

Ecological Impact Assessment

Including Habitats Survey & Mapping

In respect of:

Retention permission application for applicant David O'Toole

Description: **Application for retention of unauthorised fill on lands**

Site Location: **Cregganna Beg, Oranmore, County Galway**

Date: **20 November 2023**

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This report has been prepared by the author with all reasonable skill, care and diligence, taking account of the programme of work agreed between the author and the client on this project. All opinions, analysis, recommendations and conclusions contained in this report are based on existing site conditions and knowledge acquired during a site visit and desk study. The author accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

Author's name, qualifications, and contact email address on cover page of this report.

1. Introduction

1.1 Background and Methods

This Ecological Impact Assessment (EclA) has been prepared for the applicant David O'Toole in relation to a retention permission application in the townland of Cregganna Beg, Oranmore, County Galway. It addresses what Galway County Council have identified as unauthorised fill on a site in the ownership of the applicant's family. This document is completed to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment.

Galway County Council issued a Warning Letter Pursuant to Section 152 of the Planning & Development Act 2000 to the applicant on 31 July 2023, as outlined below:

Description of Unauthorised Development

- *Unauthorised Fill on Lands at Cregganamore, Oranmore, County Galway*
- *Unauthorised Container at Cregganamore, Oranmore, County Galway*

Since the date of this letter, the applicant has removed the container in question from within the subject site, and hence this document does not refer to the container in terms of retention permission.

A range of relevant information was compiled for the preparation of this document (and the accompanying Natura Impact Statement) during 15 September to 20 November 2023. Desktop data was gathered using existing files and information relating to the environment surrounding the retention application from relevant websites such as the National Parks and Wildlife Service, in addition to other relevant internet sources. Two surveys of the site and the surrounding area for site familiarisation, habitat identification and mapping purposes were undertaken on 16 October and 08 November 2023. The author of this document has also sourced relevant information on the site from the applicant in the preparation of the document.

The EclA has been written in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018). The author of this report has appropriate degree qualifications in the disciplines of environmental engineering, urban & regional planning, and ecology. The author has been working in the mix of these disciplines since 2003. The author possesses extensive experience in developing a variety of planning, environmental and ecological reports for a range of development applications for many Irish local authorities. These include Screening Reports, Natura Impact Statements, Construction & Environmental Management Plans, Ecological Impact Assessments, Habitat Assessments, and Wildlife Assessments. Further work has included the development of a Spatial Strategy, Site

Appraisals, HRA Appropriate Assessment, and a Sustainability Appraisal for a local authority's development plan.

1.2 Key elements of the EclA Process

Ecological Impact Assessments can be applied to projects of widely varying scales. The level of detail required in an EclA will inevitably be proportionate to the scale of the development and complexity of its potential impacts. Scoping (chapter 2) should be proportionate to potential effects on ecological features.

Emphasis in EclA is on 'significant effects' rather than all ecological effects. Relevant legislation, regulations, plans and policies should be considered at an early stage. The following principles underpin EclA:

- Avoidance: seek options that avoid harm to ecological features (for example, by locating on an alternative site);
- Mitigation: negative effects should be avoided or minimised through mitigation measures, either through the designs of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation;
- Compensation: where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures;
- Enhancement: seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

1.3 Legislation & Planning Policy

There are a number of European Union Directives which are particularly relevant to planning applications such as this, and which are outlined below.

Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (The Habitats Directive)

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics.

Council Directive on the Conservation of Wild Birds (2009/147/EC) (The Birds Directive)

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range, conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

2. Scoping of the Report

2.1 Purpose and Objectives of Scoping

Scoping determines the matters to be addressed in the EclA, including consultation where necessary to ensure the most effective input to defining the scope. Scoping is an ongoing process – the scope of the EclA may be modified following further ecological survey/research and during impact assessment. Scoping hence is the process of establishing the ecological issues to be addressed in the EclA. It sets out the methods and resources to be used and establishes the spatial and temporal limits for surveys and assessments.

Scoping is essential to:

- Establish an initial understanding of the baseline ecological conditions and the potential significant effects that could arise;
- Determine and agree the zone of influence of the project and which important ecological features could be significantly affected;
- Determine and agree the proposed surveys and methods for survey, evaluation and assessment;
- Determine and agree the content of the EclA.

2.2 Desk Study

Biodiversity records and full species accounts can be viewed and analysed through an interactive Biodiversity Maps portal (<http://maps.biodiversityireland.ie#Home>). This is a tool that can be used to help make a preliminary assessment of biodiversity issues when considering site-specific proposed development. The National Biodiversity Data Centre (NBDC) is a national organisation that collates, manages, analyses, and disseminates data on Ireland's biodiversity. The HBDC provides access to all validated biodiversity data through Biodiversity Maps, the on-line biodiversity data portal.

The chosen search area using the HBDC search tool was customised in order to customised in order to capture all records within a minimum 1km distance of the proposed development site. The principal purpose of this task is to capture any records of protected species or species of natural heritage importance in close proximity to the site boundary.

The zone of influence of the proposed development for protected species, does not extend further than this.

2.3 Habitat Survey

A Phase 1 Habitat Survey was conducted over two sessions in October and November 2023 within the site of the proposed project and in the surrounding area. A Phase 1 Habitat Survey (JNCC, 2010) is the standard system used to rapidly record, categorise and map habitats over large areas of countryside. Habitats are mapped using standard colour codes and target notes are used to describe any features of ecological or natural heritage importance. The survey was extended to include further information on the potential of the habitats identified to support species protected by law or of natural heritage importance.

The habitat survey will remain valid for a period of one year of being carried out in accordance with NIEA survey specifications (DAERA, 2019). It should be noted that whilst every effort has been made to provide a comprehensive description of the site of the proposed project no survey can consist of a complete characterisation and prediction of the ecological environment. Figure 1 shows the range of habitats of the Cregganna Marsh SPA, as viewed from the subject site.



Figure 1: The existing habitats of the Cregganna Marsh SPA as viewed from the closest point of the subject site, featuring lowland wet grassland, improved grassland, hazel scrub, freshwater marsh, and drainage ditches (image taken on 16/10/2023).

3. Establishing the baseline

3.1 Introduction

Ecological baseline conditions are those which exist in the absence of proposed activities. The impact assessment determines how the conditions will change in relation to this baseline to facilitate a clear understanding of the effects of a project.

The conditions that define the baseline need to be carefully considered. This is because the baseline at the time when the project proceeds may differ from conditions that exist at the time an assessment is made. Assessing the impacts of any project and associated activities requires an understanding of the baseline conditions prior to and at the time of the project proceeding or specific activities taking place. If there is likely to be a lengthy time between undertaking an impact assessment (for example, to inform the planning application) and project inception, potential changes in the ecological baseline during that time should be identified.

Generally, there is a requirement to collect information and describe the ecological conditions in the absence of the planning application, to inform the assessment of impacts. The emphasis of this report has to take into consideration that this is a retention application. Hence the baseline at the time of the surveys includes the works already undertaken which are the subject of the retention permission. Nevertheless, should retention permission be granted on this site, the applicant is proposing some enhancement measures to improve conditions for biodiversity on site and the surrounding environs. These proposed enhancement measures are evaluated in this report.

3.2 Identification of the Designated European Sites within the Likely Zone of Impact

Ecological baseline conditions are those which exist in the absence of proposed activities. The impact assessment determines how the conditions will change in relation to this baseline to facilitate a clear understanding of the effects of a project. The definition of these baseline conditions should be informed by changes arising from other causes (e.g. other consented developments).

The following methodology was used to establish which designated European Sites are within the Likely Zone of Impact of the proposed development:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 24/10/2023. The datasets were utilised to identify European Sites which could feasibly be affected by the proposed development;

- All European Sites within a distance of 15km surrounding the development site were identified. In addition, the potential for connectivity with European Sites at distances of greater than 15km from the proposed development was also considered in this initial assessment. In this case, no potential connectivity with sites located at a distance of over 15km from the proposed development was identified;
- The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites;
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (2016)' was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects;
- The following section provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this screening assessment;
- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report, and are available to view in Appendix I;
- Where potential pathways for significant effects are identified, the site is included within the Likely Zone of Impact and further assessment is required.

From the desktop study, it has been noted that there four Special Protection Areas and nine Special Areas of Conservation within 15km of the proposed site. The four SPAs and nine Special Areas of Conservation are listed as follows:

- Inner Galway Bay SPA (site code: 004301);
- Cregganna Marsh SPA (site code: 004142);
- Rahasane Turlough SPA (site code: 004089);
- Lough Corrib SPA (site code: 004042);
- Galway Bay Complex SAC (site code: 000268);

- Lough Fingall Complex SAC (site code: 000606);
- Kiltiernan Turlough SAC (site code: 002185);
- Ardahan Grassland SAC (site code: 002244);
- Castletaylor Complex SAC (site code: 000242);
- Rahasane Turlough SAC (site code: 000322);
- Cahermore Turlough SAC (site code: 002294);
- Ballinduff Turlough SAC (site code: 002295);
- Lough Corrib SAC (site code: 000297).

The qualifying interests, conservation objectives and site synopsis of each of these SPAs and SACs are presented in Appendix I. It is noted that the eight SACs in question are a mix of turlough habitat, grassland, and coastal habitats. Given the land type nature of these SACs, and their further distance from the retention site compared to Cregganna Marsh SPA, it is not thought that there are any significant pathways to the conservation objectives of the SACs from the retention elements of the subject site. There are no construction of buildings or wastewater treatment systems involved in this retention application. For example, the Galway Bay Complex SAC is located at a sufficient distance away from the retention site and without a hydrological conduit to it, and hence it is not expected that the elements of the retention development (i.e. unauthorised fill) will have any significant on the conservation objectives of this SAC. The boundary of the Cregganna Marsh SPA is located approximately 50 metres away from the nearest boundary of the subject site. The qualifying interest and the supporting habitats of the Cregganna Marsh SPA will be hence now analysed in more detail in this section.

Figure 2 overleaf gives an indication of the location of the subject site in relation to the Cregganna Marsh SPA. Figure 3 shows the boundary of the subject site to a buffer of agricultural land, which is located between the site and the lands of the Cregganna Marsh SPA. The subject site hence has no adjoining boundary to the designated SPA.

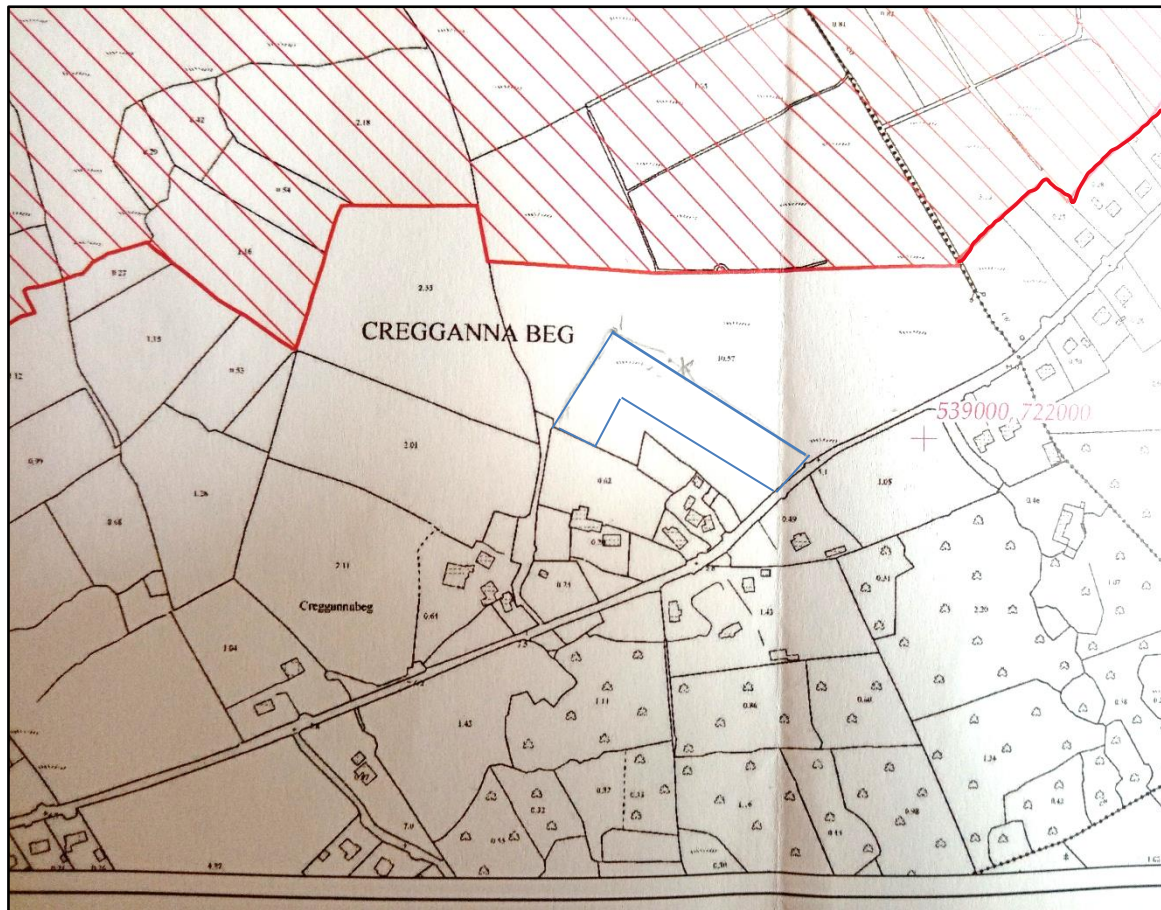


Figure 2: The location of the subject site (blue marking) in relation to the southern area of the Cregganna Marsh SPA (outlined in red).

Cregganna Marsh SPA [site code: 004142]

Qualifying Interest

Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]

Site Synopsis

Cregganna Marsh is situated about 3 km south of Oranmore, to the west of the Galway - Ennis road. The predominant habitats on the site are lowland wet grassland and improved grassland, but areas of limestone pavement and other exposed rock, Hazel (*Corylus avellana*) scrub, freshwater marsh, drainage ditches and dry grassland are also represented. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greenland White-fronted Goose.

The site is of major conservation importance as a feeding site for a nationally important flock of Greenland White-fronted Goose (157 – 5 year mean peak between 1994/95 and 1998/99). The birds using this site form part of the Rahasane flock. Cregganna Marsh SPA is of ornithological importance because it is regularly utilised by a nationally important flock of Greenland White-fronted Goose, a species listed on Annex I of the E.U. Birds Directive.



Figure 3: The fenced boundary of the subject site, adjacent to a buffer of agricultural land between the site on the left and the habitats of Cregganna Marsh SPA on the far right (image taken on 16/10/2023).

4. Important ecological features

4.1 Introduction

Identifying important ecological features (habitats, species and ecosystems, including ecosystem function and processes) that may be affected, with reference to a geographical context in which they are considered important.

The impact assessment process involves:

- Identifying and characterising impacts and their effects;
- Incorporating measures to avoid and mitigate negative impacts and effects;
- Assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to offset significant residual effects;
- Identifying opportunities for ecological enhancement.

4.2 Species of Importance in Cregganna Marsh SPA

- Greenland White-fronted Goose (*Anser albifrons flavirostris*)

The Greenland White-fronted Goose breeds in western Greenland, and migrates via Iceland to winter in Ireland and Britain. It is the most distinctive race of the circumpolar White-

fronted Goose that nests throughout most of northern Russia, Arctic Canada and Alaska. This bird is a scarce winter visitor to wetlands in County Wexford and parts of western Ireland (particularly counties Galway, Mayo, Roscommon, Sligo and Donegal) from October to April. The Cregganna Marsh SPA represents one of the strongholds for Greenland White-fronted Goose on the island of Ireland.

The Greenland White-fronted Goose is a medium-sized grey goose with orange-coloured legs. It has a long orange-yellow bill with a prominent blaze around the base of the bill (in adults). It breeds on lowland tundra, often by lakes and rivers. The nests are widely scattered, although loose colonies may be formed.

The Greenland White-fronted Goose has been on conservation concern for many years. The law was changed to protect the population from hunting in Ireland and Scotland from 1983 onwards, and a network of observers was established in 1982 to undertake regular winter counts at all the known haunts to monitor the changes in abundance of the entire population. Threats to the conservation interests of this bird include habitat loss from drainage, inappropriate development, and disturbance.

Habitat loss and degradation is major global threat to Greenland White-fronted Geese. In particular, disturbance by humans, wetland habitat degradation due to drainage, peat-extraction and changing management practices are threats to the feeding and roosting habitats used by this species across its range. Collision impacts with inappropriately located wind energy developments are identified as a potential threat, with a prerogative on appropriate survey and impact assessment.

- Other wildlife species that potentially utilise the SPA

The Greenland White-fronted Goose is the only species that is identified as a qualifying interest for the Cregganna Marsh SPA. However, the habitats within this SPA act can be important for a wide range of birds, mammals, and amphibians in the local area, which are protected under the Wildlife Act of 1976. Such species that this SPA is likely to host at least on a temporal basis, include the stoat (*Mustela erminea*), otter (*Lutra lutra*), pine marten (*Martes martes*), badger (*Meles meles*), hare (*Lepus europaeus*), common newt (*Triturus vulgaris*), and all bat species (in the order *Chiroptera*).

4.3 Habitats of Importance within Cregganna Marsh SPA

The predominant habitats within the Cregganna Marsh SPA are lowland wet grassland and improved grassland. Areas of limestone pavement and other exposed rock, Hazel (*Corylus avellana*) scrub, freshwater marsh, drainage ditches, and dry grassland are also represented. Figure 3 shows many of these habitat types within this SPA, and the habitats are described in detail overleaf.

- Lowland wet grassland: this is habitat that are periodically flooded or waterlogged by freshwater. They are characterised by flowering plants, sedges, and grasses, and often contain seasonal water-filled hollows, permanent ponds, and networks of ditches. Wet grasslands are typically found on low-lying, level land often within river or coastal floodplains. Wet grasslands provide habitat for birds to breed, nest, feed and shelter. These temporary wet areas are also important for dragonflies, water voles, and amphibians.
- Improved grassland: this is a type of grassland that is heavily managed to maximise production. It is typically re-seeded frequently, heavily fertilised, and grazed or cut for silage. This type of grassland makes up the largest proportion of Ireland's productive grassland. Improved grassland is a type of grassland that contains species such as perennial rye grass, docks, thistles, nettles, and agricultural clovers.
- Limestone pavement: this is a type of rocky habitat that is composed of exposed, flat exposures of Carboniferous, Dalradian, and Durness limestone. The flat slabs of rock are scored with deep, undulating fissures known as grykes which can be up to 6 metres deep, although most are 1-2 metres deep. Limestone pavement is typically grazed and supports little if any vegetation. However, ferns and other plants typical of rocky habitats or woodlands flourish in the damp grykes out of the reach of grazing animals. The vegetation of limestone pavements is unusual because of the combinations of floristic elements, including woodland and woodland edge species.
- Hazel scrub: this is a type of woodland habitat that is characterised by the presence of hazel shrubs. These shrubs are deciduous and can grow up to 6 metres tall. Hazel scrub woodland covers extensive areas of limestone, particularly on the Burren plateaus of northern County Clare and southern County Galway. This habitat is often associated with a rich ground flora of woodland flowers.
- Freshwater marsh: This habitat is a non-tidal, non-forested marsh wetland that contains fresh water, and is continuously or frequently flooded. Freshwater marshes primarily consist of sedges, grasses, and emergent plants. Freshwater marshes are usually found near the mouths of rivers, along lakes, and are present in areas with low drainage like abandoned oxbow lakes.
- Drainage ditches: these ditches are usually straight, follow linear field boundaries – often turning at right angles – and show little relationship with natural landscape contours. Like all other freshwater habitats, what lives in ditches depends on how polluted they are. It also varies according to their gradient, and how often they flow.
- Dry grassland: the key characteristic of dry grasslands is that they have low-growing plants, causing the area to be quite open. They also have a mottled structure, which leads to a biome with sunny or semi-shaded areas. On top of that, their soil is relatively dry and nutrient-poor. There are, however, types of grasslands with a higher humus and nutrient content.



Figure 4: The habitats of Cregganna Marsh SPA, as viewed from the subject site (image taken on 16/10/2023).

5. Impact Assessment

5.1 Strategy to assess potential effects on designated European sites

This chapter is an assessment of whether important ecological features will be subject to impacts and characterisation of these impacts and their effects. It is an assessment of the significance of the residual ecological effects of the project (those remaining after mitigation), including cumulative effects.

Any likely direct or indirect effects of the proposed development on designated European sites are considered in this assessment, both alone and in combination with other plans and projects, by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction and operation. The review here focuses on conservation objectives that relate to designated European sites. This section describes the potential direct and indirect effects on the European site(s) and the mitigation that are in place to block or sufficiently mitigate any identified potential effects. It concludes on whether there is any potential for adverse effects on the integrity of the identified European Sites.

The following plans have been reviewed and taken into consideration as part of this assessment:

- Galway County Development Plan, 2022-2028

- National Biodiversity Action Plan, 2017-2021
- The Regional Planning Guidelines for the West, 2010-2022

5.2 Description of the Retention Permission Application Site

The subject site is located at Cregganna Beg, Oranmore, in southwest County Galway. The site has an area of 1.1437 hectares or 2.826 acres. It is located approximately 3km south from the town of Oranmore. The site is accessed via a local road L-8106, which leads from the N67 route that connects Galway city to the town of Oranmore, and then to the settlements of Clarinbridge and Kilcolgan to the south. The retention site is surrounded by existing residential development of single dwellings, agricultural holdings, and hedgerows plus some tree cover. Between the retention site and the boundary of the Cregganna Marsh SPA is an existing agricultural land holding in which cattle are present at various times of the year.

The subject site was purchased by the applicant in the late 1990s. The site has a history as an agricultural holding with livestock grazing, and it does not presently host livestock. The applicant has some trees planted on the subject site and has undertaken some infilling in certain sections of the land in question. Figures 5 and 6 show an overview of the present condition and vegetation of the site. The site is located close to the existing dwelling house, shed, and yard of the applicant, which are located to the south and west of the site (see figure 7).



Figure 5: A view of the vegetation on the subject site, which is currently a mix of grasses. The applicant expects some tree coverage in the future (image taken on 16/10/2023).



Figure 6: A view of the site looking from its northern edge towards the boundary of the hedgerows and the local road L-8106 (image taken on 16/10/2023).



Figure 7: The existing house of the applicant and adjoining buildings which are located to the south and west of the subject site (image taken on 16/10/2023).

5.3 Analysis of the potential effects on Cregganna Marsh SPA

Phase 1 Habitat Surveys were undertaken during the months of October and November, the time of year when the Greenland White-fronted Goose, which is the qualifying interest of the nearby Cregganna Marsh SPA, has recently returned to Ireland from its summer breeding residence in western Greenland. The Cregganna Marsh SPA represents one of the strongholds for Greenland White-fronted Goose (*Anser albifrons flavirostris*) on the island of Ireland. From the analysis of the Phase 1 Habitat Survey, there is no evidence of the subject site itself supporting the presence of this species.

It has been noted in Chapter 4 that the Greenland White-fronted Goose has been of conservation concern for many years. Threats to the conservation interests of this bird include habitat loss from drainage, inappropriate development, and disturbance. Habitat loss and degradation is major global threat to Greenland White-fronted Geese. In particular, disturbance by humans, wetland habitat degradation due to drainage, peat-extraction and changing management practices are threats to the feeding and roosting habitats used by this species across its range. Collision impacts with inappropriately located wind energy developments are identified as a potential threat, with a prerogative on appropriate survey and impact assessment. It is in relation to these threats to the Greenland White-fronted Goose, and the habitats of the Cregganna Marsh SPA that it depends on, that the retention application and the works undertaken within the subject site are to be henceforth considered.

The applicant has infilled in portions of the subject site with selected material, and he has provided information for the purposes of this document on the infill works carried out to date. In terms of sources, there was an extensive earth mound already in place on the site before infill work commenced. The applicant has stated that this mound was levelled out first and then the remainder of the infill was sourced externally. About 20% of the fill came from material sourced from the Oranmore Maree GAA pitch development, which was a new development at the time of the infill works. The applicant has stated that there were some other infill loads from the Oranmore locality brought by an individual known to the applicant. The applicant stated he was careful to avoid the introduction of any invasive plant species such as Japanese knotweed or any other harmful foreign material before accepting any external fill. The applicant has stated that the total amount of infill now comprises approximately 40% of the area of the site. From two surveys of the site area, it does not appear that the infill works have unduly interfered with the small stream running through the site. Vegetation has grown over in the infill areas, and there are no obvious slopes on the site, apart from the small depression that currently contains a pond of water.

The works undertaken do not result in any habitat loss from drainage. The site area does not function as a wetland, and hence there is no wetland degradation in evidence due to

drainage or otherwise. There are no permanent built structures in place on the site, nor or any proposed. It is the intention of the applicant to have the site in question to help and boost biodiversity in the locality, particularly given the site's proximity to Cregganna Marsh SPA. The human disturbance was temporary and limited to the infill works. There is no on-going human disturbance within the site as there are no built or permanent structures with human occupancy on the site, or laneways to facilitate vehicular movement. There are hence no threats to the feeding or roosting habitats of the Greenland White-fronted Goose in Cregganna Marsh SPA from the retention of the infill on this site.

The retention of the works will not remove habitat for the qualifying interests of the Cregganna Marsh SPA, in terms of the key species of the Greenland White-fronted Goose. In contrast, the semi-natural landscape of the existing site (and its ongoing proposed development for biodiversity enhancement – see Chapter 6) will complement the adjacent habitats of the SPA. The subject site, free from built development and focused on biodiversity enhancement, means that the Cregganna Marsh SPA has a significant portion of land to its southwest free from human disturbance. The conservation objective of the SPA is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA, namely the Greenland White-fronted Goose. The potential pathways from the subject site are not deemed to be significant in terms of a threat to these conservation objectives, and indeed for the reasons above, the nature of the subject site should support this conservation objective.

Having regard to the location of the subject site close to the boundary of the Cregganna Marsh SPA, potential effects are also considered here. At the time of both site surveys, a walk around the perimeter and internal space of the site was undertaken. There was some evidence of surface water present on the land, which was not surprising given the periods of heavy rain preceding the visits in mid-October and early November 2023. It was observed that there was quite a level site, assisted by infill works, with no obvious overall sloping.

There is one small stream within the site (see figure 8 overleaf), and hence there can be an ecological conduit from the subject site to the designated SPA in the form of gravity flow. The applicant has stated that he has previously improved its drainage, and installed piping under an access crossing to facilitate the movement of the stream water. The stream seems to move under the ground where the subject site has its boundary with adjacent agricultural lands between it and the SPA lands. Further to retention permission being granted, the applicant has stated that he intends to clean up any excessive nutrient enrichment that exists within the stream, and he can work with the relevant team(s) of Galway County Council to undertake this as required. Upon inspection during the site surveys, the visible sections of this stream on site do not appear to have any material from the previous infill works in the water.

The second possible pathway is a potential pollution risk from the site related to any flooding episodes related to the subject site. As noted previously, the site is quite level

overall with no overall sloping of the land. During the survey, there was analysis of the surrounding environment, comprising of existing dwellings and their curtilages, tree cover, agricultural fields close to and adjacent to the subject site. There is no wastewater treatment system associated with this retention application type, or any facility which could potentially add pollutants to the nearby Cregganna Marsh SPA or other designated European sites considered in this report within the vicinity of the subject site. During heavy rain episodes on the subject site, rainwater can soak underground easily without any building impediments or be transferred via the existing stream towards the Cregganna Marsh SPA.

It is hence not expected that a pathway can exist in terms of a potential pollution risk from flooding, as accumulation of water on this site can readily be avoided. Moreover, it was noticed during the second survey on 8th November 2023 that surface water had accumulated within the boundary of the Cregganna Marsh SPA which was not in evidence during the first survey work on 16th October 2023. After a period of rain in the second half of October, water can accumulate in the freshwater marsh environment of the SPA, including taking water from surrounding lands via ground flow. Hence, the subject site is not considered to be at reasonable risk from flooding, and the infill works posed for retention do not pose a pollution risk to the habitats of the Cregganna Marsh SPA.

The cumulative impact of the works for retention is negligible, considering the nature of the retention development. The subject site is primarily focused on enhancing and supporting biodiversity, and these lands can act to support the habitat and wildlife of the Cregganna Marsh SPA. The site does not host residential, commercial, or any permanent buildings, and so it does not act in a cumulative manner with built development in the area.

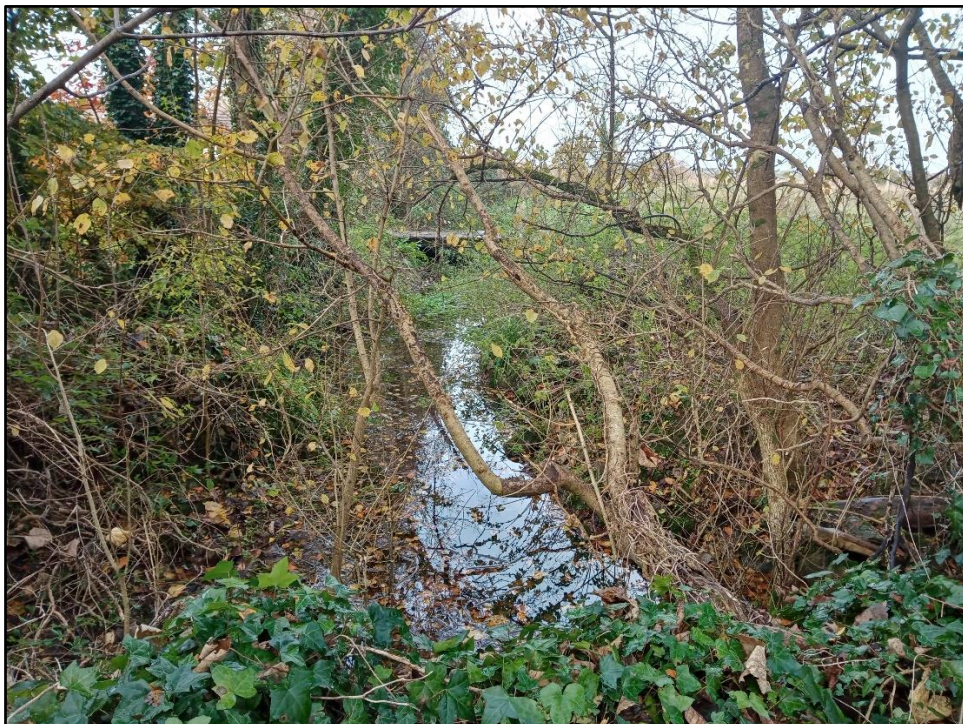


Figure 8: The small stream at the point looking in from the L-8106 local road, and the stream goes on through the centre of the subject site (image taken on 08/11/2023).

It was noted during the site surveys that there is an existing small pond within the subject site (figure 9), which does not have a surface connection to the stream running through the site area. The applicant has stated that he is willing to leave the pond in its current state, or he can liaise with the Council to undertake whatever works that may be recommended by the Council for this small water body on site.



Figure 9: The existing water body within the subject site (image taken on 16/10/2023).

6. Avoidance, mitigation, compensation and enhancement

6.1 The Mitigation Process

A sequential process should be adopted to avoid, mitigate and compensate negative ecological impacts and effects. This is often referred to as the 'mitigation hierarchy'. For most projects, avoidance, mitigation, compensation, and enhancement measures should be identified as part of the EclA. This chapter incorporates measures to avoid, reduce and compensate negative ecological impacts and their effects, and the provision of ecological enhancements. It monitors potential impacts and their effects. It evaluates the success of proposed mitigation, compensation and enhancement measures. The mitigation measures

put forward below act to minimise disturbance of the qualifying interests of the Cregganna Marsh SPA and other designated European sites under consideration within a 15km radius of the site. The proposed enhancement measures outlined below can support the qualifying interests and conservation objectives of the designated European sites under consideration.

6.2 Biodiversity Enhancement Measures

- Tree planting program

Subject to obtaining retention permission, the applicant intends to complete the native tree planting program which he has undertaken to date on the site. The applicant expects that the completion of the tree planting would be within the next two years. The applicant has planted a range of tree species (namely beech, oak, hazel, rowan, alder, willow, silver birch, and hawthorn), and also has grassed the whole area. The applicant has stated that the completion of the tree planting program will include native deciduous trees and some coniferous trees. Figure 10 below shows the existing tree species in boxes at the time of the site surveys which the applicant hopes to plant on the site in the near future.

The applicant intends to also undertake hedging work comprised of white hawthorn along the remainder of the boundary fence of the site. The applicant states that about 100 yards of hawthorn hedge was already planted approximately 30 metres from the road in the year 2019. The applicant has already planted 20 fruit trees on the site such as clover and borage, and he intends to plant another 15 fruit trees within a period of the next two years.



Figure 10: The tree species which are to be planted on site (image taken on 16/10/2023).

- Bee keeping on site and associated favourable plant species

The applicant is a member of the Kilcolgan bee keeping group, and intends to keep and look after beehives on a small section of the site. Subject to retention permission been granted, the applicant hopes to bee-friendly plants such as borage, cornflowers, goldenrod, sunflowers, foxgloves, and lavender.

6.3 Land management proposals and potential initiatives for the site

- Stream and Pond on site

Subject to retention permission be granted, the applicant has stated that he can undertake measures to remove any nutrient enrichment identified in the stream within the centre of the site. The applicant has also stated that he can leave the existing pond on the site in place in its existing condition, or work with the Council to make whatever modifications to the pond which may be required. The applicant's objective is for the site to be a suitable overall condition to support biodiversity, and he is hence content to work with the Council on any recommended works which may be required.

- Fenced paddock proposal

The applicant intends to host a fenced paddock area comprising of approximately 0.5 acres near the boundary of the existing building in his ownership adjacent to the subject site. The applicant hopes to accommodate a small pony for his daughter within the paddock. The paddock area would represent less than half of the total site area.

This proposal, combined with the beehive area, hawthorn hedging along the site boundaries, and the extensive tree planting coverage, would mean that the site has no intended future use for permanent built facilities or significant human disturbance of any kind, and that the site as a whole can be a valuable and vibrant area for biodiversity.

6.4 Invasive Species Prevention Measures

- As described in Section 5.3, the applicant has stated that good construction site hygiene has been employed when external infill was used to prevent the introduction and spread of problematic invasive alien plant species (e.g. Rhododendron, Japanese Knotweed, Giant Rhubarb etc.);
- The applicant has stated that infill material used on site which was sourced externally was from local, known sources that were free of any invasive species.

7. Conclusions

7.1 Findings of the EclA for decision making

The findings of an EclA are a material consideration in the planning process and other consent regimes. Key aspects of the EclA report that the competent authority should take into account when determining an application include:

- Whether ecological features are likely to be affected and all potential impacts are described adequately;
- Whether effects are significant and, if so, are capable of being mitigated;
- Whether the mitigation hierarchy has been applied;
- Whether it is adequately demonstrated that the proposal (retention in this case) will deliver stated outcomes, with regard to likely effectiveness and certainty over deliverability.

This report should be alongside the Natura Impact Statement which has also been prepared for this retention application.

7.2 Determination of Potential Impacts

The infill works undertaken by the applicant on the site do not constitute a threat to the qualifying interests and conservation objectives of the designated European sites within

15km of the site. There has been particular focus on the Cregganna Marsh SPA due to its proximity and the hydrological link to this SPA from the subject site. The infill works are deemed not to pose a threat to the Cregganna Marsh SPA or its qualifying interest (the Greenland White-fronted Goose (*Anser albifrons flavirostris*) and key habitats.

From two site surveys in October and November, when this bird species has returned to Ireland for over-wintering, there was no evidence that this bird utilises the habitat of the subject site. Hence there has been no direct interference with the habitat of this bird species.

For any development in the area, there are identified potential risks to designated European sites in terms of water quality deterioration, and thus interference of the habitats of the Cregganna Marsh SPA or other designated European sites under consideration here. The infill works have not interfered with or obstructed the small stream running through the site, and hence there is no hydrological pathway to negatively affect the habitats of Cregganna Marsh SPA. There are no permanent structures on the site to inhibit natural soakage of surface water, and hence water can reach the Cregganna Marsh SPA, via the ground mostly or the aforementioned stream. The objective of the applicant to leave the site in a semi-natural state, and then improve and enhance its biodiversity, mean it should be a valuable complementary habitat to the designated SPA in hydrological terms and also in terms of supporting local wildlife species.

The applicant has utilised the infill as part of this objective to improve and enhance the whole site for biodiversity. The infilling works has removed a substantial mound within the site and filled in previous depressions within the area. This process has then assisted the tree planting program which the applicant has commenced on the site, with the aim of providing improved and favourable habitat for a variety of birds and animal species.

The applicant proposes that the area of the site be kept in a semi-natural state, free from any permanent structures. As noted, this designation is aimed to complement the existing habitats of the Cregganna Marsh SPA, and human disturbance here is to be kept to a minimum. Hence, there is no potential for loss of habitat. On the contrary, should retention permission be received for the infilling works, the applicant's completion of his tree planting program, combined with the proposed bee keeping on site and associated bee-friendly plants, should ensure an enhanced environment for biodiversity and creating additional valuable habitat in the locality.

The infill works proposed for retention do not act to constitute a cumulative impact. As mentioned, the infill works have aimed to create an improved site for biodiversity, and hence the applicant has no intention to develop any permanent structures on this site. There is thus no cumulative relationship with existing developments or structures in the vicinity, nor with current or future planning applications. This site area of 1.14 hectares kept free of development is a significant positive in this respect in the local environment.

Should retention permission be received, the applicant has put forward a number of actions to enhance biodiversity and further improve the condition of the subject site. The applicant has firstly utilised mitigation measures to check any external fill material for any invasive species, and he states care was taken to avoid the introduction of such invasive material. The applicant has a tree planting program underway on site which he aims to complete within the next two years, using many native deciduous and coniferous species. The applicant has also stated he is willing to work with the Council should any improvement or alteration works be required to the existing stream or the small pond on the site.

Overall, having regard to the infill works proposed for retention, the potential for loss of qualifying interest habitat or supporting habitat of the protected bird species of the Cregganna Marsh SPA is negligible. Noting the applicant's intentions for the site and the completion of tree planting efforts, the subject site should act as a complementary and valuable habitat to local wildlife and biodiversity. It is concluded that the retention of the infill work, by itself or in combination with other development in the vicinity, would not likely have any significant adverse effects on designated European sites, including on the nearby Cregganna Marsh SPA, in terms of qualifying interests and conservation objectives. No further assessment is hence deemed required for this retention site in terms of the studied ecological impact.

Appendix II: Habitat Survey and Mapping

A map of the habitats and artificial surfaces in the surrounding environs of the subject site is shown on the following page. The legend to accompany the map is contained in the table below. In the map, the proposed development site boundaries are shown in red colour. Figures 11 and 12 show key examples of the habitat and landscape types shown overleaf. Figure 13 shows the existing roadway to access the subject site, and its tree-lined boundary to this road. Within the Cregganna Marsh SPA, the habitats consist of lowland wet grassland, improved grassland, limestone pavement, hazel scrub, freshwater marsh, drainage ditches, and dry grassland. Many of these habitats are highlighted in the mapping overleaf.



Figures 11: The mix of habitats that make up the area of the Cregganna Marsh SPA, as viewed from the subject retention site (image taken on 08/11/2023).



Figure 12: The habitats of the Cregganna Marsh SPA are bordered to the south by a network of fields and hedgerows (image taken on 08/11/2023).

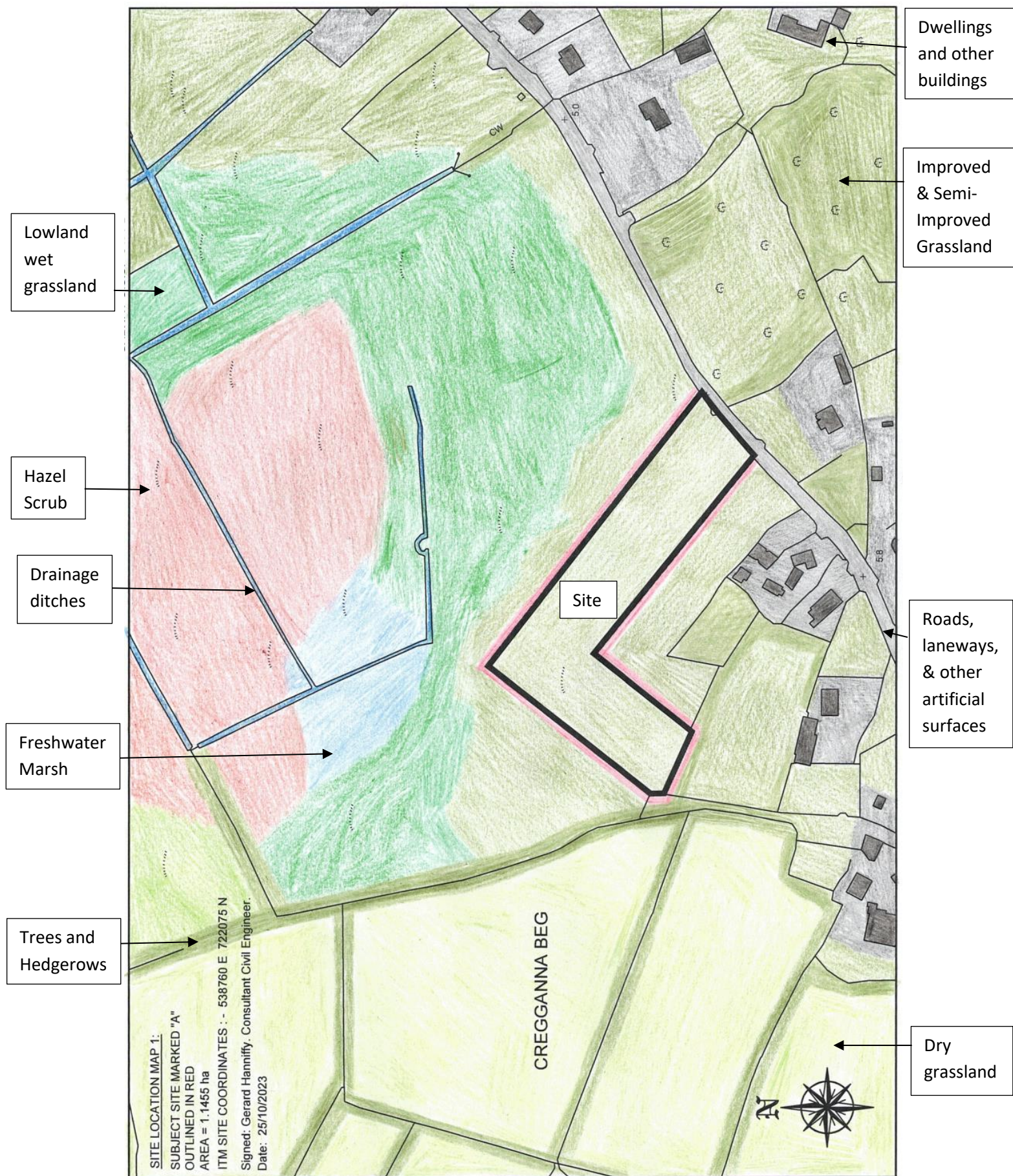


Figure 13: To the south of the Cregganna Marsh SPA is the narrow roadway lined with hedgerows and trees to serve the dispersed dwellings in the area (image taken on 08/11/2023).

Map Legend

Colour	Habitat Type
	Dry Grassland
	Trees and Hedgerows
	Freshwater Marsh
	Roads, laneways, and other artificial surfaces
	Dwellings and other buildings
	Improved & Semi-Improved Grassland
	Freshwater Marsh
	Hazel Scrub
	Lowland Wet Grassland
	Outline of Applicant's Site

Habitat Mapping (overleaf; map to be read in landscape view)



Appendix II: Site Synopsis, Qualifying Interests and Conservation Objectives of Designated European Sites

This section shows the qualifying interests, conservation objectives, and the site synopses of each designated Special Protection Area (SPA) and Special Conservation Area (SAC) within 15km of the subject site.

Cregganna Marsh SPA [site code: 004142]

Qualifying Interest

Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]

Site Synopsis

Cregganna Marsh is situated about 3 km south of Oranmore, to the west of the Galway - Ennis road. The predominant habitats on the site are lowland wet grassland and improved grassland, but areas of limestone pavement and other exposed rock, Hazel (*Corylus avellana*) scrub, freshwater marsh, drainage ditches and dry grassland are also represented. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greenland White-fronted Goose.

The site is of major conservation importance as a feeding site for a nationally important flock of Greenland White-fronted Goose (157 – 5 year mean peak between 1994/95 and 1998/99). The birds using this site form part of the Rahasane flock. Cregganna Marsh SPA is of ornithological importance because it is regularly utilised by a nationally important flock of Greenland White-fronted Goose, a species listed on Annex I of the E.U. Birds Directive.

Lough Fingall Complex SAC [site code: 000606]

Qualifying Interests

Turloughs [3180] Alpine and Boreal heaths [4060]

Juniperus communis formations on heaths or calcareous grasslands [5130]

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

(* important orchid sites) [6210]

Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]

Limestone pavements [8240] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]

Conservation Objectives

3180 Turloughs

To restore the favourable conservation condition of Turloughs* in Lough Fingall Complex SAC, which is defined by a stated list of attributes and targets.

4060 Alpine and Boreal heaths

To maintain the favourable conservation condition of Alpine and Boreal heaths in Lough Fingall Complex SAC, which is defined as a stated list of attributes and targets.

5130 *Juniperus communis* formations on heaths or calcareous grasslands

To maintain the favourable conservation condition of *Juniperus communis* formations on heaths or calcareous grasslands in Lough Fingall Complex SAC, which is defined by a stated list of attributes and targets.

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

To restore the favourable conservation condition of semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites) in Lough Fingall Complex SAC, which is defined by a stated list of attributes and targets.

7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianse*

To maintain the favourable conservation condition of Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae** in Lough Fingall Complex SAC, which is defined by a stated list of attributes and targets.

8240 Limestone pavements

To maintain the favourable conservation condition of Limestone pavements* in Lough Fingall Complex SAC, which is defined by a stated list of attributes and targets.

1303 Lesser Horseshoe Bat *Rhinolophus hipposideros*

To maintain the favourable conservation condition of Lesser Horseshoe Bat in Lough Fingall Complex SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

This site is situated immediately south-east of Ballindeereen in Co. Galway, and within 2-3 km of Galway Bay. It is within the stretch of flat low-lying bare limestones known as the Ardrahan limestones, which extend from the foot of the Burren hills northwards towards Craughwell. The site comprises a complex of habitats, the dominant being turloughs and limestone pavement.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3180] Turloughs* [4060] Alpine and Subalpine Heaths [5130] Juniper Scrub [6210] Orchid-rich Calcareous Grassland* [7210] Cladium Fens* [8240] Limestone Pavement* [1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*).

The turloughs at this site are oligotrophic (nutrient-poor) and calcareous in character. Their catchment areas are relatively small and water tends to remain in them for considerable periods of time. The surface waters usually occupy distinct separate basins in most years but during extreme floods these can be linked together as one large expanse of open water. Taken together these turloughs represent one of the largest expanses of oligotrophic turlough vegetation in the country.

Ballinderreen turlough occupies a flat limestone pavement basin and supports extensive areas of Black Bog-rush (*Schoenus nigricans*) and sedge (*Carex* spp.) fen vegetation.

Marl ponds occur in the lower lying parts, with Shoreweed (*Littorella uniflora*), Bulbous Rush (*Juncus bulbosus*), Many-stalked Spike-rush (*Eleocharis multicaulis*), Alternate Water-milfoil (*Myriophyllum alternifolium*), along with a little Horned Pondweed (*Zannichellia palustris*) and stonewort (*Chara hispida* var. *major*). Rare plants found at this turlough include Fen Violet (*Viola persicifolia*), a Red Data Book species, Water Germander (*Teucrium scordium*) and Marsh Fern (*Thelypteris palustris*).

A smaller area to the south-east of Ballinderreen, Frenchpark turlough, contains a Black Bog-rush/Purple Moor-grass (*Molinia caerulea*) stand with patches of Great Fensedge (*Cladium mariscus*) within it. Cuilidooish turlough is of linear shape with a high central section. It has level limestone pavement forming its eastern side and is aligned and lies parallel with Lough Fingall, which is effectively also a turlough.

There is much Buckthorn (*Rhamnus catharticus*) scrub here and at the northern end of the main lake. Carraghadoo turlough has a shallow basin without standing water in summer and with less peat. Creeping Willow (*Salix repens*) and Common Sedge (*Carex nigra*) are the main species here. The shores of Tullaghnafrankagh Lough flood during winter and have a similar, if slightly more eutrophic (nutrient-rich), vegetation.

Alder Buckthorn (*Frangula alnus*), a Red Data Book species, grows on sloping limestone pavement close to the limit of winter flooding in several places. Limestone pavement occurs throughout the site. It varies from the classic bare open pavement, with little vegetation, to pavement and shattered limestone blocks interspersed with calcareous grassland, heath, turlough and scrub.

A rich and diverse flora occurs, with many of the typical Burren species represented - Bloody Crane's-bill (*Geranium sanguineum*), Herb-Robert (*G. robertianum*), Rustyback (*Ceterach officinarum*), Burnet Rose (*Rosa pimpinellifolia*) and Wood Sage (*Teucrium scorodonia*), along with some rarer species such as Spring Gentian (*Gentiana verna*) and Mountain Avens (*Dryas octopetala*). Orchid species present in areas of calcareous grassland at the site include Fly Orchid (*Ophrys insectifera*), Lesser Butterfly-orchid (*Platanthera bifolia*), Early-purple Orchid (*Orchis mascula*) and several *Dactylorhiza* species.

In the past, the scarce Denseflowered Orchid (*Neotinea maculata*) has been recorded from the site. Lough Fingall, Cloghballymore Lough and Cahernalinsky Lough are shallow infilling lakes with stands of Great Fen-sedge and other fen and wetland vegetation such as Common Reed (*Phragmites australis*) and Tufted-sedge (*Carex elata*). Juniper scrub and lowland alpine heath occur in close association with one another.

The juniper scrub is dominated by Juniper (*Juniperus communis*), with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and rose (*Rosa* spp.) species. Lowland alpine heath is characterised by Bearberry (*Arctostaphylos uva-ursi*) and Mountain Avens, a rare vegetation type known from a few areas in the Burren, the Lough Fingall area and the Moycullen area near Lough Corrib.

Cloghballymore House provides a summer breeding site for the Lesser Horseshoe Bat, a species listed on Annex II of the E.U. Habitats Directive. The bats use the large roof space, although a smaller number roost in a boiler house, gaining access by means of gaps around the pipes. The surrounding mixed woods provide suitable foraging habitat within a short radius of the day roost site. In 1993 more than 200 bats were counted at this site, which makes it of international importance. The site is

of local importance for wintering waterfowl, particularly Lapwing (max. count 381 in 1995/96), with 6 breeding pairs recorded in 1996. Some scarce invertebrate species have been recorded from the Lough Fingall area.

The main land use in the site is cattle grazing, which is mostly of light to moderate intensity. Clearance of limestone pavement and scrub has taken place in the past and burning is a threat to the heath habitats. A drainage scheme to relieve exceptional flooding has been implemented recently. There are no immediate threats facing the bat population. This site is of great conservation importance for the presence of six E.U. Habitats Directive habitats, including four priority habitats. The transitions and gradations between habitats, for example between turloughs, lakes and limestone pavement, gives rise to a range of physical conditions that favour many uncommon species. In addition, the site supports an internationally important population of Lesser Horseshoe Bats.

Inner Galway Bay SPA [site code: 004301]

Qualifying Interests

Black-throated Diver (*Gavia arctica*) [A002] Great Northern Diver (*Gavia immer*) [A003]
Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028]
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Wigeon (*Anas penelope*) [A050]
Teal (*Anas crecca*) [A052] Red-breasted Merganser (*Mergus serrator*) [A069]
Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140]
Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149]
Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160]
Redshank (*Tringa totanus*) [A162] Turnstone (*Arenaria interpres*) [A169]
Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182]
Sandwich Tern (*Sterna sandvicensis*) [A191] Common Tern (*Sterna hirundo*) [A193]
Wetland and Waterbirds [A999]

Conservation Objectives

To maintain the favourable conservation condition of numerous bird species shown below in Inner Galway Bay SPA, which is defined by a stated list of attributes and targets.

A003	Great Northern Diver	<i>Gavia immer</i>	A017	Cormorant	<i>Phalacrocorax carbo</i>
A028	Grey Heron	<i>Ardea cinerea</i>	A046	Brent Goose	<i>Branta bernicla hrota</i>
A050	Wigeon	<i>Anas Penelope</i>	A052	Teal	<i>Anas crecca</i>
A056	Shoveler	<i>Anas clypeata</i>	A069	Red-breasted Merganser	<i>Mergus serrator</i>
A137	Ringed Plover	<i>Charadrius hiaticula</i>	A140	Golden Plover	<i>Pluvialis apricaria</i>
A142	Lapwing	<i>Vanellus vanellus</i>	A149	Dunlin	<i>Calidris alpina alpina</i>

A157	Bar-tailed Godwit	<i>Limosa lapponica</i>	A160	Curlew	<i>Numenius arquata</i>
A162	Redshank	<i>Tringa totanus</i>	A169	Turnstone	<i>Arenaria interpres</i>
A179	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	A182	Common Gull	<i>Larus canus</i>
A191	Sandwich Tern	<i>Sterna sandvicensis</i>	A193	Common Tern	<i>Sterna hirundo</i>
A999	Wetlands				

Site Synopsis

Inner Galway Bay SPA is a very large, marine-dominated site situated on the west coast of Ireland. The inner bay is protected from exposure to Atlantic swells by the Aran Islands and Black Head. Subsidiary bays and inlets (e.g. Poul-na-clough, Aughinish and Kinvarra Bays) add texture to the patterns of water movement and sediment deposition, which lends variety to the marine habitats and communities. The terraced Carboniferous (Viséan) limestone platform of the Burren sweeps down to the shore and into the sublittoral. The long shoreline is noted for its diversity, and comprises complex mixtures of bedrock shore, shingle beach, sandy beach and fringing salt marshes. Intertidal sand and mud flats occur around much of the shoreline, with the largest areas being found on the sheltered eastern coast between Oranmore Bay and Kinvarra Bay.

A number of small islands and rocky islets in the Bay are included within the site. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Black-throated Diver, Great Northern Diver, Cormorant, Grey Heron, Light-bellied Brent Goose, Wigeon, Teal, Redbreasted Merganser, Ringed Plover, Golden Plover, Lapwing, Dunlin, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull, Common Gull, Sandwich Tern and Common Tern.

The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. Inner Galway Bay supports an excellent diversity of wintering wetland birds, with divers, grebes, cormorants, dabbling duck, sea duck and waders all well represented.

There are internationally important wintering populations of Great Northern Diver (88) and Light-Bellied Brent Goose (676) and nationally important wintering populations of an additional sixteen species i.e. Black-throated Diver (36), Cormorant (266), Grey Heron (102), Wigeon (1,168), Teal (700), Red-breasted Merganser (249), Ringed Plover (335), Golden Plover (2,030), Lapwing (3,969), Dunlin (2,155), Bartailed Godwit (447), Curlew (697), Redshank (505), Turnstone (182), Black-headed Gull (1,941) and Common Gull (1,066) - all figures given are five year mean peaks for the seasons 1995/96 to 1999/2000. Of note is that the populations of Red-breasted Merganser and Ringed Plover represent 6.8% and 2.3% of the respective all-Ireland totals.

Other species which occur in notable numbers include Little Grebe (35), Long-tailed Duck (21), Scaup (44) and Herring Gull (216). In addition, the following species also use the site: Great Crested Grebe (16), Mallard (200), Common Scoter (87), Oystercatcher (576), Grey Plover (60), Black-tailed Godwit (46), Mute Swan (150) and Great Black-backed Gull (129). The site provides both feeding and roost sites for most of the species. Little Egret, a species which has recently colonised Ireland, also occurs at this site.

The site has several important populations of breeding birds, most notably colonies of Sandwich Tern (81 pairs in 1995) and Common Tern (98 pairs in 1995 on Green Island and 46 pairs in 2001 on

Mutton Island). A large Cormorant colony occurs on Deer Island - this had 200 pairs in 1985 and 300 pairs in 1989.

Inner Galway Bay SPA is of high ornithological importance with two wintering species having populations of international importance and a further sixteen wintering species having populations of national importance. The breeding colonies of Sandwich Tern, Common Tern and Cormorant are also of national importance. Also of note is that six of the regularly occurring species are listed on Annex I of the E.U. Birds Directive, i.e. Black-throated Diver, Great Northern Diver, Golden Plover, Bar-tailed Godwit, Sandwich Tern and Common Tern. Inner Galway Bay is a Ramsar Convention site and part of the Inner Galway Bay SPA is a Wildfowl Sanctuary.

Galway Bay Complex SAC [site code: 000268]

Qualifying Interests

Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150]
Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220]
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
Salicornia and other annuals colonising mud and sand [1310]
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
Turloughs [3180] *Juniperus communis* formations on heaths or calcareous grasslands [5130]
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]
Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]
Alkaline fens [7230] Limestone pavements [8240] *Lutra lutra* (Otter) [1355]
Phoca vitulina (Harbour Seal) [1365]

Conservation Objectives

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation of mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

1150 Coastal lagoons

To restore the favourable conservation condition of coastal lagoons in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

1160 Large shallow inlets and bays

To maintain the favourable conservation condition of large shallow inlets and bays in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

1170 Reefs

To maintain the favourable conservation condition of reefs in Galway Bay Complex SAC which is defined by a stated list of attributes and targets.

1220 Perennial vegetation of stony banks

To maintain the favourable conservation condition of Perennial vegetation of stony banks in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

1310 Salicornia and other annuals colonising mud and sand

To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Galway Bay Complex SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

Situated on the west coast of Ireland, this site comprises the inner, shallow part of a large bay which is partially sheltered by the Aran Islands. The Burren karstic limestone fringes the southern sides and extends into the sublittoral. West of Galway city the bedrock geology is granite. There are numerous shallow and intertidal inlets on the eastern and southern sides, notably Muckinish, Aughinish, and Kinvarra Bays.

A number of small islands composed of glacial deposits are located along the eastern side. These include Eddy Island, Deer Island, and Tawin Island. A diverse range of marine, coastal and terrestrial habitats, including several listed on Annex I of the E.U. Habitats Directive, occur within the site, making the area of high scientific importance.

Galway Bay South holds a very high number of littoral communities. They range from rocky terraces, to sandy beaches with rock or sand dunes behind. The intertidal sediments of Galway Bay support good examples of communities that are moderately exposed to wave action. A well-defined talitrid zone in the upper shore gives way to an intertidal, mid shore zone with sparse epifauna or infauna. On the lower, flat part of the shore, the tubes of the deposit-feeding terebellid worm, *Lanice conchilega*, are common on the surface.

Nereid and cirratulid polychaete worms (*Hediste diversicolor*, *Arenicola marina*), small crustaceans and bivalves (*Angulus tenuis*, *Cerastoderma edule* and *Macoma balthica*) are present. The area has the country's only recorded example of the littoral community characterised by *Fucus serratus* with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed substrata. This community has very high species richness (85 species), as do the sublittoral fringe communities on the Finavarra reef (88 species). The rare Purple Sea Urchin *Paracentrotus lividus* and the foliose red alga *Phyllophora sicula* are present at Finavarra, whereas the red alga *Rhododymenia delicatula* and the rare brown alga, *Ascophyllum nodosum* var. *mackii*, occur in Kinvarra and Muckinish Bays. Sublittorally, the area has a number of distinctive and important communities.

Of particular note is that Ireland's only reported piddock (bivalve mollusc) bed thrives in the shallows of Aughinish Bay. The rare sponge, *Mycale contarenii*, is also found here. There is further interest in an extensive maerl bed of *Phymatolithon calcareum* which occurs in the strong tidal currents of Muckinish Bay. There is also maerl off Finavarra Point and in Kinvarra Bay (*Lithothamnion corallioides*, *Lithophyllum dentatum* and *Lithophyllum fasciculatum*). An oyster bed in Kinvarra Bay and seagrass (*Zostera* spp.) beds off Finavarra Point are also important features. Other significant habitats which occur include secondary maerl beds and communities strongly influenced by tidal streams.

Saltmarshes are frequent within this extensive coastal site, with both E.U. Habitats Directive types. 'Atlantic Salt Meadow' and 'Mediterranean Salt Meadow' well represented. Most of the saltmarshes are classified as the bay type, with the substrate being mud or mud/sand. There is one lagoon type and one estuary type. Lagoon saltmarshes are the rarest type found in Ireland. The best examples of saltmarsh are located in inner Galway bay, east of a line running between Galway city and Kinvarra.

In this area the coastline is highly indented, thus providing the sheltered conditions necessary for extensive saltmarsh development. Common saltmarsh species include Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*), Lax-flowered Sea-lavender (*Limonium humile*), Common Saltmarsh-grass (*Puccinellia maritima*), Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*Juncus maritimus*).

On the lower levels of the saltmarshes and within pans there occurs Glasswort (*Salicornia europaea* agg.). A noteworthy feature of the saltmarsh habitat within this site is the presence of dwarfed brown seaweeds in the vegetation. These are also known as "turf fucoids" and typical species include *Fucus* spp., *Ascophyllum nodosum* and *Pelvetia canaliculata*. A number of locally rare vascular plant species also grow in saltmarsh areas within the site. These include Reflexed Saltmarsh-grass (*Puccinellia distans*) and Sea-purslane (*Halimione portulacoides*), which are both relatively rare in the western half of the country.

Shingle and stony beaches can be found throughout the site, with the best examples along the more exposed shores to the south and west of Galway city and to the north and east of Finavarra, Co. Clare. In general, these shingle shorelines are sparsely vegetated and frequently occur interspersed with areas of sandy beach and/or bedrock shore. The associated flora is dominated by plant species of frequently disturbed maritime habitats. To the south and west of Galway city, typical plants include Curled Dock (*Rumex crispus*), Common Couch (*Elymus repens*), Sea Sandwort (*Honkenya peploides*), Sea Beet (*Beta vulgaris* subsp. *maritima*), Sea Mayweed (*Matricaria maritima*), Silverweed (*Potentilla anserina*) and Oraches (*Atriplex* spp.). Two rare plant species are associated with the habitat: Henbane (*Hyoscyamus niger*), a threatened species listed in the Irish Red Data Book, grows on shingle beach to the south of Lough Atalia; there are also old records for the threatened plant species Sea-kale (*Crambe maritima*).

Soft coastal cliffs reaching heights in excess of 10m occur at Rusheen. These support coastal grassland with very sparse vegetation cover. Species recorded include Sea Plantain (*Plantago maritima*), Creeping Bent (*Agrostis stolonifera*), False Oat-grass (*Arrhenatherum elatius*), Cock's Foot (*Dactylis glomerata*), Red Fescue, Common Bird's-foot-trefoil (*Lotus corniculatus*), and the lichens *Ramalina* sp. and *Xanthoria parietina*. They are considered highly representative of the rarer soft type of sea cliffs in Ireland.

An excellent range of lagoons of different types, sizes and salinities occurs within the site. This habitat is given priority status on Annex I of the E.U. Habitats Directive. One unusual type of lagoon,

karstic rock lagoon, is particularly well represented. This type of lagoon is common on the Aran Islands, but on mainland Ireland, all but one are confined to this site. Additionally, the best example of all karstic lagoons in the country, Lough Murree, is found at this site.

The flora of the habitat is rich and diverse, reflecting the range of salinities in the different lagoons. It is typically brackish, with two species of Tasselweed (*Ruppia* spp.), two Red Data charophytes *Chara canescens* and *Lamprothamnion papulosum*, and *Chaetomorpha linum*, an alga (all lagoonal specialists). The fauna of the lagoon is also rich, diverse and lagoonal. At least 10 lagoonal specialist species were recorded in 1996 and 1998 from the combined habitat of all the lagoons, which is one of the highest number for any lagoonal habitat in the country. Many of the species appear to be rare. The lagoons within this site are excellent examples of the habitat type and of high conservation importance.

Inner Galway Bay provides extensive good quality habitat for Common Seal (maximum count of 317 in the all-Ireland survey of 2003). This species is listed on Annex II of the E.U. Habitats Directive. The seals use a range of haul-out sites distributed through the bay – these include inner Oranmore Bay, Rabbit Island, St. Brendan's Island, Tawin Island, Kinvarra Bay, Aughinish Bay and Ballyvaughan. The site provides optimum habitat for otter, also an Annex II-listed species.

Galway Bay is a very important ornithological site. The shallow waters provide excellent habitat for Great Northern Divers (35), Black-throated Divers (28), Scaup (39), Long-tailed Duck (27) and Red-breasted Merganser (232). Figures given are peak average maxima over the three winters 1994/95 to 1996/97. All of these populations are of national importance. The intertidal areas and shoreline provides feeding and roosting habitat for wintering waterfowl, with Brent Goose (517) having a population of international importance and a further 11 species having populations of national importance.

Four of the regular wintering species are listed on Annex I of the E.U. Birds Directive – Golden Plover, Bat-tailed Godwit and the two diver species. Breeding birds are also of importance, with significant populations of Sandwich Terns (81 pairs in 1995) and Common Terns (99 pairs in 1995), both also being listed on Annex I of the E.U. Birds Directive. A large Cormorant colony (approximately 300 pairs in 1989) occurs on Deer Island.

Fishing and aquaculture are the main commercial activities within the site. A concern is that sewage effluent and detritus of the aquaculture industry could be deleterious to benthic communities. Reef and sediment communities are vulnerable to disturbance or compaction from tractors accessing oyster trestles. The *Paracentrotus lividus* populations have been shown to be vulnerable to over-fishing. Extraction of maerl in Galway Bay is a threat. Owing to the proximity of Galway city, shoreline and terrestrial habitats are under pressure from urban expansion and recreational activities. Eutrophication is probably affecting some of the lagoons and is a continued threat. Drainage is a general threat to the turlough and fen habitats. Bird populations may be disturbed by aquaculture activities.

This large coastal site is of immense conservation importance, with many habitats listed on Annex I of the E.U. Habitats Directive, four of which have priority status (lagoon, Cladium fen, turlough and orchid-rich calcareous grassland). The examples of shallow bays, reefs, lagoons, and saltmarshes found within this site are amongst the best in the country. The site supports an important Common Seal colony and a breeding Otter population (Annex II species), and six regular Annex I E.U. Birds Directive species. The site also has four Red Data Book plant species, plus a host of rare or scarce marine and lagoonal animal and plant species.

Rahasane Turlough SPA [site code: 004089]

Qualifying Interests

Whooper Swan (*Cygnus cygnus*) [A038]

Wigeon (*Anas penelope*) [A050]

Golden Plover (*Pluvialis apricaria*) [A140]

Black-tailed Godwit (*Limosa limosa*) [A156]

Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Wetland and Waterbirds [A999]

Conservation Objectives

To maintain or restore the favourable conservation condition of the wetland habitat at Rahasane Turlough SPA as a resource for the regularly-occurring migratory water birds that utilise it.

Site Synopsis

Rahasane Turlough lies in gently undulating land, approximately 2 km west of Craughwell, Co. Galway. It consists of two basins which are connected at times of flood but separated as the waters recede. The larger of these, the northern basin, takes the Dunkellin River westwards. Rahasane was formerly the natural sink of the Dunkellin River, but now an artificial channel takes some of the water further downstream.

Water escapes the artificial channel to sweep around the northern basin, and again in the west, where it flows into an active swallow hole system. Some minor collapses are found elsewhere in the turlough, as well as a small number of more permanent pools. The substrate consists largely of silty clay.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation importance for the following species: Whooper Swan, Greenland White-fronted Goose, Wigeon, Golden Plover and Black-tailed Godwit. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Water birds.

Rahasane is a traditional site for Greenland White-fronted Goose, and supports a population of national importance (157 individuals - five year mean peak for the period 1994/95 to 1998/99). It is of international importance for Black-tailed Godwit (437 - all figures are five year mean peaks for the period 1995/96 to 1999/2000). It also has nationally important populations of Whooper Swan (165), Wigeon (3,430), and Golden Plover (6,613).

The site has the largest inland population of Dunlin (864) in the country and also supports Mute Swan (57), Teal (307), Mallard (142), Pintail (19), Shoveler (28), Tufted Duck (32), Grey Heron (31), Lapwing (2,220), Curlew (197), Redshank (134) and Black-headed Gull (280). Little Egret, a species which has recently colonised Ireland, also occurs at this site. Rahasane Turlough SPA is of high ornithological importance; it supports nationally important populations of four species and an internationally important population of one.

The Wigeon and Golden Plover populations are of particular note as they each represent approximately 4% of the All-Ireland totals of these species. The regular occurrence of Greenland White-fronted Goose, Whooper Swan and Golden Plover is of note as these species are listed on Annex I of the E.U. Birds Directive.

Ardrahan Grassland SAC [site code: 002244]

Qualifying Interests

Alpine and Boreal heaths [4060]

Juniperus communis formations on heaths or calcareous grasslands [5130]

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] Limestone pavements [8240]

Conservation Objectives

4060 Alpine and Boreal heaths

To maintain the favourable conservation condition of Alpine and Boreal heaths in Ardrahan Grassland SAC, which is defined by a stated list of attributes and targets.

5130 *Juniperus communis* formations on heaths or calcareous grasslands

To restore the favourable conservation condition of *Juniperus communis* formations on heaths or calcareous grasslands in Ardrahan Grassland SAC, which is defined by a stated list of attributes and targets.

8240 Limestone pavements

To maintain the favourable conservation condition of Limestone pavements* in Ardrahan Grassland SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

This site lies immediately west and north of Ardrahan in south Co. Galway. It is dominated by a large flat limestone area with a mosaic of calcareous habitats including limestone pavement, alpine heath, Juniper scrub and species rich dry grasslands. In contrast, the south-west of the site consists of a small marl lake and adjoining fens and marshes, with Juniper heath frequent on the higher ground. Soils associated with limestone pavement are generally thin rendzina; deeper pockets are more mineral rich and support limestone grassland and scrub in places.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [4060] Alpine and Subalpine Heaths [5130] Juniper Scrub [6210] Orchid-rich Calcareous Grassland* [8240] Limestone Pavement* The site contains a good example of limestone pavement, a priority habitat listed on Annex I of the E.U. Habitats Directive, a small though excellent example of the Annex I habitat alpine heath, areas of the Annex I priority habitat orchid-rich calcareous grassland, along with one other Annex I habitat, Juniper scrub.

Of particular note is the abundance of Bearberry (*Arctostaphylos uva-ursi*) and Juniper (*Juniperus communis*) in association with a typical Burren flora including species such as Mountain Avens (*Dryas octopetala*), Spring Gentian (*Gentiana verna*) and various orchid species including Fly Orchid (*Ophrys insectifera*). The southern and western part of the area is of significant interest due to the low intensity of management in the area. Both Mountain Avens and Bearberry alpine heaths occur at this site, where they form a mosaic with Juniper scrub, limestone pavement and calcareous grasslands. This site contains a relatively small but fine example of limestone pavement, which occurs in a mosaic with other habitats.

Common species include Blue Moor-grass (*Sesleria albicans*), Wild Thyme (*Thymus praecox*), Flea Sedge (*Carex pulicaris*), Quaking-grass (*Briza media*), Devil's-bit Scabious (*Succisa pratensis*) and Heather (*Calluna vulgaris*). Pockets of Hazel (*Corylus avellana*) scrub have developed, and there are lesser amounts of Blackthorn (*Prunus spinosa*), Bracken (*Pteridium aquilinum*) and Hawthorn (*Crataegus monogyna*). At the north of the site Juniper scrub forms a dense mat over limestone pavement along with Bearberry and Mountain Avens. Further south it occurs on higher undulating ground over a species rich calcareous heath with Wild Thyme, Carline Thistle (*Carlina vulgaris*), Tormantil (*Potentilla erecta*), Bloody Cranesbill (*Geranium sanguineum*), Black Bog-rush (*Schoenus nigricans*), Heather and occasional Bearberry. Areas of orchid-rich calcareous grassland are found across the site, interspersed with areas of scrub, pavement and less species-rich grassland.

At least eleven orchid species have been recorded from the site, many in good numbers. The best areas of grassland are very species rich, and support an excellent suite of calcareous indicators. Species such as Kidney Vetch (*Anthyllis vulneraria*), Squinancywort (*Asperula cynanchica*), Spring-sedge (*Carex caryophyllea*), Glaucus Sedge (*Carex flacca*), Common Knapweed (*Centaurea nigra*), Eyebright (*Euphrasia officinalis* agg.), Lady's Bedstraw (*Galium verum*), Juniper, Rough Hawkbit (*Leontodon hispidus*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Sea Plantain (*Plantago maritima*), Yellow-rattle (*Rhinanthus minor*), Blue Moor-grass, Devil's-bit Scabious and Red Clover (*Trifolium pratense*) have been commonly recorded.

Species such as Mountain Avens and Spring Gentian are also present, and the Flora (Protection) Order, 2015 species Wood Bitter- vetch (*Vicia orobus*), has been recently documented. Many areas of orchid-rich grassland are however becoming swamped and overtaken by Purple Moor-grass (*Molinia caerulea*). Brackloon Lough occurs in the south of the site and is a fine example of a small shallow marl lake, one of very few in this locality.

This open lake has a pronounced whitish appearance and a flora of lime-encrusted Thread-leaved Water-crowfoot (*Ranunculus trichophyllus*) and a little Curled Pondweed (*Potamogeton crispus*) occurs. Shoreweed (*Littorella uniflora*) is locally abundant on the shoreline, where it grows with Many-stalked Spike-rush (*Eleocharis multicaulis*), Pink Water-speedwell (*Veronica catenata*), Lesser Water-plantain (*Baldellia ranunculoides*) and some Amphibious Bistort (*Polygonum amphibium*). Although small, the lake seems in a relatively natural state.

There are two small turloughs present within the site. Both are well grazed and consist of a short-turf peaty vegetation with Common Sedge (*Carex nigra*), Lesser Spearwort (*Ranunculus flammula*), Creeping Buttercup (*Ranunculus repens*) (turlough form), Lesser Marshwort (*Apium inundatum*), Cuckooflower (*Cardamine pratensis*), Marsh Pennywort (*Hydrocotyle vulgaris*) and Water Mint (*Mentha aquatica*), along with Common Marsh-bedstraw (*Galium palustre*), Creeping Bent (*Agrostis stolonifera*), Jointed Rush (*Juncus articulatus*) and Common Spike-rush (*Eleocharis palustris*). Bird species recorded from the site include Snipe, Mute Swan and Curlew. Land use at this site consists mainly of the traditional practise of winter grazing by cattle.

This is a low intensity farming practise generally confined to the Burren in Ireland and one that is vital to the maintenance of the high scientific interest of this site. However, recent agricultural improvement has damaged the scientific interest of part of the site through loss of habitat in the turlough and limestone pavement areas. Intensification of the land usage around Brackloon Lough could lead to a deterioration in the water quality of the lake. A modification of the current grazing regime is needed to help deal with the spread of Purple Moor-grass in the best of the grassland areas of the site. Ardrahan Grassland contains a mosaic of calcareous habitats including good examples of four habitats listed on Annex I of the E.U. Habitats Directive - limestone pavement,

alpine heath, orchid-rich calcareous grassland and Juniper scrub. The presence of a relatively unpolluted marl lake adds further diversity and interest of this important site.

Castletaylor Complex SAC [site code: 000242]

Qualifying Interests

Turloughs [3180] Alpine and Boreal heaths [4060]

Juniperus communis formations on heaths or calcareous grasslands [5130]

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] Limestone pavements [8240]

Conservation Objectives

3180 Turloughs

To restore the favourable conservation condition of Turloughs in Castletaylor Complex SAC, which is defined by a stated list of attributes and targets.

4060 Alpine and Boreal heaths

To restore the favourable conservation condition of Alpine and Boreal heaths in Castletaylor Complex SAC, which is defined by a stated list of attributes and targets.

5130 *Juniperus communis* formations on heaths or calcareous grasslands

To maintain the favourable conservation condition of *Juniperis communis* formations on heaths or calcareous grasslands in Castletaylor Complex SAC, which is defined by a stated list of attributes and targets.

6120 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites) in Castletaylor Complex SAC, which is defined by a stated list of attributes and targets.

8240 Limestone pavements*

To restore the favourable conservation condition of Limestone pavements* in Castletaylor Complex SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

The Castletaylor Complex is situated approximately 4 km south-east of Kilcolgan in Co. Galway and lies in a gently undulating limestone topography. Although relatively small in area, the site contains a diverse range of habitats. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3180] Turloughs* [4060] Alpine and Subalpine Heaths [5130] Juniper Scrub [6210] Orchid-rich Calcareous Grassland* [8240] Limestone Pavement* Caranavoodaun turlough dominates the north-western half of the site.

It occupies a shallow basin set among ridges of limestone outcrop and thin glacial drift and is an excellent example of a calcareous and extremely oligotrophic (nutrient-poor) turlough. It has a

limited throughput of water, with a considerable precipitation of marl and some accumulation of peat.

Some stands of Black Bog-rush (*Schoenus nigricans*), with sparse Variegated Horsetail (*Equisetum variegatum*), occur at the upper levels, surrounded by patches of Buckthorn (*Rhamnus catharticus*) and Hawthorn (*Crataegus monogyna*) scrub. To the south-east the scrub includes Ash (*Fraxinus excelsior*), Yew (*Taxus baccata*), Whitebeam (*Sorbus aria*) and Irish Whitebeam (*Sorbus hibernica*).

Below this there is an extensive area of sedge fen vegetation with species such as Tawny Sedge (*Carex hostiana*), Carnation Sedge (*C. panicea*), Purple Moor-grass (*Molinia caerulea*), Meadow Thistle (*Cirsium dissectum*) and Devil's-bit Scabious (*Succisa pratensis*). Along the western and south-western sides the low-lying ground supports a community of Shoreweed (*Littorella uniflora*), Spike-rushes (*Eleocharis palustris* and *E. multiflora*) and Bulbous Rush (*Juncus bulbosus*) growing in shallow water that persists into June.

The deeper pools are colonised by Pondweeds (*Potamogeton gramineus*, *P. polygonifolius* and *P. coloratus*). North of the turlough and to the south of the site there is a mosaic of other habitats. The limestone pavement occurs mainly as scattered boulders with no extensive areas of flat pavement. It has a rich flora with species such as Bloody Crane's-bill (*Geranium sanguinum*), Herb-Robert (*G. robertianum*), Burnet Rose (*Rosa pimpinellifolia*), Wood Sage (*Teucrium scordonia*), Quaking-grass (*Briza media*) and the scarce species Spring Gentian (*Gentiana verna*) and Mountain Avens (*Dryas octopetala*). Limestone pavement breaks through the turlough floor in places, and supports scrub vegetation with Dewberry (*Rubus caesius*), Dog Rose (*Rosa canina*), stunted Ash and Blackthorn (*Prunus spinosa*).

The Red Data book species Alder Buckthorn (*Frangula alnus*) occurs amongst this community. Limestone outcrops also occur within the wooded area of the site. The dry calcareous grassland that occurs amongst the limestone pavement and heath is species-rich, particularly with orchids, including Autumn Lady's tresses (*Spiranthes spiralis*), Early Marsh-orchid (*Dactylorhiza incarnata*), Lesser Butterflyorchid (*Platanthera bifolia*), Fragrant Orchid (*Gymnadenia conopsea*), Broad-leaved Helleborine (*Epipactis helleborine*) and the scarce Dense-flowered Orchid (*Neotinea maculata*).

The heath at this site is characterised by the presence of Juniper (*Juniperus communis*) and Mountain Avens. The presence of Bearberry (*Arctostaphylos uva-ursi*) indicates that some of the heath is similar to the *Arctostaphylos-Dryas* vegetation of the Burren limestone area, a rare lowland alpine type heath. The eastern and much of the southern parts of the site are dominated by dry broadleaved woodland.

Species present include Downy Birch (*Betula pubescens*), Ash, Yew, Hazel (*Corylus avellana*), Holly (*Ilex aquifolium*) and Spindle (*Euonymus europaeus*). Some mature planted conifers are found to the south of the road. The turlough does not hold any significant wintering populations of birds, owing to the extreme oligotrophic conditions. Three pairs of Lapwing bred at the site in 1996.

The main land use within the open areas of the site is light grazing by cattle. Some clearance of scrub within parts of the woodland has caused some damage and is a further threat. This site is of high conservation interest, in particular for the presence in a relatively small area of good examples of five habitats that are listed on Annex I of the E.U. Habitats Directive. The transition from the wetland to the surrounding habitats is particularly well shown.

Kiltiernan Turlough SAC [site code: 001285]

Qualifying Interests

Turloughs [3180]

Conservation Objectives

3180 Turloughs

To restore the favourable conservation condition of Turloughs in Kiltiernan Turlough SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

Kiltiernan Turlough lies in a linear depression running south-westwards from the main Galway-Limerick road, north-west of Ardrahan in Co. Galway. It has a flattish basin which lies approximately 2 m below road level, and includes about eight further depressions which are joined in times of high water. The site includes a low ridge on the south-eastern side. Towards the west the topography becomes flatter and the basin breaks into separate hollows.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3180] Turloughs* This site comprises a relatively dry turlough with a limited, though regular, flood in winter. The vegetation is mostly species-poor grassland dominated by White Clover (*Trifolium repens*), Silverweed (*Potentilla anserina*) and Creeping Bent (*Agrostis stolonifera*), with some areas of species-rich grassland found in the western half.

Beside the road, the rocky outcrops support limestone grassland and there are narrow fringes of scrub along each side of the basin. The scrub is predominantly of Blackthorn (*Prunus spinosa*), but some Buckthorn (*Rhamnus catharticus*) and Alder Buckthorn (*Frangula alnus*), a rare Red Data Book species, also occur. The grassland occurring in the main depressions of this site have been modified by trampling and over-grazing. Here the main species found are Northern Bedstraw (*Galium boreale*) and Creeping Cinquefoil (*Potentilla reptans*), which grow in clumps with much Silverweed and Greater Plantain (*Plantago major*). Hollows in this vegetation contain Common Sedge (*Carex nigra*) and Amphibious Bistort (*Polygonum amphibium*).

In the less intensified eastern section of the site the Red Data Book species Fen Violet (*Viola persicifolia*) occurs. Lapwing, Pochard, Teal and Wigeon have been recorded at the site, and other bird species may visit from the nearby Tullaghnafrankagh Lough. Land use on the site comprises grazing, particularly in the eastern half, with some areas of tillage found in the west. Kiltiernan Turlough is an example of a partly modified, relatively dry turlough, without any accumulation of peat. It includes a variety of typical dry turlough vegetation types and is notable for the presence of the rare plant species, Alder Buckthorn and Fen Violet. Turloughs are important habitats that are listed with priority status on Annex I of the E.U. Habitats Directive and, as such, are of considerable conservation significance.

Cahermore Turlough SAC [site code: 002294]

Qualifying Interests

Turloughs [3180]

Conservation Objectives

3180 Turloughs

To restore the favourable conservation condition of turloughs in Cahermore Turlough SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

Cahermore Turlough SAC is situated in the limestone lowlands of south Co. Galway, about 5 km north-west of Gort and 5.5 km south-east of Kinvara. It is part of a series of lakes and turloughs in the region, most of which are Special Areas of Conservation (SACs) or Natural Heritage Areas (NHAs). The nearest is Caherglassaun Turlough, the water levels of which are slightly higher than Cahermore.

The site is mostly covered by drift which is mounded into hillocks in the south-eastern parts. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3180] Turloughs* The turlough is on the dry end of the spectrum, and there is no standing water in summer except for a few small ponds dug for cattle.

A few collapse features occur in the drift on the southern side with a regular swallow-hole at the edge of the flooded area. Another hole occurs in the south-east corner. The turlough appears to flood largely from the southern side. The site has quite a uniform grassland cover. Creeping Bent (*Agrostis stolonifera*), Rough Meadow-grass (*Poa trivialis*), Smooth Meadow-grass (*Poa pratensis*), Red Fescue (*Festuca rubra*) and Couch Grass (*Elymus repens*) are the main constituents. Hairy Sedge (*Carex hirta*) and Common Sedge (*C. nigra*) are widespread over the site. Marsh Foxtail (*Alopecurus geniculatus*) grows in the southern half.

Pools dug into the drift have a varied flora, some have Pond Water-crowfoot (*Ranunculus peltatus*) and Common Duckweed (*Lemna minor*) while others have Amphibious Bistort (*Polygonum amphibium*), Floating Sweet-grass (*Glyceria fluitans*), Water Forget-me-not (*Myosotis scorpioides*) and Common Spike-rush (*Eleocharis palustris*). Two areas of limestone pavement which are largely scrub-covered occur. The one in the east is grazed by sheep and has grassland plant species such as Wild Thyme (*Thymus praecox*) and Downy Oat-grass (*Avenula pubescens*).

The shrubs on this pavement include Blackthorn (*Prunus spinosa*), Burnet Rose (*Rosa pimpinellifolia*), Juniper (*Juniperus communis*) and the exotic species Small-leaved Cotoneaster (*Cotoneaster microphyllus*). A larger area of turlough scrub in the northern part is impenetrable and consists of Hawthorn (*Crataegus monogyna*), Buckthorn (*Rhamnus catharticus*), Blackthorn and Spindle (*Euonymus europaeus*). There is some Crested Dog's-tail (*Cynosurus cristatus*) grassland on the fringes of this scrub.

The site holds a diverse population of wintering water birds at times of flood. Dunlin are not common inland but occurred throughout the 1998/99 winter season. The following counts were made on 15th December 1998 and, in parentheses, 30th November 2000: Whooper Swan 49 (35); Mute Swan 9 (5); Wigeon 180 (160); Teal 10 (-); Mallard 6 (22); Pochard 86 (12); Tufted Duck - (8); Lapwing 250 (150); Curlew 25 (-); Dunlin 120 (70); Redshank - (4). Bewick's Swan (7, winter 1995/96) and Golden Plover (60) have been recorded. Cahermore Turlough supports a wide range of turlough habitats with well-developed plant communities. The amount and quality of the developing woodland is a special feature of this turlough. Whooper Swan, Bewick's Swan and Golden Plover are

listed on Annex I of the E.U. Birds Directive, and their presence at the site adds further to its importance and value.

Ballinduff Turlough SAC [site code: 002295]

Qualifying Interest

Turloughs [3180]

Conservation Objective

3180 Turloughs

To maintain the favourable conservation condition of Turloughs in Ballinduff Turlough SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

Ballinduff Turlough is situated in a narrow basin in the limestone lowlands of south Co. Galway, 5 km north-east of Gort. It is part of the Coole Lough complex of lakes and turloughs, most of which are Special Areas of Conservation (SACs) or Natural Heritage Areas (NHAs). There are rock outcrops around the northern half and glacial drift in the south. There is a low hill to the south outside the site. The boundary in the south-west is the Galway-Limerick railway line. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3180] Turloughs* The turlough is late-draining and a pool persists into June or July and re-floods easily.

There is a marshy hollow in the middle of the southern section which receives an inflow of water from the south. The hydrology of the site is probably controlled by a complex of swallow holes and subsidence near Coolfin. During floods the turlough drains overland towards Coole Lough. The main habitats on the site are various types of turlough grassland and turlough scrub which are related to the flooding regime.

The turlough grassland types vary. In the wettest parts plant species such as Marsh Horsetail (*Equisetum fluviatile*), Amphibious Bistort (*Polygonum amphibium*) and Common Spike-rush (*Eleocharis palustris*) occur with some Common Club-rush (*Scirpus lacustris subsp. lacustris*). Higher up Long-stalked Yellow-sedge (*Carex lepidocarpa*), Marsh Pennywort (*Hydrocotyle vulgaris*) and Jointed Rush (*Juncus articulatus*) occur on marly rises, while the common community includes Common Sedge (*Carex nigra*), Creeping Bent (*Agrostis stolonifera*), Creeping Cinquefoil (*Potentilla reptans*) and Silverweed (*Potentilla anserina*). There is also a wide band of nutrient-poor grassland with Purple Moor-grass (*Molinia careulea*), Common Sedge, Long-stalked Yellow-sedge and Tawny Sedge (*C. hostiana*).

An unusual feature of the vegetation at this turlough is that Shoreweed (*Littorella uniflora*) is very widespread and prominent throughout the turlough and is present in all of the above plant communities. Low dense woodland which is liable to flood is the other main habitat on the site, mostly along the north-western edge of the basin. Ash (*Fraxinus excelsior*), Buckthorn (*Rhamnus catharticus*) and Hawthorn (*Crataegus monogyna*) are the main constituents, with other shrubs such as Guelder-rose (*Viburnum opulus*) and Spindle (*Euonymus europaeus*).

The vicinity of the swallow-holes has a good woodland edge with tall herbs such as Yellow Loosestrife (*Lysimachia vulgaris*), Dewberry (*Rubus caesius*) and a large colony of Common Meadow-rue (*Thalictrum flavum*). Other habitats include scrub not subject to flooding and the inflowing drain from the south-east which contains abundant water-cress (*Nasturtium sp.*), around which wet grassland with Sharp-flowered Rush (*Juncus acutiflorus*) occurs. The rest of the site is mainly improved grassland, which is included for water quality protection reasons. In winter, Whooper Swans and Bewick's Swans have been recorded at the site. These feed mainly on improved pasture on Corker Hill to the south, but roost on the open water of the turlough. They are considered to be part of the large swan population that is centred at Coole Lough.

In winters 1996/97 and 1997/98, between 200 and 300 Whooper Swans were recorded, and 10-50 Bewick's Swans. Lower numbers of Whooper Swans occurred in subsequent winters and Bewick's Swans are now rarely recorded in south Galway (a trend reflected throughout Ireland). Both of these swan species are listed on Annex I of the E.U. Birds Directive, and the numbers of Whooper Swans recorded in the above years were of international importance.

Numbers of other waterbirds using the site in winter are low. The rare invertebrate *Eurycercus glacialis* (Order Cladocera), which was first found in Ireland in 1985, occurs at Ballinduff Turlough. In Ireland, the species is seen to be a turlough specialist of the east Galway region, and it is rare elsewhere in Atlantic Europe. Its presence at the site adds to the ecological interest. Grazing intensity on the turlough grassland is very low. Some clearance of dry scrub has taken place recently.

Ballinduff Turlough offers a wide range of turlough habitats with plant communities well-developed and with little grazing. The widespread presence of Shoreweed within different plant communities is an unusual turlough feature. The development of Buckthorn woodland and the swallow-hole vegetation are other unusual features. The presence of a rare turlough invertebrate adds to the ecological interest.

Rahasane Turlough SAC [site code: 000322]

Qualifying Interests

Turloughs [3180]

Conservation Objectives

To maintain the favourable conservation condition of Turloughs in Rahasane Turlough SAC, which is defined by a stated list of attributes and targets.

Site Synopsis

Rahasane Turlough lies in gently undulating land, approximately 2 km west of Craughwell, Co. Galway. It consists of two basins which are connected at times of flood but separated as the waters decline. The larger of these, the northern basin, takes the Dunkellin River westwards. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [3180] Turloughs* Rahasane Turlough was formerly the natural sink of the Dunkellin River, but now an artificial channel takes some of the water further downstream.

Water escapes the artificial channel to sweep around the northern basin, and again in the west, where it flows into an active swallow-hole system. The main swallow-holes here are constantly

changing, but reach 5 m in diameter and 2-3 m deep. Some minor collapses are found elsewhere in the turlough, as well as a small number of more permanent pools. Mostly, the edges of the turlough rise gradually into the surrounding land, but in places, rocks mark a more sudden transition. The southern basin is an impressive feature, with high rocky sides above an undulating base, strewn with boulders.

There is a low hill on the south side of the main basin, and another on the north-east, near Shanbally Castle, where smooth limestone pavement is evident. The major part of the turlough is open, flat and grassy, with occasional depressions and dry channels. The substrate consists largely of silty clay with shell fragments, reaching over 3 m in thickness. Locally in the main basin there are signs of marl, but peat is absent everywhere. Like the southern basin, the eastern end of the main (northern) basin is distinguished by the presence of large rocks scattered over the floor.

The vegetation of Rahasane is divided between dry and wet communities. Because of its large catchment, the turlough is naturally eutrophic and this, together with a lack of peat, limits the sedges (*Carex spp.*) which are usually abundant in turlough vegetation. In places with outcropping limestone, the vegetation is predominantly dry grassland with Red Fescue (*Festuca rubra*) and Crested Dog's-tail (*Cynosurus cristatus*), among a generally calcicole community.

Large areas in the drier parts of the turlough are covered by a community characterised by an abundance of Creeping Cinquefoil (*Potentilla reptans*), with Common Sedge (*Carex nigra*), Silverweed (*Potentilla anserina*) and Creeping Bent (*Agrostis stolonifera*). Where the soil is less well-drained, Creeping Cinquefoil disappears from this community and the rare species, Fen Violet (*Viola persicifolia*), which is listed in the Irish Red Data Book, occurs.

In these areas, the presence of Common Spike-rush (*Eleocharis palustris*) suggests that water is close to the surface. Wet communities are associated with the river channels and pools. Fully aquatic communities include such species as Fan-leaved Water Crowfoot (*Ranunculus circinatus*), Fennel Pondweed (*Potamogeton pectinatus*), Lesser Pondweed (*P. pusillus*), Fat Duckweed (*Lemna gibba*), Whorled Water-milfoil (*Myriophyllum verticillatum*) and Needle Spike-rush (*Eleocharis acicularis*).

Semi-aquatic communities fringe the main channel of the river and colonise muddy pools in the basin. Species such as Lesser Water-parsnip (*Berula erecta*), Fool's Water-cress (*Apium nodiflorum*), River Waterdropwort (*Oenanthe fluviatilis*) and Amphibious Bistort (*Polygonum amphibium*) occur, along with the rare species, Northern Yellow-cress (*Rorippa islandica*), which is listed in the Irish Red Data Book.

There are also some narrow fields with Yellow Iris (*Iris pseudacorus*). There are small areas of scrub on the southern and north-western sides of the turlough, but the area of flooded woodland is small. The scrub is made up of Buckthorn (*Rhamnus cathartica*), Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*). The trees support a range of epiphytic mosses such as *Leskea polycarpa*, *Amblystegium riparium*, *Isopterygium elegans*, *Isothecium myosuroides* and *Thuidium tamariscinum*.

Rahasane Turlough is renowned for its wintering wildfowl populations, but it also supports nesting waders in summer, which include Lapwing, Redshank, Snipe and Dunlin. Figures stated in the following account represent mean (and peak) counts obtained during the three seasons, 1984/85 to 1986/87. Internationally important numbers of Whooper Swan 179, Golden Plover 17680, Wigeon 7760 and Shoveler 498 are found. The first two species, together with Bewick's Swan, below, are listed on Annex I of the E.U. Birds Directive.

Species recorded in nationally important numbers are Bewick's Swan 132, Mute Swan 125, Teal 3005, Mallard 777, Pintail 102, Pochard 356, Tufted Duck 381, Coot 1289, Lapwing 3995, Dunlin 3569 (5653), Blacktailed Godwit 170 and Curlew 1205. Small numbers of the internationally important Greenland White-fronted Goose regularly overwinter at Rahasane (average count, as above, 59), but numbers have been declining over the years. There is a small run of Atlantic Salmon (*Salmo salar*) through the Dunkellin River when it is flowing overground. The fish pass through the turlough but do not use it for spawning.

This species is listed on Annex II of the E.U. Habitats Directive. The Fairy Shrimp (*Tanymastix stagnalis*, Class Crustacea) was first recorded in Ireland from the southern basin at Rahasane, though it has since been recorded elsewhere. It requires isolation from predators to grow to reproductive age and so cannot occur in permanent waterbodies.

The turlough is closely grazed by cattle, sheep and horses. Grazing is a critical factor in maintaining a balance between open swards and woodland development at the edges of the turlough. Drainage is a major threat to turloughs, but the Dunkellin River has not been arterially drained. The river was straightened many years ago where it crosses the turlough, and the artificial channel was dredged again in 1992, but this does not appear to have affected winter flooding.

Some degree of artificial enrichment of the basin is occurring from the farming areas upstream, and local enrichment is associated with grazing practices. Eutrophication is among the major threats to turlough systems in general. Rahasane Turlough is of major ecological significance as one of only two large turloughs in the country which still function naturally. It is the most important turlough in Ireland for birdlife. In a relatively recent national survey, it was also rated very highly for its vegetation, and supports two rare species listed in the Irish Red Data Book. Turloughs are a rare habitat type and are given priority status under Annex I of the E.U. Habitats Directive.

Lough Corrib SAC [site code: 000297]

Qualifying Interests

- 1029 Freshwater Pearl Mussel *Margaritifera margaritifera*
- 1092 White-clawed Crayfish *Austropotamobius pallipes*
- 1095 Sea Lamprey *Petromyzon marinus*
- 1096 Brook Lamprey *Lampetra planeri*
- 1106 Salmon *Salmo salar*
- 1303 Lesser Horseshoe Bat *Rhinolophus hipposideros*
- 1355 Otter *Lutra lutra*
- 1393 Slender Green Feather-moss *Drepanocladus vernicosus*
- 1833 Slender Naiad *Najas flexilis*
- 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*
- 3140 Hard oligo-mesotrophic waters and benthic vegetation of *Chara* species
- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*)(*important orchid sites)
- 6410 *Molinia meadowson* calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- 7110 Active raised bogs*
- 7120 Degraded raised bogs still capable of natural regeneration
- 7150 Depressions on peat substrates of the *Rhynchosporion*
- 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**
- 7220 Petrifying springs with tufa formation (*Cratoneurion*)*
- 7230 Alkaline fens
- 8240 Limestone Pavements*
- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- 91D0 Bog woodland*

Conservation Objectives

- 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) in Lough Corrib SAC, which is defined by the list of attributes and targets under the NPWS webpage: www.npws.ie/sites/default/files/protected-sites/synopsis/SY000297.pdf.

This SAC overlaps with Lough Corrib SPA (site code: 004042).

Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 hectares (the entire site is 20,556 hectares). The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included the designation as they are important for Atlantic Salmon. These rivers include the Clare, Grange, Abbert, Sinking, Dalgan, and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff

to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site.

The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (*Charophytes*) in Ireland, with species such as *Chara aspera*, *C. hispida*, *C. delicatula*, *C. contraria* and *C. desmacantha* mixed with submerged pondweeds (*Potamogeton perfoliatus*, *P. gramineus* and *P. lucens*), Shoreweed (*Littorella uniflora*) and Water Lobelia (*Lobelia dortmanna*). These *Chara* beds are an important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters, without *Chara* species, but with Shoreweed, Water Lobelia, Pipewort (*Eriocaulon aquaticum*), Quillwort (*Isotes lacustris*), Alternate Water-milfoil (*Myriophyllum alternifolium*) and Slender Naiad (*Najas flexilis*). The last-named is listed under the Flora (Protection) Order, 2015, and is an Annex II species under the E.U. Habitats Directive.

Otter and Irish Hare have been recorded regularly within this site. Both of these species are listed in the Red Data Book and legally protected by the Wildlife Act, 1976. Otter is also listed on Annex II of the E.U. Habitats Directive. Lough Corrib is considered one of the best sites in the country for Otter, due to the sheer size of the lake and associated rivers and streams, and also the generally high quality of the habitats. Atlantic Salmon (*Salmo salar*) use the lake and rivers as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. Lough Corrib is also a well-known fishing lake with a very good Trout (*Salmo trutta*) fishery. The lake has a population of Sea Lamprey (*Petromyzon marinus*), a scarce, though probably under-recorded species listed on Annex II of the E.U. Habitats Directive. Brook Lamprey (*Lampetra planeri*), also listed on Annex II, are also known from a number of areas within the site.

A population of Freshwater Pearl Mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs within the site. White-clawed Crayfish (*Austropotamobius pallipes*), also listed on Annex II, is well distributed throughout Lough Corrib and its in-flowing rivers over limestone. A summer roost of Lesser Horseshoe Bat, another Annex II species, occurs within the site – approximately 100 animals were recorded here in 1999.

The main threats to the quality of this site are from water polluting activities resulting from intensification of agricultural activities on the eastern side of the lake, uncontrolled discharge of sewage which is causing localised eutrophication of the lake, and housing and boating development, which is causing the loss of native lakeshore vegetation. The raised bog habitats are susceptible to further degradation and drying out due to drainage and peat cutting and, on occasions, burning. Peat cutting threatens Addergoole Bog and already a substantial area of it has been cut away. Fishing and shooting occur in and around the lake. Introduction of exotic crayfish species or the crayfish fungal plague (*Aphanomyces astaci*) could have a serious impact on the native crayfish population. The bat roost is susceptible to disturbance or development.

Despite these ongoing issues, however, Lough Corrib is one of the best examples of a large lacustrine catchment system in Ireland, with a range of habitats and species still well represented. These include 15 habitats which are listed on Annex I of the E.U. Habitats Directive, six of which are priority

habitats, and nine species which are listed on Annex II. The lake is also internationally important for birds and is designated as a Special Protection Area.

Lough Corrib SPA [site code: 004042]

Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

Bird Code	Common Name	Scientific Name
A051	Gadwall	<i>Anas strepera</i>
A056	Shoveler	<i>Anas clypeata</i>
A059	Pochard	<i>Aythya farina</i>
A061	Tufted Duck	<i>Aythya fuligula</i>
A065	Common Scoter	<i>Melanitta nigra</i>
A082	Hen Harrier	<i>Circus cyaneus</i>
A125	Coot	<i>Fulica atra</i>
A140	Golden Plover	<i>Pluvialis apricaria</i>
A179	Black-headed Gull	<i>Chroicocephalus ridibundus</i>
A182	Common Gull	<i>Larus canus</i>
A193	Common Tern	<i>Sterna hirundo</i>
A194	Arctic Tern	<i>Sterna paradisaea</i>
A395	Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, "Wetland and Waterbirds" may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a second objective is included as follows: to maintain or restore the favourable conservation condition of the wetland habitat at Lough Corrib SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

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