 5) The % of each site occupied by semi-natural grassland / marsh Fossitt (2000) habitat types:

- Dry calcareous and neutral grassland (GS1).
- Dry meadows and grassy verges (GS2).
- Dry-humid acid grassland (GS3).
- Wet grassland (GS4).
- Freshwater marsh (GM1).
- Tall-herb swamp (FS2).

NB: When semi-improved grassland habitats of potential conservation value were recorded, an ‘i’ was inserted into the Fossitt category of the habitat type that was deemed to have occurred prior to improvement.

- 6) The % of each site occupied by EU Annex I grassland habitats:

- Calaminarian grasslands of the *Violetalia calaminariae* (6130).
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (6210).
- Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in Continental Europe) (6230).
- *Molinia* meadows on calcareous, peaty or clayey-silt laden soils (*Molinion caeruleae*) (6410).
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430).
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510).

- 7) The number of relevés within each site occupied by the four semi-natural grassland / marsh vegetation groups defined by this project:

Festuca rubra – *Plantago lanceolata* grassland group.

Anthoxanthum odoratum – *Rhytidiadelphus squarrosus* grassland group

Agrostis stolonifera – *Juncus effusus* grassland / marsh group.

Molinia caerulea – *Cirsium dissectum* grassland group

Lolium perenne – *Trifolium repens* grassland group

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Site ID	Site Name	County	SAC	GS1	GS2	GS3	GS4	GM1	FS2	GSi	6130	6210	6230	6410	6430	6510	Fest Plan	Anth Rhyt	Agro Junc	Moli Ciri	Loli Trif
1101	Ballyhoorisky	Donegal	1975	16%			34%			50% (GSi1)							2				2
1102	Ballymichael	Donegal	1975	17%			34%			49% (GSi1, GSi4)							2		2		1
1104	Ardmalin	Donegal	2012	44%			5%			51% (GSi1)							1	1			1
1105	Carrickabraghy	Donegal	2012	71%						29% (GSi1)							1		1		
1107	Errarooley More	Donegal	1090	4%		35%	9%			52% (GSi1, GSi3, GSi4)							4		1		
1109	Knockfolia	Donegal		47%		6%	18%			30% (GSi4)							3		1		1
1110	Bamba's Crown	Donegal	2012	35%						65% (GSi1)							2				
1111	Culoort	Donegal		80%			20%											1	1		
1112	Lenan	Donegal	2012	64%			33%			3% (GSi1)							1	1			1
1113	Redford Glebe	Donegal	2012		39%		61%										1	1	2		
1114	Ballycharry	Donegal	2012	11%	14%	14%	61%										1	1	2		
1115	Bredagh Glen	Donegal					95%			5% (GSi4)								1	2		
1116	Ballymacmoriarty	Donegal	2012				100%											1	1		1
1117	Glentogher	Donegal					40%			60% (GSi4)								1			
1118	Ture	Donegal					100%												1		1
1120	Kilderry House	Donegal					100%										1	1			
1121	Greenan Mountain	Donegal					15%			85% (GSi4)								1	1		1
1124	Tullyowen	Donegal	2301				91%			9% (GSi4)									1		
1126	Claragh	Donegal	2176				33%	59%		8% (GSi4)									2		
1128	Doon Glebe	Donegal					17%			83% (GSi4)									2		
1130	Ballyconnelly	Donegal					93%			7% (GSi4)								2	2		
1133	Meenformal	Donegal				21%	43%			36% (GSi4)								1	1	1	
1134	Breaghy Head	Donegal		41%			8%			51% (GSi1)							2		1	1	
1139	Creeve	Donegal					98%			2% (GSi4)									1		
1140	Roshin	Donegal					94%			6% (GSi4)									1		
1142	Ardachrin	Donegal				7%	66%			28% (GSi3, GSi4)				15%				2		5	
1143	Muntermellan	Donegal				23%	57%			20% (GSi3, GSi4)								1	1		1
1144	Coolboy Big	Donegal				0.2%	25%	74%										1	4		1
1145	Drumnaskea	Donegal					82%			18% (GSi4)								2			1
1146	Carntressy	Donegal					88%			12% (GSi4)								2	1		
1147	Inch Level	Donegal	2287				96%			4% (GSi4)				47%				1	11		
1148	Carthage	Donegal					59%			41% (GSi4)									1		
1149	Clooneymore	Donegal	2176				32%	62%		6% (GSi4)									6		
1150	Arranmore Island	Donegal	111	96%		4%											3				
1151	Glenveagh Bridge	Donegal	2047				100%												1		
1152	Maghery Glebe	Donegal		52%			12%			37% (GSi1)				6%			1		1		2
1155	Cooladerry	Donegal	1975	100%													1				

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1157	Swillybrin	Donegal					100%							19%			1	1			1
1161	Stroove North	Donegal	2012			12%	79%			9% (GSI4)			9%					2			
1163	Carrowmore	Donegal				23%	77%											1		1	1
1164	Carn	Donegal					18%			82% (GSI4)								1			
1165	Tory Island	Donegal	2259	2%	2%		96%										1		4		1
1166	Creenary	Donegal			52%		40%			8% (GSI4)						8%		2			
1203	Dooley	Donegal					88%			12% (GSI4)				3%				1	1		
1206	Drumaneany	Donegal				5%	73%			23% (GSI4)								1	1		
1207	Meenmore East	Donegal				15%	65%			20% (GSI3, GSI4)								3			1
1208	Meenagolan	Donegal	2301	0.9%		3%	75%			21% (GSI4)								2	1	1	1
1209	Kingarrow	Donegal				33%	47%			20% (GSI3, GSI4)								4	1		
1210	Meenatinny	Donegal					62%			38% (GSI4)								2		1	
1211	Cark	Donegal					100%														1
1212	Drumanaught	Donegal					100%											2			
1219	Carrickbrack	Donegal					72%			28% (GSI4)									1		
1224	Garvan	Donegal					83%			17% (GSI4)								1			
1225	Croaghbrid	Donegal				100%												1			
1227	Maas	Donegal		23%			61%			15% (GSI2)							1		1		1
1229	Lackagh	Donegal	197	48%						52% (GSI1, GSI4)							1	1	1		1
1230	Drumboghil	Donegal	197	80%			4%			16% (GSI1, GSI4)								2			
1232	Cloghboy	Donegal	190	9%		4%	42%			45% (GSI1, GSI3, GSI4)				2%			1	4	3	1	1
1233	Maghera	Donegal	190			4%	57%			39% (GSI3, GSI4)								2	1	2	
1235	Malin Beg	Donegal	189		19%	14%				67% (GSI1, GSI2, GSI3, GSI4)							2	1			1
1236	Malinmore	Donegal	189	100%													1				1
1237	Doonalt	Donegal	190			62%	38%										2		1	1	
1238	Beefan	Donegal					73%			27% (GSI4)							1		1		
1241	Crowkeeragh	Donegal				75%	25%												1		
1242	Crowlar	Donegal			19%		4%			78% (GSI2, GSI4)								2	1		
1243	Glengesh	Donegal				96%	4%						1%					3			
1244	Meentadun	Donegal				55%	24%			21% (GSI4)								1	1	1	
1245	Carricknamoghil	Donegal					83%			17% (GSI4)								1			
1247	Ardinawark	Donegal				32%	68%											3			
1248	Rosnowlagh Lower	Donegal	138	10%	5%	1%	74%			10% (GSI1, GSI4)				16%		5%	1	6	6		
1249	Drumhome	Donegal	138		1%	9%	60%			30% (GSI4)			9%	7%			1	6	4		
1250	St. John's Point	Donegal	191	75%			22%			2% (GSI1)		24%		19%			13	1		5	1
1251	Friary	Donegal	163			2%	98%											4			
1252	Roes	Donegal					93%			7% (GSI4)				4%				5	1	1	

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1253	Heney's	Donegal					100%											1	1		
1254	Clogher	Donegal	163				63%			37% (GSi4)								3			
1256	Rahanlacky	Donegal		9%			91%											1	1		1
1257	Tawnygorm	Donegal					100%						24%					3	2	5	
1258	Glencoagh	Donegal					100%											1			
1259	Hall Demesne	Donegal					56%			44% (GSi2, GSi4)									3		1
1260	Dromore	Donegal				2%	98%											2	1		2
1263	Magheracar	Donegal	428			9%	79%			13% (GSi4)								2		1	1
1265	Creevy	Donegal		2%			52%			46% (GSi1, GSi4)								1	1	1	1
1266	Legaltan	Donegal		70%	5%					25% (GSi1, GSi2)		42%					9				1
1267	Tullyhorky	Donegal					89%			11% (GSi4)				3%				1			1
1268	Cavangarden	Donegal	1992				48%			52% (GSi4)								2	1		
1269	Carricknahorna	Donegal					100%											1			
1270	Cashelard	Donegal		3%	6%		90%			1% (GSi2)		3%		2%			1	1	1	1	1
1271	Tievemore	Donegal					100%											2			
1272	Garvanagh	Donegal		69%	9%		12%			11% (GSi1, GSi4)		69%					11	1	1		1
1275	Meenavanaghan or Greaghs Barr	Donegal					70%			30% (GSi4)				0.7%				1	2		
1276	Carntullagh	Donegal		67%			33%										1			1	
1277	Sallywood	Donegal					54%			46% (GSi4)								1			
1278	Gortnagrace	Donegal			0.8%		99%												1		
1279	Donaghmore Glebe	Donegal	2301				18%			82% (GSi4)									2		
1280	Meenagran	Donegal					100%											1			
1281	Tamur	Donegal					100%											1			
1282	Coolcholly	Donegal			27%		26%			47% (GSi4)						27%	1		1		1
1283	Ballynacarrick	Donegal	115	100%								1%					2				
1284	Drumnagroagh	Donegal		100%								76%					6				
1285	Tober	Donegal		76%			12%			12% (GSi1)		54%					7		1		2
1286	Mullyvea	Donegal	197	50%			27%			23% (GSi1)							1		1	1	1
1287	Summy	Donegal	197	94%			6%													1	1
1300	Glenasmole Valley	Dublin	1209	12%	11%	9%	50%			17% (GSi1, GSi4)		0.8%		5%		2%	3	5	2	3	6
1301	Howth Head	Dublin	202	50%	50%												1				2
1302	Ireland's Eye	Dublin	2193		100%																1
1303	Dalkey Island	Dublin		1%	99%													1			2
1304	Loughshinny Coast	Dublin		9%	91%												2		1		1
1305	Ballybrack	Dublin			2%	67%	1%			30% (GSi2, GSi3)			8%				2	4	1		3
1306	Kilmashogue	Dublin				62%				38% (GSi3, GSi4)								1			2
1307	Balally	Dublin			100%												1				

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1309	St. Annes Park	Dublin	206		100%												1		1		
1311	Baldoyle	Dublin	199	4%	96%												2				
1312	Newhaggard	Dublin	208		60%		40%										2		1		1
1313	Malahide Demesne	Dublin			100%												1				
1314	Ardgillan Demesne	Dublin			100%												1				1
1315	Phoenix Park	Dublin		32%	58%					9% (GSI1)		1%					3	1			
1316	Shanganagh Park	Dublin			74%					26% (GSI2)											3
1318	Bog of Ring	Dublin					100%												4		
1320	Waterstone Park	Dublin		2%	55%					43% (GSI1, GSI2)							2		1		
1321	Ashtown Royal Canal	Dublin					87%	13%											3		
1322	Slade of Saggart	Dublin					42%	58%											2		
1323	Portraine	Dublin					100%												3		
1324	Newbridge Demesne	Dublin		3%	88%		0.5%			8% (GSI2)		3%					6		2		1
1325	Baldonnel	Dublin			91%		0.1%			9% (GSI2)							1		1		
1326	Ballymorefinn	Dublin				57%	8%			35% (GSI3)								2			
1327	Bohernabreena	Dublin		100%								1%					3				1
1328	Hell Fire Club	Dublin			36%	29%				35% (GSI2)								1			2
1399	Friarstown Meadow	Dublin			100%																1
1400	Curragh	Kildare		0.1%		93%	2%			5% (GSI3, GSI4)			68%				1	15	1		
1401	Little Curragh	Kildare		0.3%		67%	0.5%			33% (GSI3)		0.3%	14%				4	10	1		
1402	Dunlavin Marshes	Kildare			6%		94%	0.6%						10%			1	4	3		
1404	Ballyhagan	Kildare					100%												1		
1405	Killhill	Kildare		97%	0.3%		3%										1		1		1
1406	Blacktrench	Kildare					82%	6%		13% (GSI4)									3		
1407	Moods	Kildare					6%	94%										1	2		
1408	Punchers Grange	Kildare			8%		86%			6% (GSI4)							1		2	1	
1409	Grange Common	Kildare				100%												1			
1410	Rathangan	Kildare					85%		15%										3	1	1
1411	Ardree	Kildare	2162				94%			6% (GSI1)									1		
1412	Knockaulin	Kildare								100% (GSI1)											1
1414	Bishopsland	Kildare		22%			73%			4% (GSI1)								1	3		1
1415	Bishophill Commons	Kildare								100% (GSI1)											1
1416	Ballysax Great	Kildare		1%	99%												1				1
1417	Dunshane Common	Kildare		3%			97%							80%			1		1	12	1
1418	Lullymore West	Kildare			82%		18%										1		1	2	
1420	Cupidstownhill	Kildare				94%	6%											1			1
1422	Crohane	Kildare					100%							55%			1		1	4	

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Site ID	Site Name	County	SAC	GS1	GS2	GS3	GS4	GM1	FS2	GSI	6130	6210	6230	6410	6430	6510	Fest Plan	Anth Rhyt	Agro Junc	Moli Ciri	Loli Trif
1423	Carrick Hill	Kildare		100%								1%					3				1
1498	Derryoughter East	Kildare			3%		79%		17%								1		3	1	
1499	Castletown House	Kildare			100%												1				
1500	Mullaghmore	Sligo	625	98%			2%					86%					1	3	1		
1501	Knocknarea	Sligo		75%	2%	23%						5%					8		1		1
1502	Edenbaum	Sligo		24%		42%	34%					14%	12%				4	4	3		6
1503	Ballyconnell	Sligo	627	32%			10%			58% (GSI1, GSI4)							1		1		2
1507	Rockfinlough	Sligo		18%		13%	51%			18% (GSI4)				4%				3	2		3
1508	Clooncunmy	Sligo		5%			83%			12% (GSI4)							3	1	2		1
1509	Derrybeg	Sligo		12%			53%			34% (GSI1, GSI4)				5%			4	1	4	2	2
1510	Carrownabinna	Sligo		29%	7%	29%	14%	4%		16% (GSI1, GSI3)				10%			3		5		2
1511	Tawnatruffan	Sligo		1%			87%			12% (GSI1, GSI4)								1	1	1	
1512	Portinch	Sligo	636	19%	18%	0.6%	35%	1%		26% (GSI1, GSI2, GSI4)							2	1	4		1
1513	Farranyharpy	Sligo		38%			2%			61% (GSI1)		17%					4	1	1		1
1514	Doon	Sligo		0.7%			60%			39% (GSI1, GSI4)								1	1		1
1515	Eskragh	Sligo		22%	0.4%		71%			7% (GSI1, GSI4)								1	2		
1516	Carrownyclovan	Sligo		15%			3%			81% (GSI1, GSI4)											2
1517	Doonaveeragh	Sligo	1656	48%		1.0%	29%			22% (GSI1, GSI4)							1	2	2		1
1518	Treanmacmurtagh	Sligo	1656	11%			72%			17% (GSI1, GSI4)				1%				4	2		1
1519	Greenan	Sligo	1656	60%			35%			4% (GSI1, GSI4)		5%						5	1		
1523	Annagh Beg	Sligo	1898		3%		63%			34% (GSI4)							1		2		2
1524	Cooperhill	Sligo	1898				90%	10%											3		
1525	Ardkeeran	Sligo	1898			3%	69%	2%		27% (GSI1, GSI4)					1%			2	7		
1526	Reask	Sligo					66%			34% (GSI4)								1	1		
1527	Castlegal	Sligo		40%		40%	15%			5% (GSI4)		13%					5	2			
1528	Kintogher	Sligo	627				99%	0.7%											4		
1529	Rosses Point	Sligo	627	57%	25%	5%	6%			7% (GSI1)		22%					6		1	1	1
1530	Corsallagh	Sligo					100%							7%				3	1	1	
1531	Knocknashee	Sligo		6%		76%	8%			10% (GSI1)		1%					3	2			1
1532	Formoyle	Sligo		40%	14%	16%	20%			10% (GSI1)		9%					4	1	2		
1534	Rooghan	Sligo					55%			45% (GSI4)								1			
1535	Carrigans Upper	Sligo		21%			15%			63% (GSI1)									2		2
1537	Cloonaleigha	Sligo	636		5%	10%	79%	3%		3% (GSI3)				10%		5%		1	5		2
1538	Primrosegrange	Sligo		38%	30%		9%			23% (GSI4)		16%					6		1		
1539	Markree Demesne South	Sligo	1898	0.8%		3%	96%											1	1	1	1
1540	Markree Demesne North	Sligo	1898	1%			51%			48% (GSI1, GSI4)									1		2
1541	Cloonmacduff	Sligo	1898	34%			66%	0.8%				3%		13%			1		6		4

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Site ID	Site Name	County	SAC	GS1	GS2	GS3	GS4	GM1	FS2	GSi	6130	6210	6230	6410	6430	6510	Fest Plan	Anth Rhyt	Agro Junc	Moli Ciri	Loli Trif
1544	Cabraghkeel	Sligo					83%			17% (GSi4)									2		
1545	Carns	Sligo				1%	95%			4% (GSi4)				4%				1	4	1	
1546	Culdaly	Sligo		4%			81%			14% (GSi3, GSi4)				7%				3	2		1
1547	Carrowreagh	Sligo		0.4%		12%	81%			7% (GSi4)								1	2		1
1548	Mullanfad	Sligo	623			18%	82%						5%					5	1		2
1549	Curry	Sligo	2298			0.4%	72%	0.8%		27% (GSi4)				0.8%				2	5		
1551	Gortersluin	Sligo				100%													1		1
1553	Carrownrush	Sligo				35%	32%			33% (GSi1, GSi4)									1		1
1556	Clogher Beg	Sligo	1976	29%	17%	14%	17%			22% (GSi1, GSi3, GSi4)		24%					3	2	1		5
1561	Carrickhawna	Sligo	1656	74%			3%			24% (GSi1, GSi4)		33%					6	1	1		
1566	Doonmeegin	Sligo		35%	2%		25%			38% (GSi1)						2%	3	1	3		
1568	Derrysallagh	Sligo					96%			4% (GSi4)				16%					7		
1572	Drumaskibbole	Sligo			100%											86%	4				
1573	Ballyconnell South	Sligo	627		38%		55%			7% (GSi4)							2		2		1
1575	Annaghbeg	Sligo		14%			75%			11% (GSi4)				2%					3		1
1576	Carrowmacbryan	Sligo		0.8%			51%			48% (GSi1, GSi2, GSi4)				8%			3		4		2
1577	Gleniff	Sligo	623			25%	75%											5			
1579	Cuilmore	Sligo					91%			9% (GSi4)									3		1

Appendix 5: Annex I assessment indicator species and criteria

- Calaminarian grasslands of the *Violetea calaminariae* (6130)
- Semi-natural dry grasslands & scrub facies on calcareous substrates (*Festuco-Brometalia*) (6210)
- Species-rich *Nardus* grasslands on siliceous substrates in mountain areas (and sub-mountain areas, in Continental Europe) (6230)
- *Molinia* meadows on calcareous, peaty or clayey-silt laden soils (*Molinion caeruleae*) (6410)
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510)

Calaminarian grasslands of the *Violetalia calaminariae* (6130)

Positive indicator species

Vascular:

Armeria maritima
Cochlearia pyrenaica ssp. *alpina*
Minuartia verna
Silene uniflora

Bryophyte:

Bryum pallescens
Cephaloziella integerrima
Cephaloziella massalongi
Cephaloziella nicholsonii
Cephaloziella stellulifera
Ditrichum cornubicum
Ditrichum plumbicola
Gymnocolea inflata
Pohlia andalusica
Scapania compacta
Scopelophila cataractae
Solenostoma gracillimum
Weissia controversa var. *densifolia*

Pass = 1 vascular and 1 bryophyte species

Negative indicator species

Anthriscus sylvestris
Arrhenatherum elatius
Cirsium arvense
Cirsium vulgare
Dactylis glomerata
Heracleum sphondylium
Holcus lanatus
Urtica dioica
 Pass = Collective cover ≤5%

Lolium perenne
Trifolium repens
 Pass = Collective cover ≤5%

Neophyte species
 Pass = Collective cover ≤5%

Other assessment criteria

Broadleaf herb : grass ratio

Pass = Broadleaf herb component 20-90%

Scrub/Bracken/Heath encroachment

Pass = Cover of woody species plus *Pteridium* ≤5% cover.

Sward height

Pass = sward ≤5cm (No lower limit)

Litter cover

Pass = Total extent is ≤25% cover

Bare ground

Pass = Total extent 10-90% cover

Grazing and disturbance

Pass= No more than 20m² in vicinity of monitoring stop showing signs of serious disturbance

Semi-natural dry grasslands & scrub facies on calcareous substrates (6210)

H.Q.* positive indicator species

Antennaria dioica
Anthyllis vulneraria
Briza media
Campanula rotundifolia
Carex caryophylla
Carlina vulgaris
Centaurea scabiosa
Galium verum
Gentianella campestris
Knautia arvensis
Koeleria macrantha
Lotus corniculatus
Origanum vulgare
Primula veris
Sanguisorba minor
 Orchid spp.

Negative indicator species

Arrhenatherum elatius
Dactylis glomerata

Cirsium arvense
Cirsium vulgare
Rumex crispus
Rumex obtusifolius
Senecio jacobea
Urtica dioica

Lolium perenne
Trifolium repens
 Pass = Collective cover ≤20%
 and individual cover ≤10%

 Neophyte species
 Pass = Collective cover ≤10%

Positive indicator species

Blackstonia perfoliata
Bromus erectus
Carex flacca
Conopodium majus
Daucus carota
Helictotrichon pubescens
Homalothecium lutescens
Leontodon hispidus
Linum catharticum
Pilosella officinarum
Ranunculus bulbosus
Trisetum flavescens

Pass = Must have 2 H.Q. species present, within a total of ≥7 +ve species

*H.Q. – ‘High Quality’

Other assessment criteria

Broadleaf herb : grass ratio
 Pass = Broadleaf herb component 40-90%

 Scrub/Bracken/Heath encroachment
 Pass= Cover of woody species (except *Juniperus communis*) plus *Pteridium* ≤5% cover.

 Sward height
 Pass = 30-70% of the sward 5-40cm high

 Litter cover
 Pass = Total extent is ≤25% cover

 Bare ground
 Pass = Total extent is ≤10% cover

 Grazing and disturbance
 Pass= No more than 20m² in vicinity of monitoring stops showing signs of serious disturbance

Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in Continental Europe) (6230)

H.Q.* positive indicator species

Carex binervis
Carex pilulifera
Danthonia decumbens
Lathyrus linifolius
Pseudorchis albida
Polygala serpyllifolia
Polygala vulgaris
Viola canina
Viola riviniana

Positive indicator species

Achillea millefolium
Agrostis capillaris
Anthoxanthum odoratum
Festuca ovina
Festuca vivipara
Galium saxatile
Hylocomium splendens
Hypericum maculatum
Juncus squarrosus
Luzula multiflora
Nardus stricta
Pedicularis sylvatica
Potentilla erecta
Rhytiadelphus loreus
Rhytiadelphus squarrosus
Succisa pratensis
Veronica officinalis

Pass = Must have 1 H.Q. species present, within a total of ≥7 +ve species

Negative indicator species

Arrhenatherum elatius
Dactylis glomerata
Bellis perennis
Cirsium arvense
Cirsium vulgare
Ranunculus repens
Rumex crispus
Rumex obtusifolius
Senecio jacobaea
Urtica dioica

Eriophorum angustifolium
Eriophorum vaginatum
Narthecium ossifragum

Holcus lanatus
Juncus effusus

Lolium perenne
Trifolium repens

Pass = Collective cover ≤20%
 and individual cover ≤10%

Sphagnum spp. ≤10% cover
Polytrichum spp. ≤ 25% cover

Neophyte species
 Pass = Collective cover ≤ 10%

Other assessment criteria

Broadleaf herb : grass ratio
 Pass = Broadleaf herb component 20-90%

Litter cover
 Pass = Litter, including 'thatching' should not cover >20% of ground area

Scrub/Bracken/Heath encroachment
 Pass = Cover of woody species plus *Pteridium* ≤5% cover

Bare ground
 Pass = Total extent is ≤10% cover

Sward height
 Pass = ≥25% of the sward 5-50 cm

Grazing and disturbance
 Pass = No more than 20m² in vicinity of monitoring stops showing signs of serious disturbance

*H.Q. – 'High Quality'

***Molinia* meadows on calcareous, peaty or clayey-silt laden soils (Molinion caeruleae) (6410)**

H.Q.* positive indicator species

Achillea ptarmica
Caltha palustris
Cirsium dissectum
Crepis paludosa
Juncus conglomeratus
Lychnis flos-cuculi
Lythrum salicaria
Rhinanthus minor
 Orchid sp.

Positive indicator species

Angelica sylvestris
Calliergonella cuspidata
Carex flacca
Carex panicea
Centaurea nigra
Cirsium palustre
Deschampsia caespitosa
Equisetum palustre
Filipendula ulmaria
Juncus acutiflorus
Lotus pedunculatus
Molinia caerulea
Myosotis laxa
Potentilla anglica
Potentilla erecta
Senecio aquaticus
Succisa pratensis
Trifolium pratense

Negative indicator species

Cirsium arvense
Cirsium vulgare
Rumex crispus
Rumex obtusifolius
Senecio jacobaea
Urtica dioica

Glyceria maxima
Phalaris arundinacea
Phragmites australis

Lolium perenne
Trifolium repens

Eriophorum angustifolium
Eriophorum vaginatum
Narthecium ossifragum

Pass = Collective cover $\leq 20\%$
 and individual cover $\leq 10\%$

Sphagnum spp. $\leq 10\%$ cover
Polytrichum spp. $\leq 25\%$ cover

Neophyte species
 Pass = Collective cover $\leq 10\%$

Pass = Must have 1 H.Q. species present, within a total of ≥ 7 +ve species

For an area to be considered as *Molinia* meadow it is preferable for some *Molinia* to be recorded within the habitat.
 Note the late leaf emergence of this species however (June onwards)

Other assessment criteria

Broadleaf herb : grass ratio
 Pass = Broadleaf herb component 40-90%

Litter cover
 Pass = Total extent is $\leq 25\%$ cover

Scrub/Bracken/Heath encroachment
 Pass = Cover of woody species plus
Pteridium $\leq 5\%$ cover.

Bare ground
 Pass = Total extent is $\leq 10\%$ cover

Sward height
 Pass = 30-70% of the sward 10-80cm high

Grazing and disturbance
 Pass = No more than 20m² in vicinity of monitoring stop
 showing signs of serious disturbance

*H.Q. – 'High Quality'

Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)

These communities are thought to only occur on plains within Ireland, adjacent to areas of reed bed and wet woodland

H.Q.* positive indicator species

Crepis paludosa
Epilobium hirsutum
Eupatorium cannabinum
Lythrum salicaria
Trollius europaeus

Positive indicator species

Calystegia sepium
Epilobium parviflorum
Equisetum fluviatile
Filipendula ulmaria
Galium aparine
Galium palustre
Geum urbanum
Glechoma hederacea
Hypericum tetrapterum
Iris pseudacorus
Mentha aquatica
Moehringia trinervia
Solanum dulcamara
Stachys palustris
Symphytum officinale
Viola odorata

Pass = Must have 1 H.Q. species present, within a total of ≥ 5 +ve species

Negative indicator species

Glyceria maxima
Phalaris arundinacea
Phragmites australis
 Pass = Collective cover $\leq 20\%$

Neophyte species
 Pass = Collective cover $\leq 10\%$

Other assessment criteria

Broadleaf herb : grass ratio
 Pass = Broadleaf herb component 40-90%

Litter cover
 Pass = No limit

Scrub/Bracken/Heath encroachment
 Pass= Cover of woody species plus
Pteridium $\leq 5\%$ cover.

Bare ground
 Pass = Total extent is $\leq 10\%$ cover

Sward height
 Pass= 30-70% of the sward 40-150cm high

Grazing and disturbance
 Pass = No more than 20m² in vicinity of monitoring stop showing signs of serious disturbance

*H.Q. – 'High Quality'

Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510)

H.Q.* positive indicator species

Knautia arvensis
Leucanthemum vulgare
Lotus corniculatus
Pimpinella major
Rhinanthus minor
Sanguisorba officinalis
Thalictrum flavum
 Orchid species

Positive indicator species

Alopecurus pratensis
Anthriscus sylvestris
Centaurea nigra
Crepis capillaris
Daucus carota
Festuca pratensis
Filipendula ulmaria
Heracleum sphondylium
Leontodon hispidus
Phleum pratense
Plantago lanceolata
Ranunculus acris
Succisa pratensis
Tragopogon pratensis
Trifolium pratense
Trisetum flavescens

Negative indicator species

Arrhenatherum elatius
Dactylis glomerata

Cirsium arvense
Cirsium vulgare
Rumex crispus
Rumex obtusifolius
Senecio jacobaea
Urtica dioica

Lolium perenne
Trifolium repens

Pass = Collective cover $\leq 20\%$
 and individual cover $\leq 10\%$

Neophyte species
 Pass = Collective cover $\leq 5\%$

*H.Q. – 'High Quality'

Pass = Must have 1 H.Q. species present, within a total of ≥ 7 +ve species

Other assessment criteria

Broadleaf herb : grass ratio

Pass = Broadleaf herb component 40-90%

Scrub/Bracken/Heath encroachment

Pass= Cover of woody species plus *Pteridium* $\leq 5\%$ cover.

Sward height

Pass = $>50\%$ of the sward 10-50cm

Litter cover

Pass = Total extent is $\leq 25\%$ cover

Bare ground

Pass = Total extent is $\leq 5\%$ cover

Grazing and disturbance

Pass= No more than 20m^2 in vicinity of monitoring stop showing signs of serious disturbance

Appendix 6: Structure and functions assessment scores for areas of Annex I grassland habitat surveyed in 2010

This lists the results of the structure and functions assessments for each of the 317 monitoring stops recorded during ISGS in 2010.

Abbreviations:

H.Q. = High Quality.

M.S. = Monitoring stop.

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Note: Abbreviations - HQ = High Quality; M.S. = Monitoring stop.

Releve ID	M.S.	Annex	County	Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1142/01	1	6410	Donegal	PASS	8	PASS	3	PASS	5	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1142/03	2	6410	Donegal	PASS	10	PASS	2	PASS	8	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1142/06	3	6410	Donegal	PASS	12	PASS	4	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1142/07	4	6410	Donegal	PASS	10	PASS	2	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1147/01	1	6410	Donegal	PASS	8	PASS	2	PASS	6	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1147/02	2	6410	Donegal	PASS	11	PASS	4	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1147/04	3	6410	Donegal	PASS	8	PASS	1	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1147/05	4	6410	Donegal	PASS	9	PASS	1	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1147/06	5	6410	Donegal	FAIL	6	PASS	1	FAIL	5	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1147/09	6	6410	Donegal	FAIL	6	PASS	2	FAIL	4	FAIL	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1147/10	7	6410	Donegal	PASS	11	PASS	3	PASS	8	FAIL	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1147/12	8	6410	Donegal	PASS	7	PASS	1	PASS	6	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1152/01	1	6410	Donegal	PASS	8	PASS	3	PASS	5	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1152/02	2	6410	Donegal	PASS	12	PASS	2	PASS	10	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1157/01	1	6410	Donegal	PASS	12	PASS	2	PASS	10	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1157/02	2	6410	Donegal	PASS	14	PASS	3	PASS	11	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1161/01	1	6230	Donegal	PASS	10	PASS	2	PASS	8	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1203/01	1	6410	Donegal	PASS	11	PASS	2	PASS	9	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1232/07	1	6410	Donegal	PASS	10	PASS	3	PASS	7	PASS	2	PASS	FAIL	FAIL	PASS	PASS	PASS	FAIL
1232/08	2	6410	Donegal	PASS	9	PASS	2	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1232/09	3	6410	Donegal	PASS	7	PASS	1	PASS	6	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1232/10	4	6410	Donegal	PASS	8	PASS	3	PASS	5	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1243/02	1	6230	Donegal	PASS	10	PASS	2	PASS	8	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1243/03	2	6230	Donegal	PASS	12	PASS	1	PASS	11	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1248/03	1	6410	Donegal	PASS	9	PASS	2	PASS	7	PASS	0	PASS	PASS	FAIL	FAIL	PASS	PASS	FAIL
1248/04	2	6410	Donegal	PASS	7	PASS	2	PASS	5	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1248/08	1	6510	Donegal	PASS	7	PASS	3	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1248/09	3	6410	Donegal	FAIL	6	PASS	2	FAIL	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1248/10	4	6410	Donegal	PASS	8	PASS	3	PASS	5	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1248/11	5	6410	Donegal	PASS	7	PASS	2	PASS	5	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1248/12	6	6410	Donegal	FAIL	3	FAIL	0	FAIL	3	PASS	3	FAIL	PASS	FAIL	PASS	PASS	PASS	FAIL
1248/13	2	6510	Donegal	FAIL	6	PASS	3	FAIL	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1249/01	1	6410	Donegal	PASS	11	PASS	2	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1249/02	2	6410	Donegal	PASS	11	PASS	2	PASS	9	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1249/03	3	6410	Donegal	PASS	15	PASS	3	PASS	12	FAIL	3	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1249/04	4	6410	Donegal	PASS	14	PASS	4	PASS	10	FAIL	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL

Appendix 6: Structure and functions assessment scores for areas of Annex I grassland habitat surveyed in 2010

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Releve ID	M.S.	Annex	County	Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1249/05	1	6230	Donegal	PASS	10	PASS	1	PASS	9	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1249/06	2	6230	Donegal	PASS	12	PASS	3	PASS	9	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1249/07	3	6230	Donegal	PASS	10	PASS	2	PASS	8	FAIL	2	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1249/08	4	6230	Donegal	PASS	12	PASS	3	PASS	9	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1250/02	1	6210	Donegal	PASS	10	PASS	6	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/04	2	6210	Donegal	PASS	7	PASS	5	PASS	2	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/05	3	6210	Donegal	FAIL	5	PASS	3	FAIL	2	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1250/06	4	6210	Donegal	PASS	9	PASS	6	PASS	3	PASS	2	PASS	PASS	PASS	PASS	FAIL	PASS	FAIL
1250/07	1	6410	Donegal	PASS	11	PASS	2	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/08	5	6210	Donegal	PASS	11	PASS	6	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/10	2	6410	Donegal	PASS	10	PASS	4	PASS	6	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/11	3	6410	Donegal	PASS	9	PASS	2	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/12	4	6410	Donegal	PASS	8	PASS	3	PASS	5	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1250/13	5	6410	Donegal	PASS	8	PASS	1	PASS	7	PASS	1	PASS	FAIL	PASS	FAIL	PASS	PASS	FAIL
1250/14	6	6410	Donegal	FAIL	8	FAIL	0	PASS	8	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1250/15	7	6410	Donegal	PASS	10	PASS	2	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/16	6	6210	Donegal	PASS	10	PASS	7	PASS	3	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/18	7	6210	Donegal	PASS	10	PASS	6	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1250/19	8	6410	Donegal	PASS	12	PASS	3	PASS	9	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1250/20	8	6210	Donegal	PASS	9	PASS	7	PASS	2	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1252/04	1	6410	Donegal	FAIL	6	PASS	2	FAIL	4	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1252/05	2	6410	Donegal	PASS	10	PASS	2	PASS	8	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1252/06	3	6410	Donegal	FAIL	6	PASS	1	FAIL	5	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1252/07	4	6410	Donegal	PASS	8	PASS	1	PASS	7	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1257/01	1	6410	Donegal	FAIL	7	FAIL	0	PASS	7	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1257/02	2	6410	Donegal	PASS	8	PASS	2	PASS	6	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1257/03	3	6410	Donegal	PASS	11	PASS	4	PASS	7	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1257/04	4	6410	Donegal	PASS	8	PASS	2	PASS	6	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1257/05	5	6410	Donegal	PASS	9	PASS	3	PASS	6	PASS	1	PASS	PASS	PASS	PASS	FAIL	PASS	FAIL
1257/06	6	6410	Donegal	PASS	10	PASS	3	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1257/07	7	6410	Donegal	PASS	11	PASS	2	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1257/08	8	6410	Donegal	PASS	15	PASS	5	PASS	10	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1257/09	9	6410	Donegal	PASS	10	PASS	3	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1266/01	1	6210	Donegal	PASS	10	PASS	7	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1266/02	2	6210	Donegal	FAIL	6	PASS	3	FAIL	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1266/03	3	6210	Donegal	PASS	10	PASS	6	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1266/04	4	6210	Donegal	PASS	8	PASS	4	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1266/06	5	6210	Donegal	PASS	10	PASS	6	PASS	4	PASS	3	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL

Appendix 6: Structure and functions assessment scores for areas of Annex I grassland habitat surveyed in 2010

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Releve ID	M.S.	Annex	County	PASS	Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1266/07	6	6210	Donegal	PASS	8	PASS	5	PASS	3	PASS	5	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1266/08	7	6210	Donegal	PASS	10	PASS	5	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1267/01	1	6410	Donegal	PASS	10	PASS	2	PASS	8	FAIL	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1270/02	1	6210	Donegal	PASS	8	PASS	5	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1270/05	1	6410	Donegal	PASS	11	PASS	2	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/03	1	6210	Donegal	PASS	11	PASS	6	PASS	5	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/04	2	6210	Donegal	PASS	12	PASS	7	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/05	3	6210	Donegal	PASS	11	PASS	5	PASS	6	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/06	4	6210	Donegal	PASS	10	PASS	6	PASS	4	PASS	4	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1272/07	5	6210	Donegal	PASS	12	PASS	8	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/08	6	6210	Donegal	PASS	14	PASS	7	PASS	7	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/09	7	6210	Donegal	PASS	15	PASS	8	PASS	7	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/11	8	6210	Donegal	PASS	13	PASS	10	PASS	3	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/12	9	6210	Donegal	PASS	13	PASS	8	PASS	5	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1272/13	10	6210	Donegal	PASS	13	PASS	10	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1275/03	1	6410	Donegal	PASS	10	PASS	2	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1282/03	1	6510	Donegal	FAIL	6	PASS	1	FAIL	5	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1283/01	1	6210	Donegal	PASS	13	PASS	9	PASS	4	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1283/02	2	6210	Donegal	PASS	11	PASS	7	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1284/01	1	6210	Donegal	PASS	9	PASS	6	PASS	3	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1284/02	2	6210	Donegal	PASS	12	PASS	8	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1284/03	3	6210	Donegal	PASS	11	PASS	7	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1284/04	4	6210	Donegal	PASS	11	PASS	7	PASS	4	PASS	4	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL	FAIL
1284/05	5	6210	Donegal	PASS	7	PASS	4	PASS	3	FAIL	4	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1284/06	6	6210	Donegal	PASS	10	PASS	7	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/01	1	6210	Donegal	FAIL	6	PASS	4	FAIL	2	FAIL	5	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1285/02	2	6210	Donegal	PASS	8	PASS	5	PASS	3	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/03	3	6210	Donegal	PASS	7	PASS	5	PASS	2	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/04	4	6210	Donegal	PASS	7	PASS	5	PASS	2	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/05	5	6210	Donegal	PASS	9	PASS	5	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/08	6	6210	Donegal	PASS	9	PASS	6	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/09	7	6210	Donegal	PASS	8	PASS	5	PASS	3	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1285/10	8	6210	Donegal	FAIL	6	PASS	4	FAIL	2	FAIL	3	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1300/01	1	6210	Dublin	PASS	11	PASS	5	PASS	6	FAIL	3	PASS	PASS	PASS	PASS	PASS	FAIL	PASS	FAIL
1300/04	2	6210	Dublin	PASS	7	PASS	2	PASS	5	PASS	5	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1300/08	3	6210	Dublin	FAIL	6	PASS	2	FAIL	4	FAIL	4	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL	FAIL
1300/09	1	6510	Dublin	PASS	9	PASS	3	PASS	6	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1300/10	2	6510	Dublin	PASS	7	PASS	1	PASS	6	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Appendix 6: Structure and functions assessment scores for areas of Annex I grassland habitat surveyed in 2010

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Releve ID	M.S.	Annex	County		Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1300/11	3	6510	Dublin	PASS	9	PASS	3	PASS	6	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1300/12	4	6510	Dublin	PASS	9	PASS	3	PASS	6	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1300/14	1	6410	Dublin	PASS	7	PASS	1	PASS	6	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
1300/15	2	6410	Dublin	PASS	14	PASS	3	PASS	11	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1300/17	4	6410	Dublin	FAIL	4	PASS	1	FAIL	3	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
1300/18	3	6410	Dublin	PASS	10	PASS	1	PASS	9	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1300/19	5	6410	Dublin	PASS	9	PASS	2	PASS	7	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
1305/04	1	6230	Dublin	PASS	9	PASS	1	PASS	8	FAIL	4	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1305/05	2	6230	Dublin	PASS	11	PASS	4	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1305/06	3	6230	Dublin	PASS	9	PASS	1	PASS	8	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1305/07	4	6230	Dublin	PASS	11	PASS	3	PASS	8	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1315/03	1	6210	Dublin	PASS	8	PASS	5	PASS	3	FAIL	4	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1315/04	2	6210	Dublin	PASS	9	PASS	5	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1324/03	1	6210	Dublin	PASS	7	PASS	3	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1324/04	2	6210	Dublin	FAIL	4	PASS	2	FAIL	2	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1324/08	3	6210	Dublin	FAIL	5	PASS	3	FAIL	2	FAIL	3	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1324/09	4	6210	Dublin	PASS	7	PASS	2	PASS	5	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1327/01	1	6210	Dublin	FAIL	4	PASS	3	FAIL	1	FAIL	4	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1327/02	2	6210	Dublin	PASS	11	PASS	6	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1327/03	3	6210	Dublin	PASS	9	PASS	5	PASS	4	FAIL	4	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1327/04	4	6210	Dublin	PASS	11	PASS	5	PASS	6	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1400/02	1	6230	Kildare	PASS	10	PASS	2	PASS	8	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1400/05	2	6230	Kildare	PASS	10	PASS	1	PASS	9	FAIL	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/06	3	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/07	4	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/08	5	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
1400/09	6	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/10	7	6230	Kildare	FAIL	8	FAIL	0	PASS	8	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/12	8	6230	Kildare	PASS	10	PASS	1	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1400/13	9	6230	Kildare	PASS	10	PASS	1	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1400/14	10	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
1400/15	11	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/16	12	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1400/17	13	6230	Kildare	PASS	10	PASS	1	PASS	9	PASS	2	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL	FAIL
1400/18	14	6230	Kildare	PASS	10	PASS	1	PASS	9	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL	FAIL
1401/03	2	6230	Kildare	PASS	9	PASS	1	PASS	8	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1401/04	3	6230	Kildare	PASS	10	PASS	2	PASS	8	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1401/05	1	6210	Kildare	PASS	7	PASS	2	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Appendix 6: Structure and functions assessment scores for areas of Annex I grassland habitat surveyed in 2010

Releve ID	M.S.	Annex	County	Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1401/06	4	6230	Kildare	FAIL	9	FAIL	0	PASS	9	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1401/07	5	6230	Kildare	PASS	11	PASS	2	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1401/09	1	6230	Kildare	PASS	8	PASS	1	PASS	7	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1401/10	6	6230	Kildare	PASS	9	PASS	1	PASS	8	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1401/11	7	6230	Kildare	PASS	9	PASS	1	PASS	8	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1401/12	8	6230	Kildare	PASS	10	PASS	2	PASS	8	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1401/13	2	6210	Kildare	PASS	8	PASS	3	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1401/14	3	6210	Kildare	PASS	7	PASS	2	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1401/15	4	6210	Kildare	PASS	8	PASS	3	PASS	5	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1402/05	1	6410	Kildare	PASS	10	PASS	1	PASS	9	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1402/06	2	6410	Kildare	FAIL	8	FAIL	0	PASS	8	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1402/07	3	6410	Kildare	PASS	9	PASS	2	PASS	7	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1402/08	4	6410	Kildare	PASS	8	PASS	1	PASS	7	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/01	1	6410	Kildare	PASS	8	PASS	2	PASS	6	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/03	2	6410	Kildare	PASS	11	PASS	1	PASS	10	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1417/04	3	6410	Kildare	PASS	9	PASS	2	PASS	7	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1417/05	4	6410	Kildare	PASS	10	PASS	3	PASS	7	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/06	5	6410	Kildare	PASS	10	PASS	2	PASS	8	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/07	6	6410	Kildare	PASS	10	PASS	2	PASS	8	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/08	7	6410	Kildare	PASS	12	PASS	2	PASS	10	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1417/09	8	6410	Kildare	PASS	10	PASS	2	PASS	8	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/11	9	6410	Kildare	PASS	10	PASS	3	PASS	7	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1417/12	10	6410	Kildare	PASS	9	PASS	2	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1417/13	11	6410	Kildare	PASS	10	PASS	2	PASS	8	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1417/15	12	6410	Kildare	PASS	10	PASS	2	PASS	8	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1422/03	2	6410	Kildare	PASS	9	PASS	2	PASS	7	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1422/04	3	6410	Kildare	PASS	8	PASS	3	PASS	5	PASS	1	FAIL	PASS	PASS	FAIL	PASS	PASS	FAIL
1422/05	1	6410	Kildare	PASS	10	PASS	2	PASS	8	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1422/06	4	6410	Kildare	PASS	9	PASS	1	PASS	8	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1423/01	1	6210	Kildare	PASS	11	PASS	5	PASS	6	PASS	4	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1423/02	2	6210	Kildare	PASS	9	PASS	3	PASS	6	PASS	4	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL
1423/03	3	6210	Kildare	PASS	9	PASS	5	PASS	4	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1423/04	4	6210	Kildare	PASS	8	PASS	5	PASS	3	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1500/01	1	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1500/02	2	6210	Sligo	FAIL	5	PASS	3	FAIL	2	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1500/03	3	6210	Sligo	FAIL	6	PASS	3	FAIL	3	PASS	2	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1500/05	4	6210	Sligo	PASS	8	PASS	5	PASS	3	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1501/02	1	6210	Sligo	PASS	9	PASS	6	PASS	3	PASS	0	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL

Irish Semi-natural Grasslands Survey: Counties Donegal, Dublin, Kildare & Sligo - BEC Consultants 2010

Releve ID	M.S.	Annex	County		Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1501/04	2	6210	Sligo	PASS	11	PASS	7	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1501/05	3	6210	Sligo	PASS	8	PASS	6	PASS	2	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1501/07	4	6210	Sligo	PASS	9	PASS	4	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1501/08	5	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1501/09	6	6210	Sligo	FAIL	6	FAIL	1	FAIL	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1502/04	1	6230	Sligo	PASS	9	PASS	3	PASS	6	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1502/08	2	6230	Sligo	PASS	7	PASS	2	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1502/09	1	6210	Sligo	PASS	8	PASS	4	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1502/11	2	6210	Sligo	FAIL	6	PASS	4	FAIL	2	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1502/12	3	6230	Sligo	PASS	8	PASS	1	PASS	7	PASS	5	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1502/13	4	6230	Sligo	PASS	11	PASS	2	PASS	9	PASS	1	PASS	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1502/14	4	6210	Sligo	FAIL	4	PASS	3	FAIL	1	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1502/15	5	6230	Sligo	PASS	8	PASS	1	PASS	7	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1502/16	6	6230	Sligo	PASS	11	PASS	3	PASS	8	PASS	3	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1502/17	3	6210	Sligo	FAIL	3	FAIL	1	FAIL	2	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1507/05	1	6410	Sligo	PASS	9	PASS	3	PASS	6	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1507/06	2	6410	Sligo	PASS	9	PASS	4	PASS	5	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1509/12	1	6410	Sligo	PASS	10	PASS	2	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1509/13	2	6410	Sligo	PASS	8	PASS	2	PASS	6	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1509/14	3	6410	Sligo	FAIL	9	FAIL	0	PASS	9	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1509/15	4	6410	Sligo	PASS	7	PASS	1	PASS	6	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1510/04	1	6410	Sligo	PASS	9	PASS	3	PASS	6	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1510/05	2	6410	Sligo	PASS	8	PASS	2	PASS	6	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1510/07	3	6410	Sligo	PASS	8	PASS	3	PASS	5	PASS	2	FAIL	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1513/02	1	6210	Sligo	PASS	10	PASS	7	PASS	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1513/03	2	6210	Sligo	PASS	8	PASS	6	PASS	2	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1513/05	3	6210	Sligo	PASS	12	PASS	7	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1513/06	4	6210	Sligo	PASS	8	PASS	5	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1518/04	1	6410	Sligo	PASS	13	PASS	3	PASS	10	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1518/05	2	6410	Sligo	FAIL	7	FAIL	0	PASS	7	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1518/06	3	6410	Sligo	PASS	11	PASS	1	PASS	10	PASS	0	FAIL	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1518/07	4	6410	Sligo	FAIL	6	FAIL	0	FAIL	6	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1519/01	1	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1519/02	2	6210	Sligo	FAIL	4	PASS	2	FAIL	2	PASS	2	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1519/03	3	6210	Sligo	PASS	9	PASS	4	PASS	5	PASS	1	PASS	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1519/06	4	6210	Sligo	FAIL	4	PASS	3	FAIL	1	PASS	2	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1525/01	1	6430	Sligo	FAIL	4	PASS	1	FAIL	3	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1525/05	2	6430	Sligo	FAIL	4	PASS	1	FAIL	3	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL

Appendix 6: Structure and functions assessment scores for areas of Annex I grassland habitat surveyed in 2010

Releve ID	M.S.	Annex	County	Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1525/06	3	6430	Sligo	FAIL	3	FAIL	0	FAIL	3	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1525/07	4	6430	Sligo	FAIL	2	PASS	1	FAIL	1	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1527/02	1	6210	Sligo	PASS	7	PASS	5	PASS	2	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1527/03	2	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1527/04	3	6210	Sligo	PASS	7	PASS	5	PASS	2	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1527/05	4	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1529/01	1	6210	Sligo	PASS	8	PASS	5	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1529/02	2	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1529/04	3	6210	Sligo	PASS	12	PASS	7	PASS	5	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1529/05	4	6210	Sligo	PASS	9	PASS	6	PASS	3	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1530/02	1	6410	Sligo	PASS	8	PASS	3	PASS	5	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1530/03	2	6410	Sligo	PASS	8	PASS	4	PASS	4	PASS	1	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1530/04	3	6410	Sligo	FAIL	6	PASS	2	FAIL	4	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	FAIL
1530/05	4	6410	Sligo	PASS	11	PASS	4	PASS	7	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1531/02	1	6210	Sligo	PASS	8	PASS	4	PASS	4	PASS	1	PASS	PASS	PASS	PASS	FAIL	PASS	FAIL
1531/03	2	6210	Sligo	FAIL	6	PASS	3	FAIL	3	PASS	1	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1531/04	3	6210	Sligo	PASS	10	PASS	5	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1531/05	4	6210	Sligo	FAIL	6	PASS	3	FAIL	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1532/02	1	6210	Sligo	PASS	11	PASS	5	PASS	6	PASS	2	PASS	PASS	PASS	PASS	FAIL	PASS	FAIL
1532/03	2	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1532/04	3	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1532/06	4	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1537/01	1	6410	Sligo	PASS	10	PASS	1	PASS	9	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1537/02	2	6410	Sligo	PASS	14	PASS	2	PASS	12	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1537/03	3	6410	Sligo	PASS	11	PASS	3	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1537/07	4	6410	Sligo	PASS	12	PASS	1	PASS	11	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1537/09	1	6510	Sligo	FAIL	4	PASS	1	FAIL	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1538/01	1	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	4	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1538/02	2	6210	Sligo	PASS	7	PASS	2	PASS	5	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1538/03	3	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1538/04	4	6210	Sligo	PASS	8	PASS	4	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1541/03	1	6210	Sligo	PASS	9	PASS	4	PASS	5	PASS	2	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1541/04	2	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1541/05	3	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1541/06	4	6210	Sligo	PASS	7	PASS	5	PASS	2	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1541/07	1	6410	Sligo	PASS	9	PASS	2	PASS	7	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1541/08	2	6410	Sligo	FAIL	5	PASS	1	FAIL	4	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1541/09	3	6410	Sligo	PASS	9	PASS	2	PASS	7	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Releve ID	M.S.	Annex	County		Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1541/10	4	6410	Sligo	PASS	11	PASS	3	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1541/11	5	6410	Sligo	PASS	8	PASS	2	PASS	6	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1541/12	6	6410	Sligo	PASS	10	PASS	3	PASS	7	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1545/03	1	6410	Sligo	PASS	8	PASS	1	PASS	7	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1545/04	2	6410	Sligo	PASS	9	PASS	2	PASS	7	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1545/05	3	6410	Sligo	PASS	8	PASS	2	PASS	6	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1545/06	4	6410	Sligo	PASS	12	PASS	3	PASS	9	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1546/02	1	6410	Sligo	PASS	11	PASS	3	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1546/03	2	6410	Sligo	PASS	11	PASS	4	PASS	7	PASS	2	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1546/04	3	6410	Sligo	PASS	9	PASS	4	PASS	5	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1546/05	4	6410	Sligo	PASS	12	PASS	3	PASS	9	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1548/01	1	6230	Sligo	PASS	9	PASS	1	PASS	8	PASS	6	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1548/02	2	6230	Sligo	PASS	7	PASS	1	PASS	6	FAIL	5	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1548/03	3	6230	Sligo	PASS	8	PASS	1	PASS	7	FAIL	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1548/04	4	6230	Sligo	PASS	8	PASS	1	PASS	7	FAIL	3	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1548/06	6	6230	Sligo	FAIL	6	FAIL	0	FAIL	6	FAIL	2	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1548/07	5	6230	Sligo	FAIL	10	FAIL	0	PASS	10	FAIL	2	FAIL	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1549/02	1	6410	Sligo	PASS	8	PASS	3	PASS	5	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1549/05	2	6410	Sligo	FAIL	6	PASS	2	FAIL	4	PASS	0	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	FAIL
1549/06	3	6410	Sligo	PASS	7	PASS	2	PASS	5	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1549/07	4	6410	Sligo	PASS	8	PASS	3	PASS	5	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1556/06	1	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	0	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1556/07	2	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1556/08	3	6210	Sligo	PASS	11	PASS	6	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1556/09	4	6210	Sligo	PASS	7	PASS	3	PASS	4	PASS	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1556/10	5	6210	Sligo	PASS	8	PASS	4	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1556/11	6	6210	Sligo	PASS	8	PASS	4	PASS	4	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1561/01	1	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1561/03	2	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1561/04	3	6210	Sligo	PASS	7	PASS	4	PASS	3	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1561/05	4	6210	Sligo	PASS	9	PASS	4	PASS	5	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1561/06	5	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1561/07	6	6210	Sligo	PASS	9	PASS	5	PASS	4	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1566/04	1	6510	Sligo	PASS	7	PASS	1	PASS	6	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1566/05	2	6510	Sligo	FAIL	3	PASS	1	FAIL	2	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1566/06	3	6510	Sligo	FAIL	5	PASS	1	FAIL	4	FAIL	4	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1566/07	4	6510	Sligo	FAIL	6	PASS	1	FAIL	5	PASS	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1568/01	1	6410	Sligo	PASS	9	PASS	1	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Releve ID	M.S.	Annex	County	Overall +ve indicator species	No. of overall +ve indicator species	HQ +ve species	No. of HQ +ve species	Non-HQ +ve species	No. of non-HQ +ve species	Overall -ve indicator species	No. of overall -ve indicator species	Forb : graminoid ratio	Encroachment	Sward height	Litter cover	Bare ground cover	Grazing disturbance	Overall assessment
1568/02	2	6410	Sligo	PASS	10	PASS	1	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1568/04	3	6410	Sligo	PASS	10	PASS	2	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1568/05	4	6410	Sligo	PASS	8	PASS	1	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1568/07	5	6410	Sligo	PASS	10	PASS	1	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1568/08	6	6410	Sligo	PASS	11	PASS	3	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1572/01	1	6510	Sligo	FAIL	5	PASS	2	FAIL	3	FAIL	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1572/02	2	6510	Sligo	FAIL	6	PASS	1	FAIL	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1572/03	3	6510	Sligo	FAIL	4	PASS	1	FAIL	3	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL
1572/04	4	6510	Sligo	PASS	7	PASS	2	PASS	5	PASS	2	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1575/03	1	6410	Sligo	PASS	12	PASS	2	PASS	10	PASS	1	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1575/04	2	6410	Sligo	PASS	7	PASS	1	PASS	6	PASS	0	FAIL	PASS	PASS	PASS	PASS	PASS	FAIL
1576/06	1	6410	Sligo	PASS	10	PASS	3	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1576/07	2	6410	Sligo	PASS	10	PASS	2	PASS	8	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1576/08	3	6410	Sligo	PASS	10	PASS	1	PASS	9	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1576/09	4	6410	Sligo	FAIL	7	FAIL	0	PASS	7	PASS	1	PASS	PASS	PASS	PASS	PASS	PASS	FAIL

Appendix 7: Impacts and codes for future prospects assessment used in 2010 (Ssymank 2010)

Code	Impact
A	<i>Agriculture</i>
A01	Cultivation
A02	Modification of cultivation practices
A02.01	Agricultural intensification
A02.02	Crop change
A02.03	Grassland removal for arable land
A03	Mowing / cutting of grassland
A03.01	Intensive mowing or intensification
A03.02	Non intensive mowing
A03.03	Abandonment / lack of mowing
A04	Grazing
A04.01	Intensive grazing
A04.01.01	Intensive cattle grazing
A04.01.02	Intensive sheep grazing
A04.01.03	Intensive horse grazing
A04.01.04	Intensive goat grazing
A04.01.05	Intensive mixed animal grazing
A04.02	Non-intensive grazing
A04.02.01	Non-intensive cattle grazing
A04.02.02	Non-intensive sheep grazing
A04.02.03	Non-intensive horse grazing
A04.02.04	Non-intensive goat grazing
A04.02.05	Non-intensive mixed animal grazing
A04.03	Abandonment of pastoral systems, lack of grazing
A05	Livestock farming and animal breeding (without grazing)
A05.01	Animal breeding
A05.02	Stock feeding
A05.03	Lack of animal breeding
A06	Annual and perennial non-timber crops
A06.01	Annual crops for food production
A06.01.01	Intensive annual crops for food production/ intensification
A06.01.02	Non-intensive annual crops for food production
A06.02	Perennial non-timber crops
A06.02.01	Intensive perennial non-timber crops/intensification
A06.02.02	Non-intensive perennial non-timber crops
A06.03	Biofuel-production
A06.04	Abandonment of crop production
A07	Use of biocides, hormones and chemicals
A08	Fertilisation
A09	Irrigation
A10	Restructuring agricultural land holding
A10.01	Removal of hedges and copses or scrub

Code	Impact
A10.02	Removal of stone walls and embankments
A11	Agriculture activities not referred to above
B	<i>Sylviculture, forestry</i>
B01	Forest planting on open ground
B01.01	Forest planting on open ground (native trees)
B01.02	Artificial planting on open ground (non-native trees)
B02	Forest and Plantation management & use
B02.01	Forest replanting
B02.01.01	Forest replanting (native trees)
B02.01.02	Forest replanting (non native trees)
B02.02	Forestry clearance
B02.02	Removal of forest undergrowth
B02.04	Removal of dead and dying trees
B02.05	Non- intensive timber production (leaving dead wood/ old trees untouched)
B02.06	Thinning of tree layer
B03	Forest exploitation without replanting or natural regrowth
B04	Use of biocides, hormones and chemicals (forestry)
B05	Use of fertilizers (forestry)
B06	Grazing in forests/ woodland
B07	Forestry activities not referred to above
C	<i>Mining, extraction of materials and energy production</i>
C01	Mining and quarrying
C01.01	Sand and gravel extraction
C01.01.01	Sand and gravel quarries
C01.01.02	Removal of beach materials
C01.02	Loam and clay pits
C01.03	Peat extraction
C01.03.01	Hand cutting of peat
C01.03.02	Mechanical removal of peat
C01.04	Mines
C01.04.01	Open cast mining
C01.04.01	Underground mining
C01.05	Salt works
C01.05.01	Abandonment of saltpans (salinas)
C01.05.02	Conversion of saltpans
C01.06	Geotechnical survey
C01.07	Mining and extraction activities not referred to above
C02	Exploration and extraction of oil or gas
C02.01	Exploration drilling
C02.02	Production drilling
C02.03	Jack-up drilling rig
C02.04	Semi-submersible rig
C02.05	Drill ship
C03	Renewable abiotic energy use
C03.01	Geothermal power production

Code	Impact
C03.02	Solar energy production
C03.04	Tidal energy production
C03.03	Wind energy production
D	<i>Transportation and service corridors</i>
D01	Roads, paths and railroads
D01.01	Paths, tracks, cycling tracks
D01.02	Roads, motorways
D01.03	Car parks and parking areas
D01.04	Railway lines, TGV
D01.05	Bridge, viaduct
D01.06	Tunnel
D02	Utility and service lines
D02.01	Electricity and phone lines
D02.01.01	Suspended electricity and phone lines
D02.01.02	Underground electricity and phone lines
D02.02	Pipe lines
D02.03	Communication masts and antennas
D02.09	Other forms of energy transport
D03	Shipping lanes, ports, marine constructions
D03.01	Port areas
D03.01.01	Slipways
D03.01.02	Piers
D03.01.03	Fishing harbours
D03.01.04	Industrial ports
D03.02	Shipping
D03.03	Marine constructions
D04	Airports, flightpaths
D04.01	Airport
D04.02	Aerodrome, heliport
D04.03	Flight paths
D05	Improved access to site
D06	Other forms of transportation and communication
E	<i>Urbanisation, residential and commercial development</i>
E01	Urbanised areas, human habitation
E01.01	Continuous urbanisation
E01.02	Discontinuous urbanisation
E01.03	Dispersed habitation
E01.04	Other patterns of habitation
E02	Industrial or commercial areas
E02.01	Factory
E02.02	Industrial stockage
E02.03	Other industrial / commercial area
E03	Discharges
E03.01	Disposal of household waste
E03.02	Disposal of industrial waste

Code	Impact
E03.03	Disposal of inert materials
E03.04	Other discharges
E03.04.01	Costal sand suppletion/ beach nourishment
E04	Structures, buildings in the landscape
E04.01	Agricultural structures, buildings in the landscape
E04.02	Military constructions and buildings in the landscape
E05	Storage of materials
E06	Other urbanisation, industrial and similar activities
E06.01	Demolishment of buildings & human structures
E06.02	Reconstruction, renovation of buildings
F	<i>Biological resource use other than agriculture & forestry</i>
F01	Marine and freshwater aquaculture
F01.01	Intensive fish farming, intensification
F01.02	Suspension culture
F01.03	Bottom culture
F02	Fishing and harvesting aquatic resources
F02.01	Professional passive fishing
F02.01.01	Potting
F02.01.02	Netting
F02.01.03	Demersal longlining
F02.01.04	Pelagic longlining
F02.02	Professional active fishing
F02.02.01	Benthic or demersal trawling
F02.02.02	Pelagic trawling
F02.02.03	Demersal seining
F02.02.04	Purse seining
F02.02.05	Benthic dredging
F02.03	Leisure fishing
F02.03.01	Bait digging
F03	Hunting and collection of wild animals (terrestrial)
F03.01	Hunting
F03.01.01	Damage caused by game (excess population density)
F03.02	Taking and removal of animals (terrestrial)
F03.02.01	Collection of animals (insects, reptiles, amphibians.....)
F03.02.02	Taking from nest (e.g. Falcons)
F03.02.03	Trapping, poisoning, poaching
F03.02.04	Predator control
F03.02.05	Accidental capture
F03.02.09	Other forms of taking animals
F04	Taking / Removal of terrestrial plants, general
F04.01	Pillaging of floristic stations
F04.02	Collection (fungi, lichen, berries etc.)
F04.02.01	Hand raking
F04.02.02	Hand collection
F05	Hunting, fishing or collecting activities not referred to above
F05.01	Game/ bird breeding station

Code	Impact
G	<i>Human intrusions and disturbances</i>
G01	Outdoor sports and leisure activities, recreational activities
G01.01	Nautical sports
G01.01.01	Motorized nautical sports
G01.01.02	Non-motorized nautical sports
G01.02	Walking, horse-riding and non-motorised vehicles
G01.03	Motorised vehicles
G01.03.01	Regular motorized driving
G01.03.02	Off-road motorized driving
G01.04	Mountaineering, rock climbing, speleology
G01.04.01	Mountaineering & rock climbing
G01.04.02	Speleology
G01.05	Gliding, delta plane, paragliding, ballooning
G01.06	Skiing, off-piste
G01.07	Other outdoor sports and leisure activities
G02	Sport and leisure structures
G02.01	Golf course
G02.02	Skiing complex
G02.03	Stadium
G02.04	Circuit, track
G02.05	Hippodrome
G02.06	Attraction park
G02.06	Sports pitch
G02.07	Camping and caravans
G02.08	Wildlife watching
G02.09	Other sport / leisure complexes
G03	Interpretative centres
G04	Military use and civil unrest
G04.01	Military manoeuvres
G04.02	Abandonment of military use
G05	Other human intrusions and disturbances
G05.01	Trampling, overuse
G05.02	Vandalism
G05.03	Intensive maintenance of public parks
G05.04	Tree surgery, felling for public safety, removal of roadside trees
G05.05	Missing or wrongly directed conservation measures
G05.06	Closures of caves or galleries
G05.07	Fences, fencing
G05.08	Overflying with aircrafts (agricultural)
H	<i>Pollution</i>
H01	Pollution to surface waters (limnic & terrestrial)
H01.01	Pollution to surface waters by industrial plants
H01.02	Pollution to surface waters by storm overflows
H01.03	Other point source pollution to surface water
H01.04	Diffuse pollution to surface waters via storm overflows or urban run-off
H01.05	Diffuse pollution to surface waters due to agricultural and forestry activities

Code	Impact
H01.06	Diffuse pollution to surface waters due to transport and infrastructure without connection to canalization/sweepers
H01.07	Diffuse pollution to surface waters due to abandoned industrial sites
H01.08	Diffuse pollution to surface waters due to household sewage and waste waters
H01.09	Diffuse pollution to surface waters due to other sources not listed
H02	Pollution to groundwater (point sources and diffuse sources)
H02.01	Groundwater pollution by leakages from contaminated sites
H02.02	Groundwater pollution by leakages from waste disposal sites
H02.03	Groundwater pollution associated with oil industry infrastructure
H02.04	Groundwater pollution by mine water discharges
H02.05	Groundwater pollution by discharge to ground such as disposal of contaminated water to soakaways
H02.06	Diffuse groundwater pollution due to agricultural and forestry activities
H02.07	Diffuse groundwater pollution due to non-sewered population
H02.08	Diffuse groundwater pollution due to urban land use
H03	Marine water pollution
H03.01	Oil spills in the sea
H04	Air pollution, air-borne pollutants
H04.01	Acid rain
H04.02	Nitrogen-input
H04.03	Other air pollution
H05	Soil pollution and solid waste (excluding discharges)
H05.01	Garbage and solid waste
H06	Excess energy
H06.01	Noise nuisance, noise pollution
H06.01.01	Point source or irregular noise pollution
H06.01.02	Diffuse or permanent noise pollution
H06.02	Light pollution
H06.03	Thermal heating of water bodies
H07	Other forms of pollution
I	<i>Invasive, other problematic species and genes</i>
I01	Invasive non-native species
I02	Problematic native species
I03	Introduced genetic material, GMO
I03.01	Genetic pollution (animals)
I03.02	Genetic pollution (plants)
J	<i>Natural System modifications</i>
J01	Fire and fire suppression
J01.01	Burning down
J01.02	Suppression of natural fires
J01.03	Lack of fires
J02	Human induced changes in hydraulic conditions
J02.01	Landfill, land reclamation and drying out, general
J02.01.01	Polderisation
J02.01.02	Reclamation of land from sea, estuary or marsh
J02.01.03	Infilling of ditches, dykes, ponds, pools, marshes or pits

Code	Impact
J02.01.04	Reclamation of mining areas
J02.02	Removal of sediments (mud...)
J02.02.01	Dredging/ removal of limnic sediments
J02.02.02	Estuarine and coastal dredging
J02.03	Canalisation & water deviation
J02.03.01	Large scale water deviation
J02.03.02	Canalisation
J02.04	Flooding modifications
J02.04.01	Flooding
J02.04.02	Lack of flooding
J02.05	Modification of hydrographic functioning, general
J02.05.01	Modification of marine currents
J02.05.02	Modifying structures of inland water courses
J02.05.03	Modification of standing water bodies
J02.05.04	Reservoirs
J02.05.05	Small hydropower projects, weirs
J02.06	Water abstractions from surface waters
J02.06.01	Surface water abstractions for agriculture
J02.06.02	Surface water abstractions for public water supply
J02.06.03	Surface water abstractions by manufacturing industry
J02.06.04	Surface water abstractions for the production of electricity (cooling)
J02.06.05	Surface water abstractions by fish farms
J02.06.06	Surface water abstractions by hydro-energy
J02.06.07	Surface water abstractions by quarries/ open cast (coal) sites
J02.06.08	Surface water abstractions for navigation
J02.06.09	Surface water abstractions for water transfer
J02.06.10	Other major surface water abstractions
J02.07	Water abstractions from groundwater
J02.07.01	Groundwater abstractions for agriculture
J02.07.02	Groundwater abstractions for public water supply
J02.07.03	Groundwater abstractions by industry
J02.07.04	Groundwater abstractions by quarries/open cast (coal)sites
J02.07.05	Other major groundwater abstractions from groundwater for agriculture
J02.08	Raising the groundwater table /artificial recharge of groundwater
J02.08.01	Discharges to groundwater for artificial recharge purposes
J02.08.02	Returns of groundwater to GWB from which it was abstracted
J02.08.03	Mine water rebound
J02.08.04	Other major groundwater recharge
J02.09.	Saltwater intrusion of groundwater
J02.09.01	Saltwater intrusion
J02.09.02	Other intrusion
J02.10	Management of aquatic and bank vegetation for drainage purposes
J02.11	Dumping, depositing of dredged deposits
J02.11	Dykes, embankments, artificial beaches, general
J02.11.01	Sea defence or coast protection works, tidal barrages
J02.11.02	Dykes and flooding defence in inland water systems
J02.12	Abandonment of management of water bodies

Code	Impact
J02.13	Other human induced changes in hydraulic conditions
J03	Other ecosystem modifications
J03.01	Reduction or loss of specific habitat features
J03.01.01	Reduction of prey availability (including carcasses)
J03.02	Anthropogenic reduction of habitat connectivity
J03.02.01	Reduction in migration/ migration barriers
J03.02.02	Reduction in dispersal
J03.02.03	Reduction in genetic exchange
J03.03	Reduction, lack or prevention of erosion
J03.04	Applied (industrial) destructive research
K	<i>Natural biotic and abiotic processes (without catastrophes)</i>
K01	Abiotic (slow) natural processes
K01.01	Erosion
K01.02	Silting up
K01.03	Drying out
K01.04	Submersion
K01.05	Soil salinization
K02	Biocenotic evolution, succession
K02.01	Species composition change (succession)
K02.02	Accumulation of organic material
K02.03	Eutrophication (natural)
K02.04	Acidification (natural)
K03	Interspecific faunal relations
K03.01	Competition (fauna)
K03.02	Parasitism (fauna)
K03.03	Introduction of disease
K03.04	Predation
K03.05	Antagonism arising from introduction of species
K03.06	Antagonism with domestic animals
K03.07	Other forms of interspecific faunal competition
K04	Interspecific floral relations
K04.01	Competition (flora)
K04.02	Parasitism (flora)
K04.03	Introduction of disease
K04.04	Lack of pollinating agents
K04.05	Damage by herbivores (including game species)
K05	Reduced fecundity/ genetic depression
K05.01	Reduced fecundity/ genetic depression in animals (inbreeding)
K05.02	Reduced fecundity/ genetic depression in plants (incl. Endogamy)
K06	Other forms or mixed forms of interspecific floral competition
L	<i>Geological events, natural catastrophes</i>
L01	Volcanic activity
L02	Tidal wave, tsunamis
L03	Earthquake
L04	Avalanche

Code	Impact
L05	Collapse of terrain, landslide
L06	Underground collapses
L07	Storm, cyclone
L08	Inundation (natural processes)
L09	Fire (natural)
L10	Other natural catastrophes
M	<i>Climate change</i>
M01	Changes in abiotic conditions
M01.01	Rise of temperature and extremes
M01.02	Droughts and less precipitations
M01.03	Flooding and rising precipitations
M02	Changes in biotic conditions
M02.01	Habitat shifting and alteration
M02.02	Desynchronisation of processes
M02.03	Decline or extinction of species
M02.04	Migration of species (natural newcomers)
X	<i>No threats or pressures</i>
XO	Threats and pressures from outside the Member State
XE	Threats and pressures from outside the EU territory

Appendix 8: Future prospects assessment scores for areas of Annex I grassland habitat surveyed in 2010

This appendix contains the 30 EU impacts/pressures scored as affecting the future prospects of the 72 areas of Annex I grassland habitats surveyed.

The scores equate to future prospects assessments as follows:

≥0 = Favourable; <0 to -3 = Unfavourable – Inadequate; <-3 = Unfavourable – Bad

Site ID	County	Annex	Impact Code	Impact Description	Intensity	Effect	% Area Affected	Source	Score
1142	Donegal	6410	A04.02.02	Non intensive sheep grazing	M	+	25-50	Inside	1.5
1142	Donegal	6410	A04.02.03	Non intensive horse grazing	M	+	25-50	Inside	1.5
1147	Donegal	6410	A02.03	Grassland removal for arable land	L	-	<1	Inside	-0.25
1147	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	0	100	Inside	0
1147	Donegal	6410	A08	Fertilisation	L	-	1-25	Outside	-0.25
1147	Donegal	6410	D01.01	Paths, tracks, cycling tracks	L	-	<1	Inside	-0.25
1147	Donegal	6410	F03.01	Hunting	L	0	100	Inside	0
1152	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	0	100	Inside	0
1157	Donegal	6410	A04.03	Abandonment of pastoral systems, lack of grazing	H	-	100	Inside	-4.5
1161	Donegal	6230	A02.01	Agricultural intensification	L	0	100	Outside	0
1161	Donegal	6230	A04.02.02	Non intensive sheep grazing	L	+	100	Inside	1.5
1203	Donegal	6410	A04.03	Abandonment of pastoral systems, lack of grazing	M	-	100	Inside	-3
1232	Donegal	6410	A03.02	Non intensive mowing	L	+	100	Inside	1.5
1232	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	+	100	Inside	1.5
1232	Donegal	6410	I02	Problematic native species	M	-	1-25	Inside	-1
1243	Donegal	6230	A04.02.02	Non intensive sheep grazing	M	0	100	Inside	0
1243	Donegal	6230	B02	Forest and Plantation management & use	L	-	<1	Outside	-0.125
1248	Donegal	6510	A02.03	Grassland removal for arable land	H	-	25-50	Inside	-2.25
1248	Donegal	6410	A03.02	Non intensive mowing	H	+	100	Inside	4.5
1248	Donegal	6510	A03.02	Non intensive mowing	H	+	100	Inside	4.5
1248	Donegal	6410	A04.02.03	Non intensive horse grazing	L	-	51-75	Inside	-1
1248	Donegal	6510	A04.02.03	Non intensive horse grazing	L	0	25-50	Inside	0
1249	Donegal	6410	A03.02	Non intensive mowing	M	0	25-50	Inside	0
1249	Donegal	6410	A04.01.01	Intensive cattle grazing	M	-	25-50	Inside	-1.5
1249	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	+	25-50	Inside	0.75
1249	Donegal	6230	I02	Problematic native species	L	-	1-25	Inside	-0.5
1250	Donegal	6210	A04.02.01	Non intensive cattle grazing	L	0	1-25	Inside	0
1250	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	0	1-25	Inside	0
1250	Donegal	6210	G01.02	Walking, horse-riding and non-motorised vehicles	L	-	<1	Inside	-0.25

Site ID	County	Annex	Impact Code	Impact Description	Intensity	Effect	% Area Affected	Source	Score
1250	Donegal	6210	G05.01	Trampling, overuse	L	-	<1	Inside	-0.25
1250	Donegal	6210	H05.01	Garbage and solid waste	L	-	<1	Inside	-0.25
1252	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	0	100	Inside	0
1252	Donegal	6410	I02	Problematic native species	H	-	1-25	Outside	-0.75
1257	Donegal	6410	A04.02.01	Non intensive cattle grazing	L	-	>75	Inside	-1.25
1257	Donegal	6410	A04.03	Abandonment of pastoral systems, lack of grazing	L	-	1-25	Inside	-0.5
1266	Donegal	6210	A04.02.01	Non intensive cattle grazing	M	+	25-50	Inside	1.5
1267	Donegal	6410	A04.02.01	Non intensive cattle grazing	M	0	100	Inside	0
1270	Donegal	6210	A04.01.05	Intensive mixed animal grazing	L	+	100	Inside	1.5
1270	Donegal	6410	A04.03	Abandonment of pastoral systems, lack of grazing	H	-	100	Inside	-4.5
1272	Donegal	6210	A04.02.01	Non intensive cattle grazing	L	+	>75	Inside	1.25
1272	Donegal	6210	I02	Problematic native species	H	-	1-25	Outside	-0.75
1275	Donegal	6410	A03.02	Non intensive mowing	M	0	100	Inside	0
1282	Donegal	6510	A03.01	Intensive mowing or intensification	M	+	100	Inside	3
1282	Donegal	6510	A08	Fertilisation	M	-	100	Inside	-3
1283	Donegal	6210	A04.02.01	Non intensive cattle grazing	M	-	100	Inside	-3
1283	Donegal	6210	I02	Problematic native species	L	-	1-25	Outside	-0.25
1284	Donegal	6210	A04.01.01	Intensive cattle grazing	L	-	100	Inside	-1.5
1284	Donegal	6210	I02	Problematic native species	M	-	1-25	Outside	-0.5
1285	Donegal	6210	A04.02.01	Non intensive cattle grazing	M	0	100	Inside	0
1285	Donegal	6210	A08	Fertilisation	L	-	1-25	Outside	-0.25
1300	Dublin	6510	A03.02	Non intensive mowing	H	+	100	Inside	4.5
1300	Dublin	6210	A04.02.01	Non intensive cattle grazing	M	0	1-25	Inside	0
1300	Dublin	6510	A04.02.01	Non intensive cattle grazing	M	+	1-25	Inside	1
1300	Dublin	6210	A04.02.02	Non intensive sheep grazing	H	0	51-75	Inside	0
1300	Dublin	6410	A04.02.03	Non intensive horse grazing	M	+	51-75	Inside	2
1300	Dublin	6210	I02	Problematic native species	M	-	1-25	Inside	-1
1305	Dublin	6230	A04.02.02	Non intensive sheep grazing	H	0	100	Inside	0
1315	Dublin	6210	A03.02	Non intensive mowing	H	+	>75	Inside	3.75

Site ID	County	Annex	Impact Code	Impact Description	Intensity	Effect	% Area Affected	Source	Score
1324	Dublin	6210	A03.02	Non intensive mowing	H	+	100	Inside	4.5
1327	Dublin	6210	A04.02.01	Non intensive cattle grazing	H	0	>75	Inside	0
1327	Dublin	6210	A10.01	Removal of hedges and copses or scrub	M	0	1-25	Inside	0
1400	Kildare	6230	A04.01.02	Intensive sheep grazing	M	-	1-25	Inside	-1
1400	Kildare	6230	A04.02.02	Non intensive sheep grazing	M	+	51-75	Inside	2
1400	Kildare	6230	A10.01	Removal of hedges and copses or scrub	L	+	<1	Inside	0.25
1400	Kildare	6230	D01	Roads, paths and railroads	L	-	1-25	Inside	-0.5
1400	Kildare	6230	E04.02	Military constructions and buildings in the landscape	L	0	<1	Inside	0
1400	Kildare	6230	G01.02	Walking, horse-riding and non-motorised vehicles	M	-	25-50	Inside	-1.5
1401	Kildare	6230	A04.01.02	Intensive sheep grazing	M	-	1-25	Inside	-1
1401	Kildare	6210	A04.02.02	Non intensive sheep grazing	L	+	100	Inside	1.5
1401	Kildare	6230	A04.02.02	Non intensive sheep grazing	M	+	25-50	Inside	1.5
1401	Kildare	6230	A10.01	Removal of hedges and copses or scrub	L	+	<1	Inside	0.25
1401	Kildare	6230	D01.01	Paths, tracks, cycling tracks	L	-	1-25	Inside	-0.5
1401	Kildare	6210	G01.02	Walking, horse-riding and non-motorised vehicles	L	-	1-25	Inside	-0.5
1401	Kildare	6230	G01.02	Walking, horse-riding and non-motorised vehicles	M	-	25-50	Inside	-1.5
1402	Kildare	6410	J02.07.01	Groundwater abstractions for agriculture	H	-	100	Inside	-4.5
1417	Kildare	6410	A04.02.01	Non intensive cattle grazing	M	+	25-50	Inside	1.5
1417	Kildare	6410	D01.01	Paths, tracks, cycling tracks	H	-	1-25	Inside	-1.5
1417	Kildare	6410	G01.03	Motorised vehicles	H	-	1-25	Inside	-1.5
1417	Kildare	6410	J01.01	Burning down	M	+	1-25	Inside	1
1417	Kildare	6410	J02.07.01	Groundwater abstractions for agriculture	L	-	<1	Inside	-0.25
1422	Kildare	6410	A03.02	Non intensive mowing	H	-	100	Inside	-4.5
1422	Kildare	6410	J02.07.01	Groundwater abstractions for agriculture	M	-	100	Inside	-3
1423	Kildare	6210	A04.01.01	Intensive cattle grazing	M	-	25-50	Inside	-1.5
1423	Kildare	6210	I02	Problematic native species	M	-	25-50	Outside	-0.75
1500	Sligo	6210	A04.02.01	Non intensive cattle grazing	M	+	100	Inside	3
1500	Sligo	6210	D02.01	Electricity and phone lines	L	0	1-25	Inside	0
1500	Sligo	6210	I02	Problematic native species	M	-	1-25	Inside	-1

Site ID	County	Annex	Impact Code	Impact Description	Intensity	Effect	% Area Affected	Source	Score
1501	Sligo	6210	A04.02.02	Non intensive sheep grazing	H	+	100	Inside	4.5
1501	Sligo	6210	G01.02	Walking, horse-riding and non-motorised vehicles	L	-	100	Inside	-1.5
1501	Sligo	6210	G05.01	Trampling, overuse	L	-	1-25	Inside	-0.5
1502	Sligo	6210	A04.02.02	Non intensive sheep grazing	M	+	100	Inside	3
1502	Sligo	6230	A04.02.02	Non intensive sheep grazing	M	+	100	Inside	3
1507	Sligo	6410	A04.02.01	Non intensive cattle grazing	M	+	100	Inside	3
1509	Sligo	6410	A04.03	Abandonment of pastoral systems, lack of grazing	M	-	100	Inside	-3
1510	Sligo	6410	A04.02.01	Non intensive cattle grazing	M	-	1-25	Inside	-1
1513	Sligo	6210	A04.02.01	Non intensive cattle grazing	M	+	100	Inside	3
1513	Sligo	6210	A08	Fertilisation	L	-	100	Inside	-1.5
1518	Sligo	6410	A04.02.01	Non intensive cattle grazing	M	+	100	Inside	3
1518	Sligo	6410	I02	Problematic native species	H	-	1-25	Outside	-0.75
1519	Sligo	6210	A04.02.01	Non intensive cattle grazing	L	+	>75	Inside	1.25
1519	Sligo	6210	A08	Fertilisation	M	-	25-50	Inside	-1.5
1525	Sligo	6430	A04.03	Abandonment of pastoral systems, lack of grazing	M	-	100	Inside	-3
1527	Sligo	6210	A04.02.02	Non intensive sheep grazing	H	+	100	Inside	4.5
1529	Sligo	6210	A04.02.01	Non intensive cattle grazing	H	+	100	Inside	4.5
1530	Sligo	6410	A03.02	Non intensive mowing	M	-	25-50	Inside	-1.5
1530	Sligo	6410	A04.02.01	Non intensive cattle grazing	M	+	25-50	Inside	1.5
1530	Sligo	6410	B01	Forest planting on open ground	M	0	25-50	Outside	0
1531	Sligo	6210	A04.02.02	Non intensive sheep grazing	H	+	100	Inside	4.5
1532	Sligo	6210	A04.02.02	Non intensive sheep grazing	M	+	100	Inside	3
1532	Sligo	6210	A04.02.05	Non intensive mixed animal grazing	M	-	25-50	Inside	-1.5
1532	Sligo	6210	A08	Fertilisation	M	-	51-75	Outside	-1
1537	Sligo	6510	A03.02	Non intensive mowing	L	+	100	Inside	1.5
1537	Sligo	6410	A04.02.01	Non intensive cattle grazing	L	+	100	Inside	1.5
1537	Sligo	6510	A04.02.01	Non intensive cattle grazing	L	+	100	Inside	1.5
1537	Sligo	6410	A04.02.03	Non intensive horse grazing	L	+	100	Inside	1.5
1537	Sligo	6510	A04.02.03	Non intensive horse grazing	L	+	100	Inside	1.5

Site ID	County	Annex	Impact Code	Impact Description	Intensity	Effect	% Area Affected	Source	Score
1538	Sligo	6210	A04.01.01	Intensive cattle grazing	H	-	25-50	Inside	-2.25
1538	Sligo	6210	A04.01.03	Intensive horse grazing	H	-	25-50	Inside	-2.25
1541	Sligo	6410	A03.02	Non intensive mowing	L	+	1-25	Inside	0.5
1541	Sligo	6210	A04.02.02	Non intensive sheep grazing	M	+	100	Inside	3
1541	Sligo	6410	A04.02.02	Non intensive sheep grazing	M	+	100	Inside	3
1545	Sligo	6410	A04.02.01	Non intensive cattle grazing	H	+	100	Inside	4.5
1546	Sligo	6410	A03.02	Non intensive mowing	M	-	25-50	Inside	-1.5
1546	Sligo	6410	A04.02.01	Non intensive cattle grazing	M	+	25-50	Inside	1.5
1546	Sligo	6410	J02.07.01	Groundwater abstractions for agriculture	M	+	25-50	Outside	0.75
1548	Sligo	6230	A04.01.02	Intensive sheep grazing	H	+	100	Inside	4.5
1549	Sligo	6410	A03.02	Non intensive mowing	H	-	100	Inside	-4.5
1556	Sligo	6210	A04.02.01	Non intensive cattle grazing	H	0	100	Inside	0
1561	Sligo	6210	A04.02.01	Non intensive cattle grazing	H	+	100	Inside	4.5
1561	Sligo	6210	A08	Fertilisation	M	-	25-50	Outside	-0.75
1566	Sligo	6510	A02.01	Agricultural intensification	M	-	100	Outside	-1.5
1566	Sligo	6510	A03.02	Non intensive mowing	M	+	100	Inside	3
1566	Sligo	6510	A08	Fertilisation	M	-	100	Outside	-1.5
1568	Sligo	6410	A02.01	Agricultural intensification	L	-	1-25	Outside	-0.25
1568	Sligo	6410	A04.02.01	Non intensive cattle grazing	L	+	100	Inside	1.5
1568	Sligo	6410	A04.02.03	Non intensive horse grazing	L	+	100	Inside	1.5
1568	Sligo	6410	B02	Forest and Plantation management & use	L	-	100	Outside	-0.75
1572	Sligo	6510	A03.01	Intensive mowing or intensification	H	+	100	Inside	4.5
1572	Sligo	6510	D01.03	Car parks and parking areas	H	-	1-25	Outside	-0.75
1572	Sligo	6510	J02.07.01	Groundwater abstractions for agriculture	H	+	100	Inside	4.5
1575	Sligo	6410	A04.02.01	Non intensive cattle grazing	L	+	100	Inside	1.5
1576	Sligo	6410	A04.02.01	Non intensive cattle grazing	M	+	100	Inside	3
1576	Sligo	6410	J02.07.01	Groundwater abstractions for agriculture	M	-	100	Outside	-1.5

Appendix 9: Condition assessment results for areas of Annex I grassland habitat surveyed in 2010

This lists all sites in Donegal, Dublin, Kildare and Sligo that had an area of Annex I grassland habitat assessed in 2010. Assessment results are included for each of the three criteria – area, structure and functions, future prospects – as well as the overall condition assessment for the area(s) of Annex I grassland habitat at the site.

Site ID	Annex I habitat	Area Assessment	Structure and Functions Assessment	Future Prospects Assessment	Overall Condition Assessment
1142	6410	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1147	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1152	6410	Favourable	Favourable	Favourable	Favourable
1157	6410	Favourable	Unfavourable-Bad	Unfavourable-Bad	Unfavourable-Bad
1161	6230	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1203	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1232	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1243	6230	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1248	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1248	6510	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1249	6230	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1249	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1250	6210	Favourable	Unfavourable-Inadequate	Unfavourable-Inadequate	Unfavourable-Inadequate
1250	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1252	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1257	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1266	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1267	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1270	6210	Favourable	Favourable	Favourable	Favourable
1270	6410	Favourable	Favourable	Unfavourable-Bad	Unfavourable-Bad
1272	6210	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1275	6410	Favourable	Favourable	Favourable	Favourable
1282	6510	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1283	6210	Favourable	Favourable	Unfavourable-Bad	Unfavourable-Bad
1284	6210	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1285	6210	Favourable	Unfavourable-Inadequate	Unfavourable-Inadequate	Unfavourable-Inadequate
1300	6210	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1300	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1300	6510	Favourable	Favourable	Favourable	Favourable
1305	6230	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1315	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1324	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1327	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad

Site ID	Annex I habitat	Area Assessment	Structure and Functions Assessment	Future Prospects Assessment	Overall Condition Assessment
1400	6230	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1401	6210	Favourable	Favourable	Favourable	Favourable
1401	6230	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1402	6410	Favourable	Unfavourable-Bad	Unfavourable-Bad	Unfavourable-Bad
1417	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1422	6410	Favourable	Unfavourable-Bad	Unfavourable-Bad	Unfavourable-Bad
1423	6210	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1500	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1501	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1502	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1502	6230	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1507	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1509	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1510	6410	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1513	6210	Favourable	Favourable	Favourable	Favourable
1518	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1519	6210	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1525	6430	Favourable	Unfavourable-Bad	Unfavourable-Inadequate	Unfavourable-Bad
1527	6210	Favourable	Favourable	Favourable	Favourable
1529	6210	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1530	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1531	6210	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1532	6210	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1537	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1537	6510	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1538	6210	Favourable	Unfavourable-Inadequate	Unfavourable-Bad	Unfavourable-Bad
1541	6210	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1541	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1545	6410	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1546	6410	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate
1548	6230	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1549	6410	Favourable	Unfavourable-Inadequate	Unfavourable-Bad	Unfavourable-Bad
1556	6210	Unfavourable-Inadequate	Favourable	Favourable	Unfavourable-Inadequate

Site ID	Annex I habitat	Area Assessment	Structure and Functions Assessment	Future Prospects Assessment	Overall Condition Assessment
1561	6210	Favourable	Favourable	Favourable	Favourable
1566	6510	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1568	6410	Favourable	Favourable	Favourable	Favourable
1572	6510	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1575	6410	Favourable	Unfavourable-Bad	Favourable	Unfavourable-Bad
1576	6410	Favourable	Unfavourable-Inadequate	Favourable	Unfavourable-Inadequate

Appendix 10: Conservation scores for all sites surveyed in 2010

See Table 2.4 (p. 23) for explanation of scoring criteria.

Conservation score is expressed as a percentage of the maximum possible score.

Ranking is the overall conservation ranking within the 203 sites surveyed.

‘=’ indicates a ranking is shared by two or more sites.

Site ID	Site name	County	SAC	(p)NHA	Semi-natural Grassland Habitat				Annex I grassland habitats				Adjacent semi-natural habitats				Total	Conservation indicator species	Conservation Score %	Conservation Ranking
					5	12	2.5	12	4	8	4	47.5	100.00							
1101	Ballyhoorisky	Donegal	1975	1975	2	0	1.5	2	4	0	3	12.5	26.3	=110						
1102	Ballymichael	Donegal	1975	1975	2	0	1.5	4	3	0	4	14.5	30.5	=69						
1104	Ardmalin	Donegal	2012	2012	2	0	1	1	4	0	3	11	23.2	=129						
1105	Carrickabraghy	Donegal	2012	2012	1	0	1	1	4	0	4	11	23.2	=129						
1107	Errarooley More	Donegal	147, 1090	147, 1090	3	0	2.5	3	4	0	4	16.5	34.7	=46						
1109	Knockfola	Donegal	-	-	3	0	1.5	2	4	0	3	13.5	28.4	=90						
1110	Bamba's Crown	Donegal	2012	2012	1	0	1	2	2	0	2	8	16.8	=169						
1111	Culoort	Donegal	-	-	2	0	1	1	2	0	0	6	12.6	=190						
1112	Lenan	Donegal	2012	2012	2	0	1.5	3	3	0	4	13.5	28.4	=90						
1113	Redford Glebe	Donegal	2012	2012	2	0	2	1	4	0	2	11	23.2	=129						
1114	Ballycherry	Donegal	2012	2012	4	0	2	1	4	0	4	15	31.6	=63						
1115	Bredagh Glen	Donegal	-	-	1	0	2	3	4	0	3	13	27.4	=105						
1116	Ballymacmoriarty	Donegal	2012	2012	1	0	2	2	4	0	2	11	23.2	=129						
1117	Glentogher	Donegal	-	-	2	0	1.5	1	4	0	1	9.5	20.0	=152						
1118	Ture	Donegal	-	-	1	0	1	2	1	0	0	5	10.5	=201						
1120	Kilderry House	Donegal	-	-	1	0	1	1	3	0	0	6	12.6	=190						
1121	Greenan Mountain	Donegal	-	-	1	0	1.5	6	1	0	2	11.5	24.2	=122						
1124	Tullyowen	Donegal	2301	2067	1	0	1	1	3	0	1	7	14.7	=179						
1126	Claragh	Donegal	2176	1162	2	0	1	2	2	0	1	8	16.8	=169						
1128	Doon Glebe	Donegal	-	-	1	0	1.5	3	1	0	0	6.5	13.7	=184						
1130	Ballyconnelly	Donegal	-	-	1	0	1.5	3	3	0	3	11.5	24.2	=122						
1133	Meenformal	Donegal	-	-	2	0	1.5	2	4	0	3	12.5	26.3	=110						
1134	Breaghly Head	Donegal	-	-	2	0	2	3	3	0	4	14	29.5	=82						
1139	Creeve	Donegal	-	-	1	0	1.5	3	1	0	0	6.5	13.7	=184						
1140	Roshin	Donegal	-	-	1	0	2	1	3	0	0	7	14.7	=179						
1142	Ardachrin	Donegal	-	-	2	4	1.5	3	4	0	4	18.5	38.9	=33						
1143	Muntermellan	Donegal	-	-	2	0	1.5	2	4	0	4	13.5	28.4	=90						
1144	Coolboy Big	Donegal	-	-	3	0	2	4	3	0	4	16	33.7	=50						
1145	Drumnaskea	Donegal	-	-	1	0	1.5	4	2	0	4	12.5	26.3	=110						
1146	Carntressy	Donegal	-	-	1	0	1.5	4	2	0	3	11.5	24.2	=122						
1147	Inch Level	Donegal	2287	166	2	4	2	4	3	0	4	19	40.0	=24						
1148	Carthage	Donegal	-	-	1	0	1.5	1	4	0	2	9.5	20.0	=152						
1149	Clooneymore	Donegal	2176	1162	2	0	1.5	3	4	0	4	14.5	30.5	=69						
1150	Lighthouse Lot	Donegal	111	111	2	0	1.5	4	2	0	3	12.5	26.3	=110						
1151	Glenveagh Bridge	Donegal	2047	2047	1	0	1	1	4	0	0	7	14.7	=179						
1152	Maghera Glebe	Donegal	-	-	2	2	1.5	1	4	0	4	14.5	30.5	=69						
1155	Cooladerry	Donegal	1975	1975	1	0	1	1	4	0	2	9	18.9	=157						
1157	Swillybrin	Donegal	-	-	1	2	1.5	2	4	0	4	14.5	30.5	=69						
1161	Stroove North	Donegal	2012	2012	2	2	1	1	3	0	0	9	18.9	=157						
1163	Carrowmore	Donegal	-	-	2	0	2	1	4	0	2	11	23.2	=129						
1164	Carn	Donegal	-	-	2	0	1.5	2	3	0	1	9.5	20.0	=152						
1165	Tory Island	Donegal	2259	193	3	0	2	6	2	0	3	16	33.7	=50						
1166	Creenary	Donegal	-	-	2	2	1.5	2	4	0	3	14.5	30.5	=69						
1203	Dooley	Donegal	-	-	1	2	1.5	2	3	0	2	11.5	24.2	=122						
1206	Drumaneany	Donegal	-	-	2	0	1	2	3	0	2	10	21.1	=145						
1207	Meenmore East	Donegal	-	-	2	0	1	4	1	0	1	9	18.9	=157						
1208	Meenagolan	Donegal	2301	-	3	0	1.5	3	4	0	4	15.5	32.6	=55						
1209	Kingarrow	Donegal	-	-	2.5	0	2.5	2	4	0	4	15	31.6	=63						
1210	Meenatinny	Donegal	-	-	2	0	2.5	3	2	0	4	13.5	28.4	=90						
1211	Cark	Donegal	-	-	1	0	1.5	2	1	0	0	5.5	11.6	=196						
1212	Drumanaught	Donegal	-	-	1	0	1	3	2	0	1	8	16.8	=169						
1219	Carrickbrack	Donegal	-	-	1	0	1.5	2	1	0	0	5.5	11.6	=196						
1224	Garvan	Donegal	-	-	1	0	1.5	4	1	0	1	8.5	17.9	=163						
1225	Croaghbridd	Donegal	-	-	1	0	1	1	3	0	1	7	14.7	=179						
1227	Maas	Donegal	-	-	1.5	0	2	2	3	0	2	10.5	22.1	=140						
1229	Lackagh	Donegal	197	197	1.5	0	2	6	2	0	4	15.5	32.6	=55						
1230	Drumboghill	Donegal	197	197	2	0	1.5	4	2	0	4	13.5	28.4	=90						
1232	Cloghboy	Donegal	190	190	3	2	2.5	6	2	0	4	19.5	41.1	=21						
1233	Maghera	Donegal	190	190	2	0	1.5	2	4	0	3	12.5	26.3	=110						
1235	Malin Beg	Donegal	189	189	2.5	0	0.5	1	4	0	4	12	25.3	=119						
1236	Malinmore	Donegal	189	189	1	0	1	1	4	0	3	10	21.1	=145						
1237	Doonalt	Donegal	189, 190	189, 190	2	0	1.5	3	3	0	4	13.5	28.4	=90						

Site ID	Site name	County	SAC	(p)NHA	Semi-natural Grassland Habitat- Annex I grassland habitats										Adjacent semi-natural habitats		Total	Conservation indicator species	Conservation Score %	Conservation Ranking
					5	12	2.5	12	4	8	4	47.5	100.00							
1238	Beefan	Donegal	-	-	2	0	1.5	1	4	0	4	12.5	26.3	=110						
1241	Crowkeeragh	Donegal	-	1938	2	0	1	1	4	0	0	8	16.8	=169						
1242	Crowlar	Donegal	-	-	2	0	1.5	1	4	0	2	10.5	22.1	=140						
1243	Glengesh	Donegal	-	-	2	2	1.5	3	2	0	3	13.5	28.4	=90						
1244	Meentadun	Donegal	-	-	2	0	1.5	1	4	0	2	10.5	22.1	=140						
1245	Carricknamoghil	Donegal	-	-	1	0	1.5	2	3	0	3	10.5	22.1	=140						
1247	Ardinawark	Donegal	-	-	2	0	1	2	2	0	2	9	18.9	=157						
1248	Rossnowlagh Lower	Donegal	138	-	4	8	2	6	3	0	4	27	56.8	=2						
1249	Drumhome	Donegal	138	138	2	4	2	3	4	0	4	19	40.0	=24						
1250	St. John's Point	Donegal	191	191	2	8	2	6	4	0	4	26	54.7	=4						
1251	Friary	Donegal	163	163	2	0	1	4	2	0	4	13	27.4	=105						
1252	Roes	Donegal	-	-	1	2	1.5	4	2	0	4	14.5	30.5	=69						
1253	Heney's	Donegal	-	-	1	0	2	2	4	0	4	13	27.4	=105						
1254	Clogher	Donegal	163	-	2	0	2	3	3	0	4	14	29.5	=82						
1256	Rahanlacky	Donegal	-	-	2	0	2	3	3	0	3	13	27.4	=105						
1257	Tawnygorm	Donegal	-	-	1	2	2	4	3	0	4	16	33.7	=50						
1258	Glencoagh	Donegal	-	-	1	0	1	1	4	0	3	10	21.1	=145						
1259	Hall Demesne	Donegal	-	-	1.5	0	1	3	3	0	2	10.5	22.1	=140						
1260	Dromore	Donegal	-	-	2	0	2	3	3	0	4	14	29.5	=82						
1263	Magheracar	Donegal	428	428	2.5	0	2	3	4	0	4	15.5	32.6	=55						
1265	Creevy	Donegal	-	-	2	0	2	4	3	0	4	15	31.6	=63						
1266	Legaltan	Donegal	-	-	2	2	1.5	6	2	0	4	17.5	36.8	=40						
1267	Tullyhorky	Donegal	-	-	1	2	1.5	1	4	0	3	12.5	26.3	=110						
1268	Cavangarden	Donegal	1992	1992	1	0	1.5	3	1	0	2	8.5	17.9	=163						
1269	Carricknahorna	Donegal	-	-	1	0	2	1	4	0	3	11	23.2	=129						
1270	Cashelard	Donegal	-	-	3	4	2	3	4	0	4	20	42.1	=17						
1271	Tievemore	Donegal	-	-	1	0	2	3	2	0	3	11	23.2	=129						
1272	Garvanagh	Donegal	-	2068	3	4	2.5	6	4	0	4	23.5	49.5	7						
1275	Meenavanaghan or Greaghs Barr	Donegal	-	-	1	2	1.5	2	3	0	2	11.5	24.2	=122						
1276	Carntullagh	Donegal	-	-	2	0	1.5	2	4	0	2	11.5	24.2	=122						
1277	Sallywood	Donegal	-	-	1	0	1.5	1	4	0	1	8.5	17.9	=163						
1278	Gortnagrace	Donegal	-	-	2	0	1.5	3	1	0	1	8.5	17.9	=163						
1279	Donaghmore Glebe	Donegal	2301	-	1	0	1	2	2	0	0	6	12.6	=190						
1280	Meenagran	Donegal	-	-	1	0	2	3	2	0	2	10	21.1	=145						
1281	Tamur	Donegal	-	-	1	0	1	2	2	0	2	8	16.8	=169						
1282	Coolcholly	Donegal	-	-	2	2	1.5	3	3	0	4	15.5	32.6	=55						
1283	Ballynacarrick	Donegal	115	115	1	2	2	1	4	0	4	14	29.5	=82						
1284	Drumnagroagh	Donegal	-	-	1	2	1	2	4	0	4	14	29.5	=82						
1285	Tober	Donegal	-	-	2	2	2	4	4	0	4	18	37.9	=38						
1286	Mullyvea	Donegal	197	197	2	0	2	2	4	0	4	14	29.5	=82						
1287	Summy	Donegal	197	197	2	0	2	2	4	0	4	14	29.5	=82						
1300	Glenasmole Valley	Dublin	1209	1209	4	8	2	6	4	0	4	28	58.9	1						
1301	Howth Head	Dublin	202	202	2	0	2	1	4	0	1	10	21.1	=145						
1302	Ireland's Eye	Dublin	2193	203	2	0	1.5	1	3	0	0	7.5	15.8	=177						
1303	Dalkey Island	Dublin	-	1206	2	0	1	2	1	0	0	6	12.6	=190						
1304	Loughshinny Coast	Dublin	-	2000	3	0	2	3	2	0	1	11	23.2	=129						
1305	Ballybrack	Dublin	-	-	3	4	2.5	4	3	0	4	20.5	43.2	=13						
1306	Kilmashogue	Dublin	-	-	2	0	1.5	6	2	0	2	13.5	28.4	=90						
1307	Balally	Dublin	-	-	2	0	0.5	1	2	0	0	5.5	11.6	=196						
1309	St. Annes Park	Dublin	206	206	2	0	1	2	2	0	0	7	14.7	=179						
1311	Baldoyle	Dublin	199	199	2	0	1.5	3	2	0	1	9.5	20.0	=152						
1312	Newhaggard	Dublin	208	208	2	0	1.5	3	2	4	0	12.5	26.3	=110						
1313	Malahide Demesne	Dublin	-	-	1	0	0.5	1	2	0	0	4.5	9.5	203						
1314	Ardgillan Demesne	Dublin	-	-	2	0	0.5	3	1	0	0	6.5	13.7	=184						
1315	Phoenix Park	Dublin	-	-	3	2	1	12	1	0	2	21	44.2	=10						
1316	Shanganagh Park	Dublin	-	-	1	0	0.5	3	1	0	0	5.5	11.6	=196						
1318	Bog of Ring	Dublin	-	1204	1	0	1.5	3	1	0	0	6.5	13.7	=184						
1320	Waterstone Park	Dublin	-	128	3	0	1	4	1	0	1	10	21.1	=145						
1321	Ashtown Royal Canal	Dublin	-	2103	3	0	1	1	4	0	2	11	23.2	=129						
1322	Slade of Saggart	Dublin	-	211	2	0	1	1	4	0	4	12	25.3	=119						
1323	Portrairie	Dublin	-	-	2	0	1.5	3	1	0	0	7.5	15.8	=177						
1324	Newbridge Demesne	Dublin	-	-	3	4	1	6	2	6	2	24	50.5	6						

Site ID	Site name	County	SAC	(p)NHA	Semi-natural Grassland Habitats										Annex I grassland habitats		Adjacent semi-natural habitats		Area		Species richness		Notable species		High quality indicator species		Total	Conservation Score %	Conservation Ranking
					5	12	2.5	12	4	8	4	47.5	100.00																
1325	Baldonnel	Dublin	-	-	2	0	1	12	1	0	1	17	35.8	=43															
1326	Ballymorefinn	Dublin	-	-	2	0	1.5	3	3	0	2	11.5	24.2	=122															
1327	Bohernabreena	Dublin	-	-	2	2	0.5	1	4	0	2	11.5	24.2	=122															
1328	Hell Fire Club	Dublin	-	-	2	0	1	2	1	0	0	6	12.6	=190															
1399	Friarstown Meadow	Dublin	-	-	1	0	0.5	1	3	0	0	5.5	11.6	=196															
1400	Curragh	Kildare	-	392	3	2	1.5	12	0	0	1	19.5	41.1	=21															
1401	Little Curragh	Kildare	-	392	3	4	1	12	1	0	2	23	48.4	8															
1402	Dunlavin Marshes	Kildare	-	1772	3	2	1.5	3	4	0	4	17.5	36.8	=40															
1404	Ballyhagan	Kildare	-	-	1	0	1	1	4	0	2	9	18.9	=157															
1405	Killhill	Kildare	-	-	3	0	1.5	4	2	0	2	12.5	26.3	=110															
1406	Blacktrench	Kildare	-	-	2	0	1.5	4	2	0	4	13.5	28.4	=90															
1407	Moods	Kildare	-	2104	2	0	1	1	4	0	2	10	21.1	=145															
1408	Punchers Grange	Kildare	-	-	2	0	1.5	4	3	0	4	14.5	30.5	=69															
1409	Grange Common	Kildare	-	-	1	0	1	2	1	0	0	5	10.5	=201															
1410	Rathangan	Kildare	-	2104	2	0	1	3	4	0	4	14	29.5	=82															
1411	Ardree	Kildare	2162	-	1.5	0	1.5	2	2	0	1	8	16.8	=169															
1412	Knockaulin	Kildare	-	-	1	0	1.5	3	1	0	0	6.5	13.7	=184															
1414	Bishopsland	Kildare	-	-	2	0	2	1	4	0	4	13	27.4	=105															
1415	Bishophill Commons	Kildare	-	-	0.5	0	1.5	1	3	0	0	6	12.6	=190															
1416	Ballysax Great	Kildare	-	-	1.5	0	1	2	2	0	0	6.5	13.7	=184															
1417	Dunshane Common	Kildare	-	-	3	2	1.5	4	2	0	4	16.5	34.7	=46															
1418	Lullymore West	Kildare	-	-	2	0	1.5	1	4	4	3	15.5	32.6	=55															
1420	Cupidstownhill	Kildare	-	-	2	0	0.5	4	1	0	1	8.5	17.9	=163															
1422	Crohane	Kildare	-	-	1	2	1.5	4	2	0	4	14.5	30.5	=69															
1423	Carrick Hill	Kildare	-	-	1	2	1	1	4	0	0	9	18.9	=157															
1498	Derryoughter East	Kildare	-	-	2	0	1.5	3	3	0	4	13.5	28.4	=90															
1499	Castletown House	Kildare	-	-	2	0	1.5	4	1	0	1	9.5	20.0	=152															
1500	Mullaghmore	Sligo	625	625	1	2	1.5	3	3	0	4	14.5	30.5	=69															
1501	Knocknarea	Sligo	-	1670	3	4	1.5	4	4	0	4	20.5	43.2	=13															
1502	Edenbaum	Sligo	-	2435	3	6	2	6	4	2	4	27	56.8	=2															
1503	Ballyconnell	Sligo	627	627	2	0	1.5	4	3	0	4	14.5	30.5	=69															
1507	Rockfinlough	Sligo	-	1907	3	2	2	3	4	0	4	18	37.9	=38															
1508	Clooncunny	Sligo	-	587	2	0	2	6	3	0	4	17	35.8	=43															
1509	Derrybeg	Sligo	-	587	2	2	2	6	3	0	4	19	40.0	=24															
1510	Carrownabinna	Sligo	-	-	4	2	2	3	4	0	4	19	40.0	=24															
1511	Tawnatruffan	Sligo	-	-	2	0	2	3	4	0	4	15	31.6	=63															
1512	Portinch	Sligo	636	636	5	0	2	6	4	0	4	21	44.2	=10															
1513	Farranyharpy	Sligo	-	-	2	4	0.5	4	4	0	4	18.5	38.9	=33															
1514	Doon	Sligo	-	-	2	0	1.5	3	3	0	4	13.5	28.4	=90															
1515	Eskragh	Sligo	-	-	2	0	2	3	4	0	4	15	31.6	=63															
1516	Carrownyclovan	Sligo	-	-	2	0	2	4	1	0	3	12	25.3	=119															
1517	Doonaveeragh	Sligo	1656	1656	3	0	2	6	4	0	4	19	40.0	=24															
1518	Treanmacmurtagh	Sligo	1656	1656	2	2	1.5	6	3	0	4	18.5	38.9	=33															
1519	Greenan	Sligo	1656	1656	2	2	2	6	3	0	4	19	40.0	=24															
1523	Annagh Beg	Sligo	1898	-	3	0	1.5	6	3	0	4	17.5	36.8	=40															
1524	Cooperhill	Sligo	1898	1898	2	0	1.5	3	4	0	4	14.5	30.5	=69															
1525	Ardkeeran	Sligo	1898	1898	3	2	2	6	3	0	4	20	42.1	=17															
1526	Reask	Sligo	-	-	1	0	1	4	2	0	3	11	23.2	=129															
1527	Castlegal	Sligo	-	2435	3	4	1.5	4	4	0	4	20.5	43.2	=13															
1528	Kintogher	Sligo	627	627	2	0	2.5	4	2	0	3	13.5	28.4	=90															
1529	Rosses Point	Sligo	627	627	4.5	4	1.5	3	4	0	4	21	44.2	=10															
1530	Corsallagh	Sligo	-	-	1.5	2	1.5	3	4	0	4	16	33.7	=50															
1531	Knocknashee	Sligo	-	-	3	2	2	6	2	0	4	19	40.0	=24															
1532	Formoyle	Sligo	-	-	4	4	2	4	4	0	4	22	46.3	9															
1534	Rooghan	Sligo	-	-	1	0	1.5	2	2	0	2	8.5	17.9	=163															
1535	Carrigans Upper	Sligo	-	-	2	0	2	6	3	0	4	17	35.8	=43															
1537	Cloonaleigha	Sligo	636	636	3	4	2	4	3	0	4	20	42.1	=17															
1538	Primrosegrange	Sligo	-	-	2.5	4	1.5	3	4	0	4	19	40.0	=24															
1539	Markree Demesne South	Sligo	1898	1898	3	0	1.5	4	3	0	4	15.5	32.6	=55															
1540	Markree Demesne North	Sligo	1898	1898	2	0	1.5	4	3	0	4	14.5	30.5	=69															
1541	Cloonmacduff	Sligo	1898	1898	3	8	2	6	3	0	4	26	54.7	=4															
1544	Cabraghkeel	Sligo	-	-	1	0	1.5	3	4	0	4	13.5	28.4	=90															

Site ID	Site name	County	SAC	(p)NHA	Semi-natural Grassland Habitat- Annex I grassland habitats Adjacent semi-natural habitats Area Species richness Notable species High quality indicator species Total										Conservation Score %	Conservation Ranking
					5	12	2.5	12	4	8	4	47.5	100.00			
1545	Carns	Sligo	-	-	2	2	1.5	3	4	0	4	16.5	34.7	=46		
1546	Culdaly	Sligo	-	-	2.5	4	2	4	4	0	4	20.5	43.2	=13		
1547	Carrowreagh	Sligo	-	-	3	0	1.5	3	4	0	4	15.5	32.6	=55		
1548	Mullanfad	Sligo	623	623	2	2	2	6	1	0	3	16	33.7	=50		
1549	Curry	Sligo	2298	-	3	2	1.5	6	2	0	4	18.5	38.9	=33		
1551	Gortersluin	Sligo	-	-	1	0	1	2	3	0	1	8	16.8	=169		
1553	Carrownrush	Sligo	-	-	3	0	1.5	2	4	0	4	14.5	30.5	=69		
1556	Clogher Beg	Sligo	1976	1976	4	4	1	4	3	0	4	20	42.1	=17		
1561	Carrickhawna	Sligo	1656	1656	2	4	1.5	4	4	0	4	19.5	41.1	=21		
1566	Doonmeegin	Sligo	-	-	2	2	1.5	3	4	0	3	15.5	32.6	=55		
1568	Derrysallagh	Sligo	-	-	1	4	1.5	6	2	0	4	18.5	38.9	=33		
1572	Drumaskibbole	Sligo	-	-	1	2	1	1	3	0	0	8	16.8	=169		
1573	Ballyconnell South	Sligo	627	627	2	0	1.5	2	4	0	4	13.5	28.4	=90		
1575	Annaghbeg	Sligo	-	587	2	2	1.5	3	4	0	4	16.5	34.7	=46		
1576	Carrowmacbryan	Sligo	-	-	2.5	4	1.5	4	3	0	4	19	40.0	=24		
1577	Gleniff	Sligo	623	623	2	0	2	3	4	0	4	15	31.6	=63		
1579	Cuilmore	Sligo	-	-	1	0	1.5	3	4	0	4	13.5	28.4	=90		

Appendix 11: Threat scores for all sites surveyed in 2010

See Table 2.5 (p. 24) for scoring criteria.

Threat score is expressed as a percentage of maximum possible score.

Ranking is the overall threat ranking within the 203 sites surveyed.

'=' indicates a ranking is shared by two or more sites.

Site ID	Site name	County	Adjacent habitats		Agricultural activity	Damaging operation	Agricultural weed species		Threat Score %	Threat Ranking
			2	3	3	5	13	100.00		
1101	Ballyhoorisky	Donegal	0	1	1	2	4	30.77	=77	
1102	Ballymichael	Donegal	1	1	0	2	4	30.77	=77	
1104	Ardmalin	Donegal	1	2	0	2	5	38.46	=35	
1105	Carrickabraghy	Donegal	1	2	0	2	5	38.46	=35	
1107	Errarooley More	Donegal	1	2	1	2	6	46.15	=14	
1109	Knockfolia	Donegal	1	2	0	2	5	38.46	=35	
1110	Bamba's Crown	Donegal	2	1	0	1	4	30.77	=77	
1111	Culoort	Donegal	1	0	0	2	3	23.08	=128	
1112	Lenan	Donegal	0	0	2	2	4	30.77	=77	
1113	Redford Glebe	Donegal	1	0	2	2	5	38.46	=35	
1114	Ballycharry	Donegal	2	0	1	2	5	38.46	=35	
1115	Bredagh Glen	Donegal	1	2	1	2	6	46.15	=14	
1116	Ballymacmoriarty	Donegal	2	0	1	2	5	38.46	=35	
1117	Glentogher	Donegal	1	1	0	2	4	30.77	=77	
1118	Ture	Donegal	1	2	1	1	5	38.46	=35	
1120	Kilderry House	Donegal	1	0	0	1	2	15.38	=176	
1121	Greenan Mountain	Donegal	1	1	1	2	5	38.46	=35	
1124	Tullyowen	Donegal	1	0	1	2	4	30.77	=77	
1126	Claragh	Donegal	1	0	1	1	3	23.08	=128	
1128	Doon Glebe	Donegal	1	1	1	1	4	30.77	=77	
1130	Ballyconnelly	Donegal	1	0	2	1	4	30.77	=77	
1133	Meenformal	Donegal	1	1	1	2	5	38.46	=35	
1134	Breaghy Head	Donegal	1	1	2	3	7	53.85	=6	
1139	Creeve	Donegal	1	0	1	2	4	30.77	=77	
1140	Roshin	Donegal	1	0	0	2	3	23.08	=128	
1142	Ardachrin	Donegal	1	1	2	1	5	38.46	=35	
1143	Muntermellan	Donegal	1	0	1	2	4	30.77	=77	
1144	Coolboy Big	Donegal	1	0	3	1	5	38.46	=35	
1145	Drumnaskea	Donegal	1	1	2	1	5	38.46	=35	
1146	Carntressy	Donegal	1	2	1	1	5	38.46	=35	
1147	Inch Level	Donegal	1	0	0	2	3	23.08	=128	
1148	Carthage	Donegal	1	0	1	1	3	23.08	=128	
1149	Clooneymore	Donegal	1	1	1	1	4	30.77	=77	
1150	Lighthouse Lot	Donegal	0	0	1	1	2	15.38	=176	
1151	Glenveagh Bridge	Donegal	0	0	0	1	1	7.69	=198	
1152	Maghera Glebe	Donegal	1	0	0	2	3	23.08	=128	
1155	Cooladerry	Donegal	1	0	0	2	3	23.08	=128	
1157	Swillybrin	Donegal	1	0	0	2	3	23.08	=128	
1161	Stroove North	Donegal	1	0	1	1	3	23.08	=128	
1163	Carrowmore	Donegal	1	1	1	1	4	30.77	=77	
1164	Carn	Donegal	1	1	1	1	4	30.77	=77	
1165	Tory Island	Donegal	1	1	2	3	7	53.85	=6	
1166	Greenary	Donegal	1	0	1	2	4	30.77	=77	
1203	Dooley	Donegal	1	1	0	1	3	23.08	=128	
1206	Drumaneany	Donegal	1	3	1	1	6	46.15	=14	
1207	Meenmore East	Donegal	1	3	1	1	6	46.15	=14	
1208	Meenagolan	Donegal	1	2	1	1	5	38.46	=35	
1209	Kingarrow	Donegal	0	1	1	2	4	30.77	=77	
1210	Meenatinny	Donegal	1	1	2	1	5	38.46	=35	
1211	Cark	Donegal	1	2	2	1	6	46.15	=14	
1212	Drumanaught	Donegal	1	0	1	2	4	30.77	=77	
1219	Carrickbrack	Donegal	1	0	1	2	4	30.77	=77	
1224	Garvan	Donegal	1	1	2	1	5	38.46	=35	

Site ID	Site name	County	Adjacent habitats		Agricultural activity		Damaging operation		Agricultural weed species		Threat Score %	Threat Ranking
			2	3	3	5	13	100.00				
1225	Croaghbridd	Donegal	0	0	0	1	1	7.69	=198			
1227	Maas	Donegal	1	1	0	2	4	30.77	=77			
1229	Lackagh	Donegal	0	1	1	3	5	38.46	=35			
1230	Drumboghill	Donegal	0	1	1	2	4	30.77	=77			
1232	Cloghboy	Donegal	1	3	2	2	8	61.54	=2			
1233	Maghera	Donegal	1	1	1	1	4	30.77	=77			
1235	Malin Beg	Donegal	1	2	1	2	6	46.15	=14			
1236	Malinmore	Donegal	1	0	0	2	3	23.08	=128			
1237	Doonalt	Donegal	1	0	1	1	3	23.08	=128			
1238	Beefan	Donegal	1	1	1	2	5	38.46	=35			
1241	Crowkeeragh	Donegal	0	1	0	0	1	7.69	=198			
1242	Crowlar	Donegal	1	2	1	2	6	46.15	=14			
1243	Glengesh	Donegal	0	0	2	1	3	23.08	=128			
1244	Meentadun	Donegal	0	0	2	1	3	23.08	=128			
1245	Carricknamoghil	Donegal	1	1	1	1	4	30.77	=77			
1247	Ardinawark	Donegal	1	1	1	2	5	38.46	=35			
1248	Rossnowlagh Lower	Donegal	2	2	2	2	8	61.54	=2			
1249	Drumhome	Donegal	1	0	1	2	4	30.77	=77			
1250	St. John's Point	Donegal	0	1	1	2	4	30.77	=77			
1251	Friary	Donegal	1	0	0	1	2	15.38	=176			
1252	Roes	Donegal	0	0	1	1	2	15.38	=176			
1253	Heneys	Donegal	1	0	1	1	3	23.08	=128			
1254	Clogher	Donegal	1	1	0	1	3	23.08	=128			
1256	Rahanlacky	Donegal	0	0	0	1	1	7.69	=198			
1257	Tawnygorm	Donegal	1	0	1	1	3	23.08	=128			
1258	Glencoagh	Donegal	1	0	1	1	3	23.08	=128			
1259	Hall Demesne	Donegal	1	1	1	2	5	38.46	=35			
1260	Dromore	Donegal	1	1	1	1	4	30.77	=77			
1263	Magheracar	Donegal	1	1	1	1	4	30.77	=77			
1265	Creevy	Donegal	1	1	1	2	5	38.46	=35			
1266	Legaltan	Donegal	1	1	0	2	4	30.77	=77			
1267	Tullyhorky	Donegal	1	0	2	1	4	30.77	=77			
1268	Cavangarden	Donegal	1	2	1	1	5	38.46	=35			
1269	Carricknahorna	Donegal	1	0	0	1	2	15.38	=176			
1270	Cashelard	Donegal	1	2	1	2	6	46.15	=14			
1271	Tievemore	Donegal	1	1	1	1	4	30.77	=77			
1272	Garvanagh	Donegal	1	2	1	2	6	46.15	=14			
1275	Meenavanaghan or Greaghs Barr	Donegal	0	1	1	1	3	23.08	=128			
1276	Carntullagh	Donegal	1	1	0	2	4	30.77	=77			
1277	Sallywood	Donegal	1	0	1	1	3	23.08	=128			
1278	Gortnagrace	Donegal	1	0	0	1	2	15.38	=176			
1279	Donaghmore Glebe	Donegal	1	1	2	2	6	46.15	=14			
1280	Meenagran	Donegal	1	0	1	1	3	23.08	=128			
1281	Tamur	Donegal	0	0	1	1	2	15.38	=176			
1282	Coolcholly	Donegal	1	1	0	2	4	30.77	=77			
1283	Ballynacarrick	Donegal	1	1	0	1	3	23.08	=128			
1284	Drumnagroagh	Donegal	1	1	0	1	3	23.08	=128			
1285	Tober	Donegal	1	1	0	2	4	30.77	=77			
1286	Mullyvea	Donegal	1	0	0	2	3	23.08	=128			
1287	Summy	Donegal	0	0	0	2	2	15.38	=176			
1300	Glenasmole Valley	Dublin	0	1	0	2	3	23.08	=128			
1301	Howth Head	Dublin	0	0	0	2	2	15.38	=176			
1302	Ireland's Eye	Dublin	0	0	0	1	1	7.69	=198			

Site ID	Site name	County	Adjacent habitats		Agricultural activity	Damaging operation	Agricultural weed species	Total	Threat Score %	Threat Ranking
			2	3	3	5	13	100.00		
1303	Dalkey Island	Dublin	0	0	0	2	2	15.38	=176	
1304	Loughshinny Coast	Dublin	2	1	0	3	6	46.15	=14	
1305	Ballybrack	Dublin	1	1	1	2	5	38.46	=35	
1306	Kilmashogue	Dublin	1	3	2	2	8	61.54	=2	
1307	Balally	Dublin	1	0	1	2	4	30.77	=77	
1309	St. Annes Park	Dublin	1	0	0	2	3	23.08	=128	
1311	Baldoyle	Dublin	0	0	1	2	3	23.08	=128	
1312	Newhaggard	Dublin	1	0	2	2	5	38.46	=35	
1313	Malahide Demesne	Dublin	1	0	1	1	3	23.08	=128	
1314	Ardgillan Demesne	Dublin	1	0	0	2	3	23.08	=128	
1315	Phoenix Park	Dublin	1	0	0	2	3	23.08	=128	
1316	Shanganagh Park	Dublin	1	0	0	2	3	23.08	=128	
1318	Bog of Ring	Dublin	1	1	1	2	5	38.46	=35	
1320	Waterstone Park	Dublin	1	0	0	2	3	23.08	=128	
1321	Ashtown Royal Canal	Dublin	0	0	2	1	3	23.08	=128	
1322	Slade of Saggart	Dublin	0	1	0	1	2	15.38	=176	
1323	Portrairie	Dublin	2	0	0	1	3	23.08	=128	
1324	Newbridge Demesne	Dublin	1	0	0	3	4	30.77	=77	
1325	Baldonnel	Dublin	2	2	0	2	6	46.15	=14	
1326	Ballymorefinn	Dublin	1	0	0	2	3	23.08	=128	
1327	Bohernabreena	Dublin	1	0	0	3	4	30.77	=77	
1328	Hell Fire Club	Dublin	0	0	1	1	2	15.38	=176	
1399	Friarstown Meadow	Dublin	0	0	0	2	2	15.38	=176	
1400	Curragh	Kildare	0	1	2	2	5	38.46	=35	
1401	Little Curragh	Kildare	1	0	1	2	4	30.77	=77	
1402	Dunlavin Marshes	Kildare	2	0	1	2	5	38.46	=35	
1404	Ballyhagan	Kildare	1	0	1	2	4	30.77	=77	
1405	Killhill	Kildare	1	1	1	3	6	46.15	=14	
1406	Blacktrench	Kildare	1	1	1	3	6	46.15	=14	
1407	Moods	Kildare	0	0	2	0	2	15.38	=176	
1408	Punchers Grange	Kildare	1	0	2	2	5	38.46	=35	
1409	Grange Common	Kildare	1	0	0	1	2	15.38	=176	
1410	Rathangan	Kildare	1	0	2	1	4	30.77	=77	
1411	Ardree	Kildare	0	0	0	2	2	15.38	=176	
1412	Knockaulin	Kildare	1	0	0	2	3	23.08	=128	
1414	Bishopsland	Kildare	1	0	0	2	3	23.08	=128	
1415	Bishophill Commons	Kildare	1	0	0	2	3	23.08	=128	
1416	Ballysax Great	Kildare	2	0	0	2	4	30.77	=77	
1417	Dunshane Common	Kildare	1	0	1	1	3	23.08	=128	
1418	Lullymore West	Kildare	1	0	0	1	2	15.38	=176	
1420	Cupidstownhill	Kildare	1	0	0	1	2	15.38	=176	
1422	Crohane	Kildare	1	0	1	1	3	23.08	=128	
1423	Carrick Hill	Kildare	1	0	0	2	3	23.08	=128	
1498	Derryoughter East	Kildare	1	0	0	2	3	23.08	=128	
1499	Castletown House	Kildare	0	0	0	2	2	15.38	=176	
1500	Mullaghmore	Sligo	0	0	0	1	1	7.69	=198	
1501	Knocknarea	Sligo	1	0	1	1	3	23.08	=128	
1502	Edenbaum	Sligo	0	0	1	2	3	23.08	=128	
1503	Ballyconnell	Sligo	1	1	1	2	5	38.46	=35	
1507	Rockfinlough	Sligo	1	0	2	2	5	38.46	=35	
1508	Clooncunny	Sligo	1	1	2	2	6	46.15	=14	
1509	Derrybeg	Sligo	1	2	1	3	7	53.85	=6	
1510	Carrownabinna	Sligo	1	0	1	2	4	30.77	=77	

Site ID	Site name	County	Adjacent habitats		Agricultural activity		Damaging operation		Agricultural weed species		Threat Score %	Threat Ranking
			2	3	3	5	13	100.00				
1511	Tawnatruffan	Sligo	1	2	1	3	7	53.85	=6			
1512	Portinch	Sligo	1	2	3	4	10	76.92	1			
1513	Farranyharpy	Sligo	1	1	1	2	5	38.46	=35			
1514	Doon	Sligo	1	0	2	2	5	38.46	=35			
1515	Eskragh	Sligo	1	2	1	3	7	53.85	=6			
1516	Carrownyclovan	Sligo	1	3	1	2	7	53.85	=6			
1517	Doonaveeragh	Sligo	1	2	0	2	5	38.46	=35			
1518	Treanmacmurtagh	Sligo	1	3	1	2	7	53.85	=6			
1519	Greenan	Sligo	0	0	0	2	2	15.38	=176			
1523	Annagh Beg	Sligo	1	3	1	3	8	61.54	=2			
1524	Cooperhill	Sligo	1	0	2	1	4	30.77	=77			
1525	Ardkeeran	Sligo	1	2	0	2	5	38.46	=35			
1526	Reask	Sligo	1	0	2	1	4	30.77	=77			
1527	Castlegal	Sligo	1	0	0	2	3	23.08	=128			
1528	Kintogher	Sligo	1	0	1	2	4	30.77	=77			
1529	Rosses Point	Sligo	1	0	1	2	4	30.77	=77			
1530	Corsallagh	Sligo	1	1	1	2	5	38.46	=35			
1531	Knocknashee	Sligo	1	0	0	2	3	23.08	=128			
1532	Formoyle	Sligo	1	0	1	2	4	30.77	=77			
1534	Rooghan	Sligo	1	1	2	1	5	38.46	=35			
1535	Carrigans Upper	Sligo	1	0	1	2	4	30.77	=77			
1537	Cloonaleigha	Sligo	1	2	1	1	5	38.46	=35			
1538	Primrosegrange	Sligo	1	0	0	3	4	30.77	=77			
1539	Markree Demesne South	Sligo	1	0	1	2	4	30.77	=77			
1540	Markree Demesne North	Sligo	1	1	2	2	6	46.15	=14			
1541	Cloonmacduff	Sligo	1	0	1	2	4	30.77	=77			
1544	Cabraghkeel	Sligo	1	2	0	3	6	46.15	=14			
1545	Carns	Sligo	1	1	2	2	6	46.15	=14			
1546	Culdaly	Sligo	1	1	2	2	6	46.15	=14			
1547	Carrowreagh	Sligo	1	0	2	2	5	38.46	=35			
1548	Mullanfad	Sligo	1	1	2	1	5	38.46	=35			
1549	Curry	Sligo	1	2	2	2	7	53.85	=6			
1551	Gortersluin	Sligo	0	1	0	1	2	15.38	=176			
1553	Carrownrush	Sligo	1	0	0	2	3	23.08	=128			
1556	Clogher Beg	Sligo	1	0	1	2	4	30.77	=77			
1561	Carrickhawna	Sligo	1	0	0	2	3	23.08	=128			
1566	Doonmeegin	Sligo	1	1	0	2	4	30.77	=77			
1568	Derrysallagh	Sligo	1	2	1	1	5	38.46	=35			
1572	Drumaskibbole	Sligo	1	0	1	2	4	30.77	=77			
1573	Ballyconnell South	Sligo	1	0	1	2	4	30.77	=77			
1575	Annaghbeg	Sligo	1	1	0	2	4	30.77	=77			
1576	Carrowmacbryan	Sligo	1	0	2	3	6	46.15	=14			
1577	Gleniff	Sligo	0	0	1	1	2	15.38	=176			
1579	Cuilmore	Sligo	1	1	1	3	6	46.15	=14			