Irish Semi-Natural Grasslands Survey

Annual Report No. 1: Counties Cork and Waterford

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

December 2008

BOTANICAL, ENVIRONMENTAL & CONSERVATION CONSULTANTS LTD.

www.botanicalenvironmental.com

27 Upper Fitzwilliam Street, Dublin 2.

Tel: 01 6328615/616, Fax: 01 6328601.

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 Simon Barron for his GIS expertise, opinions and advice. We acknowledge the help of NPWS field staff and local authority personnel who suggested sites for survey. We also thank staff at the National Biodiversity Data Centre.

We are grateful to Simon Barron, Edwina Cole, Willie Crowley, Mairéad Gabbett, Jo Goodyear, Therese Higgins, Steve McCormack, Chris McMahon, Pat Moran, Mieke Muyllaert and Fernando Fernandez Valverde for their hard work in the field.

Finally, we thank the farmers and landowners of Cork and Waterford for giving us permission to survey their land and for the background information they provided.

Cover photograph: Maritime grassland at Galley Head, Co. Cork.

Executive Summary

In 2008, 250 sites and 785 relevés in Cork and Waterford were surveyed. Ninety-four of these sites were associated with a NPWS conservation site (SAC, NHA, and pNHA), but just three of the 19 SACs list Annex I grassland habitats as a qualifying interest. Wet grassland was the most frequent semi-natural grassland habitat, recorded at 72.8% of sites, and freshwater marsh was the least frequent, found at 10.4% of sites. The most common EU Habitats Directive Annex I grassland habitats were *Molinia* meadows (6410), recorded at 8.4% of sites, and *Nardus* grasslands (6230), recorded at 7.6% of sites. The remaining four Annex I grassland habitats were only recorded at 3.2% of Cork and Waterford sites.

Semi-natural grassland sites in Cork and Waterford were small (median area 7.2 ha; range 0.1 – 100.7 ha). Of the 19 Cork and Waterford sites that scored highly (over 50%) in the conservation evaluation, only three were associated with a NPWS conservation site. Smaller semi-natural grassland sites, together with a low proportion of high conservation value grasslands within NPWS conservation sites, will contribute to making the conservation of semi-natural grasslands within the region more challenging.

The ISGS vegetation classification utilised hierarchical cluster analysis to analyse all relevé data recorded during 2008, plus relevé data recorded in Roscommon and Offaly in 2007. The classification contained four main groups. The two dry grassland groups, which accounted for 39.9% of the relevés, were named *Plantago lanceolata – Festuca rubra* and *Agrostis capillaris – Galium saxatile*, based on the top indicator species. The wet grassland groups, which accounted for 60.1% of the relevés, were named *Agrostis stolonifera – Ranunculus repens* and *Juncus acutiflorus – Molinia caerulea*. The four vegetation groups were further subdivided into 15 vegetation types. One of these types, the *Armeria maritima – Plantago coronopus* type representing maritime cliff-top grassland, though previously described in White & Doyle (1982), was not included within Fossitt (2000), highlighting an inadequacy of this classification. Although the grassland classification presented in this report is only based on four counties it is already contributing to the understanding of semi-natural grassland habitats in Ireland.

The overall quality of each of the six 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. The distribution of each of the Annex I grassland habitats on a 10 km square basis generally corresponded to the data for the habitats in the *Status of EU Protected Habitats and Species* (Anon. 2008). However, the ISGS 2007/08 data showed a more restricted distribution for the *Festuco-Brometalia* (6210) than the distribution presented in Anon. (2008). The ISGS is the first survey to begin to comprehensively assess *Molinia* meadows (6410) in Ireland and to present distribution data on a 10 km square basis.

As the ISGS is extended and the dataset increased, it will be possible to refine the assessment criteria to better represent each of the Annex I grassland habitats within Ireland. During 2008, the

criteria for the evaluation of the conservation status and threats to grassland sites were refined as follows:

- A new list of positive indicator species was proposed for the assessment of the structure and functions of the Annex I habitat Calaminarian grassland (6130);
- The positive indicator species list and forb : graminoid ratio were refined for *Nardus* grassland (6230).

Table of contents

List of Appendices

List of Figures

List of Tables

1: INTRODUCTION

1.1 General background

Grassland habitats cover approximately 73% of the land area of Ireland (O'Sullivan 1982), 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 & 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, 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 use 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 & 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 & Proctor 1966, O'Donovan 1987, Keane & Sheehy Skeffington 1995), Leinster (Byrne 1996) 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 & 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). Most 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.

1.3 Classification of Irish grasslands

Braun-Blanquet & 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 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 & 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.

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 but 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 cutting.
- **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 near 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 & 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 and Offaly (Martin *et al.* 2007). This vegetation classification utilised hierarchical cluster analysis to analyse relevé data and produced two main groups: a dry grassland group named *Cynosurus cristatus – Plantago lanceolata* and a wet grassland group named *Agrostis stolonifera – Filipendula ulmaria*. Each of these groups was further divided into three vegetation types. This vegetation classification proposed by Martin *et al.* (2007) 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 proportion of forbs 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 & 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).

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 have the highest level of protection, as they are state-owned and managed for conservation. SACs (Special Areas of Conservation) and SPAs (Special Protection Areas for birds) designated as a result of EU directives provide the next highest level of protection, whilst NHAs (Natural Heritage Areas) designated under domestic legislature provide the third tier of protection. As not all NHAs have been designated pNHA (proposed NHA) 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 over 25 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. 2003). Under this directive, Ireland has a responsibility to designate SACs to protect and maintain at a favourable conservation status any of these habitats that occur within the State. Seven 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]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (important orchid sites) (6211).
- 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 caerulea) (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).

Only two grassland habitats in Ireland, 6211 and 6230, are accorded priority status.

[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)

The systematic monitoring and assessment of the Annex I grassland habitats located within the State has started, with 33 orchid-rich calcareous grassland sites (6210/6211) 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 (Anon. 2007). 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 (6210/6211) and *Molinia* meadows (6410) (Martin *et al.* 2007). 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 & Wildlife Service has recently published *The Status of EU Protected Habitats and Species in Ireland* (Anon. 2008) that lists the overall conservation status of each of the Annex I grassland habitats as bad or poor.

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) 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 Scope of this report

This document reports on a survey of semi-natural grasslands and marsh communities in Cos. Cork and Waterford conducted in summer 2008, which represents the first year of the *Irish Semi-natural Grasslands Survey* (ISGS). It follows on from the pilot survey of Cos. Roscommon and Offaly (Martin *et al.* 2007). The remit of the project was to survey 250 sites across the two 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 pilot study carried out in Cos. Roscommon and Offaly and used to evaluate existing classification systems and to create an objective classification which described the diversity of vegetation types found. A scheme to assess the conservation value of each site as a whole was to be devised and used to highlight important sites outside the existing designated sites system. To facilitate comparison of results across all four counties, conservation evaluation criteria were to be calculated for all sites surveyed, including those from the pilot study. The discussion in this report will comment on data from both phases of the survey.

1.6 Study area

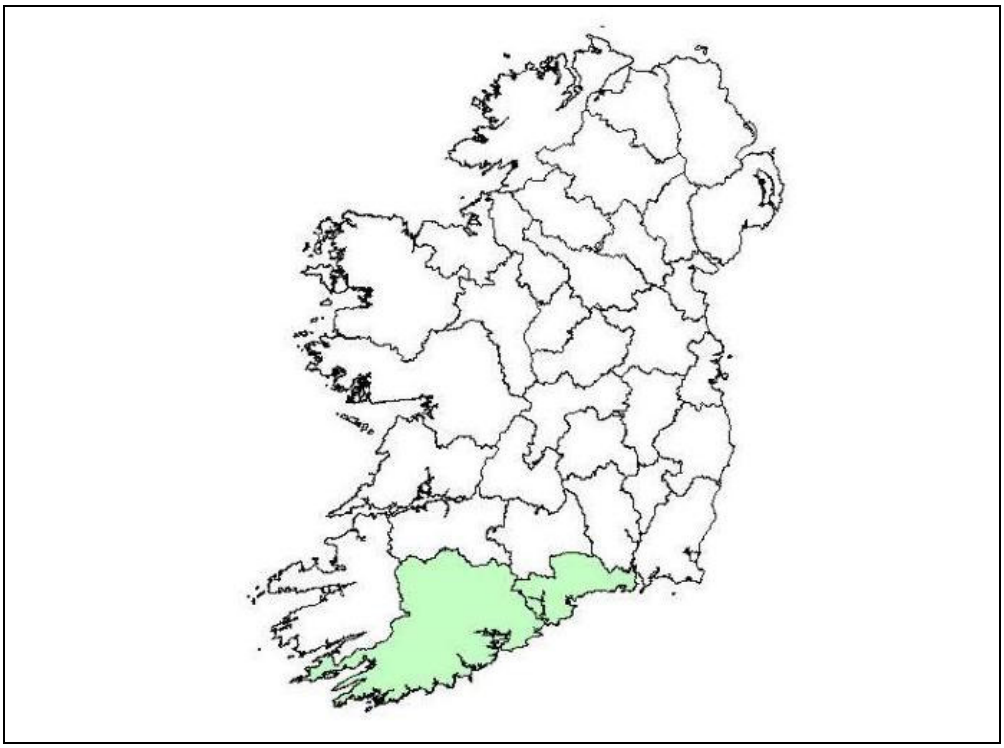
Counties Cork and Waterford are located on the south coast of Ireland, Cork being the largest and most southerly of all the counties in Ireland. Several low mountain ranges occur in Cork, mostly in the northwest, west and northeast of the county, and include the Boggeragh, Galtee, Caha, and Derrynasaggart Mountains. The highest point in Cork is Knockboy (703 m) in the west of the county. The highest point in Waterford is Knockmealdown (794 m) in the Knockmealdown Mountains on the northwestern border. The Comeragh and Monavullagh Mountains also occur in the centre of Co. Waterford, with the remainder of the region mostly comprising fairly low undulating terrain. Waterford has many rivers, including Ireland's third longest river, the River Suir (184 km); this river forms most of its eastern and northernmost border. Waterford also contains the mouth of Ireland's fourth longest river, the Munster Blackwater, which flows across Cork in an easterly direction from its source in Co. Kerry. Another major river within Cork is the River Lee. Lakes are fairly sparse in both counties, although Lough Allua and the Gearagh reservoir are notable water bodies drained by the River Lee. Both Cork and Waterford have long rugged coastlines, with many sandy beaches and rocky coves. The bedrock of both counties is mostly dominated by sandstone or a combination of sandstone and shale bedrock. A notable area of volcanic till occurs in southeast Waterford. Areas of blanket peat also occur in some higher altitude areas. The soil is primarily composed of deep, well-drained mineral soils, although in more mountainous areas or areas of overlying rock this can change to more shallow or peaty soils.

2: METHODS

2.1 Site selection

The target for this project was to visit 250 sites across counties Cork and Waterford, recording at least one relevé in each site. To ensure a good geographical spread of sites, an average of two sites were selected from each 10 km square with ≥50% of its area located within counties Cork and Waterford. 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. The geographical location of the survey area is shown in Fig. 2.1.

Figure 2.1 Map of Ireland showing the survey area of counties Cork and Waterford.



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 were included in the survey:

- NPWS conservation sites (e.g., NHAs, pNHAs, SACs[2]), particularly those which have an Annex I grassland habitat listed as being present within the site
- Sites highlighted by previous reports, such as the *Survey of the Grassland Fungi of the Vice County of West Cork* (Mitchel 2007), that had not been comprehensively surveyed

[2] Note that, throughout this report, the term "NPWS conservation sites" is used to refer to NHAs, proposed NHAs (pNHAs), SACs and SPAs

- Large areas of semi-natural grassland for which little or no data are currently available
- Sites which occurred on different soil types
- Sites that represented the geographical variation that existed in the study area, such as altitudinal range
- Sites associated with important landscape features (e.g., eskers, hills)
- Sites adjacent to river systems, ensuring a representative sample of wet grasslands and marshes
- Large sites of natural grassland or inland marsh indicated by CORINE (2000)
- Information from the Botanical Survey of the British Isles (BSBI) county recorders
- Sites suggested following consultation with the National Biodiversity Data Centre (NBDC)
- Information from NPWS regional staff.

Each of the criteria listed above were 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 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. 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. 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 which contained only a small area of Annex I grassland (e.g. Calaminarian grassland) which is nationally rare. Areas of non-grassland habitat, such as woodland, >400 m^2 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.

However, 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 over-grazing or fertiliser application were to be removed. When semi-improved GA 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 GSi1 denotes semi-improved dry calcareous grassland of potential conservation value.

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 type, 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.

The following details were recorded for each site surveyed:

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. 2003), 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 m^2 in area or linear habitats <4 m wide) were also listed.

Following Dwyer *et al.* (2007), no differentiation was made 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 (6211). 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.

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 was recorded and input into the Access database. For the three ISGS sites that were surveyed during 2008 by the bryologist David Holyoak (Holyoak 2007) additional bryophyte species that he recorded were added to the site list. Vascular plants which were dominant or abundant were noted. The bryophyte list was supplemented, particularly in the case of smaller and less obvious taxa, by the intensive sampling conducted within each relevé; identification in the laboratory was conducted as required. Nomenclature throughout the survey followed Stace (1997) for vascular plants, Smith (2004) for mosses, Paton (1999) for liverworts and Dobson (2000) for lichens. The site species field sheet is given in Appendix 3.

Site geography and topographical situation: Where the site was associated with a particular geographical feature, for example, in a valley or on a drumlin, this was recorded. The topographical position (e.g., upper slope, mid-slope, lower slope) occupied by the grassland site was also noted. In many cases, the site extended over many topographical positions, and this variation was recorded by ticking more than one box on the field sheet.

Seasonal flooding: If seasonal flooding was observed or thought to occur on the site, this was noted.

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 included frequency and timing of grazing/mowing, type of livestock and fertiliser application.

Grazing level: Grazing is an inherent part of natural grassland dynamics; however, high and very low grazing levels may have negative impacts on a grassland ecosystem. Grazing level was recorded on a three-point scale, based on the JNCC Common Standards Monitoring Guidance for grassland habitats (JNCC 2004):

- Overgrazing: High density of dung. Frequent bare ground and/or evidence of runoff. Sward height below relevant threshold: GS1 = 3cm; GS2 = 10 cm; GS3 = 5cm; GS4 = 40cm; GM1 = 40cm.
- Appropriate grazing: No indicators of inappropriate grazing.
- Undergrazing: Overall sward height above relevant thresholds: GS1 and GS3 = 50cm; GS2, GS4 and GM1 = 80cm.

The nature of any encroachment was also noted as follows:

- Scrub: Species include: *Crataegus monogyna, Prunus spinosa, Rubus fruticosus* agg., *Ulex europaeus, Corylus avellana*, *Salix* spp.
- Heath: Species include: *Calluna vulgaris, Erica* spp., *Vaccinium* spp., *Ulex gallii*.
- Bracken: *Pteridium aquilinum.*

Adjacent habitats and site boundary: Adjacent habitats (e.g., woodlands and heath) and boundary habitats (e.g., hedges and walls) observed during the field survey were recorded for each site using categories defined by Fossitt (2000). Fence and dry ditch are two additional common boundary structures that were recorded. Also, the transition from semi-natural grassland to other habitat types was described as either abrupt or diffuse. As more than one boundary type sometimes occurred over a site, both could be recorded.

Fauna: In addition to domestic animals (e.g., cattle, sheep and horses) using grassland for pasture, there are also several relatively common wild animals that utilise semi-natural grassland habitats and may contribute to the overall grazing level. The presence of any of these species was recorded on the field sheets. 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 & O'Brien 1995).

Damaging operations: Four damaging operations were listed on the field sheet: drainage, burning, dumping and recent afforestation in the vicinity. Burning may be the result of human activity or a natural event, burning can also be used in the management of grassland sites. The occurrence of burning and 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. Damage caused by grazing is not recorded within damaging operations but in the grazing level section listed above.

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

Habitat mapping: A handheld GPS minicomputer MobileMapper CE (Magellan, Carquefou) with ArcPad 7 GIS software was used in the field to accurately map site boundaries, areas of Annex I grassland habitats (Anon. 2003), non-Annex I semi-natural grasslands Fossitt (2000) and semi-improved grassland habitats. The minimum mapping unit for habitats was 400 m^2, 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 accurately derived from the ArcGIS habitat maps.

The area of each of the surveyed sites is given in Appendix 2.

Site summary: In addition to the specific data gathered and recorded on the various field sheets, a general description of each site was also made. 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.

For a summary of each site, see the Addendum to this report.
Project field sheets are reproduced in Appendix 3.
For general site survey results, see Section 3.1.

All the above 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 photos 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 sample relevé sheet is shown in Appendix 3. A minimum of one 2 m x 2 m relevé was recorded from within each grassland habitat area mapped within 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. Cover in vertical projection for each vascular and bryophyte species was recorded on the Domin scale (Kent & Coker 1992), as were other general parameters: bare soil, bare rock, 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.

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 bulked. 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 analysis. For each relevé, a 10-figure grid reference was obtained using a GPS unit, and topography, altitude, slope and aspect were recorded. 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 & 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
- Upland peat
- Other: includes rendzinas, regosols, lithosols, skeletal soils, alluvial soils and some coastal soils such as shallow peat over sand.

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

All of the above relevé data, with the exception of the digital photographs, were added to the Access database. All digital images were submitted on CD with the ArcGIS project.

Air-dried soil samples were stored for subsequent laboratory analyses of total organic carbon and total phosphorus.

2.4 Assessment of Annex I grassland

The conservation status of all mapped areas of Annex I grassland habitat within Cork and Waterford was assessed. The methodology used was similar to that used by the NPWS for their survey of dune systems (Anon. 2007) and grassland (Dwyer *et al.* 2007, Martin *et al*. 2007). *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).

Table 2.1 Summary matrix of the parameters and conditions required to assess the conservation status of habitats (Anon. 2006).

	Favourable	Unfavourable - Inadequate	Unfavourable - Bad
Area	Stable	>0% <1% decline/year	>1% decline/year
Structure & Functions	Stable	1 – 25% decline/failure	>25% decline/failure
Future Prospects	Good (≥0)	Poor (-1 to -9)	Bad (≥-10)
Overall	All green	Combination of green and / or amber	One or more red

Results of Annex I grassland assessments are on page 34, details in Appendix 8.

Area

Loss of extent was assessed by comparing the area of the Annex I grassland habitat mapped during the 2008 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.

Structure and functions

Structure and functions were assessed using a number of factors, including forb : graminoid, positive indicator species, negative indicator species, scrub and bracken encroachment, sward height, litter cover, extent of bare ground, and grazing and disturbance levels. Thresholds for each of these values for each of the Annex I grassland habitats assessed are given in Appendix 5.

Positive and negative indicator species and the threshold values for other factors varied by habitat type. The assessment criteria of Dwyer *et al*. (2007) were used for habitats *Festuco-Brometalia* (6210/6211) and species-rich *Nardus* grasslands on siliceous substrates in mountain areas (6230). For *Molinia* meadows on calcareous, peaty or clayey-silt laden soils (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 adopted. Martin *et al.* (2007) followed the general approach taken by Dwyer *et al.* (2007) and JNCC (2004), but compiled new lists of positive indicator species using the data collected during the 2007 survey, the *Interpretation Manual of European Union Habitats* (Anon. 2003) and White & Doyle (1982). For Calaminarian grasslands of the Violetalia calaminariae (6130), a similar approach was taken, but due to the importance of metalliferous bryophyte species Holyoak (2008) was also consulted.

When assessing structure and functions in the field, a number of monitoring stops, as described in Anon. (2007), were made to record the information required for the assessment.

Where the habitat area was large enough, four monitoring stops were made. When the area of the Annex I habitat was less than 400 m^2 (the minimum mapping unit for the project), the habitat was not assessed, and in the few cases when the area was only slightly larger than 400 m^2, only one or two monitoring stops were made to avoid stops being positioned adjacent to each other. The use of four monitoring stops simplified assessing whether more than 25% of the monitoring stops had failed to meet the required structure and functions criteria. At each monitoring stop a full relevé was also recorded, with the exception of soil data, which was generally only recorded from one stop in each 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.

- *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 & 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 & Doyle 1982) were also included as they are also listed for this habitat in Anon. (2003). 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 Aegopodium podagraiae, and diagnostic and differential species from the Filipendulion, all listed in White & 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*, which is listed for this habitat in Anon. (2003), was also included as a positive indicator species for this habitat.

- 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 elatoris (White & 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 elatoris 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 elatoris 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 that has not been recorded in Cork or Waterford (Preston *et al*. 2000). 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 & Doyle 1982). *Armeria maritima* from the Sileno-Armerietum maritimae metalicolae alliance (White & Doyle 1982) and *Cochlearia pyrenaica* ssp*. alpina* were also included as they are listed for this habitat in Anon. (2003). 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

Future prospects were assessed following the methodology proposed in Anon. (2007), with three particular criteria being examined:

- Indicators of local distinctiveness, such as notable plant species
- Indicators of negative trends and threats to the site
- Designation status of the habitat (proposed designation or full designation).

To assess the three criteria shown, 12 categories were utilised to calculate the overall future prospects for a site. The scoring system utilised for each of the categories is listed in Appendix 6, with the results given in Appendix 7. The importance of each category at a site was assessed and given a score ranging from zero to three, with threats being assigned a negative value. Ten of the categories represented threats to a site: drainage, overgrazing, undergrazing, agricultural improvement, dumping, active quarries, scrub encroachment, bracken encroachment, heath encroachment and afforestation. The impact of each threat category was assessed, with a score of zero indicating that the category was not recorded on the site, one that the category had a minor negative impact on the site, two a medium negative impact on the site, and three that the category represented an active and immediate threat to the site. The final two categories, NPWS conservation site status (SAC, NHA, pNHA) and occurrence of notable species, represent positive criteria. Notable species were

those listed on the Flora Protection Order, 1999, or in the Red Data Book (Curtis & McGough 1988).

All assessment data were input into the Access database.

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. In the longer term this is also important for monitoring individual sites, so that the effects of any management (conservation-orientated or otherwise) may be objectively assessed. To this end, the site survey procedure collected data on a number of criteria which may be used to help evaluate the condition of a semi-natural grassland site as a whole. Separate assessments were made for the conservation value of each site and the intrinsic threats that were identified. Whilst extrinsic threats, such as the development of a site for housing or a quarry, are undoubtedly important factors, it was beyond the scope of this survey to quantify them unless provided with the information by the landowner or local people.

The conservation value of each site[3] was calculated using the scheme presented in Table 2.2. This is a modification of that presented by Martin *et al.* (2005) and Martin *et al.* (2007). In addition, the approaches taken by Ratcliffe (1977), Kirby (1988) and Cross (1990) were considered when developing this scheme. The criteria used in Table 2.2 are all based on site information recorded during the 2007 and 2008 surveys. The first five criteria summarise the naturalness of a site in terms of the grassland species diversity (vascular and bryophyte species), occurrence of notable species, number of semi-natural grassland habitats, number of adjacent semi-natural habitats using Fossitt (2000), and number of Annex I grassland habitats (Anon. 2003). The final criterion scores the site in terms of area.

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. Fifteen 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,*

[3] To facilitate the comparison of Cork and Waterford sites (surveyed in 2008) with Roscommon and Offaly sites (surveyed and evaluated using a slightly different scheme in 2007), conservation values for **all 341 sites** surveyed between 2007 and 2008 were calculated.

Polygonum aviculare, Rumex crispus, Senecio jacobaea, Stellaria media and *Trifolium repens*.

Conservation and threat scores 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. 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 2.2 and 2.3.

Conservation and threat scores were entered into the Access database.

Conservation and threat score results are on page 39; full details in Appendices 9 and 10.

Table 2.2 Criteria used in the calculation of the conservation score for each site.

Criteria	Scoring				Max. score
Grassland plant species diversity[1]	0	<25 species			5
	1	25-50 species			
	2	51-60 species			
	3	61-72 species			
	4	73-99 species			
	5	≥100 species			
Notable species	0	No notable species			3
	1	One Red Data Book (RDB) species			
	2	Two RDB species or one Flora Protection Order (FPO) species			
	2.5	One RDB species and one FPO species			
	3	More than two RDB species or more than one FPO species			
Semi-natural grassland habitats	One point for each semi-natural grassland habitat. Half a point for each semi-improved grassland habitat, only if corresponding semi-natural grassland habitat is not present.				5
Annex I grassland habitats	0	No Annex I grassland habitats			4
	2	One Annex I grassland habitat			
	4	Two or more Annex I grassland habitats			
Adjacent and internal semi-natural habitats	One point scored for each of the following habitat groups recorded:				5
	F (Freshwater)		GS (Semi-natural grassland)		
	H/P (Heath or Bog)		WN/WS/WL (Woodland and scrub)		
	ER/CS/CM/LR/LS (Exposed rock, salt marsh and coastal habitats)				
Site area[2]	0	<0.5 ha	1	0.5-4.4 ha	5
	2	>4.4-8.6 ha	3	>8.6-18.3 ha	
	4	>18.3-99.9 ha	5	≥100 ha	
Maximum total score					**27**

[1] Woody species were excluded from this calculation; Divisions based around median number of species.
[2] Divisions based around median area.

Table 2.3 Criteria used in the calculation of the threat score for each site.

Criteria	Scoring	Max. score
Encroachment	One point for each type of encroachment (scrub, bracken or heath) present on the site	3
Grazing	0 No inappropriate grazing occurring 1 Undergrazing or overgrazing occurring on the site 2 Undergrazing and overgrazing occurring on the site	2
Negative adjacent habitats	0 No negative adjacent habitats 1 Improved grassland (GA) or Cultivated land (BC) adjacent 2 Improved grassland (GA) and Cultivated land (BC) adjacent	2
Damaging activities[3]	0 No damaging activities 1 One damaging activity 2 Two damaging activities 3 Three or more damaging activities	3
Agricultural Improvement[3]	0 No improvements 1 One improvement type 2 Two improvement types 3 Three or more improvement types	3
Negative species[4]	1 1-3 species 2 4-6 species 3 7-9 species 4 10-12 species 5 13-15 species	5
Maximum total score		**18**

[3] See Section 2.5 for description of criteria.
[4] See Section 2.5 for list of species scored.

2.6 Vegetation data analysis

Data preparation

Analysis to produce a working classification of grassland and marsh for Ireland combined the relevé data collected in counties Roscommon and Offaly during the pilot survey (Martin *et al.* 2007; $n = 305$) with the relevé data recorded during the present phase of the survey ($n = 785$) in counties Cork and Waterford. Of these 1090 relevés, 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. Thirteen 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. 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. No relevé samples with a mean distance greater than the threshold of three standard deviations above the grand mean were found.

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. Records for *Agrostis vinealis* and *Agrostis canina* were combined. To reduce noise, species recorded in fewer than five relevés were also excluded. Domin scores were converted to percentage cover using the method of Currall (1987) prior to analysis, as mean values cannot be calculated directly from a non-linear scale. This preparation resulted in a dataset of 1072 relevés and 263 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, percentage loss on ignition, total P (Phosphorous) and soil types 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 P.

Analysis techniques

A suite of four complementary statistical techniques were used to analyse the entire dataset, which included relevés recorded in the 2007 pilot study (Roscommon and Offaly) and the current study of 2008 (Cork and Waterford). 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). Perrin *et al.* (2006a, b) also 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 x *p* species, an *n* x *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 & 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 & Grace 2002). Flexible beta was used as the linkage method with $\beta = -0.25$ (Lance & 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 & Legendre 1998; McCune & Grace 2002).

2) Indicator Species Analysis (ISA). This method of Dufrene & 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 & Legendre (1997) concluded that ISA was more sensitive at identifying indicator species than TWINSPAN.

3) Multi-response Permutation Procedure (MRPP). This was employed to test for significant differences between the groupings determined by the hierarchical clustering and ISA. This is essentially a non-parametric multivariate test and thus avoids the normality requirements of parametric multivariate tests such as discriminant analysis (McCune & Grace 2002). As it is statistically inappropriate to test for differences between groups using the same variables that define them, MRPP was run on a matrix of six environmental variables: slope, altitude, bare soil, bare rock, surface water and litter cover. In addition to a *p*-value, MRPP produces a statistic *A* which describes chance-corrected within-group heterogeneity. $A = 1$ when all samples within groups are identical, $A = 0$ when heterogeneity within groups equals expectation by chance and $A < 0$ when within-group heterogeneity is less than that expected by chance. Sørensen distance was used on a rank transformed matrix following relativization of environmental factors to standard deviates (McCune & Grace 2002).

4) Non-metric Multidimensional Scaling (NMS). This was used to illustrate the relationships between relevés and between relevés and environmental variables. This iterative ordination technique is particularly well suited for analysis of ecological community data as it works well with non-normal datasets, allows the use of non-Euclidean distance measures, and does not assume that species have linear or unimodal responses to environmental gradients (McCune & Grace 2002). Being based on ranked distances, NMS is less prone to distortion due to outliers. The following parameters were used with Quantitative Sørensen (Bray-Curtis) distance and varimax rotation: number of axes = 2, maximum number of iterations = 400, step length = 0.2, stability criterion =0.00001, number of runs = 30. The use of this distance measure permits ready comparison of the results with those of the hierarchical cluster analysis and the MRPP. Pearson correlation was used to check for correlation of the resulting ordination axes and the following environmental variables: soil pH (three dummy variables), slope, altitude, topography (five dummy variables), soil type (seven dummy variables), bare soil, bare rock, surface water and litter cover, grass height, forb height and forb cover. As there were a considerable number of missing values for soil pH, existing pH values were categorised into three dummy variables: acidic (pH < 5.00), neutral (pH 5.00 – pH 6.99) and basic ($pH \geq 7.00$).

3: RESULTS

3.1 General site survey

During the Irish Survey of Semi-natural Grasslands (ISGS), from April to September 2008, 2574.8 ha of grassland were surveyed, 708.1 ha in Waterford, and 1866.7 ha in Cork. The data collected at each of the sites are summarised in Appendix 4 and the location of each site is shown in Appendix 1. A total of 250 sites were surveyed, 192 (76.8%) in Cork, and 58 (23.2%) in Waterford. The median site area was 7.2 ha, ranging from 0.1 ha to 100.7 ha.

An additional 79 sites were visited but rejected from the survey. This is equal to 24% of the 329 sites which were visited. The reasons for rejecting sites fell into five broad categories: difficulty in obtaining permission to access a site, dominance of non-grassland habitats, strong evidence of agricultural improvement, road building, and presence of dangerous livestock. 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.

Reason for rejection	Number of sites
Non-grassland habitat	39
Agricultural improvement	39
Access difficulty	22
Presence of livestock	3
Road building	2
Number of sites rejected	*79*

The most frequently cited reasons for rejecting sites were agricultural improvement and dominance of non-grassland habitats. Non-grassland habitats which were encountered most frequently included dense bracken, heath, swamp, scrub and plantation forestry. Agricultural improvement can include conversion to improved grassland for agricultural or amenity use, or conversion to arable land. The next most frequently recorded reason for rejecting sites was difficulty in obtaining access to the site. This was generally due to the refusal of permission by the owner, or difficulty in communicating with the owner. For reasons of personal safety, land was not entered if certain livestock (e.g. bull) were present or if building work was in progress. Road building was also associated with a degradation of grassland habitat.

The vast majority of sites included in the survey were owned privately, either by a single, or by multiple owners (Table 3.2). Eleven sites were in public ownership, and most of these were owned by local authorities. Ownership could not be established for three sites, all of which were open to the public.

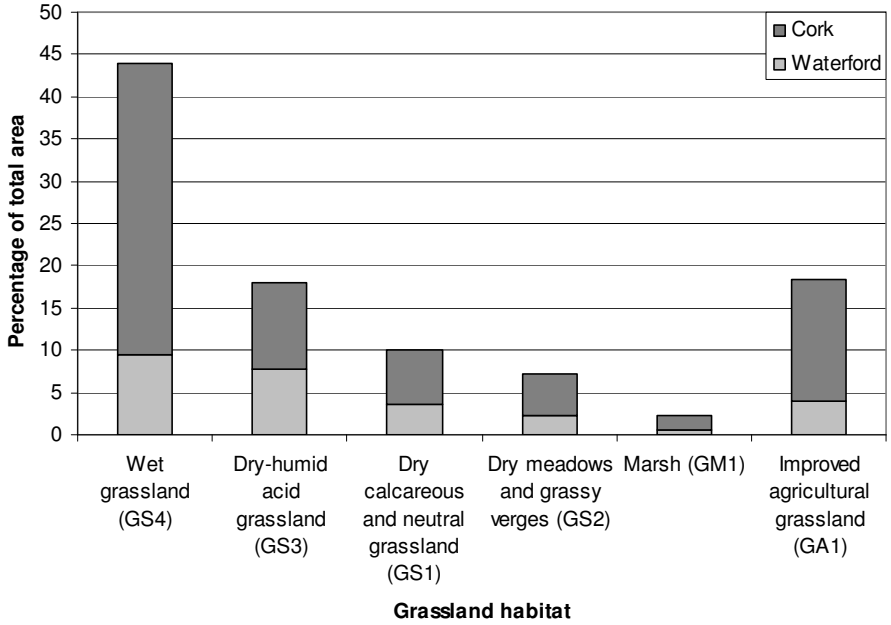
Table 3.2 The number of sites included in the survey that were in public and private ownership.

Ownership	Number of sites
Public	11
Private	236
Unknown	3
Total	*250*

Grassland habitats

A detailed habitat map has been produced for each site showing the Fossitt (2000) and the Annex I grassland habitats, the position of all relevés and the location of any associated NPWS conservation sites (pNHAs, NHAs and SACs) (see Addendum). The area covered by different grassland habitats included in the survey, defined according to Fossitt (2000), is shown in Fig. 3.1.

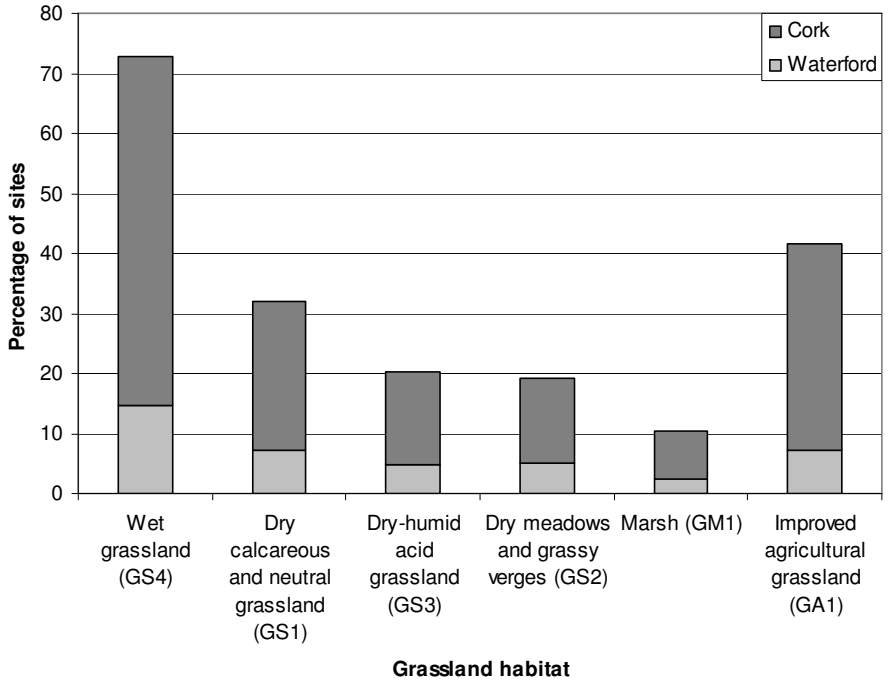
Figure 3.1 Area of grassland habitats surveyed, differentiated by county. Fossitt (2000) habitats are shown and all areas of GSi (semi-improved grassland) are listed as GA1



Areas of GA1 (improved agricultural grassland) which had a sufficient quantity of semi-natural grassland species to be of interest to the survey were included within the GSi (semi-improved grassland) category used throughout this survey. GS4 (wet grassland) was by far the most extensive of the semi-natural grassland habitats recorded in the survey, accounting for 43.9% of the grassland surveyed. This was followed in order of decreasing extent by GS3 (dry-humid acid grassland) at 17.9%, GS1 (dry calcareous and neutral grassland) at 10.2%, GS2 (dry meadows and grassy verges) at 7.2% and GM1 (Marsh) at 2.2%. GS3 was more predominant in Waterford (28.3%) than in Cork (14.0%), while GS4 covered a greater part of

the surveyed area in Cork (47.6%) than in Waterford (34.1%). GA1 covers 19.9% of the area surveyed in Cork, and 14.2% in Waterford.

Figure 3.2 Occurrence of different grassland habitats, differentiated by county. Fossitt (2000) habitats are shown and all sites that contained GSi (semi-improved grassland) are listed within the GA1 category.



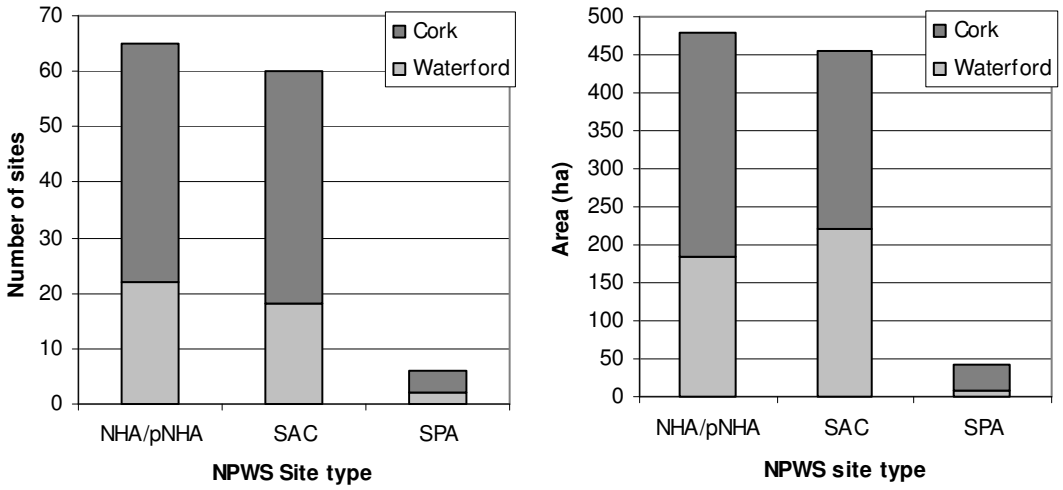
GS4 occurred at 72.8% of sites, and was the most frequently occurring grassland habitat (Fig. 3.2). The next most frequently occurring grassland habitat was GS1 (32.0% of sites) and then GS3 (20.4% of sites). Although GS3 was less frequent than GS1, it covered a greater area, indicating a larger average site size. GA1 occurred at a greater proportion of sites in Cork (44.8%) than in Waterford (31.0%), as did GS4 (present at 75.5% of sites in Cork, and 63.8% of sites in Waterford).

NPWS conservation sites

In 94 cases, sites surveyed in the 2008 ISGS included land within an NHA, pNHA, SAC or SPA, with 60 sites coinciding with an SAC (Fig. 3.3a). Both NHAs/pNHAs and SACs were found within 31 sites, while SPAs coincided with NHAs/pNHAs on six sites and SACs on five sites. NHAs/pNHAs, SACs and SPAs all occurred together on five sites.

Fig. 3.3(b) shows the total area surveyed in Cork and Waterford which coincided with an NHA, pNHA, SAC or SPA. In total, 17.4% of the area surveyed in Cork was located within an NHA/pNHA, compared to 28.8% in Waterford. The relative cover of SACs was also greater in Waterford, where 34.2% of the surveyed area within SACs, as opposed to 14.0% in Cork. The area of SPAs included in surveyed sites was 1.9% of the surveyed area in Cork, and 1.3% in Waterford.

Figure 3.3 Occurrence of NPWS conservation sites (SAC, SPA, NHA, and pNHA) within the survey: (a) number of sites surveyed which coincided with a NPWS conservation site (b) area surveyed in hectares which coincided with a NPWS conservation site.



(a) (b)

The habitat surveyed with the largest area within NHAs/pNHAs was GS3 (7.4% of all GS3 surveyed), followed by GS4 (6.4% of all GS4 surveyed) (Table 3.3). This was followed by GA1, GS1, GM1 and GS2, in that order. Other than GS3 and GS4, areas within NHAs/pNHAs accounted for no more than 1.5% of any grassland habitat. The habitats surveyed which occurred within SACs followed a similar pattern. GS4 was the habitat with the largest area in SACs (7.5% of all GS4 surveyed), followed by GS3 (6.2% of all GS3 surveyed) (Table 3.3), and again, GA1, GS1, GM1 and GS2 follow in that order. Of the GA1 surveyed, 2.2% was located within SACs, but no more than 1% of any other habitat was within SACs. There is a large overlap between the area covered by NHAs/pNHAs and SACs.

Table 3.3 Area in hectares of different grassland habitats surveyed within NHAs and pNHAs.

	Improved agricultural grassland GA1	**Marsh GM1**	**Dry calcareous and neutral grassland GS1**	**Dry meadows and grassy verges GS2**	**Dry - humid acidic grassland GS3**	**Wet grassland GS4**
Cork	35.9	24.8	28.1	12.9	58.7	134.0
Waterford	0.1	9.4	7.3	5.4	131.3	31.1
Total	*36.0*	*34.3*	*35.4*	*18.3*	*190.0*	*165.1*

Table 3.4 Area in hectares of different grassland habitats surveyed within SACs.

	Improved agricultural grassland GA1	Marsh GM1	Dry calcareous and neutral grassland GS1	Dry meadows and grassy verges GS2	Dry - humid acidic grassland GS3	Wet grassland GS4
Cork	28.8	7.7	18.0	10.2	27.1	144.7
Waterford	27.0	8.3	1.8	3.1	131.3	48.3
Total	*55.8*	*16.1*	*19.7*	*13.3*	*158.4*	*193.1*

GS4 covered the largest area surveyed in SPAs (1.2 % of all GS4 surveyed), and the second largest area was GM1 (0.3% of all GM1 surveyed) (Table 3.5). These were the only habitats in SPAs which were surveyed in Waterford. GA1, GS1 and GS2 were also associated with SPAs in Cork, but land within SPAs accounted for less than 1% of any of these habitats.

Table 3.5 Area in hectares of different grassland habitats surveyed within SPAs.

	Improved agricultural grassland GA1	Marsh GM1	Dry calcareous and neutral grassland GS1	Dry meadows and grassy verges GS2	Wet grassland GS4
Cork	3.1	4.9	0.2	0.2	25.3
Waterford	0.0	2.2	0.0	0.0	6.2
Total	*3.1*	*7.2*	*0.2*	*0.2*	*31.5*

Sites were recorded as at least partially coinciding with SPAs in only 21 cases. The two most frequently surveyed habitats which occurred in SPAs were GS4 (11 sites) and GM1 (five sites).

Annex I grassland habitats

The area of land covered by Annex I grassland habitats in Cork and Waterford is shown in Table 3.6. In total, 270.6 ha of Annex I grassland habitats were recorded during the survey, which is equal to 10.5% of the total area surveyed. The majority of this occurred in Waterford, where 173.7 ha, or 24.6% of the total area surveyed was mapped as an Annex I grassland habitat. The 96.9 ha of Annex I quality habitat mapped in Cork represents only 5.2% of the total area of grassland surveyed in Cork.

The Annex I grassland habitat with the greatest cover in both counties was *Nardus* grassland (6230), with 58.5 ha in Cork and 159.4 ha in Waterford. This was followed in both counties by *Molinia* meadows (6410), which covered 36.3 ha in Cork and 8.8 ha in Waterford. Other Annex I grassland habitats found included hydrophilous tall herb communities (6430), Calaminarian grassland (6130), *Festuco-Brometalia* (6210) in Cork, and lowland hay meadows (6510) in Waterford.

Table 3.6 Area in hectares of Annex I grassland habitats recorded in Cork and Waterford.

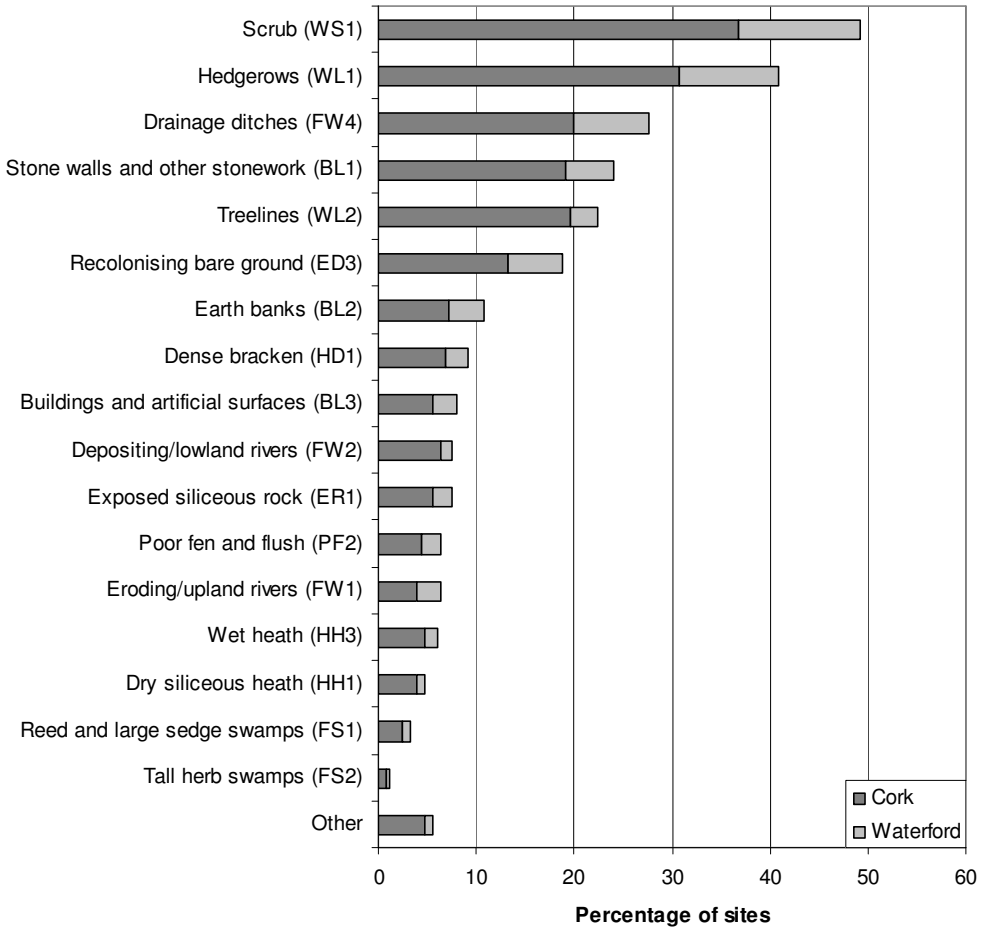
County	Calaminarian grassland (6130)	*Festuco-Brometalia* (6210)	*Nardus* grassland (6230)	*Molinia* meadows (6410)	Hydrophilous tall herb communities (6430)	Lowland hay meadows (6510)	Total
Cork	0.29	0.06	58.51	36.33	1.70	0.0	96.9
Waterford	0.09	0.0	159.38	8.81	0.0	5.46	173.7

Annex I grassland habitats occurred at 46 surveyed sites, or 18.4% of sites (Table 3.7). Of these, 33 sites were in Cork (17.2% of sites in Cork) and 13 sites were in Waterford (22.4% of sites in Waterford). Annex I grassland habitat 6410 was the most frequently recorded habitat, but covered considerably less area than Annex I grassland habitat 6230, which was the second most frequently recorded Annex I grassland habitat. The average area of Annex I habitat 6230 recorded per site was 11.6 ha, while the average area of Annex I habitat 6410 recorded per site was 2.1 ha. At two sites in Cork, two separate Annex I grassland habitats were recorded.

Table 3.7 Number of sites in which Annex I grassland habitats occurred in Cork and Waterford. Annex I grassland habitat was located within 33 Cork sites, with two sites containing two separate Annex I habitats.

	Calaminarian grassland (6130)	*Festuco-Brometalia* (6210)	*Nardus* grassland (6230)	*Molinia* meadows (6410)	Hydrophilous tall herb communities (6430)	Lowland hay meadows (6510)	Total
Cork	3	1	11	18	2	0	35
Waterford	1	0	8	3	0	1	13

Figure 3.4 Frequency of non-grassland Fossitt (2000) habitats within all surveyed sites, differentiated by county.



Internal habitats

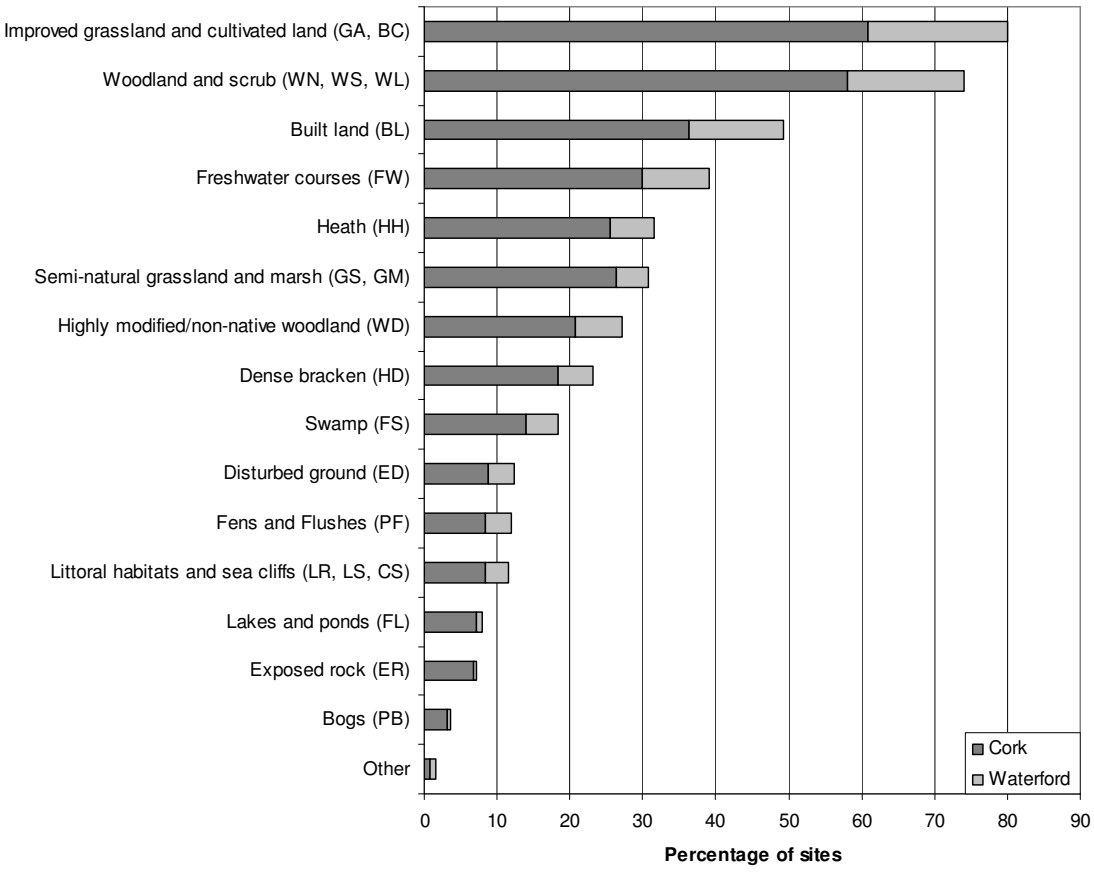
Non-grassland internal habitats recorded during the 2008 survey of Cork and Waterford are shown in Fig. 3.4. Scrub was the most frequently occurring non-grassland internal habitat at sites in Cork and Waterford, and was present at 49.2% of sites. The next most frequent internal habitat was hedgerow, which was present at 40.8% of sites, and this was followed by drainage ditches (at 27.6% of sites), stone walls (24.0% of sites), and tree lines (22.4% of sites). The "Other" category includes habitats which occurred at less than 1% of sites in the survey. These habitats include spoil and bare ground, exposed calcareous rock, non-calcareous springs, improved agricultural grassland, cutover bog, artificial lakes and ponds, upland blanket bog, rich fen and flush, mixed broadleaved woodland, and wet willow-alder-ash woodland.

Adjacent habitats

Habitats which occurred adjacent to sites are shown in Fig. 3.5. Improved grassland and cultivated land together formed the main land use adjacent to sites in the survey, and were recorded from 80.0% of sites. Highly modified woodland, including plantation forestry, occurred next to 27.2% of sites. The most prevalent semi-natural habitat recorded was woodland, including linear features and scrub, but excluding highly modified woodland. This

occurred adjacent to 74.0% of sites. The bulk of this figure can be attributed to scrub (adjacent to 54.8% of sites), followed by treelines and hedgerows (adjacent to 37.6% of sites). Other habitats which frequently occurred adjacent to sites included freshwater courses (adjacent to 39.2% of sites), heath (adjacent to 31.6% of sites) and semi-natural grassland and marsh (30.8% adjacent to of sites). Habitats included in the "Other" category included salt marsh and springs. Multiple adjacent habitats were frequently recorded at sites. 49.2% of sites were located beside built land.

Figure 3.5 Frequency of habitats occurring adjacent to surveyed sites, differentiated by county.



Management

The majority of sites in both Cork and Waterford were grazed (86.0% of sites), and not cut (17.6% of sites) (Fig. 3.6). There were a slightly higher proportion of mown sites in Waterford (20.3%) than in Cork (16.6%). Sites at which no evidence of grazing or mowing was observed were often scrubbing over or described as abandoned. Mowing was for hay or haylage, whereas fields managed for silage are included under the improved grassland habitat.

Cattle were the most frequently occurring grazing animal recorded in Cork and Waterford, and were recorded on 63.6% of sites (Fig. 3.7). Horses and sheep were equally frequently

encountered (at 22.8% of sites). Other domestic grazers included domestic rabbits and donkeys.

Wild and feral grazers were also recorded, and these included deer, goats, rabbits and hares. Most common were rabbits, recorded at 23.6% of sites.

Figure 3.6. Frequency of different management regimes at sites, differentiated by county.

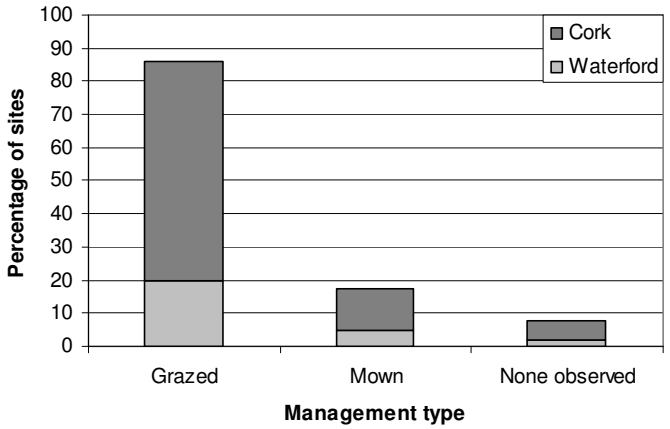


Figure 3.7 Frequency of domestic grazing animals at sites, differentiated by county.

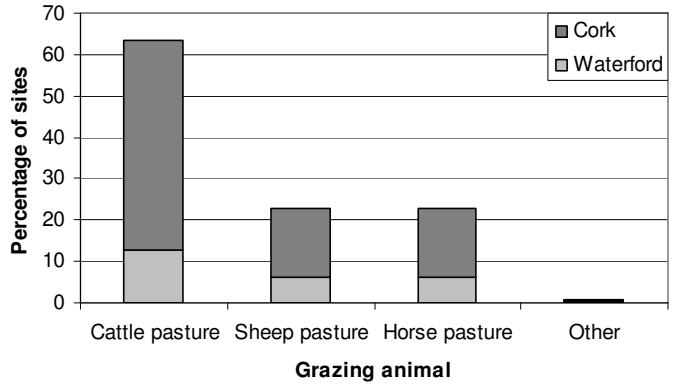


Figure 3.8 Frequency of different grazing levels and encroachment at sites, differentiated by county.

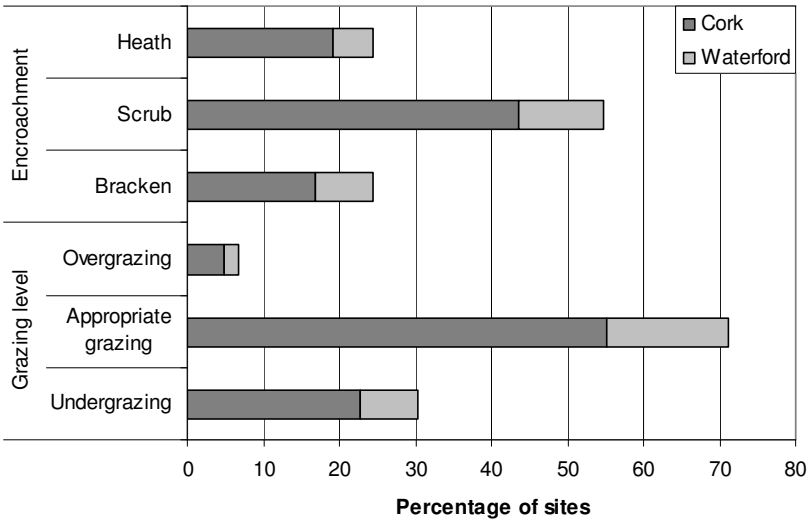


Figure 3.9 Frequency of occurrence of different types of damaging activity at sites, differentiated by county.

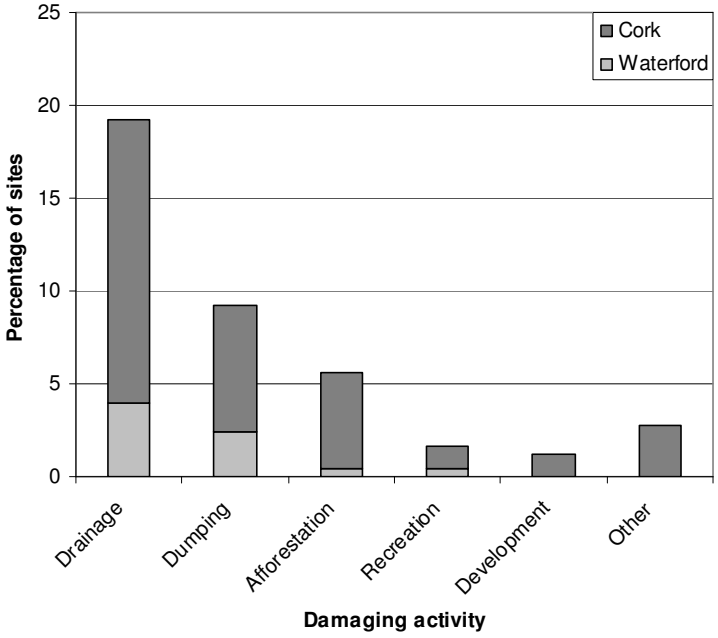
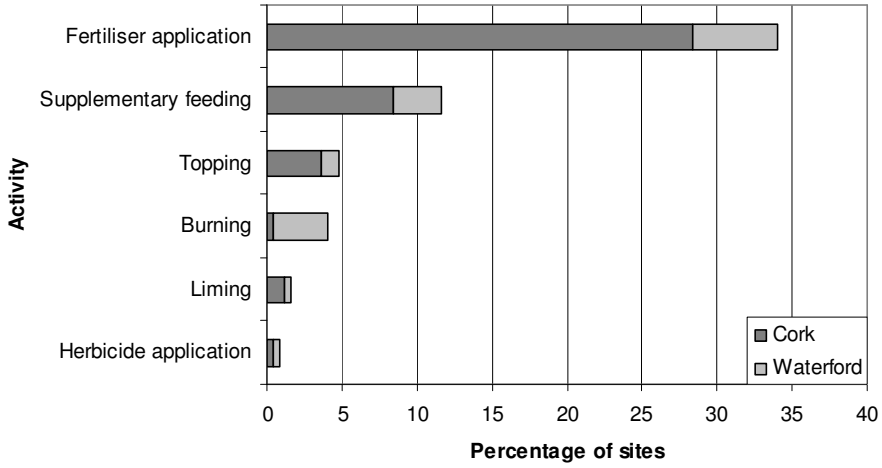


Fig. 3.8 shows the relative frequencies of different levels of grazing and types of improvement. Encroachment on sites was most frequently attributed to scrub, as opposed to heath or bracken, and 71.2% of surveyed sites suffered encroachment in Cork and Waterford. Heath was present at 24.4% of sites in Cork and Waterford. An appropriate level of grazing was recorded at 71.2% of the sites in survey, but undergrazing was recorded at 30.4% of sites. This undergrazing may be partially responsible for the encroachment of woody species on sites. More than one grazing level was recorded at some sites.

The most frequently recorded damaging activity in Cork and Waterford was drainage (19.2% of sites), followed by dumping (9.2% of sites) and afforestation (5.6% of sites) (Fig. 3.9). Other damaging activities included quarrying, topsoil removal, piling of soil from river dredging, hedge removal, horticultural tree planting, unknown localised disturbance to the ground and use of vehicles, all of which were recorded from Cork alone.

Fig. 3.10 indicates the frequency of agricultural activities in Cork and Waterford. The most frequent method of improvement observed in Cork and Waterford was the application of fertiliser (34.0% of sites), which was more frequent in Cork (36.9% of sites) than in Waterford (24.1% of sites).

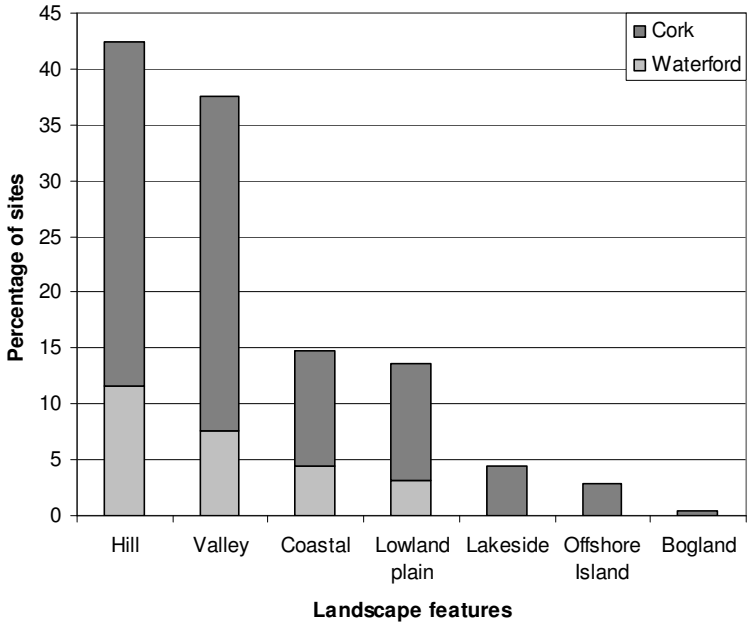
Figure 3.10 Frequency of agricultural activities recorded, differentiated by county.



Landscape features

Fig. 3.11 indicates the landscape features associated with sites included in the survey. Sites occurred most frequently on hills and valleys in both counties. 50.0% of sites in Waterford were associated with hills, compared with 40.1% in Cork. Of the valley sites, 19 of them were stated to be on river floodplains. Sites in Cork were associated with a greater diversity of geographical features than those in Waterford, where no lakeside, bogland or offshore island sites were surveyed. Coastal sites included coastal plains, cliffs and headlands.

Figure 3.11 Frequency of different geographical features associated with sites, differentiated by county.



Species richness

The mean number of species recorded from each site in Cork was 58.7, and the mean number for Waterford was 58.2 species. A one-way analysis of variance between groups was conducted to investigate whether there was a difference in the number of species per site in Cork and Waterford, and no significant difference was observed ($F = 0.04$, $p = 0.84$).

Species frequency

The frequency of the 50 most common species recorded in 2008 grassland surveys in Cork and Waterford is shown in Table 3.8. These species represent a broad range of ecological conditions, including wet (e.g., *Galium palustre, Alopecurus geniculatus*), dry (e.g., *Hypochaeris radicata, Centaurea nigra*), acidic (e.g., *Potentilla erecta, Succisa pratensis*) and neutral (e.g., *Bellis perennis, Arrhenatherum elatius*). Species confined to highly calcareous substrates are absent from this list, an indication of the relative scarcity of calcareous grassland in the area studied. The majority of the most frequently recorded plants are broad-spectrum species such as *Holcus lanatus, Agrostis stolonifera* and *Cerastium fontantum*, which are found in both wet and dry grassland, and have a wide pH range. Significantly, a number of the species on this list are also characteristic of semi-improved grassland, including *Trifolium repens, Lolium perenne* and *Cirsium arvense*, an indication of the extent to which agricultural improvements are influencing the species composition of many Irish grasslands. Also of some significance is the presence on the list of *Ulex europaeus*, which may indicate a tendency to abandonment and scrub encroachment for many of our grasslands.

Table 3.8 Frequency of the 50 most common species recorded in Cork and Waterford grasslands in 2008.

Name	No. sites	Name	No. sites
Agrostis stolonifera	250	*Alopecurus pratensis*	144
Holcus lanatus	250	*Alopecurus geniculatus*	143
Cerastium fontanum	229	*Carex flacca*	143
Trifolium repens	229	*Ranunculus flammula*	139
Ranunculus repens	226	*Rhytidiadelphus squarrosus*	139
Rumex acetosa	223	*Senecio jacobaea*	137
Festuca rubra	215	*Bellis perennis*	136
Anthoxanthum odoratum	214	*Cardamine pratensis*	135
Plantago lanceolata	197	*Ulex europaeus*	129
Lotus pedunculatus	189	*Achillea millefolium*	128
Cirsium palustre	181	*Calliergonella cuspidata*	128
Dactylis glomerata	179	*Filipendula ulmaria*	124
Lolium perenne	179	*Centaurea nigra*	121
Juncus effusus	178	*Cirsium vulgare*	118
Hypochaeris radicata	169	*Lotus corniculatus*	108
Taraxacum agg.	166	*Poa annua*	108
Cirsium arvense	162	*Poa trivialis*	108
Urtica dioica	158	*Arrhenatherum elatius*	107
Galium palustre	157	*Carex riparia*	107
Ranunculus acris	156	*Phalaris arundinacea*	107
Trifolium pretense	156	*Poa pratensis*	107
Potentilla anserina	151	*Carex nigra*	106
Potentilla erecta	151	*Epilobium obscurum*	106
Prunella vulgaris	151	*Kindbergia praelonga*	104
Rumex obtusifolius	145	*Senecio aquaticus*	100

3.2 Assessment of Annex I grassland

During the 2008 survey, 49 areas of Annex I grassland habitat were identified within 47 different sites. One of the 49 areas, in site 376, comprising the *Festuco- Brometalia* Annex I habitat (6210), was not assessed since the area it occupied was smaller than the minimum mapping unit of 400 m^2. The remaining 48 areas of Annex I grassland habitat occurred within 46 sites, with two sites (sites 415 and 584) containing two Annex I grassland habitats (Table 3.9). The Annex I grassland habitats recorded within each site are summarised in Appendix 4.

Although three of the four Calaminarian (6130) Annex I grassland sites were also surveyed in 2008 by the bryologist David Holyoak (Holyoak 2008) it was not possible to utilise his data as it was difficult to locate the exact 2 x 2m areas that he surveyed.

Area assessment

Of the 48 areas of Annex I grassland habitat assessed, 42 areas had not declined in extent between 2000 and 2008 (Table 3.9; see also Appendix 8). These habitat areas were scored as *Favourable*. Of the remaining six areas, only two had declined in extent greater than 1% per annum and were scored as *Unfavourable – Bad*; both of these sites, 489 and 642, were

Nardus grassland (6230). The remaining four areas had declined by less than 1% per annum and were scored as *Unfavourable – Inadequate*; of these, three were the Annex I grassland habitat *Molinia* meadow (6410);sites 553, 556 and 568, and one was hydrophilous tall herb (6430);site 418.

Structure and functions assessment

An assessment of structure and functions was made at 167 monitoring stops, with only 19 of stops passing this assessment. No habitat area was assessed as *Favourable* and only three habitat areas, within sites 354, 485 and 496, received an overall assessment of *Unfavourable – Inadequate*: these were all areas of *Nardus* grassland (6230). The remaining 45 habitat areas were all assessed as *Unfavourable – Bad*, mainly due to an insufficiently high forb : graminoid ratio. Of the eight criteria used, forb : graminoid ratio had by far the lowest pass rate, with positive indicator species and litter cover also having relatively low pass rates (Table 3.10). The vast majority of passes were for *Molinia* meadow (6410) habitat; the only other Annex I grassland habitat with any monitoring stops having passed was *Nardus* grassland (6230) (Table 3.11).

Table 3.9 Annual percentage change in area of each of the 48 assessed Annex I grassland habitat areas between the years 2000 and 2008.

Site no.	Annex habitat	Area in 2008 (m^2)	% change yr^{-1}	Site no.	Annex habitat	Area in 2008 (m^2)	% change yr^{-1}
307	6230	65619	0	489	6230	9645	-6.3
316	6230	1205270	0	492	6410	11020	0
317	6230	328097	0	495	6410	72358	0
320	6510	54644	0	496	6230	35700	0
326	6230	13659	0	539	6410	1571	0
344	6410	32458	0	553	6410	10737	-0.4
354	6230	77300	0	556	6410	15454	-0.6
356	6410	12376	0	565	6410	684	0
357	6230	18603	0	566	6410	7449	0
360	6230	55440	0	568	6410	1335	-0.7
366	6130	0827	0	569	6410	630	0
372	6230	40572	0	571	6230	23122	0
379	6410	35618	0	582	6130	496	0
402	6230	65250	0	584	6410	23729	0
407	6410	33129	0	584	6130	1616	0
410	6210/6211	644	0	589	6230	38264	0
415	6430	168	0	590	6410	16089	0
415	6410	17747	0	601	6410	51752	0
418	6430	8633	-0.6	618	6410	23062	0
462	6230	11174	0	627	6410	71416	0
463	6230	669	0	631	6410	7192	0
475	6230	2578	0	635	6410	2794	0
485	6230	4139	0	642	6230	279988	-3.7
488	6230	40089	0	645	6230	75073	0

Table 3.10 Pass rate for criteria used to assess the structure and functions (*n* =167).

Assessment Criteria	% of monitoring stops that passed
Forb : graminoid ratio	31
Positive indicator species	62
Litter cover	71
Encroachment	93
Negative indicator species	95
Sward height	96
Bare ground cover	97
Grazing disturbance	99

Table 3.11 Pass rate for the forb : graminoid ratio, positive indicator species and litter cover criteria for each Annex I grassland habitat. The percentage that passed for all eight structure and function criteria are shown in the final column.

Annex I habitat	No. monitoring stops	No. of passes for forb : graminoid ratio	No. of passes for positive indicator species	No. of passes for litter cover	% of monitoring stops that passed overall
6210/6211	1	0	0	0	0
6230	72	21	63	66	24
6410	72	13	38	31	3
6430	5	5	0	4	0
6510	4	2	0	4	0
6130	13	10	2	13	0
Total	*167*	*51*	*103*	*118*	*11*

Future prospects assessment

Of the 48 Annex I grassland habitat areas, 45 areas were scored as having negative overall future prospects, two of these receiving an assessment of *Unfavourable – Bad* (sites 642 and 584) and the remainder receiving an assessment of *Unfavourable – Inadequate* (Table 3.12; full details presented in Appendix 7). These included all areas of Calaminarian grassland (6130), hydrophilous tall herb (6430) and lowland hay meadows (6510). Areas of 6130 and *Nardus* grassland (6230) received among the lowest scores. Just three out of the 48 Annex I grassland habitat areas assessed were scored as *Favourable*. Of these, one area of *Festuco-Brometalia* (6210) within site 410 and one area of *Nardus* grassland (6230) within site 488, each received a score of zero, whilst one area of *Molinia* meadow (6410) within site 627 achieved a positive score.

Overall assessment of Annex I grassland habitats

None of the 48 Annex I grassland habitat areas received an overall conservation assessment of *Favourable* (Table 3.13; full details presented in Appendix 8). Only three of the habitat areas received an overall score of *Unfavourable – Inadequate*, all three areas were *Nardus* grassland (6230);sites 354, 485 and 496, with the remainder of sites all receiving an overall

score of *Unfavourable – Bad*. The majority of sites received a *Favourable* score in the area assessment and a score of *Unfavourable – Inadequate* in the future prospects assessment, whilst out of the 48 habitat areas that were assessed, 45 of these received a score of *Unfavourable – Bad* in the structure and functions assessment (Table 3.14).

Table 3.12 Future prospects scores for the 48 assessed areas of Annex I grassland habitat.

Site no.	Annex habitats	Negative threat score	Positive conservation score	Total score
307	6230	-4	1	-3
316	6230	-6	2	-4
317	6230	-8	2	-6
320	6510	-2	0	-2
326	6230	-5	0	-5
344	6410	-3	0	-3
354	6230	-3	0	-3
356	6410	-5	0	-5
357	6230	-6	0	-6
360	6230	-4	2	-2
366	6130	-4	1	-3
372	6230	-7	0	-7
379	6410	-5	0	-5
402	6230	-9	2	-7
407	6410	-5	1	-4
410	6210/6211	-1	1	0
415	6410	-1	0	-1
415	6430	-1	0	-1
418	6430	-2	1	-1
462	6230	-1	0	-1
463	6130	-1	0	-1
475	6230	-4	0	-4
485	6230	-4	0	-4
488	6230	-1	1	0
489	6230	-5	0	-5
492	6410	-8	0	-8
495	6410	-9	0	-9
496	6230	-4	3	-1
539	6410	-3	0	-3
553	6410	-3	0	-3
556	6410	-7	0	-7
565	6410	-6	0	-6
566	6410	-6	0	-6
568	6410	-4	0	-4
569	6410	-3	0	-3
571	6230	-6	0	-6
582	6130	-6	0	-6
584	6410	-4	0	-4
584	6130	-10	0	-10
589	6230	-2	0	-2
590	6410	-4	0	-4
601	6410	-5	0	-5
618	6410	-3	0	-3
627	6410	-1	2	1
631	6410	-4	0	-4
635	6410	-2	0	-2
642	6230	-10	0	-10
645	6230	-6	0	-6

Table 3.13 Overall assessment scores for the six different types of Annex I grassland habitat.

Annex I habitat	Number of sites scored as *Favourable* overall	Number of sites scored as *Unfavourable - Inadequate* overall	Number of sites scored as *Unfavourable - Bad* overall
6210/6211	0	0	1
6230	0	3	16
6410	0	0	21
6430	0	0	2
6510	0	0	1
6130	0	0	4
Total	*0*	*3*	*45*

Table 3.14 Total scores within each of the assessment parameters for the 48 areas of Annex I grassland habitat that were surveyed.

	Number of sites scored as *Favourable*	Number of sites scored as *Unfavourable - Inadequate*	Number of sites scored as *Unfavourable - Bad*
Area Assessment	42	4	2
Structure and Function Assessment	0	3	45
Future Prospects Assessment	3	43	2

3.3 Ranking of sites using conservation and threat evaluations

Conservation and threat scores were calculated according to the scheme presented in Tables 2.2 and 2.3 and applied to the 250 sites surveyed in Cork and Waterford in 2008. As the scheme differs slightly from that applied in 2007, scores for the 91 sites surveyed in Roscommon and Offaly were also recalculated. Only results for Cork and Waterford are presented here; however, conservation and threat scores for all 341 sites surveyed to date, including the 91 sites surveyed in 2007, are given in Appendices 9 and 10.

Conservation evaluation

Table 3.15 lists the 19 sites in Cork and Waterford that achieved a conservation score of 50% or over. Of these, only three are associated with a pNHA or SAC and none are associated with an NHA. Five of the top sites are in Waterford, representing 8.6% of the sites surveyed in that county, with the remaining 14 in Cork (7.3% of Cork sites). Two of the sites in Cork are in Nature Reserves. The highest ranked site is at Dawstown in Cork (site 601), a site which scored highly across most categories evaluated, including the presence of Annex I grassland habitat (*Molinia* meadow 6410). This list contains the largest site (Lyre Mountain, site 316) and the site with the highest number of species (Polleenateada, site 584). All but five of the

top 19 sites contained at least one Annex I grassland habitat. However, none of the top scoring sites contained any notable species.

Table 3.15 The highest ranking semi-natural grassland sites according to their conservation evaluation.

Site no.	Site Name	County	pNHA*	SAC	SPA	Nature Reserve	Score	Rank
601	Dawstown	Cork					**64.8**	1
344	Ballynamona Lower	Waterford					**59.3**	=2
568	Derrycarhoon	Cork					**59.3**	=2
584	Polleenateada	Cork					**59.3**	=2
357	Meoul	Waterford					**55.6**	=5
481	Glannafeen	Cork					**55.6**	=5
566	Reenaknock	Cork					**55.6**	=5
379	Tobernahulla	Waterford					**53.7**	=8
590	Bengour West	Cork					**53.7**	=8
316	Lyre Mountain	Waterford	1952	1952			**51.9**	=10
342	Rathmoylan	Waterford					**51.9**	=10
415	Coolowen	Cork					**51.9**	=10
440	Tooms West	Cork	108	108	4109	The Gearagh	**51.9**	=10
463	Urhin	Cork					**51.9**	=10
586	Toehead	Cork					**51.9**	=10
618	Kilcolman	Cork	92		4095	Kilcolman Bog	**51.9**	=10
642	Coomnagire	Cork					**51.9**	=10
510	Kilcullen South	Cork					**50.0**	=18
539	Dunkelly West	Cork					**50.0**	=18

*No sites were associated with NHAs

Table 3.16 The highest ranking semi-natural grassland sites according to their threat evaluation.

Site no.	Site Name	County	pNHA	SAC	Score	Rank
566	Reenaknock	Cork			55.56	1
359	Tallowbridge	Waterford	72	2170	50.00	=2
421	Rathdrum	Cork			50.00	=2
516	Esk South	Cork			50.00	=2
558	Shanacashel	Cork			50.00	=2
568	Derrycarhoon	Cork			50.00	=2
305	Dunabrattin	Waterford	1693		44.44	=7
415	Coolowen	Cork			44.44	=7
449	Castleredmond	Cork			44.44	=7
473	Gortnagrough	Cork			44.44	=7
503	Ballinvonear	Cork	2036		44.44	=7
523	Castlelohort Demesne	Cork			44.44	=7
552	Dromcarra	Cork			44.44	=7
560	Gortroe	Cork			44.44	=7
569	Derreenagreanagh	Cork			44.44	=7
586	Toehead	Cork			44.44	=7
606	Coolkirky	Cork			44.44	=7

Threat evaluation

The 17 most threatened sites (those that scored over 40% for the threat evaluation) are listed in Table 3.16. Three of these are in Waterford (5.2% of Waterford sites surveyed), the remaining 14 in Cork (7.3% of Cork sites surveyed). Of the three Waterford sites, two are associated with pNHAs, with one of these sites also located within an SAC. One of the Cork sites is in a pNHA. The most threatened site according to this scoring system is Reenaknock in Cork (site 566), a site which scored in all categories examined, receiving relatively high scores for encroachment, negative adjacent habitats and negative species. Also on the list is the site with the highest number of negative species (Castleredmond, site 449). Four of the sites scored maximum points for encroachment, suffering from all three types of encroachment. Negative adjacent habitats also appear to be a consistent threat.

It should be noted that four of the most threatened sites – Coolowen (site 415), Reenaknock (site 566), Derrycarhoon (site 568) and Toehead (site 586) – are also listed among the 19 sites of highest conservation value (Table 3.15).

3.4 Clustering and ordination

The results of the cluster analysis were examined manually and using expert judgement it was decided to cut the dendrogram at the four cluster level. The four ***grassland groups*** resulting from this represented combinations of two strong environmental gradients: acidic-basic and wet-dry. Groups were named using the two best indicator species as identified by ISA. For each of the four 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***. ISA was run for each of the four groups of vegetation types and each vegetation type was named after their two best indicator species. Nomenclature inevitably differs from that presented in the pilot survey (Martin *et al.* 2007). An overview of the classification is shown in Table 3.17. The classification is presented in full in chapter 4.

MRPP tests found statistically significant differences in the environmental matrix at the 4-cluster level ($A = 0.07$, $p < 0.001$). This effect size or chance-corrected within-group agreement (A) is rather small (c.f. Martin *et al.* 2007) and McCune & Grace (2002) warn that statistically significant results (small *p* values) can be obtained even when the effect size is small, if, as in this case, sample size is large. However, McCune & Grace (2002) also state that A values <0.10 are common for community ecology datasets and therefore MRPP does provide statistical support for cutting the cluster dendrogram at these levels.

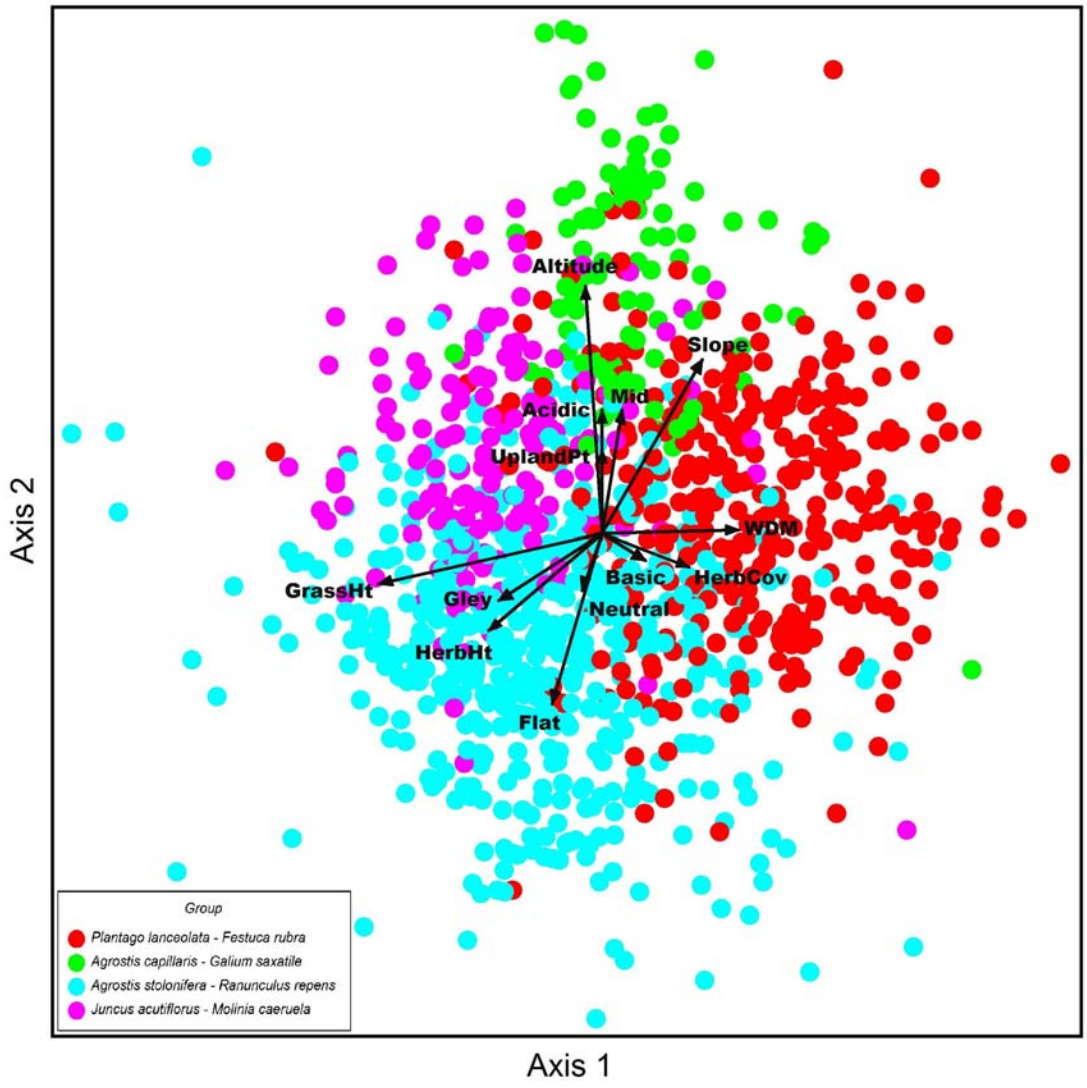
Table 3.17 Overview of the grassland classification scheme

Grouping	No. of relevés
1. *Plantago lanceolata – Festuca rubra* grassland group	326
a. *Succisa pratensis – Carex flacca* vegetation type	25
b. *Dactylis glomerata – Trifolium pratense* vegetation type	50
c. *Cynosurus cristatus – Prunella vulgaris* vegetation type	93
d. *Anthoxanthum odoratum – Agrostis capillaris* vegetation type	42
e. *Armeria maritima – Plantago coronopus* vegetation type	47
f. *Lolium perenne – Trifolium repens* vegetation type	27
g. *Festuca rubra – Arrhenatherum elatius* vegetation type	42
2. *Agrostis capillaris – Galium saxatile* grassland group	102
a. *Holcus lanatus – Anthoxanthum odoratum* vegetation type	75
b. *Nardus stricta – Festuca ovina* vegetation type	27
3. *Agrostis stolonifera – Ranunculus repens* grassland / marsh group	477
a. *Filipendula ulmaria – Mentha aquatica* vegetation type	186
b. *Holcus lanatus – Lolium perenne* vegetation type	128
c. *Juncus effusus – Lotus pedunculatus* vegetation type	94
d. *Agrostis stolonifera – Plantago lanceolata* vegetation type	69
4. *Juncus acutiflorus – Molinia caerulea* grassland group	167
a. *Holcus lanatus – Lotus pedunculatus* vegetation type	114
b. *Potentilla erecta – Succisa pratensis* vegetation type	53

The 2-dimensional solution to the NMS ordination is shown in Fig. 3.12. Stress on this solution was 29.0%, which is high and a possible cause for concern according to the guidelines of McCune & Grace (2002), but stress increases with sample size and, given the very large sample size ordinated here, a fair degree of reliance can be put on interpretation of the plot. The two axes cumulatively represented 51.4% of variance in the distance matrix. Overall, relevés within each of the four grassland groups identified by cluster analysis grouped together in the ordination, providing validation of the cluster solution.

Axis 1 (r^2 = 0.216) primarily represents a wet-dry gradient. Samples of tall vegetation from gleyed sites are found at the lower end of the axis, whilst samples from well-drained soils are found at the upper end. Axis 2 (r^2 = 0.298) primarily represents an altitudinal and base-acid gradient, with samples from higher, sloping sites on acidic soils towards the top end, and samples from flatter, lowland sites on neutral or basic soils towards the bottom end.

Figure 3.12 NMS ordination plot of 1,072 grassland relevés. Direction of black lines from origin shows Pearson correlation of environmental variables with axes. Length indicates strength of correlation. HerbCov = broadleaf herb cover; HerbHt = broadleaf herb height; GrassHt = graminoid height. Flat and Mid refer to topography dummy variables representing flat ground and mid-slope. Gley, WDM (well-drained mineral) and UplandPt (upland peats) refer to soil type dummy variables. Basic, Acidic and Neutral refer to soil pH dummy variables.



Comparisons are made in the following confusion tables between the grassland groups generated here and the *a priori* assignment of relevés to Fossitt (2000) (Table 3.18) and Annex I grassland habitat types (Table 3.19). Comparison at the vegetation type level is made under each vegetation type entry in chapter 4. GS1 relevés were chiefly assigned to group 1, whilst GS2 relevés were split fairly evenly between groups 1 and 3, as were most GA1 samples. GM1 relevés were assigned mainly to group 3, which also contains the majority of GS4 relevés. Group 4 consists primarily of most of the remaining GS4 samples. Group 2 consists largely of GS3 relevés, although a significant proportion of these were classified under group 1.

The majority of the Annex I grassland habitats Calaminarian grassland (6130), lowland hay meadows (6510) and *Festuco-Brometalia* (6210/6211) relevés were classified under group 1, whilst the majority of *Nardus* grassland (6230) samples were included in group 2. All hydrophilous tall herb (6430) relevés were assigned to group 3. Relevés from *Molinia* meadows (6410) were split chiefly between groups 3 and 4. The group with the largest proportion of non-Annex I habitat relevés was group 3 (88%).

Table 3.18 Confusion table comparing grassland group assignment of relevés using cluster analysis with *a priori* classification of relevés using Fossitt (2000).

	GA1	**GM1**	**GS1**	**GS2**	**GS3**	**GS4**	***Total***
1 *Plantago lanceolata – Festuca rubra*	36	1	153	66	48	22	*326*
2 *Agrostis capillaris – Galium saxatile*	11		4	4	76	7	*102*
3 *Agrostis stolonifera – Ranunculus repens*	43	43	32	69	7	283	*477*
4 *Juncus acutiflorus- Molinia caerulea*	1	7		1	5	153	*167*
Total	*91*	*51*	*189*	*140*	*136*	*465*	*1072*

Table 3.19 Confusion table comparing grassland group assignment of relevés using cluster analysis with assignment of relevés to Annex I habitat types.

	6130	**6210/6211**	**6230**	**6410**	**6430**	**6510**	**None**	***Total***
1 *Plantago lanceolata – Festuca rubra*	12	44	9	8		16	237	*326*
2 *Agrostis capillaris – Galium saxatile*	1		60	3		1	37	*102*
3 *Agrostis stolonifera – Ranunculus repens*		2	2	37	10	5	421	*477*
4 *Juncus acutiflorus – Molinia caerulea*			2	63			102	*167*
Total	*13*	*46*	*73*	*111*	*10*	*22*	*797*	*1072*

4: VEGETATION CLASSIFICATION

Grassland groups

For each of the four grassland groups, a list of ten key indicator species is presented, together with distribution maps, on pages 49 and 50. These ***group indicators*** help distinguish sward samples between the 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 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. These have been selected to represent the range of variation within the vegetation type, but emphasis has been placed on providing some useful points of reference to the group rather than listing sites which are strictly the most typical of the vegetation. The examples listed tend to consist of sites that are already known, such as NPWS conservation sites, or to which public access is possible.

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.
- 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 ***CEP***, subjective comparisons are made with the groupings of the Central European phytosociology tradition. The associations and subassociations described for Ireland in White & Doyle (1982) and O'Sullivan (1982) were used as the references.
- Under ***Tablefit***, comparisons are made with the British National Vegetation Classification (Rodwell 1991, 1992, 2000) using the Tablefit v1.0 software utility (Institute of Terrestrial Ecology, Huntingdon). This utility defines a measure of goodness-of-fit between samples of vegetation and the expected species composition of each NVC community. For each vegetation type, percentage cover and frequency data were used for all species with 5% or greater frequency within that vegetation type, with the exception of a small number of species that could not be input due to taxonomic changes. The three NVC communities or sub-communities with the best

matches are given with the goodness-of-fit in percent. Tablefit also cross-references NVC communities with the Corine Biotopes system (Devillers *et al.* 1991) upon which the Palaearctic Habitat classification used in the EU Habitats Directive is based; the Corine category related to the best match is presented.

- Under ***MAVIS***, a further comparison with the British NVC is presented, this time 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. Again, for each vegetation type only species with 5% or greater frequency within that vegetation type were used. The best three NVC communities or sub-communities and the most relevant Corine category are presented.
- Note that Tablefit and MAVIS utilise different goodness-of-fit methods, therefore it is not appropriate to make direct comparisons between the percentage coefficients of the two applications.

A distribution map is given for each vegetation type indicating its occurrence in the four counties surveyed 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 grassland group displaying a summary of the floristic and environmental data. The tables are arranged as follows:

- Data for each vegetation type within the group are presented in a separate column identified by lower case letter, with summary data for the group as a whole presented in the final column.
- Species are included in the table which have 5% or greater frequency in one or more of the vegetation types.
- Frequency and abundance data are given for each species in each vegetation type. ***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%.

Species are ordered within the table as follows:

- The first section contains the constant species, which in phytosociological terminology are those with an overall frequency in the group of IV or V. Within this section, species are ordered by their indicator status for each of the vegetation types.
- The subsequent sections contain the indicator species for each of the vegetation types in turn. Within these sections, species are ordered by their value as indicators.
- After the indicator species the remaining species which do not have any significant affinity for one of the vegetation types are shown. These companion species have been divided into sections according to whether they are grasses, sedges or rushes, forbs, other vascular plants or bryophytes, and within these sections they are ordered by frequency within the grassland group.

In the final sections of the synoptic table, environmental data are presented for each vegetation type and the grassland group. Species richness simply indicates the mean number of species per relevé. For soil pH, percentage loss on ignition, total P (Phosphorous), altitude and slope, median values are given. Soil type is presented by percentage of relevés for each of six broad categories: well-drained mineral soils, basin peats, gleys, uplands peats, podzols and other soils. As soil data are only available for a subset of relevés, the sample size for each data value is also presented.

Species are ordered within the table as follows:

- The first section contains the constant species, which in phytosociological terminology are those with an overall frequency in the group of IV or V. Within this section, species are ordered by their indicator status for each of the vegetation types.
- The subsequent sections contain the indicator species for each of the vegetation types in turn. Within these sections, species are ordered by their value as indicators.
- After the indicator species the remaining species which do not have any significant affinity for one of the vegetation types are shown. These companion species have been divided into sections according to whether they are grasses, sedges or rushes, forbs, other vascular plants or bryophytes, and within these sections they are ordered by frequency within the grassland group.

In the final sections of the synoptic table, environmental data are presented for each vegetation type and the grassland group. Species richness simply indicates the mean number of species per relevé. For soil pH, percentage loss on ignition, total P (Phosphorous), altitude and slope, median values are given. Soil type is presented by percentage of relevés for each of six broad categories: well-drained mineral soils, basin peats, gleys, uplands peats, podzols and other soils. As soil data are only available for a subset of relevés, the sample size for each data value is also presented.

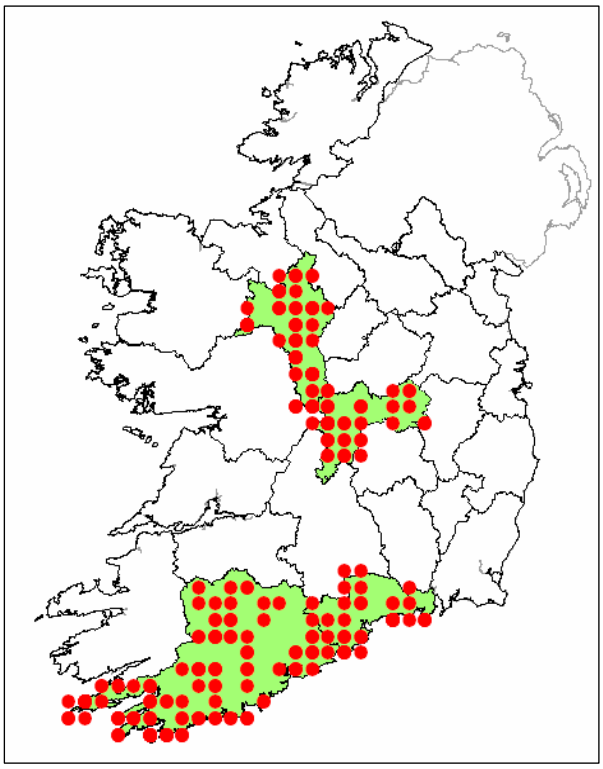
Grassland and marsh groups: indicator species and maps

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

Plantago lanceolata – Festuca rubra grassland group

326 relevés, 7 vegetation types

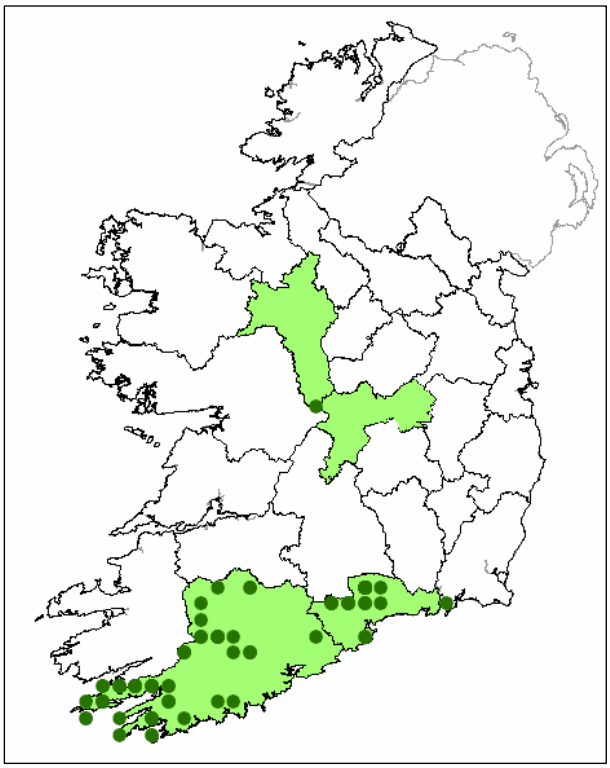
Plantago lanceolata	50%
Festuca rubra	43%
Lotus corniculatus	39%
Trifolium pratense	34%
Cynosurus cristatus	32%
Hypochaeris radicata	32%
Dactylis glomerata	31%
Trifolium repens	28%
Achillea millefolium	28%
Cerastium fontanum	25%



Agrostis capillaris – Galium saxatile grassland group

102 relevés, 2 vegetation types

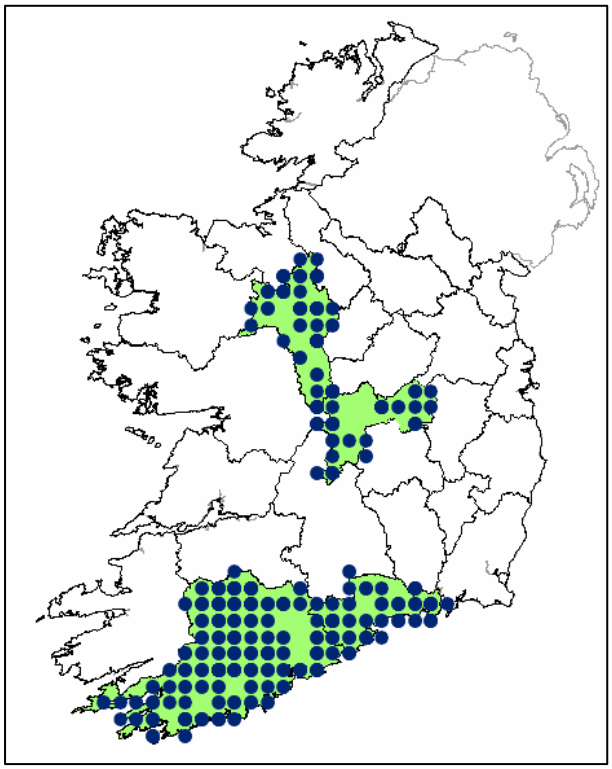
Agrostis capillaris	72%
Rhytidiadelphus squarrosus	55%
Galium saxatile	50%
Hylocomium splendens	49%
Nardus stricta	45%
Potentilla erecta	42%
Rhytidiadelphus loreus	33%
Festuca ovina	32%
Juncus squarrosus	32%
Calluna vulgaris	26%



Agrostis stolonifera – Ranunculus repens **grassland / marsh group**

477 relevés, 4 vegetation types

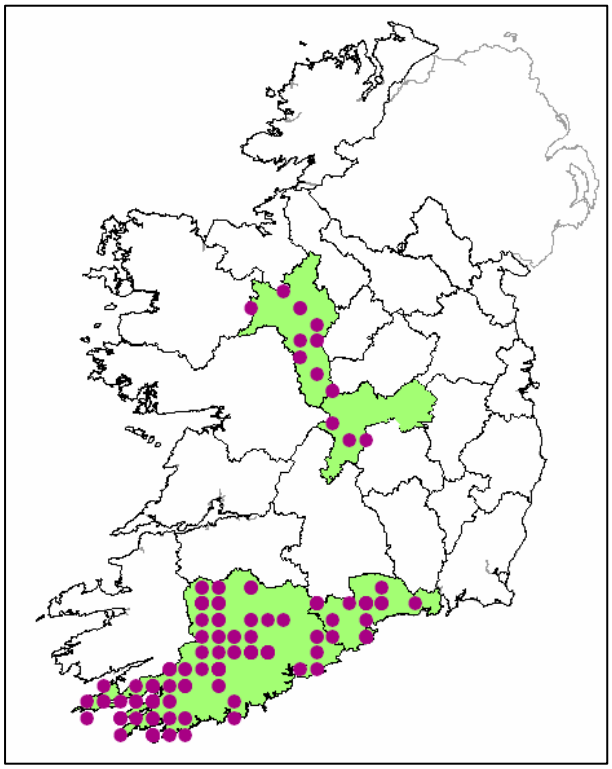
Agrostis stolonifera	49%
Ranunculus repens	40%
Holcus lanatus	34%
Juncus effusus	32%
Filipendula ulmaria	20%
Rumex acetosa	15%
Equisetum fluviatile	12%
Poa trivialis	11%
Potentilla anserina	11%
Carex disticha	10%



Juncus acutiflorus – Molinia caerulea **grassland / marsh group**

167 relevés, 2 vegetation types

Juncus acutiflorus	79%
Molinia caerulea	40%
Lotus pedunculatus	35%
Calliergonella cuspidata	20%
Cirsium palustre	17%
Ranunculus flammula	17%
Galium palustre	16%
Succisa pratensis	15%
Cardamine pratensis	11%
Epilobium obscurum	10%



1. *Plantago lanceolata – Festuca rubra* grassland group

a. *Succisa pratensis – Carex flacca* vegetation type

Description

This is a species-rich sward typically found on infertile, highly mineral well-drained soils in the lowlands. The sward is dominated by *Festuca rubra, Anthoxanthum odoratum, Succisa pratensis, Carex flacca, Briza media*, *Carex panicea, Lotus corniculatus and Centaurea nigra.* Less abundant indicators include *Linum catharticum, Hypericum pulchrum, Thymus polytrichus, Pilosella officinarum, Galium verum* and *Euphrasia officinalis* agg. Other frequent species include *Prunella vulgaris, Achillea millefolium, Potentilla erecta* and *Trifolium pratense* and there is a strong forb component to the sward. This vegetation type includes calcareous grassland samples from esker grassland and grassland found in close association with outcropping limestone and limestone pavement. Also included here are a small number of relevés from base-rich, dry fen meadows and fen margins.

Example sites

All Saint's Bog, Offaly (Site 1); Carrickmore, Roscommon (Site 215); Portruny Bay, Roscommon (Site 218); Dovegrove Callows, Offaly (Site 17).

Affinities

Fossitt: GS1 68%; GS2 20%; GS4 12%

Annex I: 6210 / 6211 Semi-natural dry grasslands and scrubland facies on calcareous substrates (32%)
6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (16%)

CEP: Centaureo – Cynosuretum galietosum subassociation / Antennarietum hibernicae association

Tablefit:

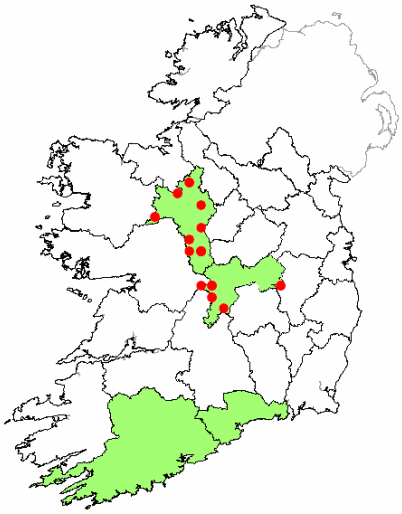
NVC: MG5c *Cynosurus cristatus – Centaurea nigra* grassland *Danthonia decumbens* sub-community (45%)
MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community (44%)
MG5b *Cynosurus cristatus – Centaurea nigra* grassland *Galium verum* sub-community (44%)

Corine: C38.112 Centaureo – Cynosuretum

MAVIS:

NVC: CG2d *Festuca ovina – Avenula pratensis* grassland *Dicranum scoparium* sub-community (55%)
SD8 *Festuca rubra – Galium verum* grassland (55%)
MG5 *Cynosurus cristatus – Centaurea* nigra grassland (55%)

Corine: C34.3216 Short Mesobromion calcareous grassland



Distribution

This rather rare sward type has only been recorded so far from Roscommon and Offaly where it has a scattered distribution.

Damp sward of *Molinia caerulea, Festuca rubra, Succisa pratensis, Filipendula ulmaria* and *Rhinanthus minor* with *Trifolium repens* and *Lotus corniculatus*, Cloonalough, Roscommon.

Sward of *Succisa pratensis, Briza media, Carex flacca* and *Centaurea nigra*, Portruny Bay, Roscommon.

1. *Plantago lanceolata – Festuca rubra* grassland group

b. *Dactylis glomerata – Trifolium pratense* vegetation type

Description

This sward type consists of relatively mesotrophic, dry pastures and meadows of the lowlands on well-drained mineral soils. The main grass species are *Festuca rubra, Dactylis glomerata, Agrostis stolonifera, Holcus lanatus* and *Anthoxanthum odoratum*. *Lolium perenne* is frequent but not abundant. *Plantago lanceolata* is a constant and usually abundant species, as to a lesser degree is *Trifolium pratense*. Other frequent herbs include *Ranunculus acris, Centaurea nigra, Lotus corniculatus*, *Rumex acetosa, Achillea millefolium* and *Cerastium fontanum*.

Example sites

Middle Calf Island, Cork (Site 594); Mallavogue, Cork (Site 471); Moystown Demesne and Island, Offaly (Site 109); Clonmacnoise, Offaly (Site 107).

Affinities

Fossitt: GS2 52%; GS1 44%; GA1 4%

Annex I: 6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (16%)

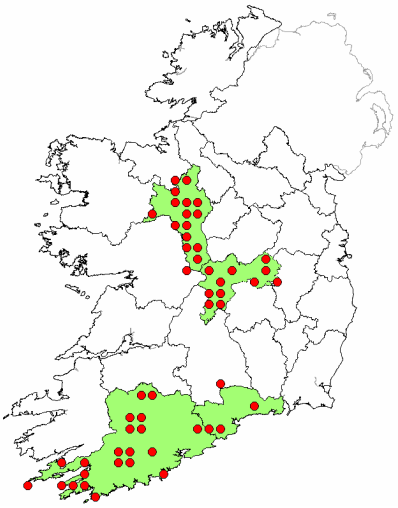
CEP: Centaureo – Cynosuretum typicum subassociation

Tablefit:

NVC:	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(63%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(62%)
	MG3b *Anthoxanthum odoratum – Geranium sylvaticum* grassland *Briza media* sub-community	(60%)
Corine:	C38.112 Centaureo – Cynosuretum	

MAVIS:

NVC:	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(75%)
	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(75%)
	MG5b *Cynosurus cristatus – Centaurea nigra* grassland *Galium verum* sub-community	(72%)
Corine:	C38.112 Centaureo – Cynosuretum	



Distribution

This sward type was recorded frequently across Roscommon and Offaly, but occurs patchily in Cork and Waterford.

Herb-rich sward dominated by *Dactylis glomerata* and *Lotus pedunculatus* with *Vicia cracca, Festuca rubra* and *Centaurea nigra*, Drisheen, Cork.

Sward dominated by *Festuca rubra* and *Lotus corniculatus*, with *Dactylis glomerata, Rhinanthus minor, Plantago lanceolata* and *Trifolium pratense,* Garrylucas Marsh, Cork.

1. *Plantago lanceolata – Festuca rubra* grassland group

c. *Cynosurus cristatus – Prunella vulgaris* vegetation type

Description

This vegetation type chiefly comprises mesotrophic, species-rich dry pastures of the lowlands. Some samples may display signs of agricultural improvement. The chief sward component is *Cynosurus cristatus* which is more abundant here than in other vegetation types in this group. Other frequent grasses are *Holcus lanatus, Festuca rubra, Briza media* and *Dactylis glomerata. Lolium perenne* is also frequent but typically not abundant; swards with a high *Lolium* content should be referred to more improved swards of type 1f. The main herb species include *Plantago lanceolata, Centaurea nigra, Lotus corniculatus, Trifolium pratense, T. repens, Cerastium fontanum, Rumex acetosa, Achillea millefolium* and *Ranunculus repens. Prunella vulgaris, Hypochaeris radicata* and *Bellis perennis* are also frequent here and form reasonable indicators for this type. The forb component of the sward is typically significant whilst sward height is low.

Example sites

Cloonfineen, Roscommon (Site 224); Lough Nanag Esker, Offaly (Site 16); Ballyroon Mountain, Cork (Site 470); Greenan, Waterford (Site 346).

Affinities

Fossitt: GS1 70%; GA1 10%; GS2 8%; GS3 8% GS4 5%

***Annex I*:** 6210 / 6211 Semi-natural dry grasslands and scrubland facies on calcareous substrates (33%)

CEP: Centaureo – Cynosuretum typicum subassociation

Tablefit:

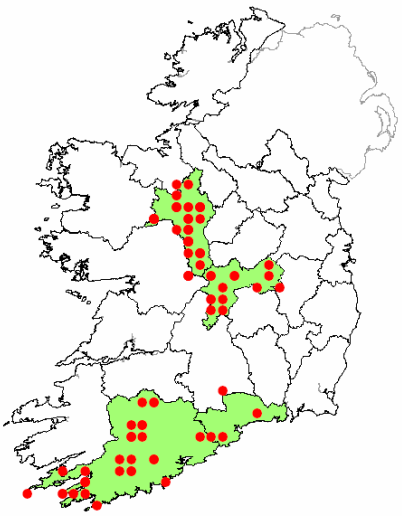
NVC:	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(58%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(58%)
	MG5b *Cynosurus cristatus – Centaurea nigra* grassland *Galium verum* sub-community	(57%)

Corine: C38.112 Centaureo – Cynosuretum

MAVIS:

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

Corine: C38.112 Centaureo – Cynosuretum



Distribution

This sward type occurs frequently throughout the midland counties but has a patchy distribution in Cork and Waterford.

Dry sward of *Cynosurus cristatus, Prunella vulgaris, Holcus lanatus* and *Plantago lanceolata*, Kildermody, Waterford.

A lightly grazed sward of *Cynosurus cristatus, Prunella vulgaris, Hypochaeris radicata* and *Trifolium repens* with *Plantago lanceolata*, *Lotus pedunculatus* and *Agrostis* spp., Imogane Bridge, Cork.

1. *Plantago lanceolata – Festuca rubra* grassland group

d. *Anthoxanthum odoratum – Agrostis capillaris* vegetation type

Description

This sward type chiefly comprises *Anthoxanthum odoratum*-dominated swards on rather base-poor soils at medium altitudes and hence differs edaphically from the other vegetation types in this group. *Agrostis capillaris* is frequent and fairly abundant whilst *Holcus lanatus* is constantly present in low amounts. *Festuca rubra* also frequently occurs. Indicator species for this sward type include many of the group indicators for grassland group 2 and hence this type may be seen as transitional between grassland types 1 and 2. These indicators include *Rhytidiadelphus squarrosus, Luzula multiflora, Potentilla erecta* and *Nardus stricta*. Other frequent herbs include *Plantago lanceolata, Trifolium repens, Cerastium fontanum, Ranunculus repens* and *Rumex acetosa.*

Example sites

Ballincollig Regional Park, Cork (Site 500); Helvick Head, Waterford (Site 308); Rathdrum, Cork (Site 421); Slieve Bloom, Offaly (Site 41).

Affinities

Fossitt: GS3 33%; GS1 31%; GS4 17%; GS2 12%; GA1 7%

Annex I: 6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (14%)

CEP: Centaureo – Cynosuretum / Achilleo – Festucetum tenuifoliae associations

Tablefit:

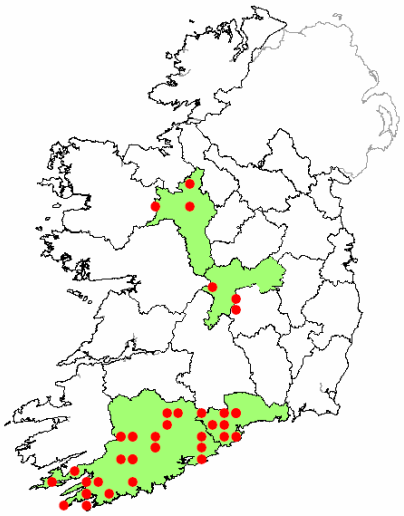
NVC: MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community (56%)
MG5 *Cynosurus cristatus – Centaurea nigra* grassland (56%)
MG5c *Cynosurus cristatus – Centaurea nigra* grassland *Danthonia decumbens* sub-community (55%)

Corine: C38.112 Centaureo – Cynosuretum

MAVIS:

NVC: U4b *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland *Holcus lanatus – Trifolium repens* sub-community (70%)
MG6 *Lolium perenne – Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community (62%)
U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland (60%)

Corine: C35.12 *Festuca – Agrostis* grassland



Distribution

This sward type is rather rare in the midland counties, scattered across much of Cork and frequent in western Waterford.

Dry grassland sward dominated by *Anthoxanthum odoratum* and *Agrostis capillaris* with ground layer dominated by *Rhytidiadelphus squarrosus*, Coomnagire, Cork.

Dry acidic grassland sward dominated by *Anthoxanthum odoratum,* with *Agrostis stolonifera, Potentilla erecta, Holcus lanatus* and *Dactylorhiza maculata*, Ballyourane, Cork.

1. *Plantago lanceolata – Festuca rubra* grassland group

e. *Armeria maritima – Plantago coronopus* vegetation type

Description

This vegetation type primarily consists of maritime cliff-top grasslands subject to considerable exposure and sea-spray, but also includes a small number of sward samples from inland sites. The typical sward is relatively species-poor and dominated by *Festuca rubra*. Whilst *Agrostis capillaris, A. stolonifera, Plantago lanceolata, Holcus lanatus, Lotus corniculatus, Hypochaeris radicata* and *Trifolium repens* are all frequent species, it is the occurrence of the suite of coastal species, *Armeria maritima, Plantago coronopus* and *P. maritima*, which best differentiate this vegetation type. Back from the cliff-tops this sward type tends to merge into dry heath communities, hence heath species such as *Calluna vulgaris* and *Erica cinerea* may occasionally occur at low frequencies. The sward is typically very low, with occasional dense clumps of *Armeria maritima*. Included in this vegetation type are grass-poor communities on metalliferous spoil with specialist communities including *Cladonia rangiformis*, *Cephaloziella* spp., *Scapania compacta* and *Silene uniflora.* This vegetation type shows little signs of agricultural improvement.

Example sites

Allihies Mountain Mine, Cork (Site 582); Sherkin Island, Cork (Site 401); Ardmore Head, Waterford (Site 320).

Affinities

Fossitt: GS3 43%; GS1 36%; GS2 15%; GS4 4%; GM1 2%

***Annex I*:** 6130 Calaminarian grasslands of the Violetalia calaminariae (25%)

CEP: Centaureo-Cynosuretum / Festuco – Armerietum rupestris associations

Tablefit:

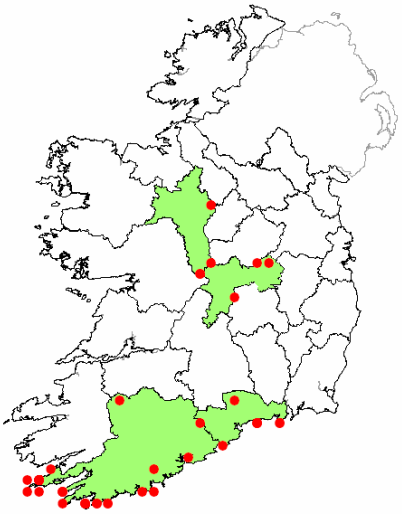
NVC:	MG5c *Cynosurus cristatus – Centaurea nigra* grassland *Danthonia decumbens* sub-community	(50%)
	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(50%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(50%)

Corine: C38.112 Centaureo-Cynosuretum

MAVIS:

NVC:	MC9 *Festuca rubra – Holcus lanatus* maritime grassland	(64%)
	MC9a *Festuca rubra – Holcus lanatus* maritime grassland *Plantago maritima* sub-community	(61%)
	MC9c *Festuca rubra – Holcus lanatus* maritime grassland *Achillea millefolium* sub-community	(60%)

Corine: C18.2 Vegetated sea cliffs (cf. C38.2 Coarse grass, hay meadow)



Distribution

This sward type occurs along much of the southern coastline, being particularly frequent in west Cork. A few scattered sites also occur inland.

Short sward of dry coastal grassland dominated by *Armeria maritima, Plantago coronopus* and *Festuca rubra*, East Calf Island, Cork.

Dry coastal grassland with *Festuca rubra, Trifolium repens, Plantago maritima* and *Hypochaeris radicata*, Dursey Island, Cork.

1. *Plantago lanceolata – Festuca rubra* grassland group

f. *Lolium perenne – Trifolium repens* vegetation type

Description

This vegetation type includes rather species-poor semi-improved swards on well-drained mineral soils typically dominated by *Lolium perenne* and *Trifolium repens.* Other frequent grass species include *Holcus lanatus, Agrostis stolonifera, Cynosurus cristatus* and *Anthoxanthum odoratum*. *Festuca rubra* is far scarcer here than in any other vegetation type within this group. The main herbaceous elements comprise *Plantago lanceolata*, *Taraxacum* agg., the ubiquitous *Cerastium fontanum, Ranunculus repens* and *Rumex acetosa*. Sward height is generally low due to fairly intensive farming practices.

Example sites

Stonehouse, Waterford (Site 350); Rossnashunsoge, Cork (Site 554); Kilcullen South, Cork (Site 510); Kilcormac Esker, Offaly (Site 45).

Affinities

Fossitt: GA1 78%; GS1 11%; GS3 7%; GS2 4%

Annex I: No major correspondence

CEP: Centaureo – Cynosuretum / Lolio – Cynosuretum associations

Tablefit:

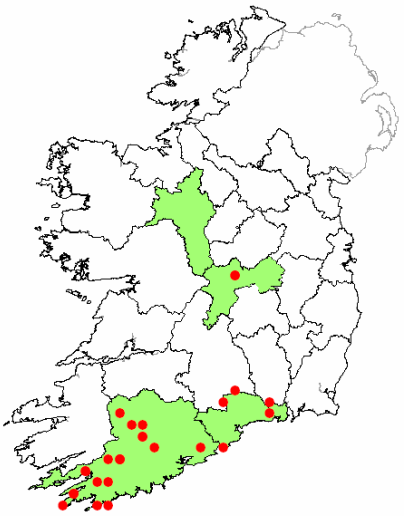
NVC:	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(59%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(58%)
	MG5b *Cynosurus cristatus – Centaurea nigra* grassland *Galium verum* sub-community	(54%)

Corine: C38.112 Centaureo - Cynosuretum

MAVIS:

NVC:	MG6a *Lolium perenne – Cynosurus cristatus* grassland typical sub-community	(70%)
	MG6b *Lolium perenne – Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community	(69%)
	MG6 *Lolium perenne – Cynosurus cristatus* grassland	(67%)

Corine: C38.111 Lolio - Cynosuretum



Distribution

This sward type was recorded from scattered locations across Cork and Waterford with one recorded occurrence in the midlands.

Short, grazed, species-poor sward dominated by *Trifolium repens* and *Lolium perenne*, Glenary, Waterford.

Sward of *Holcus lanatus, Agrostis stolonifera, Lolium perenne* and *Trifolium repens* with *Ranunculus repens and Cerastium fontanum,* Turnaspidogy, Cork.

1. *Plantago lanceolata – Festuca rubra* grassland group

g. *Festuca rubra – Arrhenatherum elatius* vegetation type

Description

This vegetation type is related to type 1e in that it primarily consists of coastal grasslands, but the swards included here are subject to much less exposure and sea-spray. Also defined here are related swards from inland sites which include abandoned grassland and road verges. *Festuca rubra* tends to dominate these communities of well-drained mineral soils, typically forming a dense, rather rank sward, and as a result they are usually species-poor. Apart from *F. rubra*, this vegetation type is poorly distinguished by indicator species, with *Arrhenatherum elatius* being of marginal aid. Other frequent grass species are *Agrostis stolonifera* and *Holcus lanatus.* The main herb species are *Lotus corniculatus, Trifolium repens* and *Plantago lanceolata.* In maritime situations, *Plantago maritima, P. coronopus* and *Armeria maritima* may occur but are far less abundant than in type 1e.

Example sites

Cape Clear, Cork (Site 400); Ballymacredmond, Cork (Site 456); Hare Island, Cork (Site 482); Leitra Callow, Offaly (Site 108).

Affinities

Fossitt: GS1 38%; GS2 36%; GS3 12%; GS4 12%; GA1 2%

***Annex I*:** No major correspondence

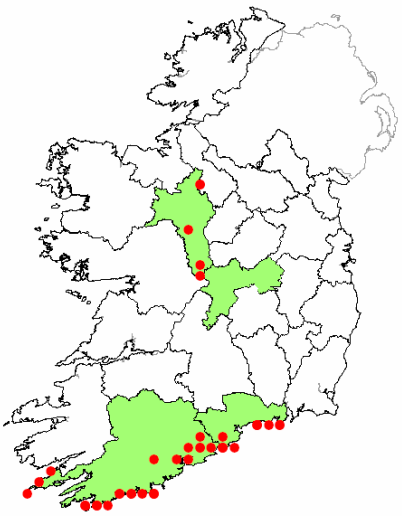
CEP: Centaureo-Cynosuretum / Festuco – Armerietum rupestris associations

Tablefit:

NVC:	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(60%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(60%)
	MG5b *Cynosurus cristatus – Centaurea nigra* grassland *Galium verum* sub-community	(57%)
Corine:	C38.112 Centaureo – Cynosuretum	

MAVIS:

NVC:	MC9 *Festuca rubra – Holcus lanatus* maritime grassland	(68%)
	MC9a *Festuca rubra – Holcus lanatus* maritime grassland *Plantago maritima* sub-community	(66%)
	MC9d *Festuca rubra – Holcus lanatus* maritime grassland *Primula vulgaris* sub-community	(63%)
Corine:	C18.2 Vegetated sea cliffs (cf. C38.2 Coarse grass, hay meadow)	



Distribution

This sward type occurs along most of the southern coastline. It is largely absent from inland surveyed areas except for a few records from Roscommon.

Festuca rubra dominated sward with *Plantago lanceolata* and *Arrhenatherum elatius,* Ardmore Head, Waterford.

Rank sward of *Festuca rubra* and *Arrhenatherum elatius,* with *Plantago lanceolata, Agrostis stolonifera, Lotus pedunculatus* and *Vicia cracca,* Crosshavenhill, Cork.

1. *Plantago lanceolata - Festuca rubra* grassland group

	a	b	c	d	e	f	g	Group
Constants								
Plantago lanceolata	IV 3.1	V 18.3 ●●	V 8.9	III 2.9	III 5.5	III 2.4	IV 2.9	IV 7.3
Holcus lanatus	II 1.6	IV 9.9	IV 7.4	V 7.6	III 3.2	V 14.0 ●●	III 2.5	IV 6.7
Festuca rubra	IV 12.0	IV 15.2	IV 8.3	III 5.4	V 16.2	I 2.4	V 57.9 ●●●	IV 16.3
a) *Succisa - Carex* vegetation type indicators								
Succisa pratensis	IV 10.9 ●●●●	I 0.1	I 0.4	I 0.5	I 0.5		I 0.3	I 1.1
Carex flacca	V 13.9 ●●●	I 0.2	II 3.2	I 0.2	II 1.3		II 0.9	II 2.3
Briza media	V 9.2 ●●●	I 0.9	III 3.3		I <0.05		I 0.1	II 1.8
Carex panicea	III 9.2 ●●●	I <0.05	I 0.4	I 0.2	I 0.2		I 0.1	I 0.9
Linum catharticum	III 1.1 ●●		II 0.5		I <0.05			I 0.2
Calliergonella cuspidata	III 3.0 ●●	II 0.3	III 1.1	I 0.3	I 0.4	II 0.1	I 0.1	II 0.7
Hypericum pulchrum	II 0.4 ●●	I <0.05	I <0.05		I <0.05			I 0.0
Pilosella officinarum	II 1.3 ●●	I 0.2	I 0.5		I <0.05			I 0.3
Thymus polytrichus	II 3.6 ●●		I 0.2		I 0.3		I 0.1	I 0.4
Rhytidiadelphus triquetrus	II 1.7 ●●	I 0.1	I 0.1		I <0.05			I 0.2
Cirsium dissectum	II 4.4 ●●	I 0.3	I 0.2					I 0.4
Carex pulicaris	II 1.1 ●●		I <0.05	I 0.1			I <0.05	I 0.1
Carlina vulgaris	I 0.5 ●		I <0.05					I 0.0
Molinia caerulea	II 6.8 ●	I 0.2	I 0.1	I 1.3			I 0.4	I 0.8
Polygala vulgaris	II 0.5 ●		I 0.1		I <0.05		I <0.05	I 0.1
Centaurea nigra	IV 4.0 ●	III 3.5	III 2.7	I 0.5	I 1.6	I 0.2	I 1.2	II 2.1
Lotus corniculatus	IV 5.7 ●	III 2.9	III 3.3	I 0.6	III 5.6	I 0.7	IV 4.5	III 3.3
Euphrasia officinalis agg.	III 1.2 ●	I 0.3	II 1.3	I 0.5	I 0.4		I <0.05	I 0.6
Galium verum	III 1.7 ●	II 0.9	II 1.2		I 0.6	I <0.05	I 0.7	II 0.8
Primula veris	I 1.0 ●	I 0.2	I 0.1					I 0.1
Leucanthemum vulgare	II 1.7 ●	I 0.8	II 1.3		I 0.1		I 0.1	I 0.7
Filipendula ulmaria	II 2.6 ●	I 0.8	I 0.4	I 0.4	I 0.5		I 0.1	I 0.6
Ctenidium molluscum	I 0.6 ●		I 0.1					I 0.1
Mentha aquatica	I 0.1 ●				I <0.05			I 0.0
Danthonia decumbens	II 1.3 ●		I 0.3	I 0.9	I 0.5		I 0.3	I 0.4
Thalictrum flavum	I 0.3 ●							I 0.0
Schoenus nigricans	I 2.1 ●							I 0.2
Crataegus monogyna	I 0.2 ●		I <0.05					I 0.0
Festuca arundinacea	I 0.6 ●		I <0.05					I 0.0
Hylocomium splendens	I 2.6 ●	I 0.1	I 0.3	I 1.2	I 0.5		I <0.05	I 0.5

1. *Plantago lanceolata - Festuca rubra* grassland group

	a	b	c	d	e	f	g	Group
b) *Dactylis - Trifolium* vegetation type indicators								
Dactylis glomerata	II 1.2	IV 14.2 ●●●	III 3.7	I 0.3	II 0.4	II 2.7	II 2.1	III 3.9
Trifolium pratense	III 3.7	IV 7.7 ●●	IV 6.8	I 0.8	II 1.9	II 0.7	II 0.7	III 3.9
Agrostis stolonifera	I 1.4	IV 10.4 ●	II 2.9	II 3.4	III 6.2	IV 8.7	IV 6.7	III 5.5
Ranunculus acris	II 0.5	III 1.9 ●	II 0.9	I 0.6	I <0.05	I <0.05	I 0.2	II 0.7
Rhinanthus minor	I 0.9	II 1.7 ●	I 0.6		I 0.1	I <0.05	I 0.1	I 0.5
Phleum pratense	I 0.1	II 1.9 ●	I 1.4		I 0.1	I 0.1		I 0.7
Vicia cracca	I 0.1	II 0.8 ●	I <0.05		I 0.1		I 0.9	I 0.3
Lathyrus pratensis	I 0.1	II 0.7 ●	I 0.1	I 0.1	I 0.1		I 0.9	I 0.3
c) *Cynosurus - Prunella* vegetation type indicators								
Cynosurus cristatus	II 2.6	II 1.7	V 15.5 ●●●	II 0.7	I 0.4	III 4.7	I 0.2	III 5.5
Prunella vulgaris	III 1.4	I 0.2	IV 2.8 ●●	I 0.6	II 0.8	I 0.4	I <0.05	II 1.2
Hypochaeris radicata	II 1.0	II 1.2	IV 3.8 ●●	II 1.2	III 2.4	II 0.7	II 0.3	III 1.9
Bellis perennis	II 0.4	I 0.2	II 1.5 ●●	I 0.1	I 0.1	II 0.6	I <0.05	I 0.6
Taraxacum agg.	I <0.05	II 0.8	III 1.3 ●	II 0.5	I 0.1	III 1.3	I 0.2	II 0.7
Trisetum flavescens		I 0.8	I 2.2 ●		I 0.2			I 0.8
Cirsium palustre	II 0.2		II 1.0 ●	II 1.2	I 0.1	I 0.8	I <0.05	I 0.5
Leontodon hispidus	II 1.2	I 0.1	I 2.0 ●	I 0.0	I 0.2		I 0.1	I 0.7
d) *Anthoxanthum - Agrostis* vegetation type indicators								
Anthoxanthum odoratum	IV 6.0	IV 5.5	IV 7.2	V 37.6 ●●●	II 1.8	III 4.3	II 2.0	III 9.1
Agrostis capillaris	II 0.9	II 2.0	III 7.0	IV 13.2 ●●	III 6.8	II 2.7	I 0.9	III 5.4
Rhytidiadelphus squarrosus	II 1.8	II 0.4	III 1.8	III 6.3 ●●	II 3.5	II 1.9	I 0.1	II 2.2
Luzula multiflora		I 0.0	I 0.1	II 0.5 ●	I 0.1			I 0.1
Nardus stricta			I <0.05	I 0.7 ●				I 0.1
Potentilla erecta	III 1.2	I 0.4	II 0.4	II 2.7 ●	II 1.9	I 0.0	II 1.6	II 1.1
e) *Armeria - Plantago* vegetation type indicators								
Armeria maritima					III 5.3 ●●●		II 0.8	I 0.9
Plantago coronopus					III 5.0 ●●●		I 0.8	I 0.8
Plantago maritima					II 6.3 ●●		II 2.0	I 1.2
Sedum anglicum					II 0.4 ●●			I 0.1
Hypnum cupressiforme			I <0.05	I <0.05	I 0.2 ●			I 0.0

1. *Plantago lanceolata - Festuca rubra* grassland group

	a	b	c	d	e	f	g	Group
Cladonia rangiformis					I 1.5 ●			I 0.2
Viola riviniana	I 0.2		I 0.1	I 0.1	II 0.7 ●		I 0.1	I 0.2
Calluna vulgaris			I <0.05	I <0.05	II 0.8 ●		I 0.3	I 0.2
Erica cinerea				I <0.05	I 1.0 ●		I 0.1	I 0.2
Silene uniflora					I 0.3 ●			I 0.0
Jasione montana			I <0.05		I 0.3 ●		I <0.05	I 0.0
f) *Lolium - Trifolium* vegetation type indicators								
Lolium perenne	I 0.1	III 2.4	IV 6.2	II 1.2		V 38.6 ●●●●	I 0.3	III 5.5
Trifolium repens	I 0.3	II 1.5	IV 8.4	III 7.2	III 3.3	V 16.3 ●●	III 2.1	III 5.7
Cerastium fontanum	I 0.2	IV 0.8	IV 1.2	III 0.5	III 0.4	V 1.4 ●●	I 0.2	III 0.8
Poa annua	I 0.1	I 0.2	I 0.1		I 0.1	II 1.5 ●●	I <0.05	I 0.2
Rumex obtusifolius						I 0.2 ●		I 0.0
Ranunculus repens	II 0.8	II 1.5	III 1.7	III 2.3	I 0.3	IV 2.0 ●	I <0.05	II 1.3
Stellaria uliginosa						I 0.5 ●		I 0.0
Veronica serpyllifolia			I <0.05	I <0.05		I 0.1 ●		I 0.0
Isolepis setacea						I 0.1 ●		I 0.0
Brachythecium rutabulum	I 0.1	I <0.05	I 0.3	I 0.4	I 0.1	II 0.7 ●	I 0.2	I 0.3
g) *Festuca - Arrhenatherum* vegetation type indicators								
Arrhenatherum elatius	I 0.6	II 1.8	I 0.7	I <0.05	I 0.1		II 5.5 ●	I 1.2
Other grasses, sedges and rushes								
Luzula campestris	I 0.2	II 0.4	II 0.3	I 0.7	I 0.2	I 0.2	I 0.1	I 0.3
Poa trivialis	I 0.4	I 1.2	I 0.6	I 0.3		I 0.4	I 1.6	I 0.7
Carex nigra	I 0.5	I <0.05	I 0.5	I 0.5	I 0.5		I 0.6	I 0.4
Juncus acutiflorus		I <0.05	I 0.6	I 1.0	I 0.3	I 0.1		I 0.4
Festuca ovina			I 1.2	I 1.8	I 1.2	I 0.2		I 0.8
Bromus hordeaceus		I 0.3	I <0.05	I 2.3		I 0.4	I 0.1	I 0.4
Juncus effusus			I 0.4	I 1.0	I 0.3	I 0.7		I 0.3
Poa pratensis		I 0.8	I 0.1	I 0.1	I 0.1	I 0.2	I <0.05	I 0.2
Carex viridula	I 0.1		I <0.05	I 0.1	I 0.2		I <0.05	I 0.1
Helictotrichon pubescens	I 0.8	I 2.1	I 0.2		I 0.2		I <0.05	I 0.5
Koeleria macrantha	I 0.5	I <0.05	I 0.2		I 0.1		I 0.1	I 0.1
Carex caryophyllea	I 0.2	I <0.05	I 0.1	I 0.1	I <0.05			I 0.0

1. *Plantago lanceolata - Festuca rubra* grassland group

	a	b	c	d	e	f	g	Group
Festuca pratensis	I 0.1	I 0.9	I 0.3		I 0.1			I 0.2
Juncus bufonius			I <0.05		I <0.05	I <0.05		I 0.0
Agrostis canina	I <0.05		I 0.1	I 1.0				I 0.2
Alopecurus pratensis		I 0.4	I 0.1				I 0.8	I 0.2
Alopecurus geniculatus			I 0.1	I <0.05		I <0.05		I 0.0
Elytrigia repens		I 0.3					I 0.6	I 0.1
Juncus squarrosus				I 0.5	I 0.3			I 0.1
Carex disticha	I 0.7							I 0.1
Other forbs								
Rumex acetosa	I 0.1	III 1.1	III 1.0	III 1.4	II 0.5	III 1.5	II 1.8	II 1.1
Achillea millefolium	III 0.8	III 1.1	III 1.9	I 0.5	II 1.0	II 1.7	I 0.6	II 1.2
Crepis capillaris		II 1.3	II 1.3	I 0.3	I 0.3	I 0.3	I 0.1	I 0.7
Senecio jacobaea	I 0.1	I 0.3	II 0.6	I 0.5	I 0.1	I 0.4	I <0.05	I 0.3
Cirsium arvense	I 0.2	I 0.7	I 0.5	I 0.4		I 0.4	I 0.2	I 0.4
Daucus carota	I 0.2	I 0.3	I 1.0		I 0.1	I <0.05	I 0.5	I 0.4
Lotus pendunculatus		I 2.3	I 0.4	II 1.6	I <0.05	I 0.2	I 0.7	I 0.8
Conopodium majus	II 0.3	I 0.5	I 0.4	I 0.1	I 0.4	I <0.05	I <0.05	I 0.3
Veronica chamaedrys	I <0.05	I 1.3	I 0.1	I 0.8	I <0.05	I 0.3	I 0.1	I 0.4
Ranunculus bulbosus	I 0.1	I 1.5	I 0.9	I 0.1		I 0.1	I 0.1	I 0.5
Stellaria graminea		I 0.1	I <0.05	I 0.2	I <0.05	I <0.05	I 0.1	I 0.1
Leontodon autumnalis	I 0.2	I <0.05	I 0.4	I <0.05	I 0.2	I 0.2	I 0.2	I 0.2
Potentilla anserina	I 0.1	I 0.4	I 0.1	I 1.2	I 0.4	I 0.4	I 0.1	I 0.4
Anthyllis vulneraria	I 0.5		I <0.05		I 0.9		I 0.7	I 0.3
Galium saxatile		I <0.05	I 0.1	I 1.0	I 1.8			I 0.4
Sagina procumbens			I 0.1	I <0.05	I 0.2	II 0.3		I 0.1
Medicago lupulina	I 0.1	I 0.7	I 0.6			I 0.2	I <0.05	I 0.3
Rumex acetosella			I <0.05	I 0.5	I 0.3	I 0.1		I 0.1
Trifolium dubium		I 0.1	I 0.5		I 0.1		I <0.05	I 0.2
Potentilla reptans		I 0.1	I <0.05		I 0.1	I 0.4	I 0.6	I 0.2
Potentilla anglica	I 0.2		I <0.05	I 1.2	I <0.05	I <0.05	I <0.05	I 0.2
Cardamine pratensis	I 0.1	I 0.1	I <0.05	I 0.1	I <0.05	I 0.1		I 0.0
Cirsium vulgare	I <0.05	I <0.05	I 0.1	I <0.05	I <0.05	I 0.2		I 0.1
Odontites vernus		I 0.2	I 0.1		I <0.05			I 0.1
Anagallis tenella	I 0.4		I 0.1	I <0.05	I <0.05		I <0.05	I 0.1
Veronica officinalis		I <0.05	I 0.1	I 0.1	I <0.05	I <0.05		I 0.1
Heracleum sphondylium		I 0.7	I 0.1				I 0.3	I 0.2

1. *Plantago lanceolata - Festuca rubra* grassland group

	a	b	c	d	e	f	g	Group
Pedicularis sylvatica		I <0.05	I <0.05	I 0.1	I 0.2			I 0.0
Galium palustre	I 0.1	I <0.05	I <0.05	I <0.05	I <0.05		I <0.05	I 0.0
Centaurium erythraea	I 0.1	I <0.05	I <0.05		I <0.05			I 0.0
Plantago major			I <0.05			I 0.1	I <0.05	I 0.0
Knautia arvensis	I 0.2	I 0.1	I 0.2				I 0.2	I 0.1
Rumex crispus		I 0.1	I <0.05		I <0.05		I <0.05	I 0.0
Veronica montana		I <0.05	I <0.05					I 0.0
Vicia sativa		I 0.1		I <0.05		I 0.2	I 0.5	I 0.1
Chamaemelum nobile			I 0.5		I <0.05	I 1.5		I 0.3
Senecio aquaticus	I 0.1		I <0.05	I <0.05		I 0.1		I 0.0
Angelica sylvestris	I 0.4	I 0.1						I 0.0
Dactylorhiza fuchsii	I 0.1		I <0.05		I <0.05			I 0.0
Hydrocotyle vulgaris	I 1.0					I <0.05	I 0.2	I 0.1
Urtica dioica		I 0.1					I 0.1	I 0.1
Leontodon saxatilis					I 0.1		I <0.05	I 0.0
Cochlearia officinalis agg.					I 0.1		I 0.1	I 0.0
Geranium dissectum		I <0.05	I <0.05			I 0.2		I 0.0
Vicia sepium							I 0.3	I 0.0
Polygala serpyllifolia				I 0.1				I 0.0
Epilobium obscurum						I <0.05		I 0.0
Other vascular plants								
Pteridium aquilinum	I 0.4	I 0.2	I 0.3	I <0.05	I <0.05	I <0.05		I 0.1
Rubus fruticosus agg.	I 0.2	I <0.05	I <0.05	I 0.1	I <0.05			I 0.0
Ulex europaeus			I <0.05	I <0.05	I 0.1	I 0.1	I <0.05	I 0.0
Ulex gallii			I <0.05	I 0.6	I <0.05			I 0.1
Fraxinus excelsior	I <0.05			I <0.05				I 0.0
Salix repens	I 0.2				I <0.05			I 0.0
Other bryophytes								
Pseudoscleropodium purum	II 1.0	I 0.1	II 0.7	I 0.5	II 1.0	I 0.1	I <0.05	II 0.5
Kindbergia praelonga	I <0.05	I 0.1	I <0.05	II 0.2	II 0.2	II 0.2	I 0.3	I 0.1
Thuidium tamariscinum	I 0.1		I 0.1	I 0.2	I <0.05		I <0.05	I 0.1
Lophocolea bidentata	I 0.1	I <0.05	I <0.05	I <0.05	I <0.05	I <0.05	I <0.05	I 0.0
Plagiomnium undulatum	I <0.05		I 0.1		I <0.05	I <0.05	I <0.05	I 0.0
Hypnum lacunosum	I 0.2		I 0.1		I 0.5			I 0.1

1. *Plantago lanceolata - Festuca rubra* grassland group

	a	b	c	d	e	f	g	Group
Climacium dendroides	I 0.1	I <0.05	I 0.3					I 0.1
Frullania tamarisci			I <0.05		I 0.1		I <0.05	I 0.0
Homalothecium lutescens		I <0.05	I 0.1					I 0.0
Rhynchostegium confertum					I <0.05	I <0.05	I <0.05	I 0.0
Number of relevés	25	50	93	41	47	27	42	326
Species richness	24	18	25	16	18	16	13	19
Altitude (m)	60	45	80	115	30	90	30	60
Slope (°)	3	1	9	8	9	6	5	7
Forb height (cm)	15	25	10	10	5	10	20	10
Grass/sedge/rush height (cm)	20	40	15	28	5	7	25	20
Forb proportion (%)	40	30	40	25	50	30	25	35
Soil pH	7.6	6.6	6.2	5.0	5.7	5.4	6.0	5.9
n =	16	41	76	40	36	27	39	275
% Loss on ignition	9	8.9	9.8	17.0	18.4	15.0	16.0	13.0
n =	16	40	77	38	36	27	38	272
Total P (Phosporous) mg/g	no data	1.0	0.9	0.8	0.6	1.1	0.6	0.8
n =	na	18	33	32	30	25	35	173
Soil types								
Well-drained mineral soils	76.2	85.7	74.7	65.0	73.5	70.4	75.6	74.7
Gleys	9.5	11.9	21.7	20.0	14.7	18.5	19.5	17.7
Basin peats	14.3	2.4	0.0	2.5	2.9	0.0	0.0	2.1
Podzols	0.0	0.0	2.4	7.5	8.8	11.1	2.4	4.2
Upland peats	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.7
Other	0.0	0.0	1.2	0.0	0.0	0.0	2.4	0.7
n =	21	42	83	40	34	27	41	288

2. *Agrostis capillaris – Galium saxatile* grassland group

a. *Holcus lanatus – Anthoxanthum odoratum* vegetation type

Description

This sward type is mainly comprised of vegetation from a variety of acidic soil types in upland areas. It shares elements of acidic heath-grasslands at higher altitudes (q.v. type 2b) and elements of well-drained lowland grasslands (q.v. group 1). The main sward components are *Agrostis capillaris* and *Anthoxanthum odoratum* with abundant *Potentilla erecta* and *Rhytidiadelphus squarrosus*. It is differentiated from type 2b by the presence of a suite of species which include improvement indicators (*Holcus lanatus, Trifolium repens, Lolium perenne* and *Plantago lanceolata*) and by the relatively low occurrence of heath-grassland species. Other frequent species include *Hylocomium splendens*, *Galium saxatile* and *Luzula multiflora*. Sward height and the cover of forbs are typically low.

Example sites

Rougham, Cork (Site 488); Glanmore, Cork (Site 402); Knockanaffrin, Waterford (Site 317); Glengarriff, Cork (Site 496).

Affinities

Fossitt: GS3 65%; GA1 15%; GS4 9%; GS1 5%; GS2 5%

Annex I: 6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (52%)

CEP: Achilleo – Festucetum tenuifoliae association

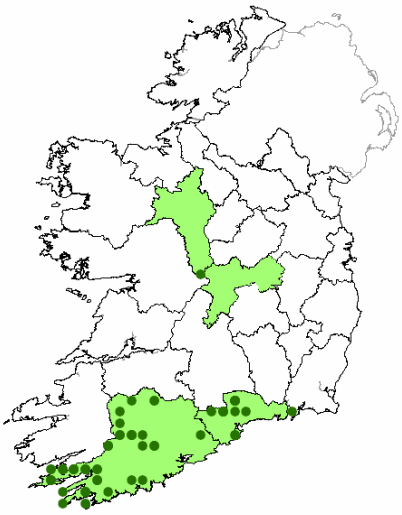
Tablefit:

NVC: U4d *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland *Vaccinium myrtillus –Deschampsia flexuosa* sub-community (57%)
CG11b *Festuca ovina – Agrostis capillaris –Alchemilla alpina* grass-heath *Carex pulicaris – Carex panicea* sub-community (54%)
CG10a *Festuca ovina – Agrostis capillaris – Thymus praecox* grassland *Trifolium repens – Luzula campestris* sub-community (50%)
Corine: C35.12 *Agrostis – Festuca* grassland

MAVIS:

NVC: U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland (67%)
U4d *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland *Vaccinium myrtillus – Deschampsia flexuosa* sub-community (66%)
U4a *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland typical sub-community (66%)

Corine: C35.12 *Agrostis – Festuca* grassland



Distribution

This sward type was almost exclusively recorded from the southern counties, being most frequent in west Cork and northwest Waterford.

Dry sward of *Agrostis capillaris, Anthoxanthum odoratum, Trifolium repens* and *Holcus lanatus,* with *Rumex acetosa, Conopodium majus* and *Ranunculus repens*, Kilclooney, Waterford.

Sward of *Agrostis capillaris, Trifolium repens, Anthoxanthum odoratum, Holcus lanatus* and *Plantago lanceolata,* with *Hypochaeris radicata, Rumex acetosa* and *T. pratense*, Derreendangan, Cork.

2. *Agrostis capillaris – Galium saxatile* grassland group

b. *Nardus stricta – Festuca ovina* vegetation type

Description

These are primarily swards of mountain slopes on acidic soils including upland peats and podzols. They are dominated by *Nardus stricta, Festuca ovina* and *Agrostis capillaris*. The herbs *Potentilla erecta* and *Galium saxatile* are typically very frequent, but are often the only broadleaf herbs and hence cover of these is very low. Other frequent species include *Juncus squarrosus, Luzula multiflora, Carex panicea, C. binervis* and *Danthonia decumbens*. *Anthoxanthum odoratum* is fairly frequent but like *A. capillaris* is far less abundant than in the vegetation type 2a. Bryophytes are an important component of this sward type; the chief species is *Rhytidiadelphus squarrosus* but *R. loreus* and *Hylocomium splendens* are also frequent. As this type of grassland often occurs in mosaic with areas of heath, ericaceous species including *Calluna vulgaris, Vaccinium myrtillus* and *Erica tetralix* frequently occur in low abundances. Grazing is typically by sheep and usually results in a tight low sward. Under lighter grazing regimes typical of commonage areas, a more rank sward prone to heath encroachment develops.

Example sites

Lyre Mountain, Waterford (Site 316); Glenpatrick, Waterford (Site 354); Derrynakilla, Cork (Site 589); Ballynacarriga, Cork (Site 461).

Affinities

Fossitt: GS3 100%

Annex I:6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (78%)

CEP: Nardo – Caricetum binervis association

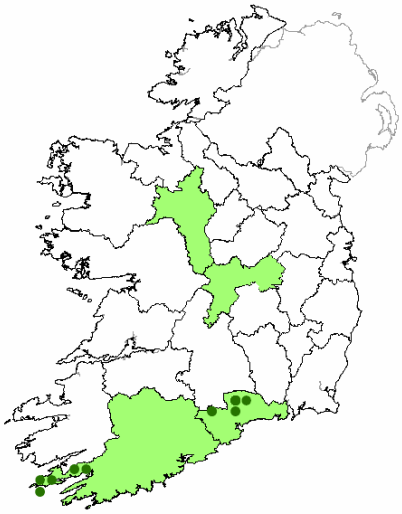
Tablefit:

NVC: U4d *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland
Vaccinium myrtillus – Deschampsia flexuosa sub-community (57%)
CG11b *Festuca ovina – Agrostis capillaris – Alchemilla alpina* grass-heath
Carex pulicaris – Carex panicea sub-community (54%)
U5 *Nardus stricta – Galium saxatile* grassland (53%)

Corine: C35.12 *Agrostis – Festuca* grassland

MAVIS

NVC: U5 *Nardus stricta – Galium saxatile* grassland (72%)
U5d *Nardus stricta – Galium saxatile* grassland
Calluna vulgaris – Danthonia decumbens sub-community (70%)
U5c *Nardus stricta – Galium saxatile* grassland
Carex panicea – Viola riviniana sub-community (67%)
Corine: C35.11 Nardo – Galion acid grassland



Distribution

This rather rare sward type is confined within the survey area to northern Waterford and far west Cork, being apparently absent from the midlands counties.

Acidic sward of *Festuca ovina, Molinia caerulea, Potentilla erecta, Agrostis capillaris, Nardus stricta* and *Juncus squarrosus*, Curraheen, Waterford.

Sward dominated by *Nardus stricta* and *Festuca ovina,* with *Galium saxatile, Juncus squarrosus and Carex panicea*, Knockanaffrin, Waterford.

2. *Agrostis capillaris - Galium saxatile* grassland group

	a		b		Group	
Constants						
Agrostis capillaris	V	39.1 ●●●●	V	16.7	V	33.2
Anthoxanthum odoratum	V	10.7 ●●●●	III	3.1	IV	8.7
Potentilla erecta	IV	6.0	V	8.3 ●●●	V	6.6
Rhytidiadelphus squarrosus	IV	9.3	V	7.6	V	8.9
a) *Holcus - Anthoxanthum* vegetation type indicators						
Holcus lanatus	IV	5.8 ●●●●	I	0.2	III	4.3
Trifolium repens	III	3.0 ●●●	I	<0.05	II	2.2
Rumex acetosa	II	0.9 ●●			II	0.7
Lolium perenne	II	2.2 ●●			I	1.6
Plantago lanceolata	II	1.5 ●●	I	<0.05	I	1.1
Ranunculus repens	I	0.4 ●			I	0.3
b) *Nardus - Festuca* vegetation type indicators						
Nardus stricta	II	3.0	V	22.4 ●●●●	III	8.1
Festuca ovina	II	2.6	IV	20.1 ●●●●	II	7.3
Juncus squarrosus	II	1.1	IV	5.1 ●●●	II	2.2
Rhytidiadelphus loreus	II	1.7	IV	4.3 ●●●	II	2.4
Carex panicea	II	1.1	III	2.9 ●●●	II	1.6
Carex binervis	II	0.9	III	2.6 ●●	II	1.4
Danthonia decumbens	II	2.0	III	3.3 ●●	II	2.4
Vaccinium myrtillus	I	0.1	II	0.8 ●●	I	0.3
Hypnum cupressiforme	I	0.1	II	3.0 ●●	I	0.8
Carex pilulifera	I	0.2	II	1.1 ●	I	0.5
Campylopus flexuosus	I	<0.05	I	0.6 ●	I	0.2
Erica tetralix	I	0.1	II	0.3 ●	I	0.2
Hypnum lacunosum			I	0.9 ●	I	0.2
Hypnum jutlandicum	I	0.1	I	0.6 ●	I	0.2
Anagallis tenella	I	<0.05	I	0.7 ●	I	0.2
Other grasses, sedges and rushes						
Luzula multiflora	III	1.0	III	0.7	III	0.9
Molinia caerulea	II	6.7	II	1.4	II	5.3
Festuca rubra	II	4.6	II	6.2	II	5.0
Agrostis canina	I	1.8	I	0.7	I	1.5
Carex viridula	I	0.2	II	0.5	I	0.3
Carex nigra	I	0.4	I	0.1	I	0.3
Juncus acutiflorus	I	1.6	I	0.5	I	1.3
Juncus effusus	I	0.8	I	<0.05	I	0.6
Carex echinata	I	0.5	I	0.2	I	0.4
Lotus corniculatus	I	0.3	I	0.2	I	0.3
Trichophorum cespitosum	I	0.4	II	1.4	I	0.7
Agrostis stolonifera	I	0.9	I	0.1	I	0.7
Cynosurus cristatus	I	0.4			I	0.3
Carex flacca	I	0.1	I	0.3	I	0.2
Deschampsia flexuosa	I	0.3	I	1.5	I	0.7
Carex pulicaris	I	0.2	I	<0.05	I	0.1
Dactylis glomerata	I	0.9			I	0.6
Juncus bulbosus	I	0.1			I	0.1
Other forbs						
Galium saxatile	III	3.4	IV	5.1	III	3.9
Cerastium fontanum	II	0.3	I	0.1	II	0.2
Polygala serpyllifolia	I	0.2	II	0.2	I	0.2

2. *Agrostis capillaris - Galium saxatile* grassland group

	a		b		Group
Cirsium palustre	II 0.6	I	0.2	I	0.5
Lotus pedunculatus	I 0.7			I	0.5
Hypochaeris radicata	I 0.4	I	<0.05	I	0.3
Achillea millefolium	I 0.3			I	0.2
Pedicularis sylvatica	I 0.1	I	0.1	I	0.1
Viola riviniana	I 0.1	I	0.1	I	0.1
Succisa pratensis	I 0.8			I	0.6
Trifolium pratense	I 0.2			I	0.2
Cardamine pratensis	I 0.1			I	<0.05
Centaurea nigra	I 0.3			I	0.2
Stellaria graminea	I 0.1			I	<0.05
Senecio jacobaea	I <0.05			I	<0.05
Bellis perennis	I 0.1	I	<0.05	I	<0.05
Plantago maritima		I	1.8	I	0.5
Armeria maritima		I	0.2	I	<0.05
Other vascular plants					
Calluna vulgaris	II 1.2	III	1.5	II	1.3
Erica cinerea	I 0.1	I	0.2	I	0.1
Blechnum spicant	I <0.05	I	<0.05	I	<0.05
Pteridium aquilinum	I 0.2	I	0.4	I	0.2
Other bryophytes					
Hylocomium splendens	III 6.4	III	5.9	III	6.3
Thuidium tamariscinum	II 1.5	II	2.2	II	1.7
Pseudoscleropodium purum	II 0.9	I	0.5	II	0.8
Polytrichastrum formosum	I 0.5	II	0.3	II	0.4
Dicranum scoparium	I 0.1	I	0.1	I	0.1
Polytrichum commune	I 0.3	I	1.6	I	0.6
Kindbergia praelonga	I 0.1	I	<0.05	I	0.1
Calliergonella cuspidata	I 0.2	I	<0.05	I	0.2
Plagiothecium undulatum	I <0.05	I	<0.05	I	<0.05
Sphagnum capillifolium	I 0.1	I	0.7	I	0.2
Pleurozium schreberi	I 0.1	I	0.6	I	0.2
Diplophyllum albicans	I <0.05	I	0.2	I	0.1
Racomitrium lanuginosum	I 0.1	I	0.2	I	0.1
Sphagnum denticulatum		I	0.3	I	0.1
Brachythecium rutabulum	I <0.05			I	<0.05
Campylopus introflexus	I <0.05			I	<0.05
Sphagnum palustre	I 0.1	I	0.4	I	0.2
Calypogeia fissa	I <0.05	I	<0.05	I	<0.05
Number of relevés	75		27		102
Species richness	17		18		17
Altitude (m)	190		320		290
Slope (°)	8		12		10
Forb height (cm)	10		5		6
Grass/sedge/rush height (cm)	13		15		15
Forb proportion (%)	14		10		15

2. *Agrostis capillaris - Galium saxatile* grassland group

	a	b	Group
Soil pH	4.8	4.3	4.6
n =	56	16	72
% Loss on ignition	22.0	22.5	22.5
n =	56	16	72
Total P (Phosporous) mg/g	0.9	0.5	0.8
n =	56	16	72
Soil types			
Well-drained mineral soils	41.5	22.2	37.3
Gleys	16.9	22.2	18.1
Basin peats	1.5	0.0	1.2
Podzols	10.8	33.3	15.7
Upland peats	26.2	22.2	25.3
Other	3.1	0.0	2.4
n =	65	18	83

3. *Agrostis stolonifera – Ranunculus repens* grassland / marsh group

a. *Filipendula ulmaria – Mentha aquatica* vegetation type

Description

This very frequent vegetation type includes a range of wet grassland and marsh communities of flat, poorly-drained or regularly inundated sites frequently adjacent to lakes or watercourses. These are typically on gleyed, relatively base-rich soils in the lowlands. The main sward species are *Agrostis stolonifera, Holcus lanatus, Ranunculus repens* and *Filipendula ulmaria*, this last species being a good indicator for the group. Other characteristic species include *Mentha aquatica, Carex disticha, Equisetum fluviatile, Galium palustre, Potentilla anserina* and *Carex nigra*. *Juncus* species are occasional but never abundant. Broadleaf herb cover is much higher than in other vegetation types in this group and occasionally approaches 50%.

Example sites

Little Brosna Callows, Offaly (Site 18); Drumlosh, Roscommon (Site 113); Cloheen Marsh, Cork (Site 468); Ballindangan Marsh, Cork (Site 505).

Affinities

Fossitt: GS4 53%; GS2 23%; GM1 22%; GS1 3%; GS3 1%

***Annex I*:** 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (15%)

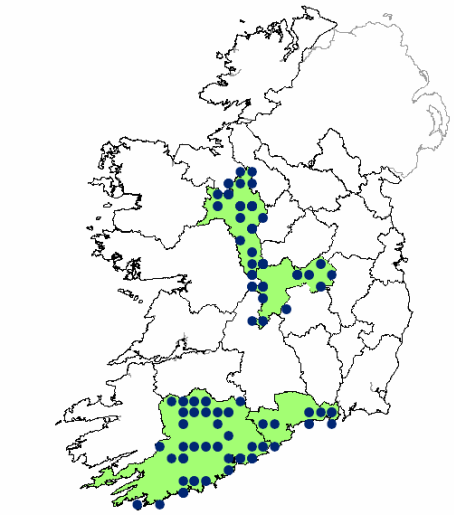
CEP: Senecioni – Juncetum acutiflori association / Filipendulion alliance

Tablefit:

NVC:	M22b *Juncus subnodulosus – Cirsium palustre* fen meadow *Briza media – Trifolium* spp. sub-community	(61%)
	M22 *Juncus subnodulosus – Cirsium palustre* fen meadow	(44%)
	M24b *Molinia caerulea – Cirsium dissectum* typical sub-community	(43%)
Corine:	C37.218 *Juncus subnodulosus* meadow	

MAVIS:

NVC:	M23 *Juncus effusus/acutiflorus – Galium palustre* rush-pasture	(70%)
	M23a *Juncus effusus/acutiflorus – Galium palustre* rush-pasture *Juncus acutiflorus* sub-community	(66%)
	M27 *Filipendula ulmaria – Angelica sylvestris* mire	(65%)
Corine:	C37.217 *Juncus effusus* meadow	



Distribution

This sward type is found throughout most of the survey area but was unrecorded from far west Cork, central parts of Offaly and northern Waterford.

Marshy sward of *Potentilla anserina, Mentha aquatica, Carex flacca, C. ovalis*, *Iris pseudacorus* and *Lythrum salicaria*, East Calf Island, Cork.

Wet pasture dominated by *Filipendula ulmaria, Potentilla anserina, Holcus lanatus, Deschampsia cespitosa* and *Festuca pratensis,* Ballymullen, Offaly.

3. *Agrostis stolonifera – Ranunculus repens* grassland / marsh group

b. *Holcus lanatus – Lolium perenne* vegetation type

Description

This vegetation type contains species-poor wet grassy swards dominated mainly by *Holcus lanatus*. *Agrostis stolonifera* and *Ranunculus repens* are also constant and typically abundant. These swards largely occur on gleyed or well-drained mineral soils on level ground. Whilst *Juncus effusus* is frequent it does not dominate here. The indicator species for this vegetation type highlight that fields of this nature are more likely to have undergone some agricultural improvement than the other wet grassland types in this group, with *Lolium perenne*, *Trifolium repens*, *Cerastium fontanum* and *Taraxacum* agg. all listed. Other frequent species are *Rumex acetosa* and *Anthoxanthum odoratum*. Cover comprising forbs is typically very low.

Example sites

Bridane Lower, Waterford (Site 352); Coolymurraghue, Cork (Site 414); Castlebarrett, Cork (Site 519); Lough Gara, Roscommon (Site 25).

Affinities

Fossitt: GS4 49%; GA1 24%; GS1 12%; GS2 9%; GS3 5%; GM1 1%

Annex I: No major correspondence

CEP: Centaureo-Cynosuretum juncetosum subassociation

Tablefit:

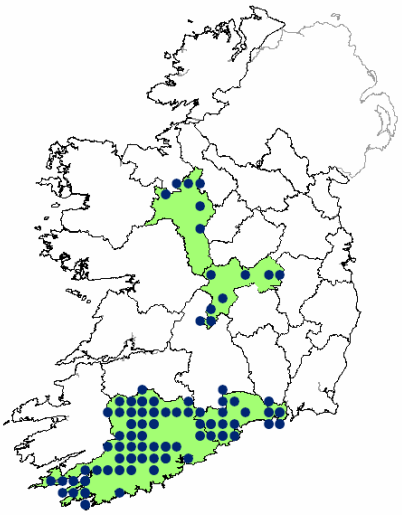
NVC:	MG4 *Alopecurus pratensis – Sanguisorba officinalis* grassland	(55%)
	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis* sub-community	(54%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(51%)

Corine: C38.11 Cynosurion pasture

MAVIS:

NVC:	MG9a *Holcus lanatus – Deschampsia cespitosa* grassland *Poa trivialis* sub-community	(71%)
	MG10a *Holcus lanatus – Juncus effusus* rush-pasture typical sub-community	(70%)
	MG9 *Holcus lanatus – Deschampsia cespitosa* grassland	(69%)

Corine: C37.213 *Deschampsia cespitosa* meadow



Distribution

This sward type occurs frequently throughout the southern counties, with scattered occurrences in Roscommon and Offaly.

Wet grassland sward dominated by *Holcus lanatus*, *Alopecurus geniculatus*, *Ranunculus repens*, *R. flammula* and *Juncus effusus*, Ballinaboy, Cork.

Species-poor sward dominated by *Holcus lanatus* with *Arrhenatherum elatius, Agrostis stolonifera* and *Dactylis glomerata*, Coolmoreen, Cork.

3. *Agrostis stolonifera – Ranunculus repens* grassland / marsh group

c. *Juncus effusus – Lotus pedunculatus* vegetation type

Description

This sward type essentially comprises very species-poor samples from flat, rushy pastures on poorly-drained, gleyed soils. *Juncus effusus* is overwhelming dominant in these fields, giving the vegetation a tall, tussocky character. *J. acutiflorus* is frequent but typically only at low abundances, and where this species is a significant sward component, the vegetation may be referable to vegetation type 4a. The main grass species are *Agrostis stolonifera* and *Holcus lanatus*, which tend to dominate cover beneath the rushy tussocks. *Anthoxanthum odoratum* is also frequent. The chief herb species are *Lotus pedunculatus*, *Ranunculus repens* and *Rumex acetosa*.

Example sites

Ahane Upper, Cork (Site 634); Hare Island, Cork (Site 482); Tallowbridge, Waterford (Site 359); Drumbridge, Roscommon (Site 39).

Affinities

Fossitt: GS4 98%; GM1 1%; GS3 1%

***Annex I*:** No major correspondence

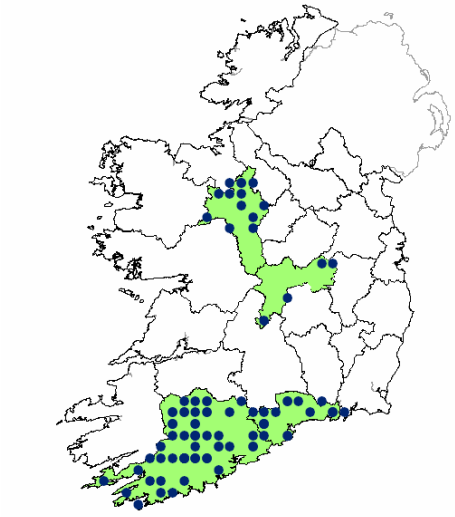
CEP: Senecioni – Juncetum acutiflori association / Junco acutiflori – Molinietum association

Tablefit:

NVC:	M23a *Juncus effusus / acutiflorus – Galium palustre* rush pasture *Juncus acutiflorus* sub-community	(52%)
	M23 *Juncus effusus / acutiflorus – Galium palustre* rush pasture	(49%)
	M23b *Juncus effusus / acutiflorus – Galium palustre* rush pasture *Juncus effusus* sub-community	(49%)
Corine:	C37.217 *Juncus effusus* meadow	

MAVIS:

NVC:	M23 *Juncus effusus / acutiflorus – Galium palustre* rush pasture	(73%)
	M23b *Juncus effusus / acutiflorus – Galium palustre* rush pasture *Juncus effusus* sub-community	(68%)
	M23a *Juncus effusus / acutiflorus – Galium palustre* rush pasture *Juncus acutiflorus* sub-community	(68%)
Corine:	C37.217 *Juncus effusus* meadow	



Distribution

This sward type occurs throughout the southern counties with a cluster of sites in north Roscommon and a few occurrences on the borders of Offaly.

Tall rush sward of *Juncus effusus, J. acutiflorus, Lotus pedunculatus* and *Agrostis stolonifera,* Gooseberryhill, Cork

A *Juncus effusus*-dominated rush-pasture on the floodplain of the River Bride, Bridane Lower, Waterford.

3. *Agrostis stolonifera – Ranunculus repens* grassland / marsh group

d. *Agrostis stolonifera – Plantago lanceolata* vegetation type

Description

This vegetation type includes species-poor swards from gleyed or well-drained minerals soils in the lowlands that are dominated by *Agrostis stolonifera*. This grass is accompanied by the other constant species *Holcus lanatus* and *Ranunculus repens*. Other indicators for this group are *Plantago lanceolata, Festuca rubra* and *Dactylis glomerata*, which signal that these swards are sometimes drier than the other types in this group. This vegetation type may thus be seen as transitional to those of grassland group 1. Other frequent species include *Lolium perenne* (in low amounts), *Trifolium repens*, *Rumex acetosa* and *Anthoxanthum odoratum*.

Example sites

Gracedieu, Waterford (Site 319); Dunworly, Cork (Site 613); Ardmore Head, Waterford (Site 320); Cleaheen, Roscommon (Site 205).

Affinities

Fossitt: GS4 43%; GS2 20%; GS1 17%; GA1 16%; GM1 3%

***Annex I*:** 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (10%)

CEP: Centaureo-Cynosuretum juncetosum subassociation

Tablefit:

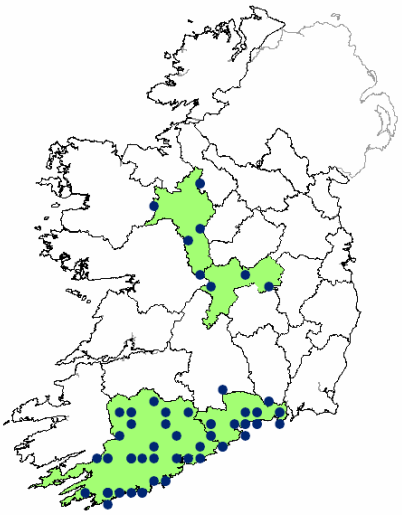
NVC:	MG4 *Alopecurus pratensis – Sanguisorba officinalis* grassland	(53%)
	MG5a *Cynosurus cristatus – Centaurea nigra* grassland *Lathyrus pratensis sub-community*	(49%)
	MG5 *Cynosurus cristatus – Centaurea nigra* grassland	(46%)

Corine: C38.11 Cynosurion pasture

MAVIS:

NVC:	MG9a *Holcus lanatus – Deschampsia cespitosa* grassland *Poa trivialis* sub-community	(69%)
	MG9 *Holcus lanatus – Deschampsia cespitosa* grassland	(68%)
	MG10a *Holcus lanatus – Juncus effusus* rush-pasture typical sub-community	(64%)

Corine: C37.213 *Deschampsia cespitosa* meadow



Distribution

This sward type was recorded fairly frequently across Cork and Waterford, with a few scattered sites in Roscommon and Offaly.

Wet grassland sward dominated by *Agrostis stolonifera*, *Dactylis glomerata* and *Anthoxanthum odoratum* with *Festuca rubra, Sonchus asper, Crepis capillaris* and *Plantago lanceolata*, Derryleigh, Cork.

Wet grassland sward dominated by *Agrostis stolonifera*, *Holcus lanatus, Anthoxanthum odoratum, Plantago lanceolata, Festuca rubra* and *Lathyrus pratensis*, Stradbally Beg, Waterford.

3. Agrostis stolonifera- Ranunculus repens grassland/marsh group

	a		b		c		d		Group	
Constants										
Agrostis stolonifera	IV	11.6	V	16.5	V	14.7	V	46.2 ●●●	V	89.1
Holcus lanatus	III	7.9	V	36.1 ●●●	V	17.2	IV	7.0	IV	68.2
Ranunculus repens	III	4.7	IV	10.1 ●●	III	2.5	IV	4.6	IV	21.9
a) *Filipendula - Mentha* vegetation type indicators										
Filipendula ulmaria	III	10.8 ●●●	I	0.5	II	3.1	I	0.6	II	15.0
Mentha aquatica	II	2.7 ●●	I	<0.05	I	0.1	I	0.4	I	3.2
Carex disticha	II	5.1 ●●	I	<0.05	I	<0.05	I	0.1	I	5.2
Equisetum fluviatile	II	2.4 ●●	I	<0.05	I	0.3	I	0.1	I	2.8
Carex nigra	II	4.0 ●●			I	1.0	I	0.1	I	5.0
Galium palustre	III	1.4 ●●	I	0.2	II	0.7	II	0.6	II	2.9
Vicia cracca	II	0.7 ●	I	<0.05			I	0.1	I	0.8
Molinia caerulea	II	3.6 ●			I	0.5	I	0.9	I	5.0
Caltha palustris	I	0.6 ●					I	0.1	I	0.8
Calliergonella cuspidata	II	2.0 ●	I	0.9	II	1.5	I	0.2	II	4.5
Phleum pratense	I	3.1 ●	I	0.5	I	0.2	I	0.7	I	4.6
Potentilla anserina	II	3.7 ●	I	0.6	I	0.8	I	2.0	I	7.0
Festuca pratense	I	1.8 ●	I	0.2	I	0.1	I	0.3	I	2.5
Carex flacca	I	1.1 ●	I	0.1	I	0.2	I	0.2	I	1.6
Carex panicea	I	1.4 ●	I	<0.05	I	0.1	I	0.3	I	1.8
Succisa pratensis	I	0.9 ●	I	0.1	I	0.1	I	0.1	I	1.3
b) *Holcus - Lolium perenne* vegetation type indicators										
Lolium perenne	I	0.7	III	4.6 ●●	I	0.3	III	2.4	II	8.0
Trifolium repens	II	1.3	IV	5.4 ●●	II	1.0	III	3.8	III	11.6
Cerastium fontanum	I	0.2	III	1.0 ●●	II	0.2	II	0.7	II	2.0
Agrostis capillaris	I	0.3	II	5.8 ●	I	1.6	I	0.6	I	8.3
Cynosurus cristatus	I	0.5	II	1.8 ●	I	0.2	I	0.3	I	2.8
Senecio aquaticus	I	0.4	I	0.4 ●	I	0.5	I	0.3	I	1.5
Taraxacum agg.	I	0.2	II	0.5 ●	I	0.2	II	0.3	I	1.2

***3. Agrostis stolonifera- Ranunculus repens* grassland/marsh group**

	a		b		c		d		Group
c) *Juncus - Lotus* vegetation type indicators									
Juncus effusus	II	3.3	III	5.0	V	44.4 ●●●●	II	3.8	III 56.6
Lotus pedunculatus	I	1.2	I	0.7	III	6.9 ●●	II	1.3	II 10.1
Rumex acetosa	II	0.7	III	2.4	III	2.6 ●	III	1.4	II 7.0
Juncus acutiflorus	II	3.0	II	1.6	III	2.9 ●	II	1.6	II 9.1
Epilobium obscurum	I	0.1	I	0.1	II	0.3 ●	I	<0.05	I 0.5
d) *Agrostis - Plantago* vegetation type indicators									
Plantago lanceolata	II	1.6	I	0.7	I	0.2	III	2.6 ●●	II 5.2
Festuca rubra	II	4.0	II	2.4	II	2.4	II	4.8 ●	II 13.6
Dactylis glomerata	I	0.4	I	1.2	I	0.1	II	2.2 ●	I 3.7
Other grasses, sedges and rushes									
Anthoxanthum odoratum	II	3.6	III	5.3	III	4.5	III	7.7	III 21.2
Poa trivialis	I	1.3	I	2.3	I	0.6	I	0.7	I 4.9
Deschampsia cespitosa	I	2.2	I	0.5	I	1.2	I	1.0	I 5.0
Arrhenatherum elatius	I	1.6	I	0.4	I	0.8	I	0.9	I 3.7
Glyceria fluitans	I	1.8	I	0.6	I	0.1	I	0.8	I 3.4
Alopecurus geniculatus	I	0.8	I	1.3	I	0.2	I	0.4	I 2.6
Carex ovalis	I	0.4	I	0.3	I	0.2	I	0.1	I 1.0
Juncus inflexus	I	1.6	I	1.7	I	0.3	I	0.1	I 3.7
Phalaris arundinacea	I	1.8	I	<0.05	I	0.1	I	0.6	I 2.5
Alopecurus pratensis	I	0.4	I	0.5	I	0.6	I	0.4	I 1.9
Poa pratensis	I	0.2	I	0.4	I	0.2	I	0.4	I 1.2
Carex hirta	I	0.6	I	0.3	I	0.2	I	0.1	I 1.1
Festuca arundinacea	I	1.0	I	<0.05	I	0.1	I		I 1.1
Carex echinata	I	0.3	I	<0.05	I	0.1	I	0.1	I 0.4
Juncus articulatus	I	0.4	I	0.2	I	0.1	I		I 0.7
Luzula multiflora	I	<0.05	I	<0.05	I	<0.05	I	<0.05	I 0.1
Juncus conglomeratus	I	0.6			I	0.1	I		I 0.8
Eleocharis palustris	I	0.6					I	1.1	I 1.7
Agrostis canina	I	0.1	I	0.1	I	1.0			I 1.2
Carex acutiformis	I	1.5	I	<0.05			I		I 1.5

3. Agrostis stolonifera- Ranunculus repens grassland/marsh group

		a		b		c		d		Group
Poa annua	I	<0.05	I	0.1	I	0.1	I	0.4	I	0.6
Other forbs										
Ranunculus acris	II	1.0	I	0.5	II	0.6	I	0.2	II	2.3
Cardamine pratensis	II	0.3	I	0.4	I	0.2	I	0.4	I	1.3
Cirsium palustre	I	0.4	I	0.5	II	0.6	I	0.3	I	1.9
Ranunculus flammula	I	0.5	I	0.3	II	0.5	I	0.6	I	1.9
Lathyrus pratensis	I	0.7	I	0.2	I	0.2	I	0.5	I	1.6
Potentilla erecta	I	0.4	I	0.4	I	0.7	I	0.9	I	2.3
Trifolium pratense	I	0.8	I	0.5	I	<0.05	I	0.7	I	2.1
Iris pseudacorus	I	2.3	I	0.4	I	0.8	I	0.5	I	3.9
Stellaria graminea	I	0.2	I	0.3	I	<0.05	I	0.1	I	0.7
Prunella vulgaris	I	0.3	I	0.2	I	0.1	I	0.3	I	0.9
Crepis capillaris	I	0.5	I	<0.05	I	<0.05	I	0.4	I	0.9
Lythrum salicaria	I	0.9	I	<0.05	I	0.2	I	0.3	I	1.3
Potentilla erecta	I	1.5	I	<0.05	I	0.5	I	0.4	I	2.4
Hypochaeris radicara	I	<0.05	I	0.1	I	<0.05	I	0.3	I	0.5
Stellaria uliginosa	I	0.1	I	0.2	I	0.1	I	<0.05	I	0.3
Epilobium palustre	I	0.2	I	<0.05	I	0.1	I	0.1	I	0.4
Cirsium arvense	I	<0.05	I	0.3	I	<0.05	I	0.5	I	0.8
Rumex obtusifolius	I	<0.05	I	0.3	I	<0.05	I	0.2	I	0.5
Hydrocotyle vulgaris	I	0.6	I	0.1	I	0.4	I	0.4	I	1.5
Centaurea nigra	I	0.6	I	0.1			I	0.6	I	1.2
Rumex crispus	I	0.1	I	0.1	I	<0.05	I	0.2	I	0.5
Rhinanthus minor	I	0.4	I	0.1			I	0.1	I	0.6
Senecio jacobea	I	<0.05	I	0.3	I	<0.05	I	0.0	I	0.4
Lychnis flos-cuculi	I	0.2	I	<0.05	I	0.1	I	<0.05	I	0.3
Lotus corniculatus	I	0.3	I	<0.05	I	<0.05	I	0.2	I	0.6
Elytrigia repens	I	1.7	I	0.2	I	0.1	I	1.1	I	3.1
Rumex conglomeratus	I	<0.05	I	0.1	I	0.2	I	0.1	I	0.3
Valeriana officinalis	I	0.4	I	<0.05			I	0.1	I	0.5
Myosotis laxa	I	0.1	I	<0.05	I	<0.05	I	0.3	I	0.4
Cardamine flexuosa	I	0.1	I	0.1	I	<0.05	I	<0.05	I	0.2
Angelica sylvestris	I	0.2	I	<0.05			I	0.2	I	0.5
Leontodon autumnalis	I	0.1	I	0.1	I	<0.05	I	<0.05	I	0.3

3. Agrostis stolonifera- Ranunculus repens grassland/marsh group

	a	b	c	d	Group
Achillea ptarmica	I 0.3		I <0.05	I 0.4	I 0.7
Veronica chamaedrys	I 0.1	I 0.1	I <0.05	I 0.3	I 0.6
Lysimachia vulgaris	I 0.3				I 0.3
Sagina procumbens	I <0.05	I <0.05		I <0.05	I 0.1
Cirsium dissectum	I 0.2				I 0.2
Achillea millefolium		I 0.1		I 0.1	I 0.2
Bellis perennis	I <0.05	I <0.05	I <0.05	I 0.1	I 0.1
Vicia sativa	I <0.05	I <0.05	I <0.05	I 0.2	I 0.2
Heracleum sphondylium		I <0.05		I 0.1	I 0.1
Plantago major				I 0.1	I 0.1
Other vascular plants					
Equisetum arvense	I 0.2	I 0.1	I 0.4	I <0.05	I 0.7
Equisetum palustre	I 0.6		I 0.1		I 0.7
Other bryophytes					
Kindbergia praelonga	I 0.1	I 0.2	II 0.3	I 0.1	I 0.7
Rhytidiadelphus squarrosus	I 0.4	I 0.8	I 0.7	I 0.1	I 2.0
Brachythecium rutabulum	I <0.05	I 0.1	I 0.1	I 0.1	I 0.3
Pseudoscleropodium purum	I 0.1	I 0.1	I 0.1		I 0.3
Lophocolea bidentata	I <0.05		I 0.2		I 0.2
Number of relevés	186	128	94	69	477
Species richness	15	13	12	13	14
Altitude (m)	40	80	95	40	60
Slope (°)	0	0	0	0	0
Forb height (cm)	35	20	33	20	30
Grass/sedge/rush height (cm)	43	30	73	30	40
Forb proportion (%)	40	17	20	25	30

3. Agrostis stolonifera- Ranunculus repens grassland/marsh group

	a	b	c	d	Group
Soil pH	6.3	5.6	5.5	5.7	5.8
n =	157	127	91	62	437
% Loss on ignition	18.0	13.0	18.0	14.0	15.0
n =	157	127	91	60	435
Total P (Phosporous) mg/g	1.0	0.9	0.8	0.9	0.9
n =	72	112	75	52	311
Soil types					
Well-drained mineral soils	19.5	35	18.2	35.5	10.9
Gleys	56.7	4.1	70.5	53.2	63.5
Basin peats	18.3	56.1	8.0	4.8	20.4
Podzols	0.0	1.6	1.1	0.0	0.0
Upland peats	0.0	0.8	0.0	0.0	1.5
Other	5.5	2.4	2.3	6.5	3.6
n =	164	123	88	62	437

4. *Juncus acutiflorus – Molinia caerulea* grassland group

a. *Holcus lanatus – Lotus pedunculatus* vegetation type

Description

Within this vegetation type are included rushy grasslands of gleyed soils dominated by *Juncus acutiflorus*. These include wet lowland meadows, uplands sites and rank, abandoned fields. *J. effusus* is a frequent associate in these tall swards but should not dominate (c.f. type 3c). *Molinia caerulea* is also occasionally present but *Molinia*-dominated swards may be referable to vegetation type 4b. The most abundant other species here are *Holcus lanatus, Anthoxanthum odoratum, Agrostis stolonifera* and *Lotus pedunculatus*. Other frequent species include *Ranunculus repens*, *Calliergonella cuspidata*, *Rumex acetosa*, *Potentilla erecta*, *Cirsium palustre, Rhytidiadelphus squarrosus* and *Galium palustre*.

Example sites

Dawstown, Cork (Site 601); Derrycarhoon, Cork (Site 568); Derrykeel Meadows, Offaly (Site 7); Curraheen, Waterford (Site 360).

Affinities

Fossitt: GS4 90%; GM1 6%; GS3 2%; GA1 1%

***Annex I*:** 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (29%)

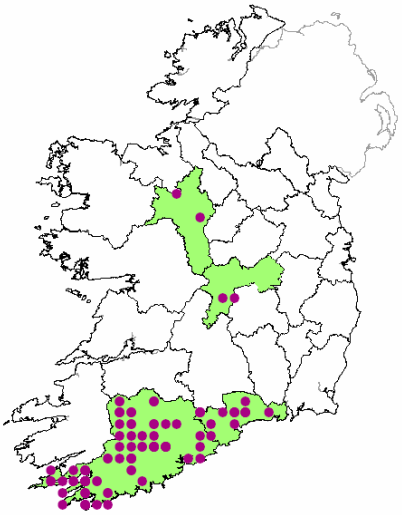
CEP: Junco acutiflori – Molinietum association

Tablefit:

NVC: M24c *Molinia caerulea – Cirsium dissectum* fen-meadow
Juncus acutiflorus – Erica tetralix sub-community (51%)
M22b *Juncus subnodulosus – Cirsium palustre* fen-meadow
Briza media – Trifolium spp. sub-community (47%)
M23a *Juncus effusus / acutiflorus – Galium palustre* rush pasture
Juncus acutiflorus sub-community (46%)
Corine: C37.312 Acid *Molinia* grassland

MAVIS:

NVC: M23 *Juncus effusus / acutiflorus – Galium palustre* rush pasture (75%)
M23a *Juncus effusus / acutiflorus – Galium palustre* rush pasture
Juncus acutiflorus sub-community (74%)
M23b J*uncus effusus / acutiflorus – Galium palustre* rush pasture
Juncus effusus sub-community (70%)
Corine: C37.217 *Juncus effusus* pasture



Distribution

This sward type is very frequent in the southern counties but with only a few scattered occurrences in Offaly and Roscommon.

Rank upland sward of *Juncus acutiflorus, J. effusus, Carex nigra, Agrostis stolonifera, Lotus pedunculatus*, Ballyroon Mountain, Cork.

Wet meadow dominated by *Juncus acutiflorus* with *Anthoxanthum odoratum, Holcus lanatus, Filipendula ulmaria, Rhinanthus minor* and *Lotus pedunculatus*, Kilcolman Bog Nature Reserve, Cork.

4. *Juncus acutiflorus – Molinia caerulea* grassland group

b. *Potentilla erecta – Succisa pratensis* vegetation type

Description

This vegetation type primarily consists of *Molinia*-dominated wet pastures and meadows on gleyed soils and basin peats. It is distinguished from type 4a by the far greater abundance of *Molinia caerulea* and the lower abundance of *Juncus acutiflorus*, although this species is still constantly present. The cover of herbaceous species is typically very low. Indicator species include *Potentilla erecta, Succisa pratensis, Festuca rubra* and *Pseudoscleropodium purum*. *Holcus lanatus*, *Agrostis stolonifera* and *Anthoxanthum odoratum* are all frequently present. This vegetation type includes regularly mown *Molinia* meadows and rank swards of lightly grazed rough pasture or abandoned fields.

Example sites

Knockaneglass, Cork (Site 667); Lag Bridge, Waterford (Site 356); Errit, Roscommon (Site 225); Clonmacnoise, Offaly (Site 107).

Affinities

Fossitt: GS4 94%; GS3 4%; GS2 2%

Annex I: 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (57%)

CEP: Cirsio – Molinietum association

Tablefit:

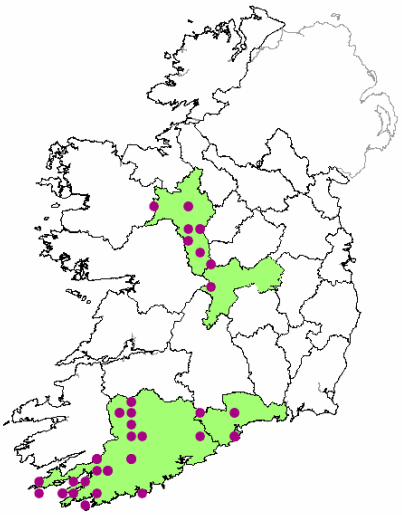
NVC: M25b *Molinia caerulea – Potentilla erecta* mire *Anthoxanthum odoratum* sub-community (72%)
M24c *Molinia caerulea – Cirsium dissectum* fen-meadow *Juncus acutiflorus – Erica tetralix* sub-community (70%)
M25 *Molinia caerulea – Potentilla erecta* mire (65%)

Corine: C37.312 Acid *Molinia* grassland

MAVIS:

NVC: M25 *Molinia caerulea – Potentilla erecta* mire (68%)
M25a *Molinia caerulea – Potentilla erecta* mire *Erica tetralix* sub-community (65%)
M23b *Juncus effusus / acutiflorus – Galium palustre* rush-pasture *Juncus effusus* sub-community (65%)

Corine: C37.312 Acid *Molinia* grassland



Distribution

This sward type is fairly frequent in western Cork with scattered sites in Waterford and Roscommon, but is absent from most of Offaly.

Sward of *Molinia caerulea, Agrostis capillaris, Cirsium palustre* and abundant *Succisa pratensis,* Urraghilmore, Cork.

Rather rank sward of *Molinia caerulea, Juncus acutiflorus, J. conglomeratus, Holcus lanatus* and *Lotus pedunculatus*, Kilmacurrane, Cork.

4. Juncus acutiflorus - Molinia caerulea grassland/marsh group

	a		b		Group	
Constants						
Juncus acutiflorus	V	27.7 ●●●●●	V	6.8	V	21.1
Holcus lanatus	V	12.7 ●●●●	IV	6.7	V	10.8
Lotus pedunculatus	IV	6.2 ●●●	II	1.4	IV	4.7
Anthoxanthum odoratum	V	7.3	IV	5.2	V	6.6
Agrostis stolonifera	IV	6.8	III	6.1	IV	6.6
a) *Holcus - Lotus* vegetation type indicators						
Juncus effusus	III	7.5 ●●●	II	1.7	III	5.7
Ranunculus repens	III	1.8 ●●●	II	0.3	III	1.4
Calliergonella cuspidata	III	2.3 ●●	II	0.7	III	1.8
Rumex acetosa	III	1.2 ●●	I	0.2	II	0.9
Galium palustre	III	0.9 ●●	I	0.2	II	0.7
Ranunculus flammula	II	0.9 ●●	I	0.1	II	0.6
Ranunculus acris	II	0.8 ●●	I	<0.05	II	0.6
Cardamine pratensis	II	0.6 ●●	I	0.1	II	0.4
Epilobium obscurum	II	0.3 ●●	I	<0.05	I	0.2
Trifolium repens	II	1.2 ●●	I	0.1	II	0.9
Cerastium fontanum	II	0.2 ●	I	0.1	II	0.2
Senecio aquaticus	II	0.5 ●	I	0.1	I	0.3
Stellaria uliginosa	II	0.2 ●	I	<0.05	I	0.1
Cynosurus cristatus	I	1.1 ●	I	<0.05	I	0.7
Potentilla palustris	I	0.5 ●	I	<0.05	I	0.3
b) *Potentilla - Succisa* vegetation type indicators						
Molinia caerulea	II	5.4	V	47.2 ●●●●●	III	18.7
Potentilla erecta	III	3.4	V	6.7 ●●●●	III	4.4
Succisa pratensis	II	1.4	III	3.3 ●●	II	2.0
Festuca rubra	II	2.1	III	3.7 ●●	II	2.6
Pseudoscleropodium purum	I	0.4	II	1.1 ●●	II	0.6
Hylocomium splendens	I	0.1	I	0.7 ●	I	0.3
Carex binervis	I	<0.05	I	0.7 ●	I	0.3
Lophocolea bidentata	I	0.1	I	0.4 ●	I	0.2
Angelica sylvestris	I	0.1	I	0.3 ●	I	0.2
Other grasses, sedges and rushes						
Agrostis capillaris	II	3.4	II	2.5	II	3.1
Luzula multiflora	I	0.3	II	0.4	II	0.3
Carex panicea	II	1.2	II	0.9	II	1.1
Carex flacca	I	1.2	II	1.5	I	1.3
Carex nigra	I	0.8	I	0.3	I	0.6
Carex echinata	I	0.3	I	0.3	I	0.3
Carex viridula	I	0.3	I	0.4	I	0.3
Agrostis canina	I	0.5	I	0.8	I	0.6
Carex pulicaris	I	0.1	I	0.2	I	0.1
Juncus bulbosus	I	0.7	I	0.1	I	0.5
Carex ovalis	I	0.3	I	0.1	I	0.2
Deschampsia cespitosa	I	0.5	I	0.1	I	0.4
Festuca ovina	I	0.6	I	0.6	I	0.6
Danthonia decumbens	I	0.1	I	<0.05	I	0.1
Poa trivialis	I	0.2			I	0.2
Juncus conglomeratus	I	0.3	I	0.3	I	0.3

4. Juncus acutiflorus - Molinia caerulea grassland/marsh group

	a		b		Group	
Arrhenatherum elatius	I	0.1	I	0.2	I	0.2
Luzula multiflora	I	0.3			I	0.2
Carex disticha	I	0.2	I	0.8	I	0.4
Isolepis setacea	I	0.1			I	<0.05
Briza media	I	0.1	I	0.4	I	0.2
Festuca arundinacea	I	<0.05	I	0.8	I	0.3
Juncus squarrosus	I	<0.05	I	0.2	I	0.1
Other forbs						
Cirsium palustre	III	1.2	II	0.7	III	1.0
Plantago lanceolata	II	0.7	I	0.2	II	0.5
Mentha aquatica	II	1.1	I	0.7	II	1.0
Filipendula ulmaria	I	2.0	II	2.4	II	2.1
Prunella vulgaris	II	0.4	I	0.2	I	0.4
Epilobium palustre	I	0.2	I	0.2	I	0.2
Lythrum salicaria	I	0.4	I	0.3	I	0.4
Hypochaeris radicata	I	0.1	I	0.3	I	0.2
Potentilla anserina	I	1.0	I	0.2	I	0.7
Hydrocotyle vulgaris	I	1.4	I	0.2	I	1.0
Viola palustre	I	0.2	I	0.2	I	0.2
Taraxacum agg.	I	0.1	I	0.1	I	0.1
Lotus corniculatus	I	0.2	I	0.3	I	0.2
Lathyrus pratensis	I	0.3	I	0.3	I	0.3
Anagallis tenella	I	0.1	I	0.1	I	0.1
Lychnis flos-cuculi	I	0.2	I	<0.05	I	0.1
Cirsium dissectum	I	0.4	I	0.7	I	0.5
Vicia cracca	I	0.1	I	0.3	I	0.2
Pedicularis sylvatica	I	0.1	I	0.1	I	0.1
Dactylorhiza maculata	I	<0.05	I	0.1	I	<0.05
Leonontodon autumnalis	I	0.1	I	<0.05	I	0.1
Potentilla anglica	I	0.1			I	0.1
Centaurea nigra	I	0.1	I	0.2	I	0.1
Valeriana officinalis	I	0.2	I	0.3	I	0.2
Myosotis secunda	I	0.1			I	0.1
Trifolium pratense	I	0.1	I	0.2	I	0.1
Iris pseudacorus	I	0.1			I	0.1
Hypericum tetrapterum	I	0.1			I	0.1
Hypericum pulchrum			I	0.1	I	<0.05
Other vascular plants						
Equisetum fluviatile	I	0.2	I	<0.05	I	0.2
Ulex europaeus	I	<0.05	I	0.3	I	0.1
Rubus fruticosus agg.	I	<0.05	I	0.1	I	<0.05
Calluna vulgaris			I	0.4	I	0.1
Erica tetralix			I	0.1	I	<0.05
Other bryophytes						
Rhytidiadelphus squarrosus	III	1.6	II	0.9	II	1.4
Kindbergia praelonga	I	0.1	I	0.3	I	0.2
Brachythecium rutabulum	I	0.1	I	0.1	I	0.1
Thuidium tamariscinum	I	0.1	I	0.1	I	0.1
Bryum pseudotriquetrum	I	<0.05	I	<0.05	I	<0.05

4. Juncus acutiflorus - Molinia caerulea grassland/marsh group

	a	b	Group
Calypogeia fissa	<0.05	0.1	<0.05
Aulacomnium palustre	<0.05	0.1	0.1
Polytrichum commune	<0.05	0.2	0.1
Sphagnum palustre	0.2	0.6	0.3
Sphagnum inundatum	<0.05	0.6	0.2
Sphagnum subnitens	<0.05	0.6	0.2
Number of relevés	114	53	167
Species richness	19	18.0	19.0
Altitude (m)	100	130	110
Slope (°)	0	2	0
Forb height (cm)	30	35	30
Grass/sedge/rush height (cm)	50	60	50
Forb proportion (%)	27	15	25
Soil pH	5.4	5.6	5.4
n =	92	34	126
% Loss on ignition	27.0	32.0	29.0
n =	91	34	125
Total P (Phosporous) mg/g	0.9	0.8	0.9
n =	88	24	112
Soil types			
Well-drained mineral soils	8.2	17.5	10.9
Gleys	74.2	37.5	63.5
Basin peats	16.5	30.0	20.4
Podzols	0.0	0.0	0.0
Upland peats	0.0	5.0	1.5
Other	1.0	10.0	3.6
n =	97	40	137

5: DISCUSSION

5.1 Summary data and the ranking of all surveyed sites

In this discussion the data collected in counties Cork and Waterford during 2008 will be compared with the data collected in 2007, the first year of the ISGS (Irish Semi-natural Grasslands survey), in Roscommon and Offaly.

Counties Cork and Waterford have a relatively intensively farmed landscape and this has resulted in semi-natural grassland being located in small fragmented sites. The median semi-natural grassland site size in Cork and Waterford was 7.2 ha, with 36.8% (92 sites) less than 5 ha. When the survey was carried out in Roscommon and Offaly, the median site size was 20.1 ha and only 5.5% (5 sites) were less than 5 ha. The more intensive nature of farming systems in Cork and Waterford is also illustrated by improved grassland and cultivated land recorded adjacent to 80.0% of semi-natural grassland sites compared to the 74.7% of sites in Roscommon and Offaly. These data collected during the ISGS are confirmed by general agricultural data for Ireland, with Cork and Waterford having higher economic farm returns per unit of labour; an indication of agricultural intensification, than Roscommon and Offaly, and proportionately less agriculturally disadvantaged areas (Lafferty *et al.* 1999). Co. Roscommon is the least intensively farmed of the areas surveyed to date, with the entire county listed as agriculturally disadvantaged, and the majority of Roscommon having very low economic returns per unit of labour, due to the use of extensive sheep and cattle farming systems (Lafferty *et al.* 1999).

The intensive nature of the farming systems within the 2008 ISGS area, and east and central Cork in particular, present a challenging environment for the conservation of high quality semi-natural grasslands. However, there are sites of high conservation importance within Cork and Waterford, in particular west Cork and the upland areas of Waterford. This is illustrated by Table 5.1, with a significant proportion (47.2%) of all sites that had a conservation score over 50% located within counties Cork and Waterford.

In addition to the intensive farming systems prevalent in large areas of Cork and Waterford making the conservation of semi-natural grasslands more challenging, the fact that only two of the 12 Cork sites of conservation importance and one of the five Waterford sites are currently associated with a NPWS conservation site, such as an SAC, could hamper conservation efforts. This contrasts with Co. Offaly, where all five sites of conservation importance are conserved within the Shannon Callows SAC (000216).

Table 5.1 The 36 semi-natural grassland sites that had a conservation score over 50%, 14 Co. Roscommon sites, 12 Co. Cork sites, 5 Co. Waterford, and 5 Co. Offaly sites.

Site no.	Site Name	County	pNHA	SAC	SPA	Nature Reserve	Score
109	Moystown Demesne and Island	Offaly	216	216	-		**75.9**
18	Little Brosna Callows	Offaly	564	216	-		**70.4**
25	Lough Gara	Roscommon	587	-	-		**70.4**
210	Portnacrinnaght	Roscommon	587		-		**70.4**
107	Clonmacnoise	Offaly	216	216	-		**66.7**
110	Clooncraff	Offaly	216	216	-		**66.7**
601	Dawstown	Cork	-	-	-		**64.8**
23	Lough Dromharlow	Roscommon	1643	-	-		**63.0**
30	Kilglas and Grange Lough	Roscommon	608	-	-		**59.3**
113	Drumlosh	Roscommon	216	216	-		**59.3**
114	Cappaleitrim	Roscommon	216	216	-		**59.3**
218	Portruny Bay	Roscommon	2310	440	-		**59.3**
344	Ballynamona Lower	Waterford	-	-	-		**59.3**
568	Derrycarhoon	Cork	-	-	-		**59.3**
584	Polleenateada	Cork	-	-	-		**59.3**
108	Leitra Callow	Offaly	216	216	-		**55.6**
236	Kilnanooan	Roscommon	-	-	-		**55.6**
357	Meoul	Waterford	-	-	-		**55.6**
481	Glannafeen	Cork	-	-	-		**55.6**
566	Reenaknock	Cork	-	-	-		**55.6**
379	Tobernahulla	Waterford	-	-	-		**53.7**
590	Bengour West	Cork	-	-	-		**53.7**
34	Lough Glin	Roscommon	1644	-	-		**51.9**
202	Cloonroughan	Roscommon	-	-	-		**51.9**
205	Cleaheen	Roscommon	1643	-	-		**51.9**
216	Mullaghmacormick	Roscommon	-	-	-		**51.9**
226	Coolteige	Roscommon	-	-	-		**51.9**
227	Carrownalassan	Roscommon	-	-	-		**51.9**
316	Lyre Mountain	Waterford	1952	1952	-		**51.9**
342	Rathmoylan	Waterford	-	-	-		**51.9**
415	Coolowen	Cork	-	-	-		**51.9**
440	Tooms West	Cork	108	108	4109	The Gearagh	**51.9**
463	Urhin	Cork	-	-	-		**51.9**
586	Toehead	Cork	-	-	-		**51.9**
618	Kilcolman	Cork	92	-	4095	Kilcolman Bog	**51.9**
642	Coomnagire	Cork	-	-	-		**51.9**

5.2 Assessment of Annex I grassland

Partly due to the large area of Annex I habitats within the Shannon Callows SAC (000216), the area of Annex I grassland habitats recorded during ISGS 2007 was slightly higher than 2008, with 13.8% (379 ha) of Annex I habitat compared to 10.5% (270.6 ha). The Annex I habitat *Molinia* meadows (6410) was relatively frequent throughout the entire area surveyed during 2007 and 2008. However, due to differences in the types of parent materials and soils recorded in the midlands (Cos. Roscommon and Offaly) and the south and west (Cos. Cork and Waterford), *Nardus* grassland (6230) was much more common in the south and west, whereas the *Festuco-Brometalia* (6210) was more common in the midlands. Hydrophilous tall herb communities (6430), Calaminarian grassland (6130), and lowland hay meadows (6510) were all uncommon throughout the survey area (Table 5.2). Table 5.2 compares the Annex I grassland habitats recorded in Cos. Cork, Offaly, Roscommon and Waterford during the 2007 and 2008 ISGS with the data published in the *Status of EU Protected Habitats and Species* (Anon. 2008).

Table 5.2 Number of 10 km squares within Cos. Cork, Offaly, Roscommon, and Waterford where Annex I grassland habitats have been recorded. For 10 km grid square occurrences from Anon. (2008) that are shared between two or more counties, a half square was counted towards the total.

Annex I habitat	No. of 10 km grid squares recorded during ISGS 2007/2008	No. of 10 km grid squares reported in Anon. (2008)	Difference in no. of 10 km squares
Calaminarian grassland 6130	4	3	+1
Festuco-Brometalia 6210	15	43	-28
Nardus grassland 6230	17	20.5	-3.5
Molinia meadows 6410	32	*	*
Hydrophilous tall herb communities 6430	5	7.5	-2.5
Lowland hay meadows 6510	7	4	+3

*No comparable data in Anon. (2008), which only presents *Molinia* meadows distribution data on 50 km square basis

Calaminarian grassland (6130) is the least common Annex I habitat (Table 5.2), with the frequency and range data in ISGS and Anon. (2008) broadly comparable. Hydrophilous tall herb communities (6430) are also quite rare, and although the frequency and range found in ISGS and Anon (2008) are similar, the fact that ISGS recorded possible hydrophilous tall herb communities (6430) in Co. Cork extends the south-west range of the Annex I habitat. Lowland hay meadows (6510) are also rare, and although the frequency and range found in ISGS and Anon (2008) are similar, the fact that ISGS recorded one lowland hay meadow (6510) in Waterford extends the southern range of the Annex I habitat.

Of the three more frequent Annex I grassland habitats, it is not possible to make any comparisons for *Molinia* meadows (6410), as this current survey is the first to present data on a 10 km square basis. *Nardus* grassland (6230) was found to have a similar frequency and range to the data presented in Anon. (2008). *Festuco-Brometalia* (6210) was found to have a much reduced frequency and range, with Anon. (2008) reporting the Annex I habitat in twelve 10 km squares in Cork and Waterford, whereas the Annex I habitat was only recorded in one 10 km square during ISGS 2008. Although *Festuco-Brometalia* (6210) is much more frequent in Roscommon and Offaly than Cork and Waterford, the ISGS only recorded this Annex I habitat in fourteen 10 km squares, compared to the 31 10 km squares reported in Anon. (2008). However, the ISGS did not survey every area of Annex I grassland habitat and Valverde (2007) reported that there were 22 10 km squares in Roscommon and Offaly where the *Festuco-Brometalia* (6210) has been located. These data show that the 31 10 km squares reported in Anon. (2008) is probably an overestimate of the occurrence of this particular Annex I habitat.

As Table 5.3 demonstrates, the overall quality of all Annex I grassland habitats recorded during ISGS 2007 and 2008 was *Unfavourable – Bad*. This finding is in general agreement with Anon. (2008), although differences do arise in the structure and functions criteria which Anon. (2008) scored as *Favourable* for Calaminarian grassland (6130) and *Unfavourable – Inadequate* for hydrophilous tall herb communities (6430)

Table 5.3 The quality of the 86 areas of Annex I grassland habitats recorded during ISGS 2007/08.

Annex I habitat	No. of areas	Area	Structure & functions	Future prospects	Overall
Calaminarian grassland (6130)	4	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable – Bad*
Festuco-Brometalia (6210)	16	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable – Bad*
Nardus grassland (6230)	20	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable – Bad*
Molinia meadows (6410)	33	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable – Bad*
Hydrophilous tall herb communities (6430)	5	Unfavourable - Inadequate	Unfavourable - Bad	Favourable	*Unfavourable - Bad*
Lowland hay meadows (6510)	8	Unfavourable - Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*

In terms of area, Calaminarian grassland (6130) was scored as *Favourable* as no decline was observed from 2000 to 2008. The other five Annex I habitats were scored as *Unfavourable – Inadequate*, as they showed declines in overall area greater than zero but less than 1% per

annum. The largest recorded drop in overall area was for *Festuco-Brometalia* (6210) at 0.8% per annum.

The structure and functions criteria were *Unfavourable – Bad* for all Annex I habitats, with only 23.6% (68 of 288 assessment stops) of the assessments recorded during the ISGS 2007-08 having passed. Martin *et al*. (2007) used the data recorded during 2007 to improve the suitability of the positive indicator species lists, and this has contributed to the percentage of passes for this section of the criteria having increased from 28% in 2007 to 62% in 2008. After analysing the 2008 ISGS data, it was found that only 31% of the assessment stops passed the forb : graminoid ratio criteria. The criteria being used were examined to test their suitability, and for the majority of Annex I habitats these were not changed. However, for *Nardus* grassland (6230) the mean relative proportion of forbs was 16%, which is much lower than the 25% proportion currently being used in the assessment criteria (Dwyer *et al.* 2007). Although it is difficult to judge if the examples of *Nardus* grassland (6230) surveyed to date represent the habitat in a good or bad condition, it was decided that the assessment criteria should be more representative of the dataset. Therefore, the criteria for the forb : graminoid ratio for *Nardus* grassland (6230) was changed, with the minimum relative proportion of forbs required for an assessment stop to pass decreased from 25% to 20%. This resulted in the number of *Nardus* grassland (6230) assessment stops that would now pass the forb : graminoid ratio criterion increasing by 29.6%. As the ISGS is extended and the dataset increased, it should be possible to refine the assessment criteria to represent the range in condition of each of the particular Annex I habitats within Ireland.

Within structure and functions, the second most significant reason for the number of assessment stops failing was positive indicator species, with 62% of stops passing on this criterion. The positive indicator species for *Molinia* meadows (6410) and lowland hay meadows (6510) were updated by Martin *et al.* (2007). As these criteria had been updated on the basis of data collected from semi-natural grassland sites in relatively good condition along the River Shannon, the criteria were not updated again this year.

As 72 assessment stops have now been surveyed within the Annex I habitat *Nardus* grassland (6230), the positive indicator species for this habitat were examined. *Nardus* grassland (6230) had close affinity to both of the vegetation types within the *Agrostis capillaris – Galium saxatile* grassland group in the ISGS vegetation classification. The indicator species for this group therefore include species that were frequently recorded within 6230 assessment stops. Table 5.4 lists the top nine indicator species for this vegetation group, all with an indicator value score greater than 30%.

Table 5.4 The group indicators for the *Agrostis capillaris – Galium saxatile* grassland group with an IndVal over 30%. * denotes species that are currently positive indicator species for *Nardus* grassland (6230).

*Agrostis capillaris**	72%
*Rhytidiadelphus squarrosus**	55%
*Galium saxatile**	50%
Hylocomium splendens	49%
*Nardus stricta**	45%
*Potentilla erecta**	42%
Rhytidiadelphus loreus	33%
*Festuca ovina**	32%
*Juncus squarrosus**	32%

Seven of the group indicators are already positive indicators for *Nardus* grassland 6230, but the two additional bryophyte species *Hylocomium splendens* and *Rhytidiadelphus loreus* will be added to the list of positive indicator species.

For the remaining three Annex I habitats of Calaminarian grassland (6130), *Festuco-Brometalia* (6210) and hydrophilous tall herb communities (6430), too few assessment stops were recorded during the 2008 survey to allow the positive indicator species lists to be changed.

For Calaminarian grassland (6130), as bryophytes are such an important component of the positive indicator species list, due to the fact that they exhibit obligate heavy metal tolerance (Holyoak 2008), specialist training will be required before this Annex I habitat can be monitored.

For hydrophilous tall herb communities (6430), it should be noted that only a subset of the Annex I habitat is currently being surveyed within the ISGS. When hydrophilous tall herb communities (6430) do not exist in association with a semi-natural grassland site, such as in association with wet woodlands or swamps, they will often be missed as these habitat types are currently outside the remit of the ISGS. To try and increase the number of hydrophilous tall herb communities (6430) relevés recorded (only ten relevés were recorded in 2007 and 2008), for 2009 the ISGS will aim to select and survey areas of the Fossitt (2000) habitat tall-herb swamps (FS2) where it forms a complex with semi-natural grassland communities.

Encroachment was not a significant problem, with 93% of assessment stops passing on this criterion. However, it was noted in the field that the Annex I habitat *Nardus* grassland (6230) often existed in mosaics with heath and this should probably be taken into account when managing this Annex I grassland habitat, as future reductions in grazing levels could result in heath encroachment into the grassland.

At the end of this phase of the ISGS, in December 2009, it is envisaged that for each Annex I grassland habitat a primary and secondary list of sites will be produced. The primary list will

include sites where the Annex I grassland habitat was assessed as *Favourable* or sites where no significant changes in the flora or management of the Annex I grassland would be required for the area to be assessed as *Favourable*. The primary list would also only contain areas of Annex I grassland habitat above a certain size, with each of the Annex I habitats requiring the establishment of different thresholds, as a habitat such as Calaminarian grassland (6130) exists on a much smaller scale than *Nardus* grassland (6230). The secondary list would mostly include sites that contain areas where some of the positive indicator species for a particular Annex I grassland habitat are found but other aspects of structures and function, such as a low forb to graminoid ratio, do not correspond to the assessment criteria. It would also often be the case that there would need to be significant changes in the management conditions currently prevalent in a secondary example of an Annex I habitat before the area could be assessed as *Favourable*. This approach should help conservation managers to make more informed decisions concerning the conservation of Annex I grassland habitats.

A comparison between the Annex I grassland habitats identified by the NPWS as being present within SACs and the data collected during this study provided the following results. For the seven SACs within Cork and Waterford that were surveyed during this project and were identified by NPWS as containing Annex I grassland habitats (only three of these had grassland listed as a qualifying interest) only SACs 000019 and 002137 had areas of Annex I grassland habitat relocated during 2008. For the other five SACs no Annex I grassland habitat was located or in one instance, SAC 001879, a different Annex I grassland habitat was recorded (Table 5.5). In addition, during the 2008 survey Annex I grassland habitats were found to be associated with six SACs that had previously not had an Annex I grassland habitat listed (Table 5.5). The poor correlation between the results of the 2008 survey and the NPWS data could be due to the fact that the Annex I grassland habitat listed for two of the surveyed SACs was hydrophilous tall herb communities (6430) which is often associated with wet woodlands or swamps, habitat types that are currently outside the remit of the ISGS. In counties Roscommon and Offaly the correlation was much better with the Annex I grassland habitat listed as a qualifying interest by NPWS being relocated for each of the four SACs that were surveyed. However the comparison between the NPWS and ISGS 2007 dataset was not perfect, the Annex I grassland habitat listed by NPWS for SAC 001626 was not located during the survey of Roscommon and an Annex I grassland habitat not listed by NPWS was found to be associated with SAC 000218.

Table 5.5 List of the Annex I grassland habitats associated with SACs that were surveyed during the ISGS 2007/08. The Annex I grassland habitats listed are Calaminarian grassland 6130, *Festuco-Brometalia* 6210, *Nardus* grassland 6230, *Molinia* meadows 6410, Hydrophilous tall herb communities 6430, and Lowland hay meadows 6510. For SAC 1879 NPWS list 6410 as the Annex I grassland habitat present and the ISGS recorded 6230.

SAC	Annex I grassland habitat*	County	Recorded by NPWS or ISGS 2008/09
90	6230	Cork	ISGS
93	6230	Cork	NPWS/ISGS
101	6210	Cork	NPWS
216	6410* and 6510*	Offaly & Roscommon	NPWS/ISGS
440	6210*	Roscommon	NPWS/ISGS
218	6210	Roscommon	ISGS
566	6210*	Offaly	NPWS/ISGS
919	6210*	Offaly	NPWS/ISGS
1040	6410	Cork	NPWS
1626	6210	Roscommon	NPWS
1873	6230	Cork	ISGS
1879	6230 & 6410	Cork	NPWS/ISGS
1952	6230	Waterford	ISGS
2123	6510	Waterford	ISGS
2137	6210 & 6430*	Waterford	NPWS
2158	6130*	Cork	NPWS/ISGS
2162	6430*	Waterford	NPWS
2170	6410	Cork	ISGS

* denotes that the Annex I grassland habitat is listed as a qualifying interest for the SAC

5.3 Vegetation Classification

The vegetation classification comprised four vegetation groups which were further divided into 15 vegetation types. Two of the groups within the vegetation classification, *Plantago lanceolata – Festuca rubra* and *Agrostis capillaris – Galium saxatile* groups, represented plant communities located in drier habitats. The *Plantago lanceolata – Festuca rubra* group was the more frequently recorded of the drier vegetation groups, representing 30% (326 of 1072 relevés) of all ISGS relevés. The remaining two groups within the classification, *Agrostis stolonifera – Ranunculus repens* and *Juncus acutiflorus – Molinia caerulea*, represented plant communities that were recorded in wetter habitats. The *Agrostis stolonifera – Ranunculus repens* group was the most frequently recorded overall, representing 44% (477 of 1072 relevés) of all ISGS relevés.

Within the four vegetation groups, the *Agrostis capillaris – Galium saxatile* group corresponded well to the Fossitt (2000) habitat dry acid grassland (GS3), with 76 of the 102 relevés within this group recorded within the habitat (Table 3.18). The *Juncus acutiflorus – Molinia caerulea* group had a high affinity to the Fossitt (2000) habitat wet grassland (GS4), with 153 of 167 relevés within this group recorded within the habitat. Although the *Plantago lanceolata – Festuca rubra* group had some affinity to each of the drier Fossitt (2000) habitats, the highest affinity was to the Fossitt (2000) habitat dry calcareous and neutral grassland (GS1) (153 out of 326 relevés), with a high proportion (81%) of all GS1 relevés assigned to this vegetation group. The *Agrostis stolonifera – Ranunculus repens* group generally corresponded to the wetter Fossitt (2000) habitats, freshwater marsh (GM1) in particular showing a high affinity, with 43 of the 51 marsh relevés within this group.

One of the vegetation types within the *Plantago lanceolata – Festuca rubra* group was a maritime cliff-top grassland community, the *Armeria maritima – Plantago coronopus* type. Although a similar vegetation type has been recorded before in Ireland (White & Doyle 1982) and in Britain (Rodwell *et al.* 2000), a comparable habitat type was not listed in Fossitt (2000). The fact that Fossitt (2000) does not include a maritime cliff-top grassland habitat – not to be confused with the steep or vertical rocky cliff habitat (CS1) included within Fossitt – resulted in the majority (79%) of the *Armeria maritima – Plantago coronopus* vegetation type being recorded as the Fossitt categories dry calcareous and neutral grassland (GS1) or dry-humid acid grassland (GS3). It should be noted that the majority of maritime cliff-top grassland surveyed during 2008 was a natural vegetation type, whereas the majority of all other Irish grassland types are anthropogenic in origin.

Marsh habitat (GM1) was the rarest (51 of 1072 relevés) of the Fossitt (2000) habitats recorded within the ISGS. This was partly due to the requirement within Fossitt (2000) for freshwater marsh (GM1) to contain no more than 50% sedge and grass cover, resulting in

some examples of marsh communities being classified as wet grassland (GS4) within the Fossitt classification. The vegetation type within the ISGS vegetation classification having the highest affinity with marsh was the *Filipendula – Mentha* type within the *Agrostis stolonifera – Ranunculus repens* group, with 78% of freshwater marsh relevés within this vegetation type. The *Filipendula – Mentha* vegetation type was the most common within the *Agrostis stolonifera – Ranunculus repens* wet grassland group, with 186 relevés, and this does raise the possibility that a large number of relevés that were classified as wet grassland (GS4) within Fossitt (2000) are actually freshwater marsh. The indicator species listed for the *Filipendula – Mentha* type (synoptic table for vegetation type 3a, Section 4) correspond well to the characteristic species listed for freshwater marsh (GM1) in Fossitt (2000), but the vegetation type differs in that the median proportion of forbs is 40% rather than the 50% stipulated by Fossitt. To try and accurately assess the occurrence of freshwater marsh (GM1), the field methodology will be adjusted for 2009 by lowering the proportion of forbs required in a freshwater marsh relevé from 50% to 40%.

The *Plantago lanceolata – Festuca rubra* group included the majority of relevés recorded within three of the drier Annex I grassland habitats: 96% of the *Festuco-Brometalia* (6210) relevés, 92% of the Calaminarian grassland (6130) relevés, and 73% of lowland hay meadows (6510) relevés. It should be noted that, although the *Festuco-Brometalia* phytosociological community is strongly associated with Annex I habitat 6210, the data presented in Section 4 have also shown that the mesotrophic Centaureo–Cynosuretum has a strong affinity with this Annex I habitat in Ireland.

Relevés in the *Agrostis capillaris – Galium saxatile* group were generally located on acidic substrate (median pH 4.6) and included 82% of the *Nardus* grassland (6230) relevés. The *Juncus acutiflorus – Molinia caerulea* group was the less common of the wetter vegetation groups, but represented the majority (57%) of *Molinia* meadows (6410) relevés.

5.4 Utilisation of the dataset

The GIS package which accompanies this report contains the habitat map for each of the 250 sites surveyed in 2008. To this has been added a data layer entitled 'Relevé'. This contains the co-ordinates of all 785 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 data provide important baseline information, especially for delineating the positive indicator species for certain Annex I habitats.

5.5 Concluding remarks

This survey of 250 semi-natural grassland sites in Cork and Waterford, representing the second phase of the Irish Semi-natural Grasslands Survey, has refined the methodology that will be used to study the range of different semi-natural grassland habitats within a region, identify and assess Annex I grassland habitats, and accurately map and store all survey data using a combination of GIS and a database.

This report has presented a hierarchical vegetation classification for semi-natural grasslands in Cork, Offaly, Roscommon and Waterford with four main grassland groups, *Plantago lanceolata – Festuca rubra*, *Agrostis capillaris – Galium saxatile*, *Agrostis stolonifera – Ranunculus repens* and *Juncus acutiflorus – Molinia caerulea*, and 15 vegetation types. One of these vegetation types, the *Armeria maritima – Plantago coronopus* type, represents maritime cliff-top grassland that has been discussed previously by White & Doyle (1982) but was not included within Fossitt (2000).

The data showed that semi-natural grassland sites in Cork and Waterford tended to be smaller than sites in Roscommon and Offaly, and that only three of the 19 Cork and Waterford sites ranked as having a high conservation value ($\geq$50%) were associated with a NPWS conservation site. Smaller semi-natural grassland sites, and a low proportion of high conservation value grasslands within NPWS conservation sites, will contribute to making the conservation of semi-natural grasslands within the region more challenging.

The criteria for the evaluation of the conservation status and the threats affecting grassland sites have been refined. A new list of positive indicator species has been recommended for the assessment of the structure and functions of the Annex I habitat Calaminarian grassland (6130), and the positive indicator species list and forb : graminoid ratio have been refined for *Nardus* grassland (6230). As the ISGS is extended and the dataset increased, it should be possible to refine the assessment criteria to represent the range in condition of each of the particular Annex I grassland habitats within Ireland.

A detailed habitat map has been produced for each site, showing the Fossitt (2000) and the Annex I grassland habitats, the position of all relevés, and the location of any associated conservation sites (NHAs/pNHAs and SACs).

The survey has highlighted the vulnerability of each of the six Annex I grassland habitats recorded within Ireland and the urgency with which these habitats need to be studied and an effective monitoring regime implemented. The critical nature of Annex I grassland habitats within Ireland has also recently been highlighted by the *Status of EU Protected Habitats and Species* (Anon. 2008).

6: REFERENCES

Anon. (2003). *Interpretation manual of European Union habitats*. EUR 25. European Commission, DG Environment.

Anon. (2006). *Assessment, monitoring and reporting under Article 17 of the Habitats Directive: Explanatory notes & guidelines, Draft 2*. European Commission, DG Environment.

Anon. (2007). *Draft field methodology to assess the conservation status of dune habitats*. Unpublished report for National Parks and Wildlife Service, Dublin.

Anon. (2008).*The Status of EU Protected Habitats and Species in Ireland* . National Parks and Wildlife Service, Dublin.

Blackstock, Rimes, Stevens, Jefferson, Robertson, Mackintosh & Hopkins (1999). The extent of semi-natural grassland communities in lowland England and Wales: A review of conservation surveys 1978-96. *Grass and Forage Science* **54**(1), 1-18.

Bleasdale, A. (1998). *A desk study of eskers in Ireland: Collation of information from the National Parks and Wildlife Service and the Geological Survey of Ireland*. Unpublished report for National Parks and Wildlife Service, Dublin.

Braun-Blanquet, J. & Tüxen, R. (1952). Irische pflanzengesellschaften. In *Die pflanzenwelt Irlands.* (ed. W. Ludi). Hans Huber, Bern.

Breen, J. & O'Brien, A. (1995). Species richness in oldfield limestone grassland. In *Irish Grasslands – their biology and management.* D.W. Jeffrey, M.B. Jones & J.H. McAdam (eds). Royal Irish Academy, Dublin. pp. 204-209.

Byrne, C. (1996). *Semi-natural grassland communities in eastern Ireland: Classification, conservation and management*. Ph.D. Thesis, University of Dublin.

Cross, J.R. (1990). Survey and selection of peat sites for conservation in the Republic of Ireland. In *Ecology and conservation of Irish peatlands* (ed. G.J. Doyle). Royal Irish Academy, Dublin. pp. 175-188.

Currall, J.E.P. (1987). A transformation of the Domin scale. *Vegetatio* **72**, 81-87.

Curtis, T. G. F. & McGough, H.N. (1988). *The Irish red data book: 1 Vascular plants.* Wildlife Service Ireland, Dublin.

Dobson, F.S. (2000). *Lichens, an illustrated guide to the British and Irish species*. 4th edition. Richmond Publishing, Slough.

Doyle, G.J. (1982). Minuartio-Thlaspietum alpestris (Violetea calaminariae) in Ireland. *Journal of Life Sciences, Royal Dublin Society* **3**, 143-146.

Dufrene, M. & Legendre, P. (1997). Species assemblages and indicator species: the need for a flexible asymmetrical approach. *Ecological Monographs* **67**, 345-366.

Dwyer, R., Crowley, W. & Wilson, F. (2007). *Grassland monitoring project 2006*. Unpublished report for National Parks and Wildlife Service, Dublin.

Eakin, M. (1995). A botanical survey of conserved grassland in County Fermanagh. In *Irish Grasslands, their biology and management.* D.W. Jeffrey, M.B. Jones & J.H. McAdam (eds). Royal Irish Academy, Dublin. pp. 227-235.

Feehan, J. (2003). *Farming in Ireland – history, heritage and environment,* University College. Dublin.

Fossitt, J.A. (2000). *A Guide to habitats in Ireland.* The Heritage Council, Kilkenny.

Gardiner, M.J. & Radford, T. (1980). *Soil associations of Ireland and their land use potential*. Soil Survey Bulletin 36, An Foras Talúntais, Dublin.

Hall, V.A. & Pilcher, R.P. (1995). Irish grassland history. In *Irish grasslands: their biology and management.* D.W. Jeffrey, M.B. Jones & J.H. McAdam (eds). Royal Irish Academy, Dublin. pp. 188-193.

Heery S. (1991). The plant communities of the grazed and mown grasslands of the River Shannon callows. *Proceedings of the Royal Irish Academy* **91B**, 199-217.

Holyoak D. (2008). *Bryophytes and metallophyte vegetation on metalliferous mine-waste in Ireland*. Unpublished report for National Parks and Wildlife Service, Dublin.

Ivimey-Cook R.B. & Proctor M.C.F. (1966). The plant communities of the Burren Co. Clare. *Proceedings of the Royal Irish Academy* **64B**, 211-301.

JNCC (2004). *UK guidance on conservation objectives for monitoring designated sites*. Joint Nature Conservation Committee Report, Peterborough.

Keane S. & Sheehy-Skeffington M. (1995). Vegetation in east Burren uplands in relation to land use and conservation. In *Irish grasslands, their biology and management.* D.W. Jeffrey, M.B. Jones & J.H. McAdam (eds). Royal Irish Academy, Dublin. pp. 253-266.

Kent, M. & Coker, P. (1992). *Vegetation description and analysis: a practical approach.* Belhaven Press, London.

Kirby, K.J. (1988). *A woodland survey handbook No.11.* Nature Conservancy Council, Peterborough.

Laffery, S,. Commins, P. & Walsh, J.A. (1999). *Irish agriculture in transition: a census atlas of agriculture in the Republic of Ireland*. Teagasc. Dublin

Lance, G.N. and Williams, W.T. (1967). A general theory of classification sorting strategies. II. Clustering strategies. *Computer Journal* **10**, 271-277.

Legendre, P. & Legendre, L. (1998). *Numerical ecology*, 2nd edition, Elsevier, Amsterdam.

Martin, J.R., Gabbett, M., Perrin, P.M & Delaney, A. (2007). *Semi-natural grassland survey of Counties Roscommon and Offaly.* Unpublished report for National Parks & Wildlife Service, Dublin.

Martin, W.L. (1991). Survey of hay meadows in the area of west Corrib, Co. Galway. *Irish Naturalists' Journal* **23**(9), 365-371.

Martin, J.R., Higgins, G.T. & Perrin, P.M. (2005). A national survey of native woodland in Ireland: using the 2003 data to evaluate the conservation status of sites. In *Ireland's native woodlands*. C. Doyle & D. Little (eds). Conference proceedings, Galway, 8-11th September, 2004. Woodlands of Ireland, Dublin. pp. 127-135.

McCune, B. & Grace, J.B. (2002). *Analysis of ecological communities*. MjM Software Design, Oregon.

Mitchel, D. (2007). *Survey of the Grassland Fungi of the Vice County of West Cork*. The Heritage Council, Kilkenny.

O'Donovan G. (1987). *Ecosystem dynamics of Burren limestone grassland.* Ph.D. Thesis, University of Dublin.

O'Donovan, G. & Byrne, C. (2004). *A scoping study for the classification of lowland grassland in Ireland*. The Heritage Council, Kilkenny.

O'Donovan, G. (2007). *Lowland grassland survey of Sligo*. Unpublished report for Sligo County Council.

O'Sullivan, A.M. (1965). *A phytosociological survey of Irish lowland meadows and pastures.* Ph.D. Thesis, University College, Dublin.

O'Sullivan, A.M. (1968). *The lowland grasslands of Co. Limerick (Irish Vegetation Studies No. 2).* An Foras Talúntais, Dublin.

O'Sullivan, A.M. (1976). The phytosociology of the Irish wet grasslands belonging to the order Molinietalia. *Coll. Phytosoc*. **5,** 259-267.

O'Sullivan, A.M. (1982). The lowland grasslands of Ireland. *Journal of Life Sciences, Royal Dublin Society* **3**, 131-142.

Paton, J.A. (1999). *The liverwort flora of the British Isles*. Harley Books, Colchester.

Perrin, P.M., Martin, J.R., Barron, S.J. & Roche, J.R. (2006a). A cluster analysis approach to classifying Irish native woodlands. *Biology and the Environment*: *Proceedings of the Royal Irish Academy* **106B**(3), 261-275.

Perrin, P.M., Barron, S.J. & Martin, J.R. (2006b). *National survey of native woodlands in Ireland: Second phase report*. Report submitted to National Parks & Wildlife Service, Dublin.

Perrin, P.M, Martin, J.R., Barron, S.J., O'Neill, F.H., McNutt, K.E. & Delaney, A.M. (2008a) *National Survey of Native Woodlands 2003-2008: Volume I: Main report.* Report submitted to National Parks & Wildlife Service, Dublin.

Perrin, P.M, Martin, J.R., Barron, S.J., O'Neill, F.H., McNutt, K.E. & Delaney, A.M. (2008b) *National Survey of Native Woodlands 2003-2008: Volume II: Woodland classification.* Report submitted to National Parks & Wildlife Service, Dublin.

Preston, C.D., Pearman, D.A. & Dines, T.D. (2002). *Atlas of the British and Irish flora*. Oxford University Press, Oxford.

Ratcliffe, D. (1977). *A nature conservation review Vol. 1* Cambridge University Press, Cambridge.

Rodwell, J.S. (ed.) (1991). *British plant communities Volume 2: Mires and heaths*. Cambridge Community Press, Cambridge.

Rodwell, J.S. (ed.) (1992). *British plant communities Volume 3: Grasslands and montane communities*. Cambridge Community Press, Cambridge.

Rodwell, J.S. (ed.) (1995). *British plant communities Volume 4: Aquatic communities, swamps and tall-herb fens.* Cambridge Community Press, Cambridge.

Rodwell, J.S. (ed.) (2000). *British plant communities Volume 5: Maritime communities and vegetation of open habitats*. Cambridge Community Press, Cambridge.

Rodwell, J.S., Morgan, V., Jefferson, R.G. & Moss, D. (2007). *The European context of British lowland grasslands*. Joint Nature Conservation Committee Report No. 394, Peterborough.

Simkin, J.M. (2008). *The vegetation and management of Calaminarian grassland in the North Pennines.* Ph.D. Thesis, University of Newcastle.

Smith, A.J.E. (2004). *The moss flora of Britain and Ireland*. Cambridge University Press, Cambridge.

Stace, C. (1997). *New flora of the British Isles*, 2nd Edition. Cambridge University Press, Cambridge.

Tolkamp, W. (2001). *Gradients in floristic composition of callow grasslands, County Longford Ireland*. Undergraduate thesis, Wageningen University.

Trudgill, S. (1989). Soil types: a field identification guide. *Field Studies* **7**, 337-363.

Tubridy, M. (2006). *County Offaly esker survey 2006*. Unpublished report for Offaly County Council.

Valverde, F. F. (2007) *Semi-natural grassland Survey of Counties Roscommon and Offaly. Technical Annex: Mapping and predictive modelling*. Unpublished Report. National Parks and Wildlife Service, Dublin.

White, J. & Doyle, G. (1982). The vegetation of Ireland: a catalogue raisonné. *Journal of Life Sciences*, *Royal Dublin Society* **3,** 289-368.

Appendix 1: Location of 250 sites surveyed

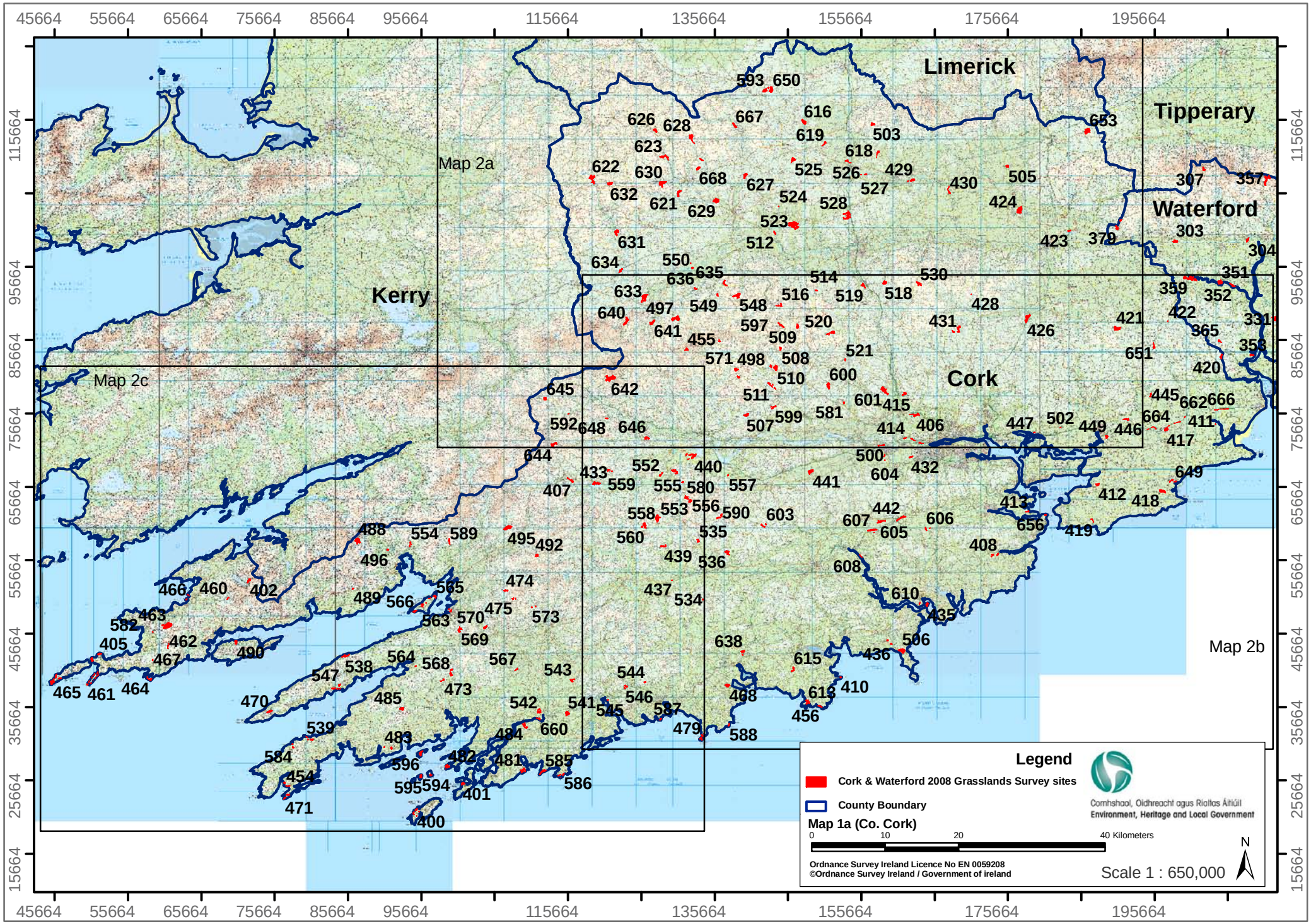
Map 1a: Location of sites in Co. Cork (scale 1:650 000; indicates layout of maps 2a – c)

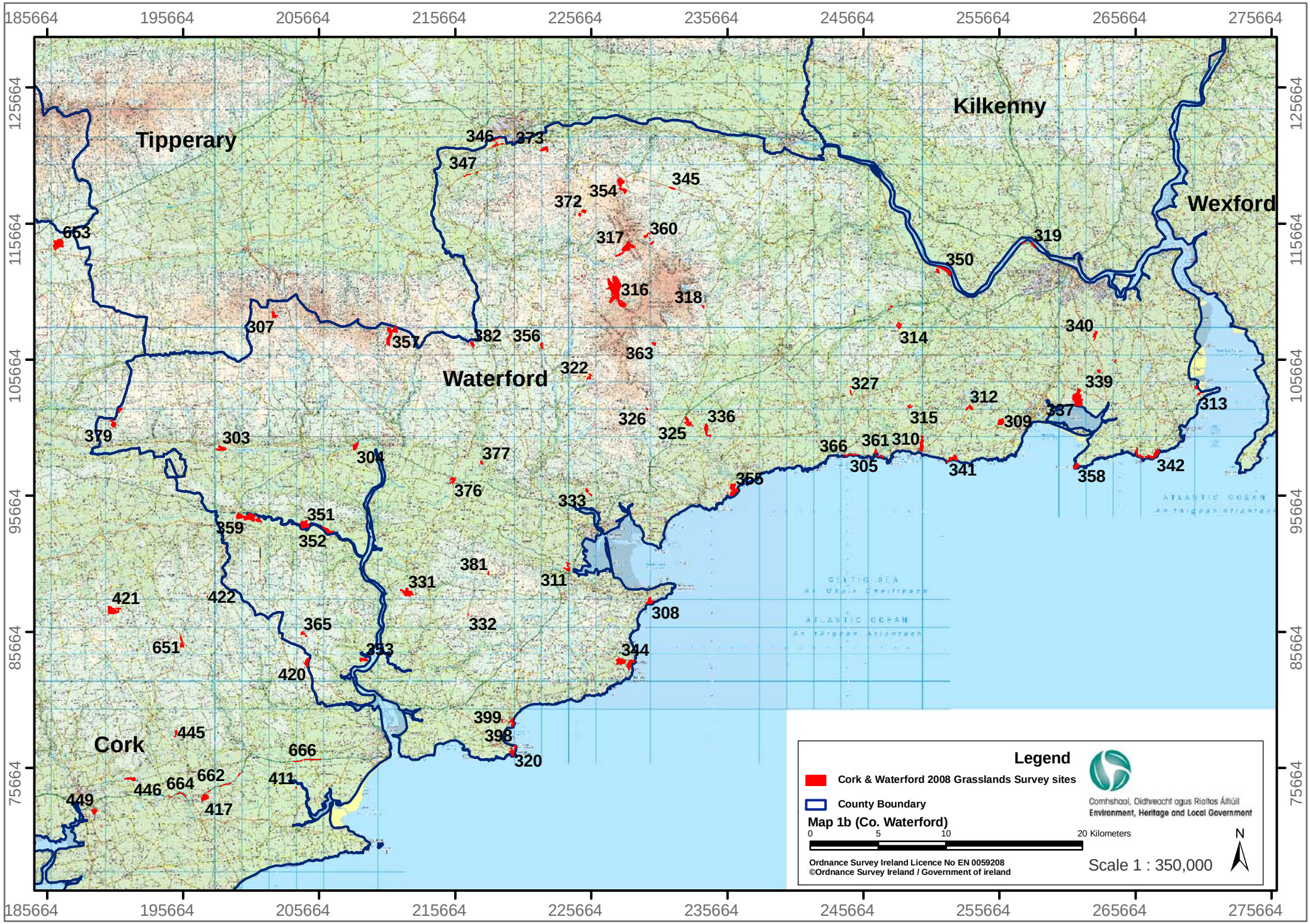
Map 1b: Location of sites in Co. Waterford (scale 1:350 000)

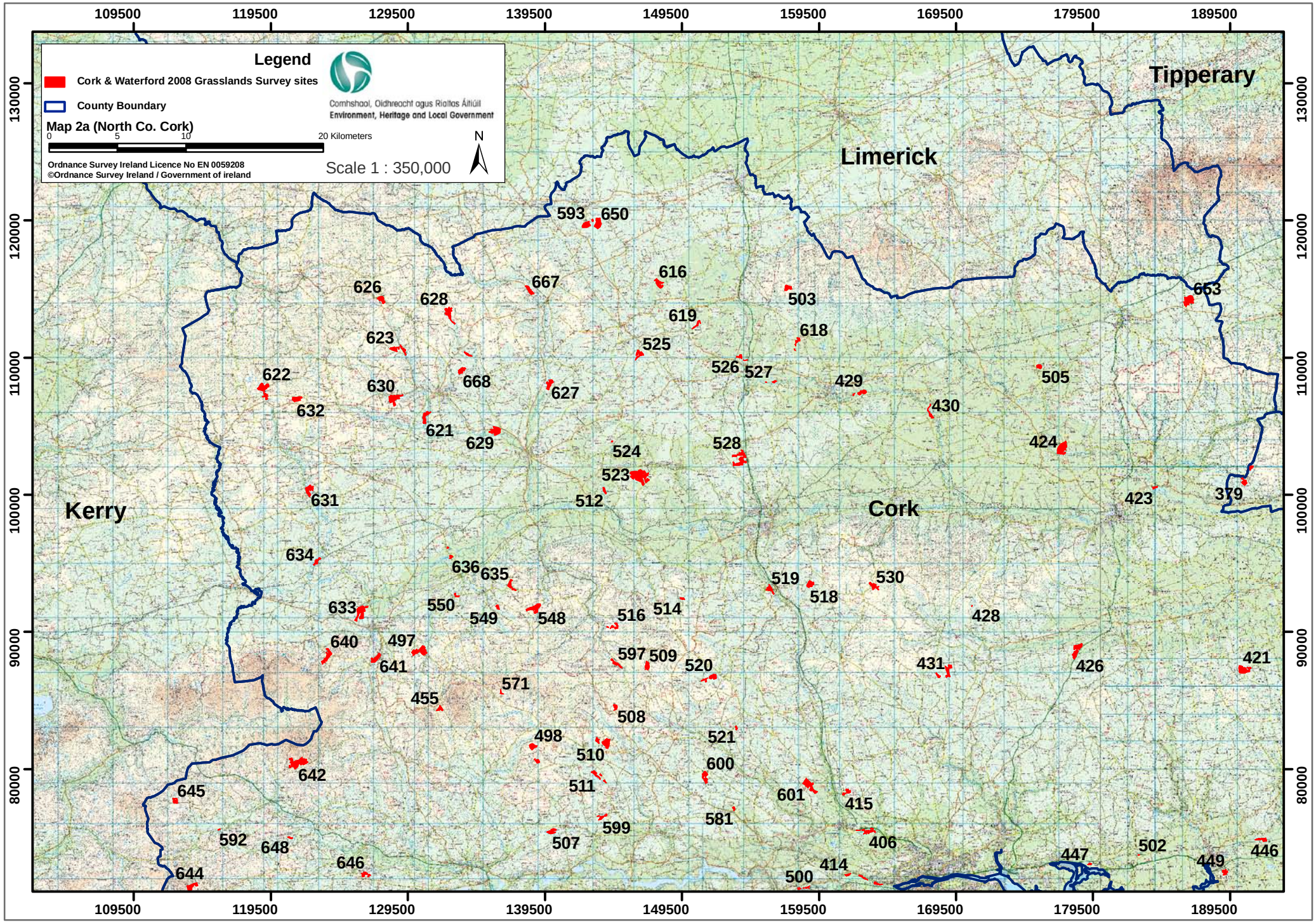
Map 2a: Location of sites in north Co. Cork (scale 1:350 000)

Map 2b: Location of sites in east Co. Cork (scale 1:350 000)

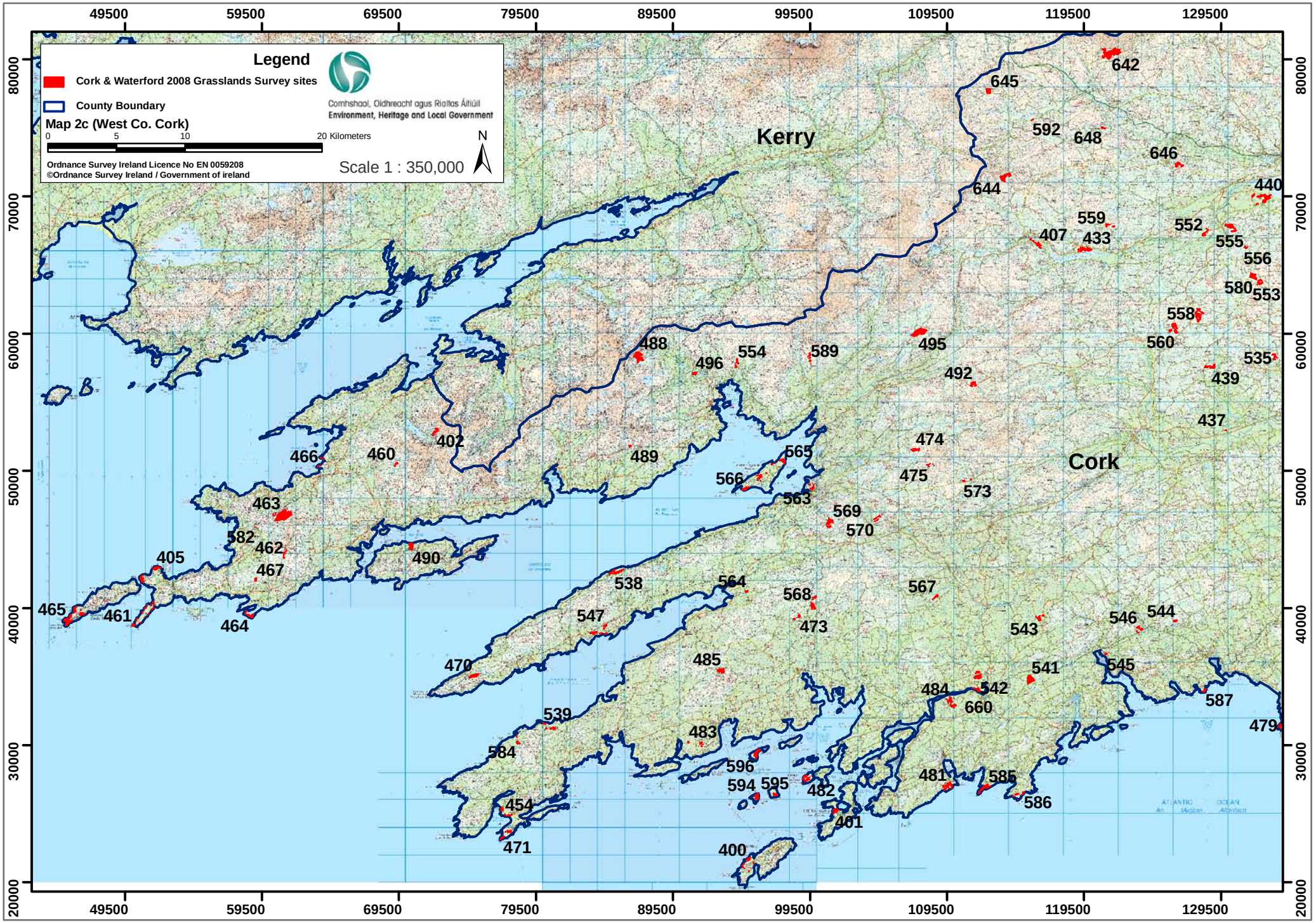
Map 2c: Location of sites in west Co. Cork (scale 1:350 000)


45664
55664
65664
75664
85664
95664
115664
135664
155664
175664
195664
115664
95664
85664
75664
65664
55664
45664
35664
25664
15664
Limerick
Tipperary
Waterford
Kerry
Cork
Map 2a
Map 2b
Map 2c
Legend
Cork & Waterford 2008 Grasslands Survey sites
County Boundary
Map 1a (Co. Cork)
0
10
20
40 Kilometers
N
Scale 1 : 650,000
Ordnance Survey Ireland Licence No EN 0059208
©Ordnance Survey Ireland / Government of ireland
Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government


185664
195664
205664
215664
225664
235664
245664
255664
265664
275664
125664
115664
105664
95664
85664
75664
Tipperary
Kilkenny
Wexford
Waterford
Cork
346
373
347
345
354
372
360
317
663
319
350
316
318
307
357
382
356
340
314
363
322
327
339
312
313
337
315
309
326
336
325
379
303
304
377
366
361
310
305
341
342
358
355
376
333
351
359
352
381
331
311
421
422
308
365
332
651
353
344
420
399
398
320
445
666
662
411
446
664
449
417
Legend
Cork & Waterford 2008 Grasslands Survey sites
County Boundary
Map 1b (Co. Waterford)
0
5
10
20 Kilometers
Ordnance Survey Ireland Licence No EN 0059208
©Ordnance Survey Ireland / Government of ireland
Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
N
Scale 1 : 350,000
ATLANTIC OCEAN
CELTIC SEA


Legend
Cork & Waterford 2008 Grasslands Survey sites
County Boundary
Map 2a (North Co. Cork)
0 5 10 20 Kilometers
Scale 1 : 350,000
N
Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
Ordnance Survey Ireland Licence No EN 0059208
©Ordnance Survey Ireland / Government of ireland
109500 119500 129500 139500 149500 159500 169500 179500 189500
130000 120000 110000 100000 90000 80000
Tipperary
Limerick
Kerry
Cork
593 650 667 616 626 628 503 663 619 618 623 525 622 630 668 627 526 527 429 505 632 621 629 430 524 528 424 523 631 512 423 379 634 636 635 519 530 518 633 550 549 548 516 514 428 640 497 597 509 520 431 426 421 641 571 455 508 498 521 510 600 642 645 511 601 415 592 648 599 581 507 406 502 449 446 646 644 414 500 447


Kerry
Cork
Waterford
125664
135664
145664
155664
165664
175664
185664
195664
205664
85664
75664
65664
55664
45664
35664
Legend
Cork & Waterford 2008 Grasslands Survey sites
County Boundary
Map 2b (East Co. Cork)
0
5
10
20 Kilometers
Ordnance Survey Ireland Licence No EN 0059208
©Ordnance Survey Ireland / Government of ireland
Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
Scale 1 : 350,000
N


Legend
Cork & Waterford 2008 Grasslands Survey sites
County Boundary
Map 2c (West Co. Cork)
0 5 10 20 Kilometers
Scale 1 : 350,000
N
Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
Ordnance Survey Ireland Licence No EN 0059208
©Ordnance Survey Ireland / Government of ireland
Kerry
Cork
49500
59500
69500
79500
89500
99500
109500
119500
129500
80000
70000
60000
50000
40000
30000
20000
642
645
592
648
646
644
440
559
407
433
552
555
556
580
553
558
560
535
439
437
495
492
488
496
554
589
474
475
573
565
566
563
569
570
402
466
460
489
463
582
462
405
467
490
465
461
464
538
564
568
567
547
473
543
546
544
470
485
541
545
484
542
660
587
479
539
483
584
596
594
595
482
481
585
586
454
401
471
400

Appendix 2: Summary information for each of the 250 surveyed sites

This appendix contains the following information on each site:

- Site ID
- Site Name
- Townland Name
- County
- Site Area (ha)
- Grid Reference
- pNHA (proposed Natural Heritage Area); no grassland sites were found within a NHA
- SAC (Special Area of Conservation)
- Parent material ID
- Soil ID
- Conservation score
- Threat score

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
303	Ballygally	Ballygally East; Ballygally	Waterford	8.4	W 98478 99196	73	2170	Alluvium undifferentiated; Bedrock at surface-Calcareous; Water	Mineral alluvium; Rendzinas/Lithosols; Lake/Reservoir	33.3%	27.8%
304	Ballyrafter Flats	Salterbridge	Waterford	9	X 08341 99249	72	2170	Alluvium undifferentiated; Sandstone till (Devonian); Water	Mineral alluvium; Surface water Gleys/Ground water Gleys; Lake/Reservoir	29.6%	22.2%
305	Dunabrattin	Dunabrattin	Waterford	1.7	X 46730 98575	1693		Bedrock at surface-Non calcareous	Lithosols/Regosols	22.2%	44.4%
307	Knockaunabulloga	Knockaveelish; Knockaunabulloga	Waterford	7.8	S 02416 08851			Blanket peat; Scree; Sandstone till (Devonian)	Peaty Gleys; Blanket Peats; Scree	40.7%	22.2%
308	Helvick Head	Ballynagaul More; Killinoorin	Waterford	11.1	X 29957 87968	665	665	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	29.6%	33.3%
309	Islandtarnsey	Coolnagoppoge	Waterford	14.7	S 55802 01130			Fen peat; Acid volcanic till	Surface water Gleys/Ground water Gleys; Peaty Gleys; Basin Peats	29.6%	38.9%
310	Annestown	Woodstown (Mid. By.) Islandikane Par.; Annestown	Waterford	16.2	X 49950 99165			Alluvium undifferentiated; Bedrock at surface-Non calcareous	Mineral alluvium; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Lithosols/Regosols	44.4%	16.7%
311	Killongford	Killongford	Waterford	6.3	X 23989 90222	663		Estuarine sediments (silts/clays); Sandstone till (Devonian)	Peaty Gleys; Marine/ Estuarine sediments	25.9%	27.8%
312	Fennor Bog	Matthewstown; Ballyscanlan	Waterford	5.9	S 53542 02146	1697		Alluvium undifferentiated; Fen peat; Bedrock at surface-Non calcareous; Acid volcanic till	Mineral alluvium; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Basin Peats	31.5%	27.8%
313	Creadan	Creadan; Fornaght	Waterford	4.7	S 70325 03160	787	2162	Alluvium undifferentiated; Beach sand; Bedrock at surface-Non calcareous; Acid volcanic till	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Beach sand and gravels	37.0%	27.8%
314	Kildermody	Carrickanure; Kildermody	Waterford	8.4	S 48279 08164			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Acid volcanic till; Shale till (Lower Palaeozoic)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	38.9%
315	Castlecraddock Bog	Ballynageeragh; Castlecraddock	Waterford	2.8	S 49052 02210	1695		Fen peat; Acid volcanic till	Surface water Gleys/Ground water Gleys; Peaty Gleys; Basin Peats	22.2%	22.2%
316	Lyre Mountain	Lyre West (D. Wt. By.); Lyre East (D. Wt. By.)	Waterford	100.7	S 27514 10580	1952	1952	Alluvium undifferentiated; Blanket peat; Bedrock at surface-Non calcareous; Scree; Sandstone till (Devonian); Water	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Blanket Peats; Scree; Lake/Reservoir	51.9%	22.2%
317	Knockanaffrin	Knockanaffrin	Waterford	32.8	S 28198 13850	1952	1952	Bedrock at surface-Non calcareous; Scree; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Scree	33.3%	16.7%
318	Kilclooney	Kilclooney	Waterford	1.1	S 33894 09550			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	25.9%	16.7%
319	Gracedieu	Granny	Waterford	3.8	S 58151 14060		2137	Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	44.4%	22.2%
320	Ardmore Head	Dysert	Waterford	9.3	X 19887 76785	2123	2123	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	40.7%	33.3%
322	Kilbryan Upper	Kilbryan Upper	Waterford	3.9	S 25487 04336			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	25.9%	33.3%
325	Knockyelan	Adramone More; Lemybrien (D. Wt. By.) Kilros. Par.	Waterford	9	S 32804 01098			Alluvium undifferentiated; Shale till (Lower Palaeozoic)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	37.0%	22.2%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
326	Barnankile	Barnankile	Waterford	1.4	S 29756 02043			Bedrock at surface-Non calcareous	Peaty Gleys (Shallow); Podzols (Peaty)/Lithosols/Peats	25.9%	11.1%
327	Ballinlough	Ballinlough	Waterford	1.7	S 44747 03239	1691		Acid volcanic till	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys	29.6%	27.8%
331	Tinnascart	Shanakill (D. Wn. By.) Aglish Par.; Tinnascart	Waterford	18.9	X 12171 88523			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	48.1%	27.8%
332	Carronbeg	Carronbeg; Carronadavderg	Waterford	0.5	X 16631 86942			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	11.1%	16.7%
333	Gliddane Beg	Gliddane Beg; Gliddane More	Waterford	5.1	X 25353 96049			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	22.2%	27.8%
336	Millerstown	Adramone Beg; Fox's Castle	Waterford	13.3	S 34147 00498			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Basic igneous till; Shale till (Lower Palaeozoic)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Lithosols/Regosols	40.7%	27.8%
337	Lisellan	Lisselan Intake; Lisselan	Waterford	36.2	S 61353 02697	671	671	Estuarine sediments (silts/clays); Acid volcanic till	Surface water Gleys/Ground water Gleys; Marine/ Estuarine sediments	48.1%	22.2%
339	Keiloge	Ballygarran (Gaul. By.); Keiloge	Waterford	4.9	S 62980 04832			Alluvium undifferentiated; Acid volcanic till	Mineral alluvium; Surface water Gleys/Ground water Gleys	25.9%	38.9%
340	Killure	Killure	Waterford	7.5	S 62700 07472			Fen peat; Acid volcanic till	Surface water Gleys/Ground water Gleys; Peaty Gleys; Basin Peats	40.7%	22.2%
341	Kilfarrasy	Kilfarrasy	Waterford	8.9	X 52281 98374	1693		Beach sand; Bedrock at surface-Non calcareous; Acid volcanic till	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols; Beach sand and gravels	33.3%	22.2%
342	Rathmoylan	Portally; Ballymacaw	Waterford	30.3	X 67132 98714			Alluvium undifferentiated; Beach sand; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Lithosols/Regosols; Beach sand and gravels	51.9%	33.3%
344	Ballynamona Lower	Monagoush; Ballynamona Lower	Waterford	38.7	X 27854 83528			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	59.3%	33.3%
345	Clondonnell	Park (Upp. By.)	Waterford	2.8	S 31613 18260			Shale till (Lower Palaeozoic)	Surface water Gleys/Ground water Gleys	18.5%	27.8%
346	Greenan	Kilmacomma; Greenan (Glen. By.)	Waterford	5.1	S 18525 21370		2137	Alluvium undifferentiated; Sandstone sands and gravels (Devonian); Sandstone till (Devonian)	Mineral alluvium; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	35.2%	27.8%
347	Russellstown	Kilmacomma; Russellstown	Waterford	1.3	S 17296 19420		2137	Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	22.2%	38.9%
350	Stonehouse	Stonehouse	Waterford	16.9	S 51629 12296		2137	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Lithosols/Regosols	38.9%	27.8%
351	Ballinvella	Ballinvella (Cos. By.); Monatrim Lower	Waterford	23.6	X 04602 93479		2170	Alluvium undifferentiated; Bedrock at surface-Calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Rendzinas/Lithosols	37.0%	11.1%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
352	Bridane Lower	Ballynaraha; Bridane Lower	Waterford	11	X 06307 93120	72		Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	29.6%	38.9%
353	Ballynatray Demesne	Ballynatray Demesne	Waterford	8.9	X 08944 83634	72	2170	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	22.2%	22.2%
354	Glenpatrick	Glenpatrick	Waterford	24.5	S 27815 18744			Bedrock at surface-Non calcareous; Scree; Sandstone till (Devonian); Shale till (Lower Palaeozoic)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Peaty Gleys (Shallow); Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Scree	48.1%	33.3%
355	Stradbally Beg	Stradbally Beg; Island	Waterford	25.8	X 36107 96111	1693		Bedrock at surface-Non calcareous; Basic igneous till	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Lithosols/Regosols	37.0%	27.8%
356	Lag Bridge	Knockboy (D. Wt. By.) Seskinan Par.; Bleantasour	Waterford	4.1	S 22010 06799			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	37.0%	22.2%
357	Meoul	Kilnacarriga; Knocknanask	Waterford	34.5	S 10923 07616			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Scree; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Scree	55.6%	27.8%
358	Brownstown	Brownstown	Waterford	8.4	X 61313 97849			Bedrock at surface-Non calcareous; Acid volcanic till	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	40.7%	22.2%
359	Tallowbridge	Loughnasollis Lower; Parkdotia	Waterford	41.9	X 00244 94140	72	2170	Alluvium undifferentiated; Sandstone till (Devonian); Water	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lake/Reservoir	40.7%	50.0%
360	Curraheen	Curraheen (Upp. By.)	Waterford	6.2	S 29691 14739	1952	1952	Bedrock at surface-Non calcareous; Scree; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Scree	33.3%	22.2%
361	Kilmurrin	Kilmurrin; Dunabrattin	Waterford	2.5	X 46575 98920	1693		Alluvium undifferentiated; Beach sand; Bedrock at surface-Non calcareous; Acid volcanic till	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Surface water Gleys (Shallow)/Ground water Gleys (Shallow); Beach sand and gravels	33.3%	27.8%
363	Coumtay Glen	Comeragh-Mountain	Waterford	4	S 30286 06844	1952	1952	Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	22.2%	22.2%
365	Ballynatray Commons	Ballynatray Commons; Ballycondon Commons	Waterford	3.9	X 04485 85571			Alluvium undifferentiated; Cutover peat; Sandstone till (Devonian)	Mineral alluvium; Surface water Gleys/Ground water Gleys; Basin Peats Blanket Peats	18.5%	27.8%
366	Knockmahon	Tankardstown; Knockmahon	Waterford	2.8	X 44697 98652	1693		Bedrock at surface-Non calcareous; Acid volcanic till	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	44.4%	33.3%
372	Glendalough	Knocknaree; Glendalough	Waterford	6.5	S 25123 16573			Blanket peat; Sandstone till (Devonian)	Peaty Gleys; Blanket Peats	33.3%	16.7%
373	Glenary	Glennagad; Poulnagunoge	Waterford	10.6	S 22253 21126			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	33.3%
376	Kilcloher	Rockfield; Kilcloher	Waterford	6.6	X 15551 96763			Alluvium undifferentiated; Bedrock at surface-Calcareous; Sandstone till (Devonian); Limestone till (Carboniferous)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Grey Brown Podzolics/Brown Earths; Rendzinas/Lithosols	35.2%	38.9%
377	Knockgarraun(hely)	Knockgarraun (Hely)	Waterford	2.5	X 17624 98099		2170	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	25.9%	33.3%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
379	Tobernahulla	Tobernahulla; Knockaunroe	Waterford	13.1	R 90554 00894			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	53.7%	22.2%
381	Knocknaglogh Upper	Knocknaglogh Upper	Waterford	1.5	X 18099 89968			Sandstone till (Devonian)	Podzols (Peaty)/Lithosols/Peats	18.5%	22.2%
382	Doon	Doon	Waterford	6.4	S 16927 06800			Bedrock at surface-Non calcareous	Lithosols/Regosols	24.1%	16.7%
398	Curragh North	Curragh (D. Wn. By.)	Waterford	6.6	X 19878 78801			Beach sand; Bedrock at surface-Calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols; Beach sand and gravels	33.3%	38.9%
399	Curragh	Curragh	Waterford	1	X 19108 79143			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	11.1%	16.7%
400	Cape Clear	Ballyieragh North; Ballyieragh South	Cork	6	V 94930 21665	101	101	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	37.0%	27.8%
401	Sherkin Island	Cloddagh; Kilmoon	Cork	5.4	W 01335 25144	101	101	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	40.7%	33.3%
402	Glanmore	Glenbeg	Cork	6.5	V 72155 52874	1879	1879	Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	48.1%	22.2%
405	Garinish Point	Billeragh; Ballaghboy	Cork	12.8	V 51817 42895	1986		Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	29.6%	11.1%
406	Blarney Bog	Killeens; Killard	Cork	14.1	W 63149 75437	1857		Alluvium undifferentiated; Fen peat; Sandstone till (Devonian); Water	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Basin Peats; Lake/Reservoir	44.4%	33.3%
407	Lough Allua Curraghy	Currahy; Illauninagh East	Cork	3.6	W 16230 66534	1065		Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian); Water	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Lake/Reservoir	33.3%	27.8%
408	Minane Bridge	Farranbrien East; Tubbrid	Cork	7.2	W 74237 56450	1966		Alluvium undifferentiated; Sandstone and shales till (Devonian/Carboniferous)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	22.2%	27.8%
410	Lisleecourt	Lisleecourt	Cork	1.8	W 52883 39708			Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	27.8%
411	Shanakill	Shanakill	Cork	0.9	X 03978 74209			Estuarine sediments (silts/clays); Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Marine/ Estuarine sediments	18.5%	11.1%
412	Rostellan	Rostellan	Cork	10.2	W 87971 65953	1076		Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	37.0%	16.7%
413	Curraghbinny	Curraghbinny	Cork	4.8	W 78171 62294			Estuarine sediments (silts/clays); Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Marine/ Estuarine sediments	22.2%	22.2%
414	Coolymurraghue	Coolymurraghue; Mount Desert	Cork	12.7	W 61631 72322	94		Alluvium undifferentiated; Bedrock at surface-Non calcareous	Mineral alluvium; Lithosols/Regosols	44.4%	33.3%
415	Coolowen	Ballygibbon; Curraghnalaght	Cork	7.7	W 61371 78211			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	51.9%	44.4%
417	Clasharinka	Clasharinka; Gortnahomna More	Cork	16.1	W 97264 73443	1183		Sandstone till (Devonian); Limestone till (Carboniferous)	Acid Brown Earths/Brown Podzolics; Grey Brown Podzolics/Brown Earths	25.9%	33.3%
418	Ballybraher	Ballingarrane; Ballybraher	Cork	21	W 96525 65107	76		Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Surface water Gleys/Ground water Gleys	37.0%	16.7%
419	Inch	Ballintra East; Glanturkin	Cork	1.8	W 87259 61022			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	33.3%	27.8%
420	Ballydaniel	Ballydaniel (ED Ardagh)	Cork	10.7	X 04779 83253			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	38.9%	27.8%
421	Rathdrum	Rathdrum (ED Ballynoe); Killasseragh	Cork	30.5	W 90427 87218			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	33.3%	50.0%
422	Kilfurrery	Kilnafurrery	Cork	0.8	W 97462 88237			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	18.5%	22.2%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
423	Ballyderown	Ballyderown	Cork	3.8	R 84023 00515	73	2170	Alluvium undifferentiated; Bedrock at surface-Calcareous	Mineral alluvium; Rendzinas/Lithosols	24.1%	22.2%
424	Manning	Ballyquane; Manning	Cork	40	R 77169 03262			Alluvium undifferentiated; Bedrock at surface-Calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols	48.1%	38.9%
426	Curraghprevin	Curraghprevin; Ballinaltig	Cork	31.8	W 78183 88321			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	33.3%	22.2%
428	Moneygorm	Moneygorm	Cork	0.3	W 70670 91898		2170	Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Peaty Gleys	25.9%	16.7%
429	Castlesaffron	Castlesaffron	Cork	4.8	R 62764 07498		2170	Alluvium undifferentiated; Bedrock at surface-Calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols	29.6%	33.3%
430	Ballygriggan	Ballygriggan; Ballyellis	Cork	8.6	R 67633 05929	74	2170	Alluvium undifferentiated; Bedrock at surface-Calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Rendzinas/Lithosols	25.9%	33.3%
431	Ballynabortagh	Graigue West; Coom	Cork	19.9	W 68957 87239			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys	29.6%	16.7%
432	Ballinaspig More	Carrigrohane; Ballinaspig More	Cork	8.3	W 62440 69731			Alluvium undifferentiated	Mineral alluvium	22.2%	33.3%
433	Turnaspidogy	Currahy; Turnaspidogy	Cork	6.6	W 19400 66156	1065		Alluvium undifferentiated; Sandstone sands and gravels (Devonian); Water	Mineral alluvium; Lithosols/Regosols; Lake/Reservoir	35.2%	33.3%
435	Oldfort	Old-Fort	Cork	6.7	W 64675 49646	1060		Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	22.2%	38.9%
436	Garrettstown	Coolbane; Ballincurrig	Cork	7.3	W 59743 44278	1053		Alluvium undifferentiated; Fen peat; Sandstone and shales till (Devonian/Carboniferous)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Basin Peats	29.6%	38.9%
437	Manch West	Manch Middle	Cork	0.7	W 29859 52955			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	22.2%	22.2%
439	Behagullane	Shanagh; Ahakeera	Cork	4.1	W 28915 57586			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	20.4%	33.3%
440	Tooms West	Dromkeen; Toomsbog	Cork	25.5	W 32846 69852	108	108	Alluvium undifferentiated; Blanket peat; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Blanket Peats	51.9%	33.3%
441	Rathard	Aherla Beg; Rathard	Cork	9.8	W 48970 67832			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	29.6%	27.8%
442	Ballinaboy	Ballinaboy; Ballyhooleen	Cork	20.1	W 61107 61416			Alluvium undifferentiated; Made ground; Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous); Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols; Made/Built land	33.3%	33.3%
445	Kilrush	Kilrush	Cork	3.3	W 95194 78277			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	25.9%	22.2%
446	Bilberry	Stumphill; Bilberry	Cork	3.3	W 92036 74807			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Surface water Gleys/Ground water Gleys	29.6%	27.8%
447	Killacloyne	Killacloyne	Cork	1.8	W 79260 73076	1058	1058	Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	22.2%	22.2%
449	Castleredmond	Castleredmond	Cork	9.2	W 89140 72392			Bedrock at surface-Calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols	33.3%	44.4%
454	Lackenakea	Dough; Lackenakea	Cork	4.4	V 77607 24895	1040	1040	Beach sand; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Beach sand and gravels	33.3%	27.8%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
455	Maulnahorna	Cusloura; Maulnahorna	Cork	7	W 31812 84426			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Lithosols/Regosols	18.5%	16.7%
456	Ballymacredmond	Ballymacredmond	Cork	4.4	W 50052 35773	1077		Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	18.5%	38.9%
460	Gowlane	Gowlane	Cork	2.1	V 69303 50536			Blanket peat; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Blanket Peats	13.0%	11.1%
461	Ballynacarriga	Ballynacarriga	Cork	4.4	V 50088 38742		2158	Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	37.0%	16.7%
462	Knockroe East	Cloghane Upper; Knockroe East	Cork	2.1	V 61088 43749			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	40.7%	16.7%
463	Urhin	Urhin	Cork	48	V 61010 46760			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	51.9%	16.7%
464	Canalough	Canalough	Cork	6.9	V 58592 39457			Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	25.9%	5.6%
465	Dursey Island	Tilickafinna	Cork	28.2	V 45345 39081	86		Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	48.1%	22.2%
466	Eyeries	Eyeries	Cork	1.1	V 63629 50341		2158	Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	22.2%	27.8%
467	Cahermeeleboe	Kilkinnikin East	Cork	2.7	V 59046 42084			Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	14.8%	27.8%
468	Cloheen Marsh	Garranagoleen; Cloheen Strand Intake	Cork	15	W 37509 38624	91	91	Estuarine sediments (silts/clays); Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Marine/ Estuarine sediments	44.4%	5.6%
470	Ballyroon Mountain	Ballyroon Mountain	Cork	11.8	V 75043 35112	102	102	Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	40.7%	27.8%
471	Mallavogue	Mallavoge	Cork	6	V 77060 23272	1040	1040	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	44.4%	33.3%
473	Gortnagrough	Glansallagh; Gortnagrough	Cork	2.3	V 98727 39413			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	38.9%	44.4%
474	Barnagowlane West	Coomanore North	Cork	7.8	W 07245 51527			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	25.9%	27.8%
475	Glandart	Glandart; Glanaclogha	Cork	1.7	W 08140 50448			Bedrock at surface-Non calcareous; Water	Podzols (Peaty)/Lithosols/Peats; Lake/Reservoir	33.3%	27.8%
479	Dundeady	Dundeady	Cork	7.3	W 33810 31423			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	22.2%	22.2%
481	Glannafeen	Glannafeen	Cork	9.8	W 09546 27086			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	55.6%	38.9%
482	Hare Island	Inishodriscol Or Hare Island	Cork	7.1	V 99275 27490	101	101	Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	44.4%	38.9%
483	Gubbeen	Gubbeen; Caherlusky	Cork	3.8	V 90621 30223			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	22.2%	22.2%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
484	Drisheen	Drisheen; Deelish (ED Skibbereen)	Cork	6	W 09695 33306			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	37.0%	38.9%
485	MountGabriel	Mountgabriel	Cork	10.3	V 93029 35498			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats	44.4%	27.8%
488	Rougham	Rougham	Cork	8.3	V 86947 58450	93	93	Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Blanket Peats	44.4%	22.2%
489	Kealagowlane	Lackavane	Cork	1	V 86342 51798			Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	29.6%	27.8%
490	Bear Island	Ballynakilla (ED Bear)	Cork	8.7	V 70389 44365			Sandstone and shales till (Devonian/Carboniferous); Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	42.6%	38.9%
492	Cousane	Cousane	Cork	7.1	W 11334 56326			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	40.7%	38.9%
495	Cappaboy More	Cappaboy More; Derryfadda	Cork	25	W 07407 60076			Alluvium undifferentiated; Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	44.4%	33.3%
496	Glengarriff	Glengarriff	Cork	4.4	V 91045 57096		90	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	33.3%	16.7%
497	Tullig	Garraneduff; Tullig	Cork	35	W 30061 88527		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	44.4%	22.2%
498	Oughtihery	Dooneens	Cork	21.1	W 38611 81646			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	33.3%
500	Ballincollig Regional Park	Coolyduff	Cork	4.2	W 58064 71284	94		Alluvium undifferentiated	Mineral alluvium	22.2%	22.2%
502	Rockfield Farm	Part Of Terry'S-Land; Carrigtohill	Cork	0.5	W 82841 73753			Bedrock at surface-Calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols	22.2%	5.6%
503	Ballinvonear	Ballyhoura; Ballinvonear	Cork	13	R 57234 15084	2036		Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys	25.9%	44.4%
505	Ballindangan Marsh	Commons (ED Derryvillane); Ballindangan	Cork	7.4	R 75667 09327	899		Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	29.6%	22.2%
506	Garrylucas Marsh	Kilcolman; Lispatrick Lower	Cork	31.8	W 61296 43326	87		Raised beach sands and gravels; Sandstone and shales till (Devonian/Carboniferous); Tidal marsh	Acid Brown Earths/Brown Podzolics; Beach sand and gravels; Marine/ Estuarine sediments	48.1%	22.2%
507	Inchaleagh	Inchaleagh	Cork	9.3	W 40068 75481	1067		Fen peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols; Basin Peats	44.4%	16.7%
508	Barrahaurin	Barrahaurin	Cork	7.8	W 44660 84532			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	24.1%	16.7%
509	Gowlane North	Glandine; Gowlane North	Cork	12.9	W 46999 87544			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	22.2%
510	Kilcullen South	Rylane; Knocknagoun	Cork	26.9	W 44005 81837			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	50.0%	33.3%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
511	Mountrivers	Coolineagh; Knockrour	Cork	11.7	W 43261 79526			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	33.3%	27.8%
512	Cloonteens	Cloonteens; Kippagh Middle	Cork	5.9	R 43855 00312		2170	Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	22.2%	11.1%
514	Shanavoher	Shanavoher (ED Dromore)	Cork	2	W 49491 92437			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	25.9%	27.8%
516	Esk South	Esk South	Cork	9.4	W 44739 90541			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	38.9%	50.0%
518	Monee West	Monee West; Ballinvuskig West	Cork	11.3	W 58837 93426			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys	29.6%	33.3%
519	Castlebarrett	Ballynamona; Dromore North	Cork	13.1	W 55901 93158		2170	Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	31.5%	22.2%
520	Glashaboy West	Glashaboy West; Beennamweel East	Cork	5.5	W 51823 86740			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	29.6%	22.2%
521	Pluckanes East	Pluckanes East; Garraun North	Cork	2.4	W 53480 82990			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	18.5%	22.2%
523	Castlelohort Demesne	Lohort West; Lohort East	Cork	66.1	R 45924 01470			Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	37.0%	44.4%
524	Subulter	Subulter	Cork	0.5	R 44420 03891			Bedrock at surface-Calcareous	Rendzinas/Lithosols	22.2%	11.1%
525	Lackaroe	Lackaroe; Knockbarry	Cork	15	R 46396 10256			Shales and sandstones till (Namurian)	Surface water Gleys/Ground water Gleys	29.6%	16.7%
526	Creggane	Rathclare	Cork	7.4	R 53703 10052		2170	Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	37.0%	27.8%
527	Waterhouse Marsh	Knockanare; Lag	Cork	1.9	R 56204 80241		2170	Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	16.7%	33.3%
528	Baltydaniel	Dromdowney Upper; Ballybeg	Cork	33.8	R 53904 02940			Cutover peat; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols; Basin Peats Blanket Peats	37.0%	27.8%
530	Knockacullata	Knockacullata; Knockbrack (ED Rahan)	Cork	11.1	W 63614 93299			Cutover peat; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Basin Peats Blanket Peats	40.7%	22.2%
534	Knockacullen	Currane	Cork	2.3	W 34045 50282			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	18.5%	33.3%
535	Ballaghanure	Garland; Ballaghanure	Cork	5.5	W 33429 58229			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	33.3%	38.9%
536	Kilnacranagh East	Kilnacranagh East	Cork	14.8	W 37252 56829			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	37.0%	38.9%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
538	Gouladoo	Foilakilly; Doonour	Cork	10.7	V 85268 42574			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	48.1%	33.3%
539	Dunkelly West	Gortduff; Dunkelly West	Cork	4	V 80135 31549			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	50.0%	33.3%
541	Derryleigh	Smorane; Lettertinlish	Cork	19.2	W 15567 34792			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	38.9%	33.3%
542	Derreendangan	Curragh	Cork	13.4	W 11755 34981			Made ground; Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols; Made/Built land	37.0%	33.3%
543	Coornishal	Adrigool; Coornishal	Cork	6.2	W 16233 39187			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	27.8%
544	Benduff	Benduff	Cork	3.4	W 26164 39056			Bedrock at surface-Non calcareous	Lithosols/Regosols	18.5%	22.2%
545	Drom	Drom	Cork	1.4	W 21114 36643			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	18.5%	33.3%
546	Cullane East	Cullane East	Cork	4.8	W 23442 38605			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	33.3%	38.9%
547	Dromnea	Rosskerrig; Dromnea	Cork	7.5	V 84607 38730	102	102	Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous); Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	44.4%	38.9%
548	Charlesfield	Charlesfield	Cork	17.1	W 38870 91657			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	33.3%	22.2%
549	Carraraigue	Carragraigue	Cork	3.3	W 36087 91715			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	22.2%	22.2%
550	Drombeg	Drombeg	Cork	2.4	W 32985 92662		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	22.2%	33.3%
552	Dromcarra	Inchineill; Dromcarra South	Cork	4.1	W 28232 67247			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	31.5%	44.4%
553	Reanacaragh	Deshure; Lisnacuddy	Cork	8.9	W 32340 63737			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	33.3%	33.3%
554	Rossnashunsoge	Gortroe Upper; Rossnashunsoge	Cork	4.4	V 94168 58093	1826		Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	24.1%	27.8%
555	Cooldaniel	Cooldaniel	Cork	12.7	W 30448 67492			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	29.6%	33.3%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
556	Moneycusker	Moneycusker; Teerelton	Cork	2.1	W 31286 66303			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	33.3%	33.3%
557	Teereeven	Kilbarry; Dunisky	Cork	2.2	W 37492 67229			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	18.5%	16.7%
558	Shanacashel	Glan; Shanacashel	Cork	20.4	W 27776 61393			Alluvium undifferentiated; Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	48.1%	50.0%
559	Derryvane	Derreen (ED Inchigeelagh); Derryvane	Cork	4.5	W 21143 67882			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	31.5%	16.7%
560	Gortroe	Gortroe (ED Aultagh)	Cork	11.5	W 26202 60164			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	46.3%	44.4%
563	Reenrour West	Town Lots; Reenrour West	Cork	3.9	V 99681 48737			Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics	22.2%	27.8%
564	Dromreagh	Dromreagh	Cork	2	V 94880 41222			Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	14.8%	11.1%
565	Reenavanny	Reenavanny; Crowkingle	Cork	6.8	V 97544 50728			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	44.4%	22.2%
566	Reenaknock	Kilmore; Close	Cork	9.8	V 94766 48694			Made ground; Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols; Made/Built land	55.6%	55.6%
567	Ballyourane	Ballyourane; Dromcorragh	Cork	1.5	W 08773 40875			Alluvium undifferentiated; Blanket peat; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Blanket Peats	22.2%	22.2%
568	Derrycarhoon	Derrycarhoon	Cork	10.1	V 99706 40155			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	59.3%	50.0%
569	Derreenagreanagh	Derreengreanagh; Ardrah	Cork	9.9	W 00939 46284			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous); Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	44.4%	44.4%
570	Inchibegga	Derryishal; Inchybegga	Cork	5.3	W 04266 46521			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	29.6%	33.3%
571	Ballynagree East	Ballynagree East	Cork	2.3	W 36324 85572			Blanket peat; Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats; Blanket Peats	22.2%	22.2%
573	Deelish	Deelish; Glanaclogha	Cork	1.7	W 10734 49247			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	20.4%	11.1%
580	Lisnacuddy	Lisnacuddy; Deshure	Cork	13.9	W 31834 64184			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys	40.7%	27.8%
581	Ballyshoneen	Ballyshoneen (ED Dripsey)	Cork	1.8	W 53275 77093			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics	25.9%	33.3%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
582	Allihies Mountain Mine	Cloan	Cork	0.1	V 58994 45896		2158	Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats	33.3%	11.1%
584	Polleenateada	Carrigacat And Milleen	Cork	3.5	V 78155 30191			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Podzols (Peaty)/Lithosols/Peats; Blanket Peats	59.3%	33.3%
585	Gokane	Gokane	Cork	13.5	W 12376 26993	97	97	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	40.7%	33.3%
586	Toehead	Gortacrossig; Toehead	Cork	4.6	W 15070 26546			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	51.9%	44.4%
587	Downeen	Downeen	Cork	2.5	W 28318 34026			Bedrock at surface-Non calcareous	Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	22.2%	22.2%
588	Dunowen	Dunowen	Cork	2.5	W 37615 33182			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	22.2%	22.2%
589	Derrynakilla	Carran; Derrynakilla	Cork	3.8	V 99509 58023	1873	1873	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Peaty Gleys; Podzols (Peaty)/Lithosols/Peats	22.2%	16.7%
590	Bengour West	Garranereagh; Bengour West	Cork	7.2	W 36431 61456			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Peaty Gleys	53.7%	27.8%
592	Lumnagh More	Lumnagh More; Coolea	Cork	1	W 15723 75593			Alluvium undifferentiated; Bedrock at surface-Non calcareous	Mineral alluvium; Podzols (Peaty)/Lithosols/Peats	25.9%	33.3%
593	Teeracurra	Gortnagoul; Teeracurra	Cork	18.9	R 42536 19676			Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Surface water Gleys/Ground water Gleys	33.3%	22.2%
594	Middle Calf Island	Calf Island Middle	Cork	8.2	V 95642 26265	101	101	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	33.3%	27.8%
595	East Calf Island	Calf Island Eas	Cork	3.1	V 96932 26435	101	101	Lake sediments undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Lacustrine	40.7%	11.1%
596	Castle Island	Castle Island	Cork	11.8	V 95614 29392	101	101	Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	40.7%	27.8%
597	Glannaharee West	Glannaharee West; Glenaknockane	Cork	10.2	W 44786 87647			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	44.4%	33.3%
599	Leckaneen	Dromatimore; Gortacroghig	Cork	7.2	W 43645 76466			Blanket peat; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Blanket Peats	37.0%	27.8%
600	Scarteen	Ballyhennessy; Scarteen	Cork	10.3	W 51209 79649			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	44.4%	38.9%
601	Dawstown	Dawstown (ED Blarney); Knocknalyre	Cork	35.4	W 58560 78900			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	64.8%	22.2%
603	Mossgrove	Mossgrove	Cork	5.7	W 42689 60521			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	25.9%	33.3%
604	Maglin	Maglin; Ballincollig	Cork	1.8	W 58851 70002	1249		Made ground; Bedrock at surface-Calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols; Made/Built land	33.3%	38.9%
605	Coolatooder	Coolatooder; Annagh More	Cork	15.7	W 58227 60949			Alluvium undifferentiated; Sandstone and shales till (Devonian/Carboniferous)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	29.6%	33.3%
606	Coolkirky	Fahanalooscane; Coolkirky	Cork	7.5	W 64487 59934			Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Surface water Gleys/Ground water Gleys	22.2%	44.4%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
607	Coolcullitha	Annagh More; Tooreen	Cork	7	W 56963 59752			Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	24.1%	16.7%
608	Coolmoreen	Coolmoreen	Cork	0.9	W 55663 56178			Alluvium undifferentiated; Estuarine sediments (silts/clays); Sandstone and shales till (Devonian/Carboniferous)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Marine/ Estuarine sediments	33.3%	38.9%
610	Dromderrig	Dromderrig	Cork	1.8	W 63631 49803			Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	14.8%	22.2%
613	Dunworly	Dunworly; Ballymacredmond	Cork	12.8	W 48418 36429	1077		Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	48.1%	22.2%
615	Aghmanister	Garrane; Grange More	Cork	8.9	W 46427 40993			Lake sediments undifferentiated; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lacustrine	40.7%	38.9%
616	Carrigeen	Moyge; Carrigeen	Cork	13.9	R 47811 15444			Alluvium undifferentiated; Bedrock at surface-Calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Rendzinas/Lithosols	48.1%	22.2%
618	Kilcolman	Kilcolman East; Kilcolman Middle	Cork	7.6	R 58020 11338	92		Fen peat; Bedrock at surface-Calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Rendzinas/Lithosols; Basin Peats	51.9%	22.2%
619	Imogane Bridge	Clashelane; Ballyadam	Cork	6.1	R 50598 12423			Alluvium undifferentiated; Bedrock at surface-Calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Rendzinas/Lithosols	37.0%	22.2%
621	Longacre	Longacre; Clonfert	Cork	15.6	R 30782 05660		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	44.4%	16.7%
622	Croanrea	Croanrea; Glentanefinnane	Cork	9.1	R 18909 07865		2170	Alluvium undifferentiated; Blanket peat; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	37.0%	27.8%
623	Knockduff Lower	Knockduff Lower; Meens	Cork	13.1	R 28510 10640		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	33.3%	33.3%
626	Twomey's Bridge	Meentinny East; Meenkearagh	Cork	10.6	R 27543 14306			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Lithosols/Regosols	37.0%	27.8%
627	Garrison	Knockardfree; Coolageela East	Cork	15.9	R 39849 08142		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	48.1%	27.8%
628	Gooseberryhill	Meenroe; Gooseberryhill	Cork	11.5	R 32507 13373			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	37.0%	27.8%
629	Rossacon	Meelaherragh; Rossacon	Cork	30.2	R 35899 04629		2170	Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Surface water Gleys/Ground water Gleys	44.4%	38.9%
630	Ballyduane	Ballyduane West; Gortnaglogh	Cork	28.4	R 28447 07019		2170	Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	38.9%	22.2%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
631	Urraghilmore	Doonasleen East; Urraghilmore (West)	Cork	13.5	R 22376 00448		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	48.1%	27.8%
632	Clashykinleen	Foilogohig; Clashykinleen West	Cork	16.2	R 21368 06975			Shales and sandstones till (Namurian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	33.3%	22.2%
633	Claraghatlea	Liscreagh; Claraghatlea North	Cork	8.5	W 25973 91281		2170	Alluvium undifferentiated; Blanket peat; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols; Blanket Peats	29.6%	16.7%
634	Ahane Upper	Ahane Upper; Euglaune	Cork	6.8	W 22683 94931		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	29.6%	22.2%
635	Kilmacurrane	Knockeenatuder; Kilmacurrane	Cork	2.7	W 36931 93548			Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys	44.4%	33.3%
636	Dromahoe	Rathcool; Dromahoe	Cork	4.6	W 32657 95461		2170	Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	22.2%	22.2%
638	Gallanes	Gallanes; Templebryan South	Cork	6.6	W 39491 43289	1052		Lake sediments undifferentiated; Bedrock at surface-Non calcareous; Sandstone and shales till (Devonian/Carboniferous)	Acid Brown Earths/Brown Podzolics; Lithosols/Regosols; Lacustrine	40.7%	22.2%
640	Ballydaly	Kilmeedy West; Claragh Beg	Cork	24.1	W 23772 88539			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	37.0%	22.2%
641	Geararoe	Cloghboola Beg; Geararoe	Cork	9.3	W 27357 88238			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	33.3%	22.2%
642	Coomnagire	Coomnaclohy; Coomnagire	Cork	28	W 21319 80511			Blanket peat; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols; Blanket Peats	51.9%	33.3%
644	Cahernacaha	Carrignadoura; Cahernacaha	Cork	10.6	W 13568 71311			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Peaty Gleys; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	29.6%	33.3%
645	Inchamore	Inchamore	Cork	7.5	W 12533 77687			Blanket peat; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Blanket Peats	37.0%	22.2%
646	Caherkereen	Caherkereen	Cork	2.5	W 26387 72395			Bedrock at surface-Non calcareous	Lithosols/Regosols	40.7%	38.9%
648	Gortanimill	Gortanacra	Cork	2.2	W 20855 75017			Alluvium undifferentiated; Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Lithosols/Regosols	25.9%	38.9%
649	Shanagarry South	Part Of Ballynamona; Shanagarry South	Cork	2.9	W 98504 66399	76		Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics	22.2%	11.1%
650	Gortnagoul	Farthingville West; Gortnagoul	Cork	27.9	R 43378 19791			Alluvium undifferentiated; Shales and sandstones till (Namurian)	Mineral alluvium; Surface water Gleys/Ground water Gleys	40.7%	16.7%
651	Shanaboola	Ballyknock South; Shanaboola	Cork	7.2	W 95547 84862			Bedrock at surface-Non calcareous; Sandstone till (Devonian)	Acid Brown Earths/Brown Podzolics; Podzols (Peaty)/Lithosols/Peats; Lithosols/Regosols	35.2%	22.2%

Site ID	Site Name	Townland Name	County	Site Area	Grid Ref.	pNHA	SAC	Parent material ID	Soil ID	Conservation score	Threat score
653	Furrow	Carrigane; Furrow	Cork	22.9	R 86611 14213			Alluvium undifferentiated; Sandstone till (Devonian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys	44.4%	33.3%
656	Crosshavenhill	Crosshavenhill	Cork	0.6	W 80695 61803			Made ground; Bedrock at surface-Non calcareous	Lithosols/Regosols; Made/Built land	29.6%	27.8%
660	Skibbereen Marsh	Abbeystrowry; Marsh	Cork	5.4	W 11825 33982			Alluvium undifferentiated; Made ground	Mineral alluvium; Made/Built land	29.6%	33.3%
662	Killeagh West Verge	Lissacrue; Mountbell	Cork	1.4	W 98737 74441			Sandstone till (Devonian); Limestone till (Carboniferous)	Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Grey Brown Podzolics/Brown Earths	18.5%	22.2%
664	Castlemartyr Verge	Castlemartyr; Caherultan	Cork	1.6	W 95485 73779			Made ground; Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys; Made/Built land	11.1%	22.2%
666	Youghal Verge	Inchiquin; Burges Lower	Cork	1.7	X 04841 76281			Sandstone till (Devonian)	Surface water Gleys/Ground water Gleys	18.5%	16.7%
667	Knockaneglass	Keeltane; Coolbane (ED Allow)	Cork	3.7	R 38468 14807		2170	Alluvium undifferentiated; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Lithosols/Regosols	22.2%	22.2%
668	Killowen	Killowen; Barleyhill	Cork	12.6	R 33417 08977			Alluvium undifferentiated; Blanket peat; Bedrock at surface-Non calcareous; Shales and sandstones till (Namurian)	Mineral alluvium; Acid Brown Earths/Brown Podzolics; Surface water Gleys/Ground water Gleys; Peaty Gleys; Lithosols/Regosols; Blanket Peats	44.4%	33.3%

Appendix 3: Field sheets

- General site survey sheet
- Site species list
- Relevé sheet
- EU Annex I grassland habitat assessment sheet

Site ID:		**Adjacent Habitats (✓)**				**Fossitt Grassland within Site**	✓	**Relevé No.**	**Description** (✓ box if relevé is also an assessment)	✓
Ecologist ID:		FL		WN		**GS1** Dry calcareous & neutral				
Date:		FW		WD		**GS2** Dry meadows & grass verges				
Site Area (ha):		FP		WS		**GS3** Dry-humid grassland				
Site Geography	✓	FS		WL		**GS4** Wet grassland				
Esker		GA		BC		**GM1** Freshwater marsh				
Drumlin		GS		BL						
Hill		GM		ER						
Valley		HH		ED		**Other Fossitt Habitats**	✓			
Lakeside		HD		Other		**FW4** Drainage ditches				
Bogland		PB		Dry ditch		**HD1** Dense bracken				
Lowland plain		PF		Fence		**PB4** Cutover bog				
Other:		**Boundary Type**			✓	**WL1** Hedgerows				
		Abrupt				**WL2** Treelines				
Topographical Situation	✓	Diffuse				**WS1** Scrub				
Flat		**Site Management (✓)**				**ED3** Recolonising bare ground				
Summit		Cattle pasture				**BL1** Stone walls		No. relevés:		
Upper slope		Sheep pasture				**BL2** Earth banks		**General Site Notes** (write 'limestone pavement' in other adjacent habitats if present)		
Mid-slope		Horse pasture				**BL3** Buildings & artificial surfaces				
Lower slope		Hay meadow				Other:				
		Org. fertilizer application				None				
Soil Moisture Regime	✓	Non-org fertilizer app.								
Freely draining		Unknown fertilizer app.				**EU Annex I Habitats**	✓			
Moderately free		Liming				**6130** Calaminarian grasslands				
Impeded		Topping				**6210** *Festuco-Brometalia*				
Strongly impeded		Mown: May-Jun				**6211** **Festuco-Brometalia*				
		Mown: Jul-Oct				**6230** Species-rich *Nardus* grassland				
Seasonal flooding		Spring grazing: May-Jun				**6410** *Molinion* meadows				
		Summer grazing: Jul-Aug				**6430** Hydrophilous tall herb comm**.**				
Damaging Operations	✓	Autumn grazing: Sep-Nov				**6510** Lowland hay meadows				
Drainage		Winter grazing: Dec- Apr				None				
Burning		Cut once or <1 per year								
Dumping		Cut >1 per year				**Grazing level**	✓			
Afforestation		Supplementary feeding				Undergrazing				
Other:		**Fauna**			✓	Appropriate grazing				
None		Rabbits				Overgrazing				
		Hares								
Archaeological Features	✓	Deer				**Encroachment**	✓			
Earthworks		Badgers				Bracken				
Lazy beds		Frogs				Scrub				
Ringforts		Anthills				Heath				
Other:		Other:				None				
None		None								

Site species list

Woody sp.	**Herbs**	**Herbs**	**Herbs**	**Sedges**	**Grasses**	**Mosses**	**Mosses**
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
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
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	
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 erec	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	
	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		Oxyr 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 feli	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 erec	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 feli	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	

Site ID:

Date:

Ecologist ID:

Additional species notes:

Other sp. (write names in full)

Other sp.

Relevé species list

Woody	Herbs	Herbs	Herbs	Sedges	Grasses	Mosses	Mosses
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
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
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	
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 erec	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	
	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		Oxyr 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 feli	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 erec	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 feli	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	

Site ID:
Relevé ID:
Ecologist ID:
Date:
Grid Ref: ±
Fossitt habitat:
EU Annex I habitat:
Annex I assessment stop no:
Soil ID:
Topography:
Altitude:
Aspect:
Slope:
Additional relevé notes:

Other sp. (write names in full)

Other relevé data

Cover score (DOMIN)
Bare soil
Bare rock
Surface water
Litter: incl. dead grass stems
Bryophyte layer
Field layer
Broadleaf herbs
Median grass height (cm)
Median herb height (cm)
Broadleaf herb:grass etc (%)
Soil pH
Sample 1
Sample 2
Mean

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

Site ID	Date	Recorder ID	EU Annex I habitat

Each stop (2 x 2m)	STOP	
STOP NUMBER		
	PASS	**FAIL**
+ve indicator species (record number)		
-ve indicator species (record number)		
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. 9 +ve indicator species or 15% litter cover, in either the pass or fail box

Appendix 4: Summary habitat information for each of the 250 surveyed sites

This appendix contains the following information on each site:

1) Site ID
2) Site Name
3) County
4) 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).

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.

5) 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).
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (important orchid sites) (6211).
- 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 caerulea*) (6410).
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430).
- Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (6510).

6) The number of relevés within each site occupied by the four semi-natural grassland / marsh vegetation groups defined by this project:
Plantago lanceolata – Festuca rubra grassland group.
Agrostis capillaris – Galium saxatile grassland group.
Agrostis stolonifera – Ranunculus repens grassland / marsh group.
Juncus acutiflorus – Molinia caerulea grassland group.

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
303	Ballygally	Waterford				73%	27%								1		1	
304	Ballyrafter Flats	Waterford				100%											1	
305	Dunabrattin	Waterford	100%												1			
307	Knockaunabulloga	Waterford			83%	17%					83%					4	1	
308	Helvick Head	Waterford	45%	11%				45% (GSi1)							1		1	
309	Islandtarnsey	Waterford				76%		24% (GSi4)									2	
310	Annestown	Waterford				100%											5	
311	Killongford	Waterford				100%											2	
312	Fennor Bog	Waterford				17%		83% (GSi3)							1			1
313	Creadan	Waterford	44%			36%		20% (GSi4)								1	1	
314	Kildermody	Waterford	84%			16%									2		1	
315	Castlecraddock Bog	Waterford					100%										1	
316	Lyre Mountain	Waterford			99%	1%					99%				1	3		
317	Knockanaffrin	Waterford			100%						100%					4		
318	Kilclooney	Waterford			100%											1		
319	Gracedieu	Waterford		8%		92%											4	
320	Ardmore Head	Waterford		100%										59%	4		2	
322	Kilbryan Upper	Waterford			76%	5%		19% (GSi3)							2			1
325	Knockyelan	Waterford	43%			57%											1	2
326	Barnankile	Waterford			100%						100%				1	3		
327	Ballinlough	Waterford				97%	3%										3	
331	Tinnascart	Waterford	1%	79%		14%		6% (GSi1)							2		2	
332	Carronbeg	Waterford	100%														1	
333	Gliddane Beg	Waterford				100%												1
336	Millerstown	Waterford	5%			95%											1	1
337	Lisellan	Waterford				100%											2	
339	Keiloge	Waterford				100%											4	
340	Killure	Waterford		16%		83%	1%										5	
341	Kilfarrasy	Waterford	100%												1		1	
342	Rathmoylan	Waterford	82%	18%											2		2	
344	Ballynamona Lower	Waterford	16%	2%		63%		18% (GSi2)				8%			1	2	3	3
345	Clondonnell	Waterford				100%											1	
346	Greenan	Waterford				93%		7% (GSi1)							1		2	
347	Russellstown	Waterford	45%			55%									1		1	
350	Stonehouse	Waterford				75%		25% (GSi1)							1		1	
351	Ballinvella	Waterford		30%		70%									1		1	1

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
352	Bridane Lower	Waterford				100%											4	
353	Ballynatray Demesne	Waterford		100%													1	
354	Glenpatrick	Waterford			37%	3%		60% (GSi3)			32%					5	2	
355	Stradbally Beg	Waterford	100%														2	
356	Lag Bridge	Waterford				100%						30%						5
357	Meoul	Waterford			72%	10%		18% (GSi3)			5%				1	4	2	1
358	Brownstown	Waterford	17%			3%		80% (GSi1)							2		2	
359	Tallowbridge	Waterford				21%	15%	64% (GSi4)									4	
360	Curraheen	Waterford			90%	10%					64%					5		1
361	Kilmurrin	Waterford	6%				89%								1		1	
363	Coumtay Glen	Waterford				90%												1
365	Ballynatray Commons	Waterford				38%		62% (GSi4)									2	
366	Knockmahon	Waterford	3%	97%					3%						5			
372	Glendalough	Waterford			91%	9%					91%					4	1	
373	Glenary	Waterford			100%										1			
376	Kilcloher	Waterford						100% (GSi1)									1	
377	Knockgarraun(hely)	Waterford	100%												1			
379	Tobernahulla	Waterford				89%		11% (GSi1)				33%			1		2	5
381	Knocknaglogh Upper	Waterford			13%			87% (GSi3)							1		1	
382	Doon	Waterford						100% (GSi1)								1		
398	Curragh North	Waterford	15%	85%											3		1	
399	Curragh	Waterford		100%													1	
400	Cape Clear	Cork		3%	67%	14%		16% (GSi2,GSi4)							2		1	2
401	Sherkin Island	Cork	41%	33%				26% (GSi1,GSi2)							3			
402	Glanmore	Cork			100%						100%				1	3		
405	Garinish Point	Cork			100%										4			
406	Blarney Bog	Cork				100%											2	1
407	Lough Allua Curraghy	Cork				100%						92%					2	2
408	Minane Bridge	Cork				64%		36% (GSi4)									2	
410	Lisleecourt	Cork	100%							4%					2			
411	Shanakill	Cork				100%									1		1	
412	Rostellan	Cork				42%	58%										4	
413	Curraghbinny	Cork				100%									1		2	
414	Coolymurraghue	Cork	23%			33%	2%	42% (GSi1,GSi4)									4	1
415	Coolowen	Cork				58%	26%	15% (GSi4)				23%					2	5
417	Clasharinka	Cork	31%					69% (GSi1)							1		1	

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
418	Ballybraher	Cork				92%	8%						8%				4	1
419	Inch	Cork	44%			49%	7%								1		1	1
420	Ballydaniel	Cork	22%			37%		42% (GSi2)							1		1	1
421	Rathdrum	Cork				7%		93% (GSi1,GSi2,GSi4)							1		1	2
422	Kilfurrery	Cork	100%												1			
423	Ballyderown	Cork					20%	80% (GSi4)									2	
424	Manning	Cork	14%	86%											1		1	
426	Curraghprevin	Cork	39%			61%											2	
428	Moneygorm	Cork				100%												1
429	Castlesaffron	Cork	14%			86%									1		2	
430	Ballygriggan	Cork				100%											2	
431	Ballynabortagh	Cork				100%											1	
432	Ballinaspig More	Cork				100%											1	
433	Turnaspidogy	Cork				47%		53% (GSi1)							1		1	
435	Oldfort	Cork		100%													1	
436	Garrettstown	Cork		22%		78%											3	
437	Manch West	Cork	100%														1	
439	Behagullane	Cork						100% (GSi1)							1		1	
440	Tooms West	Cork				94%	6%								1		4	1
441	Rathard	Cork				100%											2	
442	Ballinaboy	Cork				100%											2	
445	Kilrush	Cork	73%			27%									1		1	
446	Bilberry	Cork				100%											1	1
447	Killacloyne	Cork				100%											2	
449	Castleredmond	Cork	50%					50% (GSi1)							2			
454	Lackenakea	Cork			54%			46% (GSi3)							2			
455	Maulnahorna	Cork			100%										1	1		
456	Ballymacredmond	Cork	100%												2			
460	Gowlane	Cork						100% (GSi3)								2		
461	Ballynacarriga	Cork			93%	7%									1	1		1
462	Knockroe East	Cork			52%	48%					52%				1	1	2	2
463	Urhin	Cork			100%											4		
464	Canalough	Cork			100%											2		
465	Dursey Island	Cork	6%		79%			14% (GSi1)							4			
466	Eyeries	Cork			67%	33%									2			1
467	Cahermeeleboe	Cork			100%													1

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
468	Cloheen Marsh	Cork				83%	17%										5	
470	Ballyroon Mountain	Cork			16%	62%		21% (GSi3)							1			2
471	Mallavogue	Cork	40%	45%		5%		10% (GSi2)							2	1		1
473	Gortnagrough	Cork	29%			57%		13% (GSi2)							1		1	1
474	Barnagowlane West	Cork				100%											1	
475	Glandart	Cork			15%	85%					15%					2		1
479	Dundeady	Cork	42%					58% (GSi1)							2			
481	Glannafeen	Cork	4%	7%	3%	1%		85% (GSi1)							5			1
482	Hare Island	Cork	4%	6%	12%	1%		78% (GSi1)							4		2	
483	Gubbeen	Cork	34%			7%		59% (GSi1)							2		2	
484	Drisheen	Cork		22%		78%									1			1
485	MountGabriel	Cork			34%	66%					4%				1	4		1
488	Rougham	Cork			52%	48%					48%				1	3		1
489	Kealagowlane	Cork			100%						100%					4		
490	Bear Island	Cork				11%		89% (GSi3,GSi4)									1	1
492	Cousane	Cork				15%		85% (GSi4)				15%					2	4
495	Cappaboy More	Cork				99%		1% (GSi4)				29%					2	4
496	Glengarriff	Cork			82%	18%					82%					2	2	1
497	Tullig	Cork	6%			68%		26% (GSi1,GSi4)							3		2	3
498	Oughtihery	Cork			70%			30% (GSi3)							1		1	
500	Ballincollig Regional Park	Cork		56%				42% (GSi2)							1		2	
502	Rockfield Farm	Cork		100%											1			
503	Ballinvonear	Cork				100%											1	
505	Ballindangan Marsh	Cork				36%	17%										4	
506	Garrylucas Marsh	Cork	11%			53%	34%								2			
507	Inchaleagh	Cork				19%		81% (GSi3)								1		1
508	Barrahaurin	Cork						100% (GSi1)								1		
509	Gowlane North	Cork	86%			5%											2	
510	Kilcullen South	Cork		28%	47%	14%		10% (GSi1,GSi3)							3		1	
511	Mountrivers	Cork	62%			38%											2	
512	Cloonteens	Cork				100%											2	
514	Shanavoher	Cork				100%											2	
516	Esk South	Cork	28%			5%		67% (GSi3,GSi4)							3		1	
518	Monee West	Cork				73%		27% (GSi4)									1	1
519	Castlebarrett	Cork				17%		83% (GSi1)									2	1
520	Glashaboy West	Cork				80%		20% (GSi4)										1

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
521	Pluckanes East	Cork				100%									1		1	
523	Castlelohort Demesne	Cork	21%			73%		6% (GSi4)									2	
524	Subulter	Cork	100%												1			
525	Lackaroe	Cork				100%											1	
526	Creggane	Cork	48%			18%	34%										3	
527	Waterhouse Marsh	Cork						100% (GSi4)									1	
528	Baltydaniel	Cork		26%		74%											4	
530	Knockacullata	Cork			6%	89%		5% (GSi3)							1		2	1
534	Knockacullen	Cork	74%		26%										1		1	
535	Ballaghanure	Cork				100%											1	1
536	Kilnacranagh East	Cork	44%			3%		53% (GSi1,GSi4)							1			1
538	Gouladoo	Cork	12%		9%	30%		49% (GSi1)									2	3
539	Dunkelly West	Cork	3%	4%		52%		41% (GSi2)				4%			2		1	1
541	Derryleigh	Cork				1%		99% (GSi2)									1	1
542	Derreendangan	Cork			92%	8%										1	1	
543	Coornishal	Cork		8%		91%		1% (GSi2)							1			1
544	Benduff	Cork		100%													1	
545	Drom	Cork	100%														1	
546	Cullane East	Cork	55%			45%											2	
547	Dromnea	Cork		39%		14%		47% (GSi1,GSi3,GSi4)							3		1	
548	Charlesfield	Cork				100%											1	1
549	Carraraigue	Cork				100%												1
550	Drombeg	Cork	22%					78% (GSi1)							2			
552	Dromcarra	Cork				26%		74% (GSi1)							1		1	
553	Reanacaragh	Cork		82%		18%						12%			2		4	1
554	Rossnashunsoge	Cork						100% (GSi4)							2			
555	Cooldaniel	Cork	73%			5%		22% (GSi4)									3	
556	Moneycusker	Cork				100%						75%					1	3
557	Teereeven	Cork				62%		38% (GSi4)									2	
558	Shanacashel	Cork	55%			25%		21% (GSi1)							3		1	1
559	Derryvane	Cork				46%		54% (GSi3)							1		1	
560	Gortroe	Cork				15%		85% (GSi1)							1		1	
563	Reenrour West	Cork	9%			66%		25% (GSi4)							1		1	1
564	Dromreagh	Cork				12%		88% (GSi4)									2	
565	Reenavanny	Cork	6%			10%	3%	82% (GSi1)				3%			1	1		3
566	Reenaknock	Cork	1%			28%		71% (GSi1,GSi4)				8%			1		1	4

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
567	Ballyourane	Cork				100%									1			
568	Derrycarhoon	Cork			12%	14%		74% (GSi3)				1%			2			7
569	Derreenagreanagh	Cork	4%			2%		94% (GSi1,GSi4)				1%			2	1	1	1
570	Inchibegga	Cork			66%	10%		24% (GSi3)								2		1
571	Ballynagree East	Cork			100%						100%					4		
573	Deelish	Cork				22%		78% (GSi1)							1		1	
580	Lisnacuddy	Cork	6%			94%									1		1	2
581	Ballyshoneen	Cork				44%		56% (GSi4)							1	1	1	
582	Allihies Mountain Mine	Cork			100%				37%						5			
584	Polleenateada	Cork	5%			74%		17% (GSi4)	5%			68%			4	1	1	3
585	Gokane	Cork	35%					65% (GSi1)							2			
586	Toehead	Cork	17%	40%		25%	18%								2		2	1
587	Downeen	Cork	39%					61% (GSi1)							3			
588	Dunowen	Cork	100%														1	
589	Derrynakilla	Cork			100%						100%					2		
590	Bengour West	Cork				90%	7%	3% (GSi1)				22%					4	4
592	Lumnagh More	Cork				100%											1	
593	Teeracurra	Cork				100%											2	
594	Middle Calf Island	Cork	100%												2			1
595	East Calf Island	Cork		76%	15%	4%	4%								3		1	1
596	Castle Island	Cork			84%	16%										2		1
597	Glannaharee West	Cork			48%	48%		4% (GSi3)									2	2
599	Leckaneen	Cork				12%	88%										2	1
600	Scarteen	Cork				2%		98% (GSi1,GSi3)								1		
601	Dawstown	Cork		7%		52%	1%	40% (GSi3)				15%			1	1	1	7
603	Mossgrove	Cork	47%			36%		17% (GSi4)									4	
604	Maglin	Cork	29%	11%		49%		11% (GSi1)							3		2	
605	Coolatooder	Cork				89%		11% (GSi4)									3	
606	Coolkirky	Cork				100%											2	
607	Coolcullitha	Cork						100% (GSi4)									1	
608	Coolmoreen	Cork	55%	40%		5%									1		1	
610	Dromderrig	Cork	100%														1	
613	Dunworly	Cork	1%	54%		2%		44% (GSi2)							2		2	1
615	Aghmanister	Cork	45%			8%	47%									1	3	1
616	Carrigeen	Cork	17%	3%		80%									1		3	
618	Kilcolman	Cork		65%		30%	5%					22%				1	5	2

Site ID	Site Name	County	GS1	GS2	GS3	GS4	GM1	GSi	6130	6210/ 6211	6230	6410	6430	6510	Plan Fest	Agro Gali	Agro Ranu	Junc Moli
619	Imogane Bridge	Cork	1%			79%		20% (GSi1)							2	1		1
621	Longacre	Cork	9%			90%	1%										2	1
622	Croanrea	Cork	5%			95%											2	
623	Knockduff Lower	Cork				70%		30% (GSi4)							1		2	
626	Twomey's Bridge	Cork				100%												2
627	Garrison	Cork				100%						45%					2	3
628	Gooseberryhill	Cork				100%											3	
629	Rossacon	Cork		33%		54%		13% (GSi4)							1		3	
630	Ballyduane	Cork				81%		19% (GSi1,GSi4)							1			2
631	Urraghilmore	Cork		18%		69%		12% (GSi4)				5%				1	4	3
632	Clashykinleen	Cork				100%												2
633	Claraghatlea	Cork	1%			99%										1	1	
634	Ahane Upper	Cork				100%											2	1
635	Kilmacurrane	Cork	3%			97%						10%					3	1
636	Dromahoe	Cork				33%		67% (GSi4)									2	
638	Gallanes	Cork	33%			34%	2%	31% (GSi1)							1	1	2	
640	Ballydaly	Cork			92%	8%										1	1	
641	Geararoe	Cork				38%		62% (GSi4)									2	
642	Coomnagire	Cork			100%						100%				2	2		
644	Cahernacaha	Cork				100%											2	
645	Inchamore	Cork			100%						100%					4		
646	Caherkereen	Cork			40%	50%		10% (GSi3)									1	1
648	Gortanimill	Cork				100%											1	
649	Shanagarry South	Cork				100%									1		2	
650	Gortnagoul	Cork		3%		92%		6% (GSi4)									3	
651	Shanaboola	Cork			7%	76%		17% (GSi1)							1	1	2	
653	Furrow	Cork				99%	1%										3	
656	Crosshavenhill	Cork		100%											2			
660	Skibbereen Marsh	Cork		84%		11%		5% (GSi4)									4	
662	Killeagh West Verge	Cork		100%											1			
664	Castlemartyr Verge	Cork		100%											1		1	
666	Youghal Verge	Cork		100%													1	
667	Knockaneglass	Cork				100%												2
668	Killowen	Cork		7%		33%		60% (GSi4)								1	4	

Appendix 5: Annex I assessment indicator species and criteria

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%

2 passes required for overall pass

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 $\leq$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 20m^2 in vicinity of monitoring stop showing signs of serious disturbance

Semi-natural dry grasslands & scrub facies on calcareous substrates (6210)
Semi-natural dry grasslands & scrub facies on calcareous substrates: orchid rich sites (6211)

Positive indicator species

Antennaria dioica
Anthyllis vulneraria
Blackstonia perfoliata
Briza media
Bromus erectus
Campanula rotundifolia
Carex caryophyllea
Carex flacca
Carlina vulgaris
Centaurea scabiosa
Conopodium majus
Daucus carota
Galium verum
Gentianella campestris
Helictotrichon pubescens
Homalothecium lutescens
Knautia arvensis
Koeleria macrantha
Leontodon hispidus
Linum catharticum
Lotus corniculatus
Origanum vulgare
Pilosella officinarum
Primula veris
Ranunculus bulbosus
Sanguisorba minor
Trisetum flavescens
Orchid species
Anacamptis pyramidalis
Dactylorhiza fuchsii
Dactylorhiza maculata
Gymnadenia conopsea
Listera ovata
Neotinea maculata
Ophyrs apifera
Orchis masculata
Orchis morio
Platanthera bifoliata
Platanthera chlorantha
Spiranthes spiralis

Pass = ≥7 of listed species present

Negative indicator species

Rumex crispus
Rumex obtusifolius
Urtica dioica
Pass = Collective cover ≤5%

Dactylis glomerata
Arrhenatherum elatius
Pass = Collective cover ≤10%

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

Neophyte species
Pass = Collective cover ≤ 5%

Four passes required for overall pass

Other assessment criteria

Grass/sedge : Forb ratio
Pass = Forb 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 2-50cm high

Litter cover
Pass = Total extent is ≤25% cover

Bare ground
Pass = Total extent is ≤10% cover

Grazing and disturbance
Pass= No more than $20m^2$ 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)

Positive indicator species

Achillea millefolium
Agrostis capillaris
Anthoxanthum odoratum
Carex pilulifera
Danthonia decumbens
Festuca ovina
Galium saxatile
Hypericum maculatum
Juncus squarrosus
Lathyrus montanus
Luzula multiflora
Pseudorchis albida
Nardus stricta (in small quantities)
Pedicularis sylvatica
Polygala serpyllifolia
Polygala vulgaris
Potentilla erecta
Rhytidiadelphus squarrosus
Succisa pratensis
Viola canina
Viola riviniana
Pass = ≥7 of listed species present

Negative indicator species

Arrhenatherum elatius
Bellis perennis
Cirsium arvense
Cirsium vulgare
Cynosurus cristatus
Holcus lanatus
Juncus effusus
Lolium perenne
Ranunculus repens
Rumex obtusifolius
Rumex crispus
Senecio jacobea
Trifolium repens
Urtica dioica
Pass = Individual cover ≤10%

Neophyte species
Pass = Collective cover ≤ 5%

Both passes required for overall pass

Other assessment criteria

Grass/sedge : Forb ratio
Pass = Forb component >25%

Scrub/Bracken/Heath encroachment
Pass = Cover of woody species plus *Pteridium* ≤5% cover.

Sward height
Pass = ≥25% of the sward >5cm high (No upper limit)

Litter cover
Pass = '"Thatches"'of dead plant litter >2cm across should not cover >20% of ground area

Bare ground
Pass = Total extent is ≤10% cover

Grazing and disturbance
Pass = No more than 20m^2 in vicinity of monitoring stops showing signs of serious disturbance

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

Positive indicator species	Negative indicator species
Achillea ptarmica	*Cirsium arvense*
Angelica sylvestris	*Cirsium vulgare*
Caltha palustris	*Rumex crispus*
Cirsium dissectum	*Rumex obtusifolius*
Cirsium palustre	*Urtica dioica*
Crepis paludosa	Pass = Collective cover ≤ 5%
Deschampsia caespitosa	
Equisetum palustre	*Glyceria maxima*
Filipendula ulmaria	*Phalaris arundinacea*
Juncus acutiflorus	*Phragmites australis*
Juncus conglomeratus	Pass = Collective cover ≤10%
Lotus pedunculatus	
Lychnis flos-cuculi	*Lolium perenne*
Lythrum salicaria	*Trifolium repens*
Molinia caerulea	*Ranunculus repens*
Myosotis laxa	Pass = Collective cover ≤20%
Potentilla anglica	and individual cover ≤10%
Senecio aquaticus	
Succisa pratensis	Neophyte species
Orchid sp.	Pass = Collective cover ≤ 5%
Pass = ≥7 of listed species present	Four passes required for overall pass

Other assessment criteria

Grass/sedge : Forb ratio
Pass = Forb component 40-90%

Scrub/Bracken/Heath encroachment
Pass = Cover of woody species plus *Pteridium* ≤5% cover.

Sward height
Pass = 30-70% of the sward 5-80cm high

Litter cover
Pass = Total extent is ≤25% cover

Bare ground
Pass = Total extent is ≤10% cover

Grazing and disturbance
Pass = No more than $20m^2$ in vicinity of monitoring stop showing signs of serious disturbance

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

Positive indicator species	**Negative indicator species**
Calystegia sepium	*Glyceria maxima*
Crepis paludosa	*Phalaris arundinacea*
Epilobium hirsutum	*Phragmites australis*
Epilobium parviflorum	Pass = Collective cover ≤10%
Eupatorium cannabinum	
Filipendula ulmaria	Neophyte species
Glechoma hederacea	Pass = Collective cover ≤ 5%
Galium aparine	
Geum urbanum	Both passes required for overall pass
Hypericum tetrapterum	
Lythrum salicaria	
Moehringia trinervia	
Silene dioica	
Solanum dulcamara	
Stachys palustris	
Symphytum officinale	
Viola odorata	

Pass = ≥7 of listed species present

Other assessment criteria

Grass/sedge : Forb ratio
Pass = Forb component 40-90%

Scrub/Bracken/Heath encroachment
Pass= Cover of woody species plus *Pteridium* ≤5% cover.

Sward height
Pass= 30-70% of the sward 5-80cm high

Litter cover
Pass = Total extent is ≤25% cover

Bare ground
Pass = Total extent is ≤10% cover

Grazing and disturbance
Pass = No more than $20m^2$ in vicinity of monitoring stop showing signs of serious disturbance

Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510)

Positive indicator species

Alopecurus pratensis
Anthriscus sylvestris
Centaurea nigra
Daucus carota
Filipendula ulmaria
Heracleum sphondylium
Knautia arvensis
Leucanthemum vulgare
Leontodon hispidus
Lotus corniculatus
Pimpinella major
Rhinanthus minor
Sanguisorba officinalis
Succisa pratensis
Thalictrum flavum
Tragopogon pratensis
Trisetum flavescens
Orchid sp.

Pass = ≥7 species present

Negative indicator species

Cirsium arvense
Cirsium vulgare
Galium aparine
Plantago major
Rumex crispus
Rumex obtusifolius
Senecio jacobaea
Urtica dioica
Pass = Collective cover ≤5%

Glyceria maxima
Phalaris arundinacea
Phragmites australis
Pass = Collective cover ≤20%

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

Arrhenatherum elatius
Dactylis glomerata
Pass = Collective cover ≤10%

Neophyte species
Pass = Collective cover ≤5%

Five passes required for overall pass

Other assessment criteria

Grass/sedge : Forb ratio
Pass = Forb component 40-90%

Scrub/Bracken/Heath encroachment
Pass= Cover of woody species plus *Pteridium* ≤5% cover.

Sward height
Pass = >50% of the sward >5cm (No upper limit)

Litter cover
Pass = Total extent is ≤25% cover

Bare ground
Pass = Total extent is ≤5% cover

Grazing and disturbance
Pass= No more than 20m^2 in vicinity of monitoring stop showing signs of serious disturbance

Appendix 6: Future prospects categories

Listed here are the 12 categories used to assess the future prospects of Annex I grassland habitats, with their impact and activities codes added from the *Natura 2000 Form Explanatory Notes.*

Negative threat categories (10)

Drainage (code 850)
0 Not recorded.
-1 Recorded as occurring on the site but not in the vicinity of the Annex I habitat.
-2 Recorded adjacent to Annex I habitat.
-3 Recorded within the Annex I habitat.

Dumping (code 420)
0 Not recorded.
-1 Recorded on the site but not in the vicinity of Annex I habitat.
-2 Recorded adjacent to Annex I habitat.
-3 Recorded within the Annex I habitat.

Active quarries (code 301)
0 Not recorded.
-1 Small to medium sized quarry used sporadically by landowners for infill or farm maintenance recorded adjacent to Annex I habitat.
-2 Large quarry actively used for commercial purposes recorded adjacent to the site.
-3 Quarry of any size recorded within a grassland site, or a quarry that has infringed on a grassland site in recent times (within the last 10 years).

Evidence of undergrazing (code 140)
0 Not recorded
-1 Tall sward recorded within the associated Fossitt habitat but sward height appropriate at all monitoring stops.
-2 Tall sward recorded adjacent to the Annex I habitat.
-3 Tall sward recorded within the Annex I habitat.

Evidence of overgrazing (code 140)
0 Not recorded.
-1 Short sward recorded within the associated Fossitt habitat but sward height appropriate at all monitoring stops.
-2 Short sward recorded adjacent to the Annex I habitat.
-3 Short sward recorded within the Annex I habitat.

Afforestation (code 162)
0 Not recorded.
-1 Afforestation recorded adjacent to site but not near Annex I habitat.
-2 Afforestation recorded adjacent to Annex I habitat.
-3 Afforestation recorded adjacent to Annex I habitat and plans for future forestry on the site.

Bracken encroachment (code 970)
0 Not recorded.
-1 Bracken encroachment recorded on site but not within monitoring stops.
-2 Bracken encroachment recorded from one monitoring stop.
-3 Bracken encroachment recorded from more than one monitoring stop.

Scrub encroachment (code 970)
0 Not recorded.
-1 Scrub encroachment recorded on site but not within monitoring stops.
-2 Scrub encroachment recorded from one monitoring stop.
-3 Scrub encroachment recorded from more than one monitoring stop.

Heath encroachment (code 970)

0 Not recorded.
-1 Heath encroachment recorded on site but not within monitoring stops.
-2 Heath encroachment recorded from one monitoring stop.
-3 Heath encroachment recorded from more than one monitoring stop.

Agricultural improvement (code 190)

This includes fertiliser application, topping, liming and supplementary feeders.

0 Not recorded.
-1 Recorded on site but not in close vicinity to Annex I habitat.
-2 Recorded in close vicinity to Annex I habitat
-3 Recorded within Annex I habitat.

Positive conservation categories (2)

Notable species

0 None recorded
1 Species listed in Red Data Book recorded on site.
2 Species listed under Flora Protection Order recorded on site.
3 Both Red Data Book and Flora Protection Order species recorded on the site.

NPWS conservation site status

1 Annex I habitat within NHA or pNHA boundary
2 Annex I habitat within SAC boundary
3 Annex I habitat within National Park or NPWS-managed Nature Reserve.

Overall score

After scores from both threat and conservation categories are totalled.

≥ 0	Favourable
-1 to -9	Unfavourable – Inadequate
≥ -10	Unfavourable – Bad

Appendix 7: Future prospects assessment scores of sites in Cork and Waterford with Annex I habitat present

Site ID	Annex Habitats	Drainage	Dumping	Active quarries	Evidence of undergrazing	Evidence of overgrazing	Afforestation	Bracken encroachment	Scrub encroachment	Heath encroachment	Agricultural imiprovement	Notable species	Designated site status	*Total score*
307	6230	0	0	0	0	0	-2	0	0	-2	0	0	1	*-3*
316	6230	0	0	0	0	-3	0	0	0	-1	-2	0	2	*-4*
317	6230	0	-3	0	0	-3	0	0	0	-2	0	0	2	*-6*
320	6510	0	0	0	0	0	0	-1	-1	0	0	0	0	*-2*
326	6230	0	0	0	0	0	-2	-3	0	0	0	0	0	*-5*
344	6410	0	0	0	0	0	0	0	-2	0	-1	0	0	*-3*
354	6230	0	0	0	0	0	-1	-1	-1	0	0	0	0	*-3*
356	6410	0	0	0	-1	0	0	0	-2	0	-2	0	0	*-5*
357	6230	0	-1	0	0	-1	-1	-1	-1	-1	0	0	0	*-6*
360	6230	0	0	0	0	0	0	-1	0	-3	0	0	2	*-2*
366	6130	0	0	0	0	0	0	0	-1	-3	0	0	1	*-3*
372	6230	0	0	0	-3	0	0	0	0	-1	-3	0	0	*-7*
379	6410	0	0	0	-1	0	0	0	-2	-2	0	0	0	*-5*
402	6230	0	0	0	0	-3	0	-2	-1	0	-3	0	2	*-7*
407	6410	-1	0	0	-3	0	0	0	-1	0	0	0	1	*-4*
410	6210	0	0	0	0	0	0	0	-1	0	0	0	1	*0*
415	6410	0	0	0	0	0	0	0	-1	0	0	0	0	*-1*
415	6430	0	0	0	0	0	0	0	-1	0	0	0	0	*-1*
418	6430	-2	0	0	0	0	0	0	0	0	0	0	1	*-1*
462	6230	0	0	0	0	0	0	0	0	0	-1	0	0	*-1*
463	6130	0	0	0	0	0	0	0	0	-1	0	0	0	*-1*
475	6230	0	0	0	0	0	-2	0	0	-2	0	0	0	*-4*
485	6230	0	0	0	0	0	0	-1	0	-3	0	0	0	*-4*
488	6230	0	0	0	0	0	0	-1	0	0	0	0	1	*0*
489	6230	0	0	0	0	0	0	-1	-1	-3	0	0	0	*-5*
492	6410	-2	0	0	-3	0	0	0	-1	-1	-1	0	0	*-8*
495	6410	-3	0	0	-1	0	-2	-1	-1	0	-1	0	0	*-9*
496	6230	0	0	0	0	0	0	-1	-1	-2	0	0	3	*-1*
539	6410	0	0	0	-1	0	0	0	-1	-1	0	0	0	*-3*
553	6410	0	0	0	0	0	0	0	-3	0	0	0	0	*-3*

Site ID	Annex Habitats	Drainage	Dumping	Active quarries	Evidence of undergrazing	Evidence of overgrazing	Afforestation	Bracken encroachment	Scrub encroachment	Heath encroachment	Agricultural imiprovement	Notable species	Designated site status	*Total score*
556	6410	-3	0	0	-3	0	0	0	-1	0	0	0	0	*-7*
565	6410	0	0	0	-1	-3	0	-1	0	0	-1	0	0	*-6*
566	6410	0	-2	0	0	0	0	-1	-1	0	-2	0	0	*-6*
568	6410	0	0	0	0	0	0	-1	-1	-1	-1	0	0	*-4*
569	6410	0	0	0	0	0	0	0	-1	-1	-1	0	0	*-3*
571	6230	0	0	0	0	0	0	0	0	-3	-3	0	0	*-6*
556	6410	-3	0	0	-3	0	0	0	-1	0	0	0	0	*-7*
565	6410	0	0	0	-1	-3	0	-1	0	0	-1	0	0	*-6*
566	6410	0	-2	0	0	0	0	-1	-1	0	-2	0	0	*-6*
568	6410	0	0	0	0	0	0	-1	-1	-1	-1	0	0	*-4*
569	6410	0	0	0	0	0	0	0	-1	-1	-1	0	0	*-3*
571	6230	0	0	0	0	0	0	0	0	-3	-3	0	0	*-6*
582	6130	0	0	0	0	-3	0	0	0	-3	0	0	0	*-6*
584	6410	0	0	0	0	0	0	-1	-1	-2	0	0	0	*-4*
584	6130	0	-3	0	0	0	0	-2	-2	-3	0	0	0	*-10*
589	6230	0	0	0	0	0	0	-2	0	0	0	0	0	*-2*
590	6410	-1	0	0	0	0	0	0	-1	-1	-1	0	0	*-4*
601	6410	0	0	0	-3	0	0	0	-1	-1	0	0	0	*-5*
618	6410	0	0	0	-3	0	0	0	0	0	0	0	0	*-3*
627	6410	0	0	0	0	0	0	0	-1	0	0	0	2	*1*
631	6410	0	0	0	-3	0	0	0	-1	0	0	0	0	*-4*
635	6410	0	0	0	-1	0	0	0	-1	0	0	0	0	*-2*
642	6230	-3	0	0	0	0	0	0	-2	-2	-3	0	0	*-10*
645	6230	-2	0	0	0	0	-1	0	-1	-2	0	0	0	*-6*

Appendix 8: Annex I habitat overall assessment scores for sites in Cork and Waterford

Site ID	Annex habitats	Area Assessment	Structure and Functions Assessment	Future Prospects Assessment	*Overall Assessment*
307	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
316	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
317	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
320	6510	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
326	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
344	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
354	6230	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	*Unfavourable - Inadequate*
356	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
357	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
360	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
366	6130	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
372	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
379	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
402	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
407	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
410	6210/6211	Favourable	Unfavourable - Bad	Favourable	*Unfavourable - Bad*
415	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
415	6430	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
418	6430	Unfavourable – Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
462	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
463	6130	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
475	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
485	6230	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	*Unfavourable - Inadequate*
488	6230	Favourable	Unfavourable - Bad	Favourable	*Unfavourable - Bad*
489	6230	Unfavourable – Bad	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
492	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*

Site ID	Annex habitats	Area Assessment	Structure and Functions Assessment	Future Prospects Assessment	*Overall Assessment*
495	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
496	6230	Favourable	Unfavourable - Inadequate	Unfavourable - Inadequate	*Unfavourable - Inadequate*
539	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
553	6410	Unfavourable – Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
556	6410	Unfavourable – Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
565	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
566	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
568	6410	Unfavourable – Inadequate	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
569	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
571	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
582	6130	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
584	6130	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Inadequate*
584	6410	Favourable	Unfavourable - Bad	Unfavourable - Bad	*Unfavourable - Bad*
589	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
590	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
601	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
618	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
627	6410	Favourable	Unfavourable - Bad	Favourable	*Unfavourable - Bad*
631	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
635	6410	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*
642	6230	Unfavourable – Bad	Unfavourable - Bad	Unfavourable - Bad	*Unfavourable - Bad*
645	6230	Favourable	Unfavourable - Bad	Unfavourable - Inadequate	*Unfavourable - Bad*

Appendix 9: Conservation Scores for sites in Cork and Waterford and revised scores for Roscommon and Offaly

Site no.	Site Name	County	Plant diversity 5	Notable species 3	Grassland habitats 5	Annex habitats 4	Adjacent s-n habitats 5	Area 5	Total 27	Conservation Score 100.0
1	All Saints Bog	Offaly	4	0	2	2	1	2	11	40.7
3	Ridge Road	Offaly	4	0	1	2	1	3	11	40.7
7	Derrykeel Meadows	Offaly	3	0	2	0	2	2	9	33.3
8	Drumakeenan, Eagles Hill and Perry's Mill	Offaly	4	0	1	2	1	4	12	44.4
15	Clonfinlough Esker	Offaly	3	0	2	0	0	1	6	22.2
16	Lough Nanag Esker	Offaly	4	0	1	0	2	4	11	40.7
17	Dovegrove Callows	Offaly	4	0	1	0	2	4	11	40.7
18	Little Brosna Callows	Offaly	5	1	4	2	2	5	19	70.4
20	Ballyduff Esker	Offaly	4	0	1	2	1	4	12	44.4
21	Pallas Lough	Offaly	3	0	2	0	2	1	8	29.6
23	Lough Dromharlow	Roscommon	5	0	2	2	4	4	17	63.0
25	Lough Gara	Roscommon	5	0	3	4	3	4	19	70.4
27	Annaghmore Lough	Roscommon	4	0	2	0	3	2	11	40.7
30	Kilglas and Grange Lough	Roscommon	4	0	3	4	2	3	16	59.3
34	Lough Glin	Roscommon	5	0	2	0	3	4	14	51.9
39	Drumbridge	Roscommon	4	0	1	0	3	4	12	44.4
40	Hundred Acres	Offaly	4	0	2	0	3	4	13	48.1
41	Slieve Bloom	Offaly	3	0	1	0	1	2	7	25.9
44	Croghan Hill	Offaly	1	0	3	0	2	4	10	37.0
45	Kilcormac Esker	Offaly	3	0	1	0	1	4	9	33.3
53	Kilcolman	Offaly	3	0	1	0	2	3	9	33.3
54	Pigeon Park	Offaly	1	0	1	0	1	4	7	25.9
57	Clooncreen-Clonbulloge	Offaly	3	0	1.5	0	2	4	10.5	38.9
60	Moanvane	Offaly	2	0	1	0	2	2	7	25.9
61	Raheenakeeran	Offaly	1	0	1	0	2	3	7	25.9
62	Roosk	Offaly	2	0	1	0	2	4	9	33.3
67	Raheen Lough	Offaly	1	0	1	0	3	3	8	29.6
68	Slate River	Offaly	3	0	0	4	1	4	12	44.4
73	Silver River	Offaly	4	1	2	0	2	2	11	40.7
81	Mount St Joseph Esker	Offaly	3	0	1	2	2	2	10	37.0
82	Coolderry	Offaly	2	0	0	2	2	2	8	29.6
83	Boveen	Offaly	3	0	1	0	2	3	9	33.3
84	Island	Offaly	3	0	1	0	2	2	8	29.6
86	Glasscloon	Offaly	2	0	1	0	2	3	8	29.6
87	Bricknagh	Offaly	3	0	1.5	0	2	4	10.5	38.9
90	Derrinlough	Offaly	4	0	2	0	2	1	9	33.3
92	Rathcobican	Offaly	2	0	1	0	1	3	7	25.9
93	Clonmore	Offaly	3	0	2	0	2	2	9	33.3
97	Ballymullen	Offaly	4	0	2	0	2	2	10	37.0
99	Cappancur	Offaly	2	0	3	0	4	3	12	44.4
101	Clonminch	Offaly	3	0	1.5	2	3	4	13.5	50.0
102	Drumcullen Church	Offaly	4	0	2	0	3	3	12	44.4
107	Clonmacnoise	Offaly	5	1	2	4	2	4	18	66.7
108	Leitra Callow	Offaly	5	0	2	2	2	4	15	55.6
109	Moystown Demesne and Island	Offaly	5	2.5	2	4	2	5	20.5	75.9
110	Clooncraff	Offaly	4	0	2	4	4	4	18	66.7
111	Long Island	Roscommon	4	1	1	0	2	4	12	44.4
112	Callowbeg	Roscommon	2	1	1	0	3	4	11	40.7
113	Drumlosh	Roscommon	4	1	2	2	3	4	16	59.3
114	Cappaleitrim	Roscommon	4	1	2	2	2	5	16	59.3
116	Culliaghmore	Roscommon	4	0	1	2	1	3	11	40.7
117	Rathpeake	Roscommon	1	0	1	0	1	1	4	14.8
200	Derryhanee	Roscommon	4	0	1	0	2	4	11	40.7

Site no.	Site Name	County	Plant diversity	Notable species	Grassland habitats	Annex habitats	Adjacent s-n habitats	Area	Total	Conservation Score
			5	**3**	**5**	**4**	**5**	**5**	**27**	**100.0**
201	Coggalbeg	Roscommon	3	0	1	0	3	3	10	37.0
202	Cloonroughan	Roscommon	4	0	3	0	3	4	14	51.9
203	Glenballythomas	Roscommon	4	0	2	0	2	4	12	44.4
205	Cleaheen	Roscommon	4	0	1	2	3	4	14	51.9
206	Rathmoyle	Roscommon	1	0	1	0	2	4	8	29.6
208	Cloonalough	Roscommon	4	0	2	0	4	2	12	44.4
210	Portnacrinnaght	Roscommon	5	0	3	4	3	4	19	70.4
212	Dromore	Roscommon	3	0	1	0	3	4	11	40.7
214	Clerragh	Roscommon	4	0	3	0	3	3	13	48.1
215	Carrickmore	Roscommon	4	0	1	2	2	4	13	48.1
216	Mullaghmacormick	Roscommon	4	0	2	2	2	4	14	51.9
218	Portruny Bay	Roscommon	5	0	3	0	4	4	16	59.3
220	Crunaun Bridge	Roscommon	4	0	2	0	3	4	13	48.1
221	Cartroncaran	Roscommon	3	0	3	0	1	3	10	37.0
224	Cloonfineen	Roscommon	4	0	1	2	2	4	13	48.1
225	Errit	Roscommon	2	0	2	0	2	2	8	29.6
226	Coolteige	Roscommon	4	0	2	2	2	4	14	51.9
227	Carrownalassan	Roscommon	4	0	2	2	2	4	14	51.9
229	Reagh	Roscommon	2	0	2	0	1	2	7	25.9
230	Kiltrustan	Roscommon	4	0	2	2	1	3	12	44.4
233	Cloonfenbaun	Roscommon	2	0	2	0	0	3	7	25.9
234	Peak	Roscommon	2	0	0.5	0	3	3	8.5	31.5
236	Kilnanooan	Roscommon	4	0	2	2	3	4	15	55.6
238	Cloonshanville	Roscommon	4	0	2	0	2	2	10	37.0
239	Castlestrange	Roscommon	2	0	1	0	0	3	6	22.2
241	Cloonaddra	Roscommon	4	0	1	2	2	4	13	48.1
242	Roxborough	Roscommon	4	0	2	0	3	4	13	48.1
243	Carraun South	Roscommon	2	0	1	0	2	4	9	33.3
245	Ahagower	Roscommon	4	0	3	0	2	4	13	48.1
246	Skrine	Roscommon	4	0	1.5	2	2	4	13.5	50.0
252	Ardmullen	Roscommon	2	0	1	0	2	4	9	33.3
254	Pollalaher	Roscommon	3	0	1	2	2	2	10	37.0
256	Turrock	Roscommon	4	0	1	2	2	4	13	48.1
259	Carrowmurragh	Roscommon	4	0	1	2	3	3	13	48.1
260	Mihanboy	Roscommon	4	0	2	0	2	4	12	44.4
263	Curry	Roscommon	3	0	1	2	3	3	12	44.4
264	Derreen Lough	Roscommon	3	0	1	0	4	2	10	37.0
265	Cashel	Roscommon	3	0	1	0	2	2	8	29.6
303	Ballygally	Waterford	2	0	2	0	3	2	9	33.3
304	Ballyrafter Flats	Waterford	1	0	1	0	3	3	8	29.6
305	Dunabrattin	Waterford	2	0	1	0	2	1	6	22.2
307	Knockaunabulloga	Waterford	3	0	2	2	2	2	11	40.7
308	Helvick Head	Waterford	2	0	2	0	1	3	8	29.6
309	Islandtarnsey	Waterford	1	0	1	0	3	3	8	29.6
310	Annestown	Waterford	4	0	2	0	3	3	12	44.4
311	Killongford	Waterford	2	0	1	0	2	2	7	25.9
312	Fennor Bog	Waterford	3	0	1.5	0	2	2	8.5	31.5
313	Creadan	Waterford	2	0	3	0	3	2	10	37.0
314	Kildermody	Waterford	3	0	2	0	1	2	8	29.6
315	Castlecraddock Bog	Waterford	1	0	1	0	3	1	6	22.2
316	Lyre Mountain	Waterford	2	0	2	2	3	5	14	51.9
317	Knockanaffrin	Waterford	1	0	1	2	1	4	9	33.3
318	Kilclooney	Waterford	1	0	1	0	4	1	7	25.9
319	Gracedieu	Waterford	4	1	4	0	2	1	12	44.4
320	Ardmore Head	Waterford	3	0	1	2	2	3	11	40.7
322	Kilbryan Upper	Waterford	3	0	2	0	1	1	7	25.9
325	Knockyelan	Waterford	3	0	2	0	2	3	10	37.0

Site no.	Site Name	County	Plant diversity 5	Notable species 3	Grassland habitats 5	Annex habitats 4	Adjacent s-n habitats 5	Area 5	Total 27	Conservation Score 100.0
326	Barnankile	Waterford	1	0	1	2	2	1	7	25.9
327	Ballinlough	Waterford	3	0	2	0	2	1	8	29.6
331	Tinnascart	Waterford	3	0	3	0	3	4	13	48.1
332	Carronbeg	Waterford	1	0	1	0	0	1	3	11.1
333	Gliddane Beg	Waterford	1	0	1	0	2	2	6	22.2
336	Millerstown	Waterford	4	0	2	0	2	3	11	40.7
337	Lisellan	Waterford	4	0	1	0	4	4	13	48.1
339	Keiloge	Waterford	2	0	1	0	2	2	7	25.9
340	Killure	Waterford	3	0	3	0	3	2	11	40.7
341	Kilfarrasy	Waterford	2	0	1	0	3	3	9	33.3
342	Rathmoylan	Waterford	5	0	3	0	2	4	14	51.9
344	Ballynamona Lower	Waterford	3	0	3	2	4	4	16	59.3
345	Clondonnell	Waterford	2	0	1	0	1	1	5	18.5
346	Greenan	Waterford	4	0	1.5	0	2	2	9.5	35.2
347	Russellstown	Waterford	2	0	2	0	1	1	6	22.2
350	Stonehouse	Waterford	2	0	1.5	0	3	4	10.5	38.9
351	Ballinvella	Waterford	1	0	2	0	3	4	10	37.0
352	Bridane Lower	Waterford	2	0	1	0	2	3	8	29.6
353	Ballynatray Demesne	Waterford	1	0	1	0	1	3	6	22.2
354	Glenpatrick	Waterford	3	0	2	2	2	4	13	48.1
355	Stradbally Beg	Waterford	4	0	1	0	1	4	10	37.0
356	Lag Bridge	Waterford	3	0	1	2	3	1	10	37.0
357	Meoul	Waterford	4	0	2	2	3	4	15	55.6
358	Brownstown	Waterford	3	0	2	0	3	3	11	40.7
359	Tallowbridge	Waterford	2	0	2	0	3	4	11	40.7
360	Curraheen	Waterford	1	0	2	2	2	2	9	33.3
361	Kilmurrin	Waterford	2	0	2	0	4	1	9	33.3
363	Coumtay Glen	Waterford	2	0	1	0	2	1	6	22.2
365	Ballynatray Commons	Waterford	1	0	1	0	2	1	5	18.5
366	Knockmahon	Waterford	5	0	2	2	2	1	12	44.4
372	Glendalough	Waterford	1	0	2	2	2	2	9	33.3
373	Glenary	Waterford	1	0	1	0	3	3	8	29.6
376	Kilcloher	Waterford	2	0	0.5	2	3	2	9.5	35.2
377	Knockgarraun(hely)	Waterford	3	0	1	0	2	1	7	25.9
379	Tobernahulla	Waterford	4	0	1.5	2	4	3	14.5	53.7
381	Knocknaglogh Upper	Waterford	1	0	1	0	2	1	5	18.5
382	Doon	Waterford	2	0	0.5	0	2	2	6.5	24.1
398	Curragh North	Waterford	3	0	2	0	2	2	9	33.3
399	Curragh	Waterford	1	0	1	0	0	1	3	11.1
400	Cape Clear	Cork	2	0	3	0	3	2	10	37.0
401	Sherkin Island	Cork	4	0	3	0	2	2	11	40.7
402	Glanmore	Cork	3	0	1	2	5	2	13	48.1
405	Garinish Point	Cork	1	0	1	0	3	3	8	29.6
406	Blarney Bog	Cork	3	0	2	0	4	3	12	44.4
407	Lough Allua Curraghy	Cork	2	0	1	2	3	1	9	33.3
408	Minane Bridge	Cork	1	0	1	0	2	2	6	22.2
410	Lisleecourt	Cork	2	0	1	2	2	1	8	29.6
411	Shanakill	Cork	1	0	1	0	2	1	5	18.5
412	Rostellan	Cork	3	0	2	0	2	3	10	37.0
413	Curraghbinny	Cork	1	0	1	0	2	2	6	22.2
414	Coolymurraghue	Cork	4	0	3	0	2	3	12	44.4
415	Coolowen	Cork	4	0	2	4	2	2	14	51.9
417	Clasharinka	Cork	1	0	1	0	2	3	7	25.9
418	Ballybraher	Cork	1	0	2	2	1	4	10	37.0
419	Inch	Cork	3	0	3	0	2	1	9	33.3
420	Ballydaniel	Cork	3	0	2.5	0	2	3	10.5	38.9
421	Rathdrum	Cork	2	0	2	0	1	4	9	33.3

Site no.	Site Name	County	Plant diversity	Notable species	Grassland habitats	Annex habitats	Adjacent s-n habitats	Area	Total	Conservation Score
			5	3	5	4	5	5	27	100.0
422	Kilfurrery	Cork	2	0	1	0	1	1	5	18.5
423	Ballyderown	Cork	2	0	1.5	0	2	1	6.5	24.1
424	Manning	Cork	4	1	2	0	2	4	13	48.1
426	Curraghprevin	Cork	1	0	2	0	2	4	9	33.3
428	Moneygorm	Cork	3	0	1	0	3	0	7	25.9
429	Castlesaffron	Cork	2	0	2	0	2	2	8	29.6
430	Ballygriggan	Cork	1	0	1	0	2	3	7	25.9
431	Ballynabortagh	Cork	1	0	1	0	2	4	8	29.6
432	Ballinaspig More	Cork	1	0	1	0	2	2	6	22.2
433	Turnaspidogy	Cork	3	0	1.5	0	3	2	9.5	35.2
435	Oldfort	Cork	1	0	1	0	2	2	6	22.2
436	Garrettstown	Cork	3	0	2	0	1	2	8	29.6
437	Manch West	Cork	3	0	1	0	1	1	6	22.2
439	Behagullane	Cork	1	0	0.5	0	3	1	5.5	20.4
440	Tooms West	Cork	4	0	3	0	3	4	14	51.9
441	Rathard	Cork	1	0	1	0	3	3	8	29.6
442	Ballinaboy	Cork	1	0	1	0	3	4	9	33.3
445	Kilrush	Cork	2	0	2	0	2	1	7	25.9
446	Bilberry	Cork	3	0	1	0	3	1	8	29.6
447	Killacloyne	Cork	2	0	1	0	2	1	6	22.2
449	Castleredmond	Cork	3	0	1	0	2	3	9	33.3
454	Lackenakea	Cork	4	0	1	0	3	1	9	33.3
455	Maulnahorna	Cork	1	0	1	0	1	2	5	18.5
456	Ballymacredmond	Cork	1	0	1	0	2	1	5	18.5
460	Gowlane	Cork	0	0	0.5	0	2	1	3.5	13.0
461	Ballynacarriga	Cork	4	1	2	0	2	1	10	37.0
462	Knockroe East	Cork	4	0	2	2	2	1	11	40.7
463	Urhin	Cork	4	0	1	2	3	4	14	51.9
464	Canalough	Cork	1	0	1	0	3	2	7	25.9
465	Dursey Island	Cork	3	0	2	0	4	4	13	48.1
466	Eyeries	Cork	1	0	2	0	2	1	6	22.2
467	Cahermeeleboe	Cork	0	0	1	0	2	1	4	14.8
468	Cloheen Marsh	Cork	3	0	2	0	4	3	12	44.4
470	Ballyroon Mountain	Cork	3	0	2	0	3	3	11	40.7
471	Mallavogue	Cork	3	0	3	0	4	2	12	44.4
473	Gortnagrough	Cork	4	0	2.5	0	3	1	10.5	38.9
474	Barnagowlane West	Cork	1	0	1	0	3	2	7	25.9
475	Glandart	Cork	2	0	2	2	2	1	9	33.3
479	Dundeady	Cork	1	0	1	0	2	2	6	22.2
481	Glannafeen	Cork	5	0	4	0	3	3	15	55.6
482	Hare Island	Cork	3	0	4	0	3	2	12	44.4
483	Gubbeen	Cork	1	0	2	0	2	1	6	22.2
484	Drisheen	Cork	2	0	2	0	4	2	10	37.0
485	MountGabriel	Cork	3	0	2	2	2	3	12	44.4
488	Rougham	Cork	2	0	2	2	4	2	12	44.4
489	Kealagowlane	Cork	1	0	1	2	3	1	8	29.6
490	Bear Island	Cork	4	0	1.5	0	3	3	11.5	42.6
492	Cousane	Cork	2	0	1	2	4	2	11	40.7
495	Cappaboy More	Cork	2	0	1	2	3	4	12	44.4
496	Glengarriff	Cork	3	0	2	2	1	1	9	33.3
497	Tullig	Cork	4	0	2	0	2	4	12	44.4
498	Oughtihery	Cork	1	0	1	0	2	4	8	29.6
500	Ballincollig Regional Park	Cork	1	0	1	0	3	1	6	22.2
502	Rockfield Farm	Cork	1	0	1	0	3	1	6	22.2
503	Ballinvonear	Cork	1	0	1	0	2	3	7	25.9
505	Ballindangan Marsh	Cork	2	0	2	0	2	2	8	29.6
506	Garrylucas Marsh	Cork	4	0	3	0	2	4	13	48.1

Site no.	Site Name	County	Plant diversity 5	Notable species 3	Grassland habitats 5	Annex habitats 4	Adjacent s-n habitats 5	Area 5	Total 27	Conservation Score 100.0
507	Inchaleagh	Cork	3	0	2	0	4	3	12	44.4
508	Barrahaurin	Cork	1	0	0.5	0	3	2	6.5	24.1
509	Gowlane North	Cork	1	0	2	0	2	3	8	29.6
510	Kilcullen South	Cork	3	0	3.5	0	3	4	13.5	50.0
511	Mountrivers	Cork	1	0	2	0	3	3	9	33.3
512	Cloonteens	Cork	1	0	1	0	2	2	6	22.2
514	Shanavoher	Cork	3	0	1	0	2	1	7	25.9
516	Esk South	Cork	3	0	2.5	0	2	3	10.5	38.9
518	Monee West	Cork	2	0	1	0	2	3	8	29.6
519	Castlebarrett	Cork	1	0	2.5	0	2	3	8.5	31.5
520	Glashaboy West	Cork	3	0	1	0	2	2	8	29.6
521	Pluckanes East	Cork	1	0	1	0	2	1	5	18.5
523	Castlelohort Demesne	Cork	2	0	1	0	3	4	10	37.0
524	Subulter	Cork	2	0	1	0	2	1	6	22.2
525	Lackaroe	Cork	2	0	1	0	2	3	8	29.6
526	Creggane	Cork	2	0	3	0	3	2	10	37.0
527	Waterhouse Marsh	Cork	1	0	0.5	0	2	1	4.5	16.7
528	Baltydaniel	Cork	2	0	2	0	2	4	10	37.0
530	Knockacullata	Cork	4	0	2	0	2	3	11	40.7
534	Knockacullen	Cork	1	0	2	0	1	1	5	18.5
535	Ballaghanure	Cork	3	0	1	0	3	2	9	33.3
536	Kilnacranagh East	Cork	3	0	2	0	2	3	10	37.0
538	Gouladoo	Cork	4	0	3	0	3	3	13	48.1
539	Dunkelly West	Cork	3	0	3.5	2	4	1	13.5	50.0
541	Derryleigh	Cork	3	0	1.5	0	2	4	10.5	38.9
542	Derreendangan	Cork	3	0	2	0	2	3	10	37.0
543	Coornishal	Cork	1	0	2	0	3	2	8	29.6
544	Benduff	Cork	1	0	1	0	2	1	5	18.5
545	Drom	Cork	1	0	1	0	2	1	5	18.5
546	Cullane East	Cork	2	0	2	0	3	2	9	33.3
547	Dromnea	Cork	3	0	3	0	4	2	12	44.4
548	Charlesfield	Cork	1	0	1	0	3	4	9	33.3
549	Carraraigue	Cork	2	0	1	0	2	1	6	22.2
550	Drombeg	Cork	1	0	1	0	3	1	6	22.2
552	Dromcarra	Cork	3	0	1.5	0	3	1	8.5	31.5
553	Reanacaragh	Cork	2	0	2	2	1	2	9	33.3
554	Rossnashunsoge	Cork	1	0	0.5	0	4	1	6.5	24.1
555	Cooldaniel	Cork	1	0	2	0	2	3	8	29.6
556	Moneycusker	Cork	3	0	1	2	2	1	9	33.3
557	Teereeven	Cork	1	0	1	0	2	1	5	18.5
558	Shanacashel	Cork	4	0	2	0	3	4	13	48.1
559	Derryvane	Cork	2	0	1.5	0	3	2	8.5	31.5
560	Gortroe	Cork	3	0	2.5	0	4	3	12.5	46.3
563	Reenrour West	Cork	1	0	2	0	2	1	6	22.2
564	Dromreagh	Cork	0	0	1	0	2	1	4	14.8
565	Reenavanny	Cork	3	0	3	2	2	2	12	44.4
566	Reenaknock	Cork	4	0	2	2	4	3	15	55.6
567	Ballyourane	Cork	1	0	1	0	3	1	6	22.2
568	Derrycarhoon	Cork	5	0	2	2	4	3	16	59.3
569	Derreenagreanagh	Cork	3	0	2	2	2	3	12	44.4
570	Inchibegga	Cork	1	0	2	0	3	2	8	29.6
571	Ballynagree East	Cork	1	0	1	2	1	1	6	22.2
573	Deelish	Cork	1	0	1.5	0	2	1	5.5	20.4
580	Lisnacuddy	Cork	2	0	2	0	4	3	11	40.7
581	Ballyshoneen	Cork	3	0	1	0	2	1	7	25.9
582	Allihies Mountain Mine	Cork	4	0	1	2	2	0	9	33.3
584	Polleenateada	Cork	5	0	2	4	4	1	16	59.3

Site no.	Site Name	County	Plant diversity 5	Notable species 3	Grassland habitats 5	Annex habitats 4	Adjacent s-n habitats 5	Area 5	Total 27	Conservation Score 100.0
585	Gokane	Cork	3	0	1	0	4	3	11	40.7
586	Toehead	Cork	4	0	4	0	4	2	14	51.9
587	Downeen	Cork	2	0	1	0	2	1	6	22.2
588	Dunowen	Cork	1	0	1	0	3	1	6	22.2
589	Derrynakilla	Cork	1	0	1	2	1	1	6	22.2
590	Bengour West	Cork	5	0	2.5	2	3	2	14.5	53.7
592	Lumnagh More	Cork	1	0	1	0	4	1	7	25.9
593	Teeracurra	Cork	2	0	1	0	2	4	9	33.3
594	Middle Calf Island	Cork	1	0	2	0	4	2	9	33.3
595	East Calf Island	Cork	3	0	4	0	3	1	11	40.7
596	Castle Island	Cork	2	0	2	0	4	3	11	40.7
597	Glannaharee West	Cork	4	0	2	0	3	3	12	44.4
599	Leckaneen	Cork	3	0	2	0	3	2	10	37.0
600	Scarteen	Cork	2	0	2	0	5	3	12	44.4
601	Dawstown	Cork	4	0	3.5	2	4	4	17.5	64.8
603	Mossgrove	Cork	2	0	2	0	1	2	7	25.9
604	Maglin	Cork	4	0	2	0	2	1	9	33.3
605	Coolatooder	Cork	2	0	1	0	2	3	8	29.6
606	Coolkirky	Cork	1	0	1	0	2	2	6	22.2
607	Coolcullitha	Cork	1	0	0.5	0	3	2	6.5	24.1
608	Coolmoreen	Cork	3	0	3	0	2	1	9	33.3
610	Dromderrig	Cork	1	0	1	0	1	1	4	14.8
613	Dunworly	Cork	4	0	3	0	3	3	13	48.1
615	Aghmanister	Cork	4	0	3	0	2	2	11	40.7
616	Carrigeen	Cork	4	0	3	0	3	3	13	48.1
618	Kilcolman	Cork	4	0	3	2	3	2	14	51.9
619	Imogane Bridge	Cork	4	0	2	0	2	2	10	37.0
621	Longacre	Cork	3	0	3	0	3	3	12	44.4
622	Croanrea	Cork	2	0	2	0	3	3	10	37.0
623	Knockduff Lower	Cork	2	0	1	0	3	3	9	33.3
626	Twomey's Bridge	Cork	2	0	1	0	4	3	10	37.0
627	Garrison	Cork	4	0	1	2	3	3	13	48.1
628	Gooseberryhill	Cork	3	0	1	0	3	3	10	37.0
629	Rossacon	Cork	3	0	2	0	3	4	12	44.4
630	Ballyduane	Cork	2	0	1.5	0	3	4	10.5	38.9
631	Urraghilmore	Cork	2	0	2	2	4	3	13	48.1
632	Clashykinleen	Cork	2	0	1	0	3	3	9	33.3
633	Claraghatlea	Cork	1	0	2	0	3	2	8	29.6
634	Ahane Upper	Cork	3	0	1	0	2	2	8	29.6
635	Kilmacurrane	Cork	4	0	2	2	3	1	12	44.4
636	Dromahoe	Cork	1	0	1	0	2	2	6	22.2
638	Gallanes	Cork	3	0	3	0	3	2	11	40.7
640	Ballydaly	Cork	1	0	2	0	3	4	10	37.0
641	Geararoe	Cork	2	0	1	0	3	3	9	33.3
642	Coomnagire	Cork	2	0	1	2	5	4	14	51.9
644	Cahernacaha	Cork	1	0	1	0	3	3	8	29.6
645	Inchamore	Cork	2	0	1	2	3	2	10	37.0
646	Caherkereen	Cork	3	0	2	0	5	1	11	40.7
648	Gortanimill	Cork	2	0	1	0	3	1	7	25.9
649	Shanagarry South	Cork	1	0	1	0	3	1	6	22.2
650	Gortnagoul	Cork	3	0	2	0	2	4	11	40.7
651	Shanaboola	Cork	2	0	2.5	0	3	2	9.5	35.2
653	Furrow	Cork	3	0	2	0	3	4	12	44.4
656	Crosshavenhill	Cork	4	0	1	0	2	1	8	29.6
660	Skibbereen Marsh	Cork	3	0	2	0	1	2	8	29.6
662	Killeagh West Verge	Cork	2	0	1	0	1	1	5	18.5
664	Castlemartyr Verge	Cork	1	0	1	0	0	1	3	11.1

Site no.	Site Name	County	Plant diversity 5	Notable species 3	Grassland habitats 5	Annex habitats 4	Adjacent s-n habitats 5	Area 5	Total 27	Conservation Score 100.0
666	Youghal Verge	Cork	2	0	1	0	1	1	5	18.5
667	Knockaneglass	Cork	1	0	1	0	3	1	6	22.2
668	Killowen	Cork	3	0	2	0	4	3	12	44.4

Appendix 10: Threat Scores for sites in Cork and Waterford and revised scores for sites in Roscommon and Offaly

Site no.	Site Name	County	Encroachment	Neg. Grazing	Neg. Adj habitats	Damaging operations	Agricultural improvement	Neg. species	Total	Threat Score
			3	2	2	3	3	5	18	100.0
1	All Saints Bog	Offaly	1	2	1	1	1	2	8	44.4
3	Ridge Road	Offaly	1	2	1	0	0	2	6	33.3
7	Derrykeel Meadows	Offaly	0	0	1	0	0	1	2	11.1
8	Drumakeenan, Eagles Hill and Perry's Mill	Offaly	1	1	1	0	0	2	5	27.8
15	Clonfinlough Esker	Offaly	0	1	1	0	0	2	4	22.2
16	Lough Nanag Esker	Offaly	2	1	1	0	0	3	7	38.9
17	Dovegrove Callows	Offaly	0	1	1	0	1	2	5	27.8
18	Little Brosna Callows	Offaly	0	0	1	1	0	3	5	27.8
20	Ballyduff Esker	Offaly	0	0	1	1	0	3	5	27.8
21	Pallas Lough	Offaly	1	0	1	0	0	2	4	22.2
23	Lough Dromharlow	Roscommon	0	1	1	1	0	2	5	27.8
25	Lough Gara	Roscommon	1	0	0	1	1	3	6	33.3
27	Annaghmore Lough	Roscommon	0	0	0	0	0	1	1	5.6
30	Kilglas and Grange Lough	Roscommon	0	0	1	0	0	1	2	11.1
34	Lough Glin	Roscommon	1	0	1	0	0	2	4	22.2
39	Drumbridge	Roscommon	1	1	0	1	0	1	4	22.2
40	Hundred Acres	Offaly	3	1	0	1	0	1	6	33.3
41	Slieve Bloom	Offaly	0	0	0	0	0	1	1	5.6
44	Croghan Hill	Offaly	1	0	1	0	0	1	3	16.7
45	Kilcormac Esker	Offaly	1	0	0	1	1	2	5	27.8
53	Kilcolman	Offaly	1	1	1	0	0	2	5	27.8
54	Pigeon Park	Offaly	0	0	1	0	0	2	3	16.7
57	Clooncreen-Clonbulloge	Offaly	0	0	1	1	0	3	5	27.8
60	Moanvane	Offaly	0	0	0	0	0	2	2	11.1
61	Raheenakeeran	Offaly	0	1	1	1	0	2	5	27.8
62	Roosk	Offaly	0	0	1	1	0	2	4	22.2
67	Raheen Lough	Offaly	0	0	1	0	0	2	3	16.7
68	Slate River	Offaly	0	0	1	0	1	1	3	16.7
73	Silver River	Offaly	1	0	1	0	2	4	8	44.4
81	Mount St Joseph Esker	Offaly	0	1	1	1	2	2	7	38.9
82	Coolderry	Offaly	0	0	0	1	0	2	3	16.7
83	Boveen	Offaly	0	1	1	0	0	2	4	22.2
84	Island	Offaly	0	0	1	1	0	2	4	22.2
86	Glasscloon	Offaly	0	0	1	2	1	2	6	33.3
87	Bricknagh	Offaly	1	1	1	0	2	4	9	50.0
90	Derrinlough	Offaly	1	2	1	0	0	1	5	27.8
92	Rathcobican	Offaly	0	0	1	0	0	2	3	16.7
93	Clonmore	Offaly	1	1	1	0	0	3	6	33.3
97	Ballymullen	Offaly	1	0	1	0	0	3	5	27.8
99	Cappancur	Offaly	1	0	1	0	1	1	4	22.2
101	Clonminch	Offaly	0	0	1	1	0	2	4	22.2
102	Drumcullen Church	Offaly	1	0	1	0	0	2	4	22.2
107	Clonmacnoise	Offaly	0	0	1	1	0	2	4	22.2
108	Leitra Callow	Offaly	0	0	1	1	0	2	4	22.2
109	Moystown Demesne and Island	Offaly	0	0	0	0	1	3	4	22.2
110	Clooncraff	Offaly	0	0	0	1	0	2	3	16.7
111	Long Island	Roscommon	0	0	0	0	0	3	3	16.7
112	Callowbeg	Roscommon	0	0	0	1	0	1	2	11.1
113	Drumlosh	Roscommon	1	0	0	1	0	2	4	22.2
114	Cappaleitrim	Roscommon	0	0	1	1	0	3	5	27.8
116	Culliaghmore	Roscommon	0	0	1	1	0	4	6	33.3
117	Rathpeake	Roscommon	0	0	1	1	0	2	4	22.2
200	Derryhanee	Roscommon	0	1	1	1	0	2	5	27.8
201	Coggalbeg	Roscommon	0	1	1	0	1	1	4	22.2
202	Cloonroughan	Roscommon	0	0	1	1	0	2	4	22.2
203	Glenballythomas	Roscommon	1	0	1	0	2	2	6	33.3
205	Cleaheen	Roscommon	0	0	0	1	2	1	4	22.2

Site no.	Site Name	County	Encroachment	Neg. Grazing	Neg. Adj habitats	Damaging operations	Agricultural improvement	Neg. species	Total	Threat Score
			3	2	2	3	3	5	18	100.0
206	Rathmoyle	Roscommon	0	0	1	0	2	2	5	27.8
208	Cloonalough	Roscommon	1	0	1	1	2	2	7	38.9
210	Portnacrinnaght	Roscommon	1	0	0	1	0	3	5	27.8
212	Dromore	Roscommon	0	0	1	1	2	1	5	27.8
214	Clerragh	Roscommon	1	0	1	1	1	3	7	38.9
215	Carrickmore	Roscommon	1	0	1	0	0	2	4	22.2
216	Mullaghmacormick	Roscommon	0	1	0	1	2	2	6	33.3
218	Portruny Bay	Roscommon	1	1	0	0	0	2	4	22.2
220	Crunaun Bridge	Roscommon	1	1	1	2	2	3	10	55.6
221	Cartroncaran	Roscommon	0	2	1	0	1	2	6	33.3
224	Cloonfineen	Roscommon	3	1	1	1	1	2	9	50.0
225	Errit	Roscommon	0	0	0	0	0	1	1	5.6
226	Coolteige	Roscommon	2	1	1	0	0	2	6	33.3
227	Carrownalassan	Roscommon	0	1	1	2	0	2	6	33.3
229	Reagh	Roscommon	1	0	0	1	0	2	4	22.2
230	Kiltrustan	Roscommon	2	1	1	0	0	3	7	38.9
233	Cloonfenbaun	Roscommon	0	1	1	0	0	3	5	27.8
234	Peak	Roscommon	1	0	1	0	2	2	6	33.3
236	Kilnanooan	Roscommon	0	1	1	1	1	2	6	33.3
238	Cloonshanville	Roscommon	0	0	1	0	0	2	3	16.7
239	Castlestrange	Roscommon	0	0	1	0	2	4	7	38.9
241	Cloonaddra	Roscommon	1	1	1	0	0	2	5	27.8
242	Roxborough	Roscommon	1	1	1	1	1	2	7	38.9
243	Carraun South	Roscommon	0	1	1	1	0	2	5	27.8
245	Ahagower	Roscommon	1	1	1	1	0	3	7	38.9
246	Skrine	Roscommon	1	0	1	1	2	3	8	44.4
252	Ardmullen	Roscommon	2	1	1	0	1	3	8	44.4
254	Pollalaher	Roscommon	2	1	1	1	0	2	7	38.9
256	Turrock	Roscommon	2	0	1	0	0	3	6	33.3
259	Carrowmurragh	Roscommon	2	1	0	0	0	1	4	22.2
260	Mihanboy	Roscommon	0	0	1	1	0	2	4	22.2
263	Curry	Roscommon	2	1	0	1	0	1	5	27.8
264	Derreen Lough	Roscommon	2	0	1	1	0	1	5	27.8
265	Cashel	Roscommon	0	0	0	1	2	2	5	27.8
303	Ballygally	Waterford	0	0	1	1	0	3	5	27.8
304	Ballyrafter Flats	Waterford	0	0	1	0	1	2	4	22.2
305	Dunabrattin	Waterford	2	1	1	2	0	2	8	44.4
307	Knockaunabulloga	Waterford	2	1	0	0	0	1	4	22.2
308	Helvick Head	Waterford	2	1	1	0	0	2	6	33.3
309	Islandtarnsey	Waterford	1	1	1	2	0	2	7	38.9
310	Annestown	Waterford	0	1	0	0	0	2	3	16.7
311	Killongford	Waterford	1	1	1	0	0	2	5	27.8
312	Fennor Bog	Waterford	2	0	1	0	0	2	5	27.8
313	Creadan	Waterford	1	0	1	1	0	2	5	27.8
314	Kildermody	Waterford	2	1	1	1	0	2	7	38.9
315	Castlecraddock Bog	Waterford	0	1	1	1	0	1	4	22.2
316	Lyre Mountain	Waterford	1	0	1	0	1	1	4	22.2
317	Knockanaffrin	Waterford	0	0	0	1	1	1	3	16.7
318	Kilclooney	Waterford	1	0	1	0	0	1	3	16.7
319	Gracedieu	Waterford	0	1	1	0	0	2	4	22.2
320	Ardmore Head	Waterford	2	0	2	0	0	2	6	33.3
322	Kilbryan Upper	Waterford	2	1	1	0	1	1	6	33.3
325	Knockyelan	Waterford	1	1	0	0	0	2	4	22.2
326	Barnankile	Waterford	1	0	0	0	0	1	2	11.1
327	Ballinlough	Waterford	2	0	1	0	0	2	5	27.8
331	Tinnascart	Waterford	2	0	1	0	0	2	5	27.8
332	Carronbeg	Waterford	0	0	1	0	0	2	3	16.7
333	Gliddane Beg	Waterford	1	1	1	0	0	2	5	27.8
336	Millerstown	Waterford	1	0	1	0	1	2	5	27.8
337	Lisellan	Waterford	1	0	0	0	1	2	4	22.2
339	Keiloge	Waterford	1	2	1	1	0	2	7	38.9

Site no.	Site Name	County	Encroachment	Neg. Grazing	Neg. Adj habitats	Damaging operations	Agricultural improvement	Neg. species	Total	Threat Score
			3	2	2	3	3	5	18	100.0
340	Killure	Waterford	1	0	1	0	0	2	4	22.2
341	Kilfarrasy	Waterford	1	0	1	0	0	2	4	22.2
342	Rathmoylan	Waterford	1	0	2	1	0	2	6	33.3
344	Ballynamona Lower	Waterford	1	0	1	0	2	2	6	33.3
345	Clondonnell	Waterford	0	0	1	0	3	1	5	27.8
346	Greenan	Waterford	0	0	2	0	1	2	5	27.8
347	Russellstown	Waterford	1	1	1	1	1	2	7	38.9
350	Stonehouse	Waterford	1	0	1	1	1	1	5	27.8
351	Ballinvella	Waterford	0	0	0	0	0	2	2	11.1
352	Bridane Lower	Waterford	1	1	1	1	1	2	7	38.9
353	Ballynatray Demesne	Waterford	0	0	2	0	0	2	4	22.2
354	Glenpatrick	Waterford	2	0	1	0	1	2	6	33.3
355	Stradbally Beg	Waterford	1	0	1	0	1	2	5	27.8
356	Lag Bridge	Waterford	1	1	1	0	0	1	4	22.2
357	Meoul	Waterford	2	0	1	1	0	1	5	27.8
358	Brownstown	Waterford	0	0	1	0	1	2	4	22.2
359	Tallowbridge	Waterford	1	1	2	1	2	2	9	50.0
360	Curraheen	Waterford	2	1	0	0	0	1	4	22.2
361	Kilmurrin	Waterford	2	1	1	0	0	1	5	27.8
363	Coumtay Glen	Waterford	3	0	0	0	0	1	4	22.2
365	Ballynatray Commons	Waterford	0	0	2	1	1	1	5	27.8
366	Knockmahon	Waterford	2	1	1	0	0	2	6	33.3
372	Glendalough	Waterford	1	0	0	0	1	1	3	16.7
373	Glenary	Waterford	2	1	1	0	0	2	6	33.3
376	Kilcloher	Waterford	1	1	2	0	1	2	7	38.9
377	Knockgarraun(hely)	Waterford	0	0	2	0	2	2	6	33.3
379	Tobernahulla	Waterford	1	1	1	0	0	1	4	22.2
381	Knocknaglogh Upper	Waterford	1	0	1	0	1	1	4	22.2
382	Doon	Waterford	0	0	1	0	1	1	3	16.7
398	Curragh North	Waterford	2	0	2	1	0	2	7	38.9
399	Curragh	Waterford	0	0	1	0	0	2	3	16.7
400	Cape Clear	Cork	2	1	1	0	0	1	5	27.8
401	Sherkin Island	Cork	1	0	2	1	0	2	6	33.3
402	Glanmore	Cork	2	0	0	0	1	1	4	22.2
405	Garinish Point	Cork	0	1	0	0	0	1	2	11.1
406	Blarney Bog	Cork	1	0	1	2	0	2	6	33.3
407	Lough Allua Curraghy	Cork	1	0	1	1	1	1	5	27.8
408	Minane Bridge	Cork	0	0	2	1	1	1	5	27.8
410	Lisleecourt	Cork	1	1	1	0	0	2	5	27.8
411	Shanakill	Cork	0	0	1	0	0	1	2	11.1
412	Rostellan	Cork	1	0	1	0	0	1	3	16.7
413	Curraghbinny	Cork	1	0	0	1	0	2	4	22.2
414	Coolymurraghue	Cork	0	1	2	1	0	2	6	33.3
415	Coolowen	Cork	1	1	2	0	1	3	8	44.4
417	Clasharinka	Cork	0	0	2	0	2	2	6	33.3
418	Ballybraher	Cork	0	0	2	0	0	1	3	16.7
419	Inch	Cork	1	0	2	1	0	1	5	27.8
420	Ballydaniel	Cork	1	0	1	0	1	2	5	27.8
421	Rathdrum	Cork	2	1	2	0	1	3	9	50.0
422	Kilfurrery	Cork	0	1	0	1	0	2	4	22.2
423	Ballyderown	Cork	0	0	2	0	0	2	4	22.2
424	Manning	Cork	1	1	2	0	1	2	7	38.9
426	Curraghprevin	Cork	0	0	2	0	0	2	4	22.2
428	Moneygorm	Cork	0	0	1	0	0	2	3	16.7
429	Castlesaffron	Cork	0	0	2	0	2	2	6	33.3
430	Ballygriggan	Cork	1	0	1	1	1	2	6	33.3
431	Ballynabortagh	Cork	0	0	1	0	1	1	3	16.7
432	Ballinaspig More	Cork	1	1	1	1	0	2	6	33.3
433	Turnaspidogy	Cork	2	0	1	0	1	2	6	33.3
435	Oldfort	Cork	2	0	1	1	1	2	7	38.9
436	Garrettstown	Cork	0	1	2	2	0	2	7	38.9

Site no.	Site Name	County	Encroachment	Neg. Grazing	Neg. Adj habitats	Damaging operations	Agricultural improvement	Neg. species	Total	Threat Score
			3	2	2	3	3	5	18	100.0
437	Manch West	Cork	1	0	1	0	0	2	4	22.2
439	Behagullane	Cork	1	0	1	1	1	2	6	33.3
440	Tooms West	Cork	1	0	2	0	1	2	6	33.3
441	Rathard	Cork	0	0	1	1	1	2	5	27.8
442	Ballinaboy	Cork	0	0	2	1	1	2	6	33.3
445	Kilrush	Cork	0	0	1	0	1	2	4	22.2
446	Bilberry	Cork	1	0	1	0	1	2	5	27.8
447	Killacloyne	Cork	0	1	1	0	0	2	4	22.2
449	Castleredmond	Cork	1	0	1	1	1	4	8	44.4
454	Lackenakea	Cork	1	0	1	0	1	2	5	27.8
455	Maulnahorna	Cork	1	0	0	0	1	1	3	16.7
456	Ballymacredmond	Cork	2	1	1	1	0	2	7	38.9
460	Gowlane	Cork	0	1	0	0	0	1	2	11.1
461	Ballynacarriga	Cork	1	1	0	0	0	1	3	16.7
462	Knockroe East	Cork	0	0	0	0	1	2	3	16.7
463	Urhin	Cork	1	0	0	1	0	1	3	16.7
464	Canalough	Cork	0	0	0	0	0	1	1	5.6
465	Dursey Island	Cork	0	1	0	0	1	2	4	22.2
466	Eyeries	Cork	1	0	1	0	0	3	5	27.8
467	Cahermeeleboe	Cork	2	1	0	0	1	1	5	27.8
468	Cloheen Marsh	Cork	0	0	0	0	0	1	1	5.6
470	Ballyroon Mountain	Cork	3	1	0	0	0	1	5	27.8
471	Mallavogue	Cork	2	1	1	0	0	2	6	33.3
473	Gortnagrough	Cork	2	1	1	1	2	1	8	44.4
474	Barnagowlane West	Cork	1	0	1	1	0	2	5	27.8
475	Glandart	Cork	1	2	0	1	0	1	5	27.8
479	Dundeady	Cork	1	0	1	0	0	2	4	22.2
481	Glannafeen	Cork	3	1	0	0	0	3	7	38.9
482	Hare Island	Cork	3	1	1	0	0	2	7	38.9
483	Gubbeen	Cork	1	0	1	0	0	2	4	22.2
484	Drisheen	Cork	2	1	2	1	0	1	7	38.9
485	MountGabriel	Cork	2	1	1	0	0	1	5	27.8
488	Rougham	Cork	2	0	0	0	1	1	4	22.2
489	Kealagowlane	Cork	3	0	0	0	1	1	5	27.8
490	Bear Island	Cork	3	1	0	0	1	2	7	38.9
492	Cousane	Cork	2	0	1	1	2	1	7	38.9
495	Cappaboy More	Cork	1	0	0	1	2	2	6	33.3
496	Glengarriff	Cork	2	0	0	0	0	1	3	16.7
497	Tullig	Cork	1	0	1	0	0	2	4	22.2
498	Oughtihery	Cork	3	0	1	0	1	1	6	33.3
500	Ballincollig Regional Park	Cork	2	0	1	0	0	1	4	22.2
502	Rockfield Farm	Cork	0	0	0	0	0	1	1	5.6
503	Ballinvonear	Cork	3	1	1	0	1	2	8	44.4
505	Ballindangan Marsh	Cork	0	0	1	1	0	2	4	22.2
506	Garrylucas Marsh	Cork	0	0	1	0	1	2	4	22.2
507	Inchaleagh	Cork	0	0	0	0	0	3	3	16.7
508	Barrahaurin	Cork	1	0	0	0	1	1	3	16.7
509	Gowlane North	Cork	1	0	1	0	1	1	4	22.2
510	Kilcullen South	Cork	1	0	1	1	1	2	6	33.3
511	Mountrivers	Cork	1	0	0	1	1	2	5	27.8
512	Cloonteens	Cork	0	0	1	0	0	1	2	11.1
514	Shanavoher	Cork	0	1	1	1	0	2	5	27.8
516	Esk South	Cork	2	0	2	3	0	2	9	50.0
518	Monee West	Cork	2	1	1	0	0	2	6	33.3
519	Castlebarrett	Cork	0	0	1	1	0	2	4	22.2
520	Glashaboy West	Cork	0	1	1	1	0	1	4	22.2
521	Pluckanes East	Cork	1	1	1	0	0	1	4	22.2
523	Castlelohort Demesne	Cork	1	0	1	1	2	3	8	44.4
524	Subulter	Cork	0	0	1	0	0	1	2	11.1
525	Lackaroe	Cork	0	0	1	0	0	2	3	16.7
526	Creggane	Cork	1	0	1	0	1	2	5	27.8

Site no.	Site Name	County	Encroachment 3	Neg. Grazing 2	Neg. Adj habitats 2	Damaging operations 3	Agricultural improvement 3	Neg. species 5	Total 18	Threat Score 100.0
527	Waterhouse Marsh	Cork	1	1	2	0	1	1	6	33.3
528	Baltydaniel	Cork	1	0	2	0	1	1	5	27.8
530	Knockacullata	Cork	1	0	1	0	1	1	4	22.2
534	Knockacullen	Cork	2	0	1	0	1	2	6	33.3
535	Ballaghanure	Cork	2	0	1	1	1	2	7	38.9
536	Kilnacranagh East	Cork	2	0	1	1	1	2	7	38.9
538	Gouladoo	Cork	2	0	1	0	1	2	6	33.3
539	Dunkelly West	Cork	2	1	1	0	0	2	6	33.3
541	Derryleigh	Cork	1	0	1	1	1	2	6	33.3
542	Derreendangan	Cork	1	0	2	1	0	2	6	33.3
543	Coornishal	Cork	1	0	1	1	0	2	5	27.8
544	Benduff	Cork	0	1	1	0	0	2	4	22.2
545	Drom	Cork	2	0	0	0	1	3	6	33.3
546	Cullane East	Cork	2	1	1	0	1	2	7	38.9
547	Dromnea	Cork	3	1	0	0	1	2	7	38.9
548	Charlesfield	Cork	0	0	1	1	1	1	4	22.2
549	Carraraigue	Cork	1	0	1	0	1	1	4	22.2
550	Drombeg	Cork	1	1	1	0	1	2	6	33.3
552	Dromcarra	Cork	2	0	1	1	2	2	8	44.4
553	Reanacaragh	Cork	1	1	1	0	1	2	6	33.3
554	Rossnashunsoge	Cork	1	0	0	0	2	2	5	27.8
555	Cooldaniel	Cork	1	1	1	0	1	2	6	33.3
556	Moneycusker	Cork	1	1	1	1	1	1	6	33.3
557	Teereeven	Cork	0	0	1	1	0	1	3	16.7
558	Shanacashel	Cork	3	1	1	1	1	2	9	50.0
559	Derryvane	Cork	1	0	1	0	0	1	3	16.7
560	Gortroe	Cork	1	1	1	0	3	2	8	44.4
563	Reenrour West	Cork	0	0	1	1	1	2	5	27.8
564	Dromreagh	Cork	0	0	1	0	0	1	2	11.1
565	Reenavanny	Cork	2	0	1	0	0	1	4	22.2
566	Reenaknock	Cork	2	1	2	1	1	3	10	55.6
567	Ballyourane	Cork	1	1	1	0	0	1	4	22.2
568	Derrycarhoon	Cork	3	1	0	0	3	2	9	50.0
569	Derreenagreanagh	Cork	2	0	1	0	2	3	8	44.4
570	Inchibegga	Cork	2	1	1	0	1	1	6	33.3
571	Ballynagree East	Cork	1	0	1	0	1	1	4	22.2
573	Deelish	Cork	0	0	1	0	0	1	2	11.1
580	Lisnacuddy	Cork	1	1	1	1	0	1	5	27.8
581	Ballyshoneen	Cork	1	0	1	0	1	3	6	33.3
582	Allihies Mountain Mine	Cork	1	0	0	0	0	1	2	11.1
584	Polleenateada	Cork	3	0	1	1	0	1	6	33.3
585	Gokane	Cork	1	0	1	1	1	2	6	33.3
586	Toehead	Cork	3	1	1	0	0	3	8	44.4
587	Downeen	Cork	0	1	1	0	1	1	4	22.2
588	Dunowen	Cork	0	0	2	0	0	2	4	22.2
589	Derrynakilla	Cork	1	0	1	0	0	1	3	16.7
590	Bengour West	Cork	2	0	1	1	0	1	5	27.8
592	Lumnagh More	Cork	3	1	0	1	0	1	6	33.3
593	Teeracurra	Cork	0	0	1	1	0	2	4	22.2
594	Middle Calf Island	Cork	2	1	0	0	0	2	5	27.8
595	East Calf Island	Cork	1	0	0	0	0	1	2	11.1
596	Castle Island	Cork	2	1	0	0	0	2	5	27.8
597	Glannaharee West	Cork	2	0	1	1	0	2	6	33.3
599	Leckaneen	Cork	2	1	1	0	0	1	5	27.8
600	Scarteen	Cork	0	0	2	1	2	2	7	38.9
601	Dawstown	Cork	1	1	1	0	0	1	4	22.2
603	Mossgrove	Cork	1	1	2	0	0	2	6	33.3
604	Maglin	Cork	1	1	1	2	0	2	7	38.9
605	Coolatooder	Cork	1	1	1	1	0	2	6	33.3
606	Coolkirky	Cork	1	1	2	2	0	2	8	44.4
607	Coolcullitha	Cork	0	0	1	0	1	1	3	16.7

Site no.	Site Name	County	Encroachment 3	Neg. Grazing 2	Neg. Adj habitats 2	Damaging operations 3	Agricultural improvement 3	Neg. species 5	Total 18	Threat Score 100.0
608	Coolmoreen	Cork	2	0	2	1	0	2	7	38.9
610	Dromderrig	Cork	1	0	2	0	0	1	4	22.2
613	Dunworly	Cork	0	0	1	1	0	2	4	22.2
615	Aghmanister	Cork	1	0	1	1	1	3	7	38.9
616	Carrigeen	Cork	0	0	1	0	0	3	4	22.2
618	Kilcolman	Cork	0	1	2	0	0	1	4	22.2
619	Imogane Bridge	Cork	0	0	1	0	1	2	4	22.2
621	Longacre	Cork	1	0	0	0	0	2	3	16.7
622	Croanrea	Cork	2	0	1	0	0	2	5	27.8
623	Knockduff Lower	Cork	1	0	1	1	2	1	6	33.3
626	Twomey's Bridge	Cork	1	0	1	1	1	1	5	27.8
627	Garrison	Cork	1	0	2	0	0	2	5	27.8
628	Gooseberryhill	Cork	1	0	1	1	1	1	5	27.8
629	Rossacon	Cork	1	1	1	1	0	3	7	38.9
630	Ballyduane	Cork	1	0	1	0	0	2	4	22.2
631	Urraghilmore	Cork	1	1	1	0	0	2	5	27.8
632	Clashykinleen	Cork	0	0	1	1	1	1	4	22.2
633	Claraghatlea	Cork	1	0	1	0	0	1	3	16.7
634	Ahane Upper	Cork	1	0	1	0	0	2	4	22.2
635	Kilmacurrane	Cork	1	2	1	0	0	2	6	33.3
636	Dromahoe	Cork	0	0	1	1	0	2	4	22.2
638	Gallanes	Cork	1	0	1	0	0	2	4	22.2
640	Ballydaly	Cork	1	0	1	0	0	2	4	22.2
641	Geararoe	Cork	0	0	1	1	1	1	4	22.2
642	Coomnagire	Cork	2	0	1	1	1	1	6	33.3
644	Cahernacaha	Cork	1	0	1	0	3	1	6	33.3
645	Inchamore	Cork	1	0	0	1	1	1	4	22.2
646	Caherkereen	Cork	0	1	2	0	2	2	7	38.9
648	Gortanimill	Cork	1	0	1	1	2	2	7	38.9
649	Shanagarry South	Cork	1	0	0	0	0	1	2	11.1
650	Gortnagoul	Cork	0	0	1	0	0	2	3	16.7
651	Shanaboola	Cork	1	0	1	0	1	1	4	22.2
653	Furrow	Cork	1	0	1	1	1	2	6	33.3
656	Crosshavenhill	Cork	2	1	1	0	0	1	5	27.8
660	Skibbereen Marsh	Cork	0	1	0	2	0	3	6	33.3
662	Killeagh West Verge	Cork	0	0	1	1	0	2	4	22.2
664	Castlemartyr Verge	Cork	0	0	0	2	0	2	4	22.2
666	Youghal Verge	Cork	0	0	1	1	0	1	3	16.7
667	Knockaneglass	Cork	1	1	0	1	0	1	4	22.2
668	Killowen	Cork	1	1	2	0	0	2	6	33.3