

5. BIODIVERSITY

5.1 INTRODUCTION

5.1.1 Background

McCarthy Keville O’Sullivan Ltd. (MKO) has been appointed by Glenveagh Living to provide an assessment of the ecological impacts relating to a proposed strategic housing development at Gort na mBro, Rahoon, Knocknacarra, Galway.

The aim of this Ecological Impact Assessment is to ensure that elements of the proposed project that may potentially affect protected sites, habitats or species are adequately assessed. This assessment quantifies any potential impacts relating to flora/fauna and identifies the mitigation or design measures required to avoid, reduce and mitigate any potential impacts. Where potential for impact was identified at an early stage in the project, alterations to the project layout have been incorporated. Where potential for residual impact remains, mitigation has been derived following a collaborative approach working with a multi-disciplinary team including project engineers and ecologists.

The information provided in this assessment describes the baseline ecological environment; provides a prediction of the likely ecological impacts of the proposed development; prescribes mitigation as necessary; and, describes the residual ecological impacts.

5.1.2 Relevant Legislation and Policy

5.1.2.1 National Legislation

The Wildlife Act, 1976–2017 (S.I. No. 166 of 2017), is the principle mechanism for the legislative protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act protects species from injury, disturbance and damage to breeding and resting sites. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis and have no statutory protection. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2018).

The Flora (Protection) Order, 2015 provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order, it is illegal to cut, uproot or damage species listed in any way or to alter, damage or interfere in any way with their habitats.

5.1.2.2 National Policy

The National Biodiversity Action Plan 2017-2021 is a framework for the conservation and protection of biodiversity in Ireland. The main objective of the plan is to conserve and restore biodiversity and ecosystem services. Objective 1 of the National Biodiversity Action Plan identifies the following relevant measures in relation to future developments:

› *“Mainstreaming biodiversity into decision-making across all sectors”.*

- › “All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure”.

Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

5.1.2.3 European Legislation

The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The EU Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC), which were transposed into Irish law as S.I. No. 94/1997 *European Communities (Birds and Natural Habitats) Regulations 1997*, recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats. The 1997 Regulations and their amendments were subsequently revised and consolidated in S.I. No. 477/2011- *European Communities (Birds and Natural Habitats) Regulations 2011*. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'.

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV.

Council Directive 2009/147/EC (the Birds Directive) on the conservation of wild birds instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species have been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment.

5.1.3 Scoping/Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment;

- › Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).
- › Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (Environmental Protection Agency (EPA), 2003).
- › Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002).
- › Draft Revised guidelines on the information to be contained in Environmental Impact Statements (EPA, 2017).
- › Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).
- › Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- › Environmental Assessment and Construction Guidelines (NRA, 2006).

5.1.4 **Statement of Authority**

Field surveys were undertaken on the 22nd March 2019 and 23rd September 2019 by James Owens (B.Sc., M.Sc). James is an experienced ecologist with over 4 years professional ecological consultancy experience. Additional ecological surveys were undertaken by David McNicholas (B.Sc., M.Sc., MCIEEM) on the 29th of April 2019. David is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and has over 8 years professional ecological consultancy experience. This report has been prepared by James Owens and David McNicholas. This report has been reviewed by Pat Roberts (B.Sc. Environmental Science, MCIEEM) who has over 14 years' experience in management and ecological assessment.

5.2

ASSESSMENT METHODOLOGY

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

The following sections outline the methodologies utilised to establish the baseline ecological condition of the proposed development site.

5.2.1

Establishing the Zone of Influence

AS described in the CIEEM, 2018 Guidelines for Ecological Impact Assessment in The UK and Ireland, *‘the ‘zone of influence’ for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities’*. The zone of influence will vary with different ecological features, depending on their sensitivities to an environmental change. This may extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The assessment of the development site began with a desk study of available published data on sites designated for nature conservation, other ecologically sensitive sites, habitats and species of interest in the vicinity of the proposed development. A review of OSI mapping, online environmental web-mappers and ortho-photography was also undertaken. The baseline information obtained from the desk study was the first stage in defining a zone of influence of the proposed development. The variables for determining potential for effect include;

- › The physical distance between the proposed development and the Key Ecological Receptors identified during the desk and field surveys, and
- › The sensitivity of the Key Ecological Receptors to physical change in the area (CIEEM, 2018).

The zone of likely influence for the proposed development varied depending on the key ecological receptors identified on site. In the assessment, effects on habitats and species within the site were considered and also the potential for the proposed development to affect habitats and species outside the site. Any potential pathways for ex-situ impacts were also considered in the assessment.

5.2.2

Desk Study

The desk study undertaken for this assessment included a thorough review of the available ecological data associated with the study area of the proposed development. Sources of data included the following:

- › Review of online web-mappers: National Parks and Wildlife Service (NPWS), Teagasc, Environmental Protection Agency (EPA), Water Framework Directive (WFD), Office of Public Works (OPW) flood Mapping,
- › Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons et al., 1993; Balmer et al., 2013),
- › Review of the Bat Conservation Ireland (BCI) database,
- › Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper,
- › Data on potential occurrence of protected bryophytes in the NPWS; recently launched Flora Protection Order Map Viewer – Bryophytes
- › Records from the NPWS web-mapper,
- › Review of NPWS Article 17 metadata and GIS database files,
- › Ecological data submitted with the planning application for the N6 Galway City Ring Road.

5.2.3 Multidisciplinary Ecological Walkover Survey

A multidisciplinary ecological walkover survey of the proposed development site and was conducted on the 29th of April 2019 by David McNicholas and Irene Sullivan.

Habitats were identified in accordance with the Heritage Council's *'Guide to Habitats in Ireland'* (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in *'Best Practice Guidance for Habitat Survey and Mapping'* (Smith et al., 2011). Plant nomenclature for vascular plants follows *'New Flora of the British Isles'* (Stace, 2010), while mosses and liverworts nomenclature follows *'Mosses and Liverworts of Britain and Ireland - a field guide'* (British Bryological Society, 2010).

The multi-disciplinary walkover survey was designed to detect the presence, or likely presence, of a range of protected habitats and species. Incidental sighting/observations of birds and additional fauna were noted during the site visit. Surveys were undertaken in accordance best practice guidance (TII, 2008: *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*). During the multi-disciplinary ecological walkover surveys the potential for the study area to support protected mammals listed in the Wildlife Acts, 1976–2018, such as pine marten, red squirrel, Irish hare, pygmy shrew, Irish stoat etc. was assessed.

During the multi-disciplinary walkover survey, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed. All plants were readily identifiable, and it is considered that a comprehensive and accurate assessment of the habitats was achieved.

Bat Survey

A bat activity survey was undertaken on the 29th of April 2019. The bat survey was conducted on site to record bat activity within the site and determine the level of usage of the site by bat species. Bat surveys were undertaken in accordance with Bat Conservation Trust (BCT) *Bat Surveys for Professional Ecologists: good practice Guidelines (3rd edn)* (Collins, J (ed.), 2016). BCT guidance were also used for the classification of roosting/foraging features within the site. In addition, any bats using the site for foraging or commuting were noted. Two surveyors, equipped with Batlogger M bat detectors (Elekon AG, Lucerne, Switzerland), walked the site to cover representative habitats and features likely to be used by bats. Conditions were highly suitable for a bat survey. Conditions were dry, and calm (Force 1-2 on the Beaufort Scale). The temperature at the beginning and end of the survey was 12°C, optimal conditions for bat surveys.

5.2.4 Methodology for Assessment of Effects

5.2.4.1 Geographical framework

Guidance on Ecological Impact Assessment (CIEEM, 2018) recommends categories of nature conservation value that relate to a geographical framework (e.g. international, through to local). This assessment utilises the geographical framework described in *Guidelines for Assessment of Ecological Impact of National Road Schemes* (NRA 2009). The guidelines provide a basis for determination of whether any particular site is of importance on the following scales:

- › International

- > National
- > County
- > Local Importance (Higher Value)
- > Local Importance (Lower Value)

Locally Important (lower value) receptors include habitats and species that are widespread and of low ecological significance only in the local area. Internationally Important sites are designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna.

5.2.4.2 Characterising Ecological Impacts and Effects

Effects identified have been described in accordance with (EPA, 2017) impact assessment criteria presented in table 3.1. The criteria for characterising magnitude and scale of ecological impacts are further contextualised based on CIEEM guidelines (CIEEM, 2018) in table 3.2.

The following terms were utilised when quantifying duration:

- > Temporary – up to 1 year
- > Short-term – 1 to 7 years
- > Medium term – 7 to 15 years
- > Long term – 15 to 60 years
- > Permanent – over 60 years

Table 3.1 Criteria for assessing impact quality based on (EPA, 2017)

Effect Type	Criteria
Positive	A change which improves the quality of the environment e.g. increasing species diversity, improving reproductive capacity of an ecosystem or removing nuisances.
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment e.g. lessening species diversity or reducing the reproductive capacity of an ecosystem or by causing nuisance.

Table 3.2 Criteria for characterising magnitude and scale of ecological impacts (CIEEM, 2018)

Characteristic	Definition
Positive or Negative	<p>Positive impact – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment.</p> <p>Negative impact – a change which reduces the quality of the environment e.g. destruction of habitat, removal of foraging habitat, habitat fragmentation, pollution.</p>
Extent	The spatial or geographical area over which the impact/effect may occur under a suitably representative range of conditions.
Magnitude	Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
Duration	Impacts and effects may be described as short, medium or long-term and permanent or temporary and are defined in months/years. Duration is defined in relation to ecological characteristics.
Frequency and Timing	The number of times an activity occurs will influence the resulting effect. The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons.
Reversibility	An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

5.2.4.3 Significance of Effect

The criteria for assessing impact significance based on EPA guidelines is outlined in table 3.3 (EPA, 2017).

Table 3.3 Criteria for assessing impact significance based on (EPA, 2017)

Effect Magnitude	Definition
No change	No discernible change in the ecology of the affected feature.
Imperceptible Effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant Effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics.

As per TII (NRA, 2009) and CIEEM (2018) best practice guidelines the following key elements should also be examined when determining the significance of effects:

- › The likely effects on ‘integrity’ should be used as a measure to determine whether an impact on a site is likely to be significant (NRA, 2009)
- › A ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018)

Integrity

In the context of EcIA, ‘integrity’ refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued. Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

- › Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area
- › Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

- › Its natural range, and areas it covers within that range, are stable or increasing
- › The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future
- › The conservation status of its typical species is favourable.

The conservation of a species is favourable when:

- › Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- › The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
- › There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

According to the NRA/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international).

5.2.5 Incorporation of Mitigation

The proposed development layout has been designed through an iterative design process to ensure that the proposal avoids potential effects on sensitive ecological receptors. Section 5 of this report assesses the potential effects of the proposal to ensure that all effects on Key Ecological Receptors (KER) are adequately addressed. Where significant effects on KERs are predicted, mitigation is incorporated into the project design or layout to address such impacts. Any implemented mitigation measures avoid potential for significant residual effects, post mitigation.

5.3 ESTABLISHING THE ECOLOGICAL BASELINE

5.3.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline for the of the ecology of the existing environment. Material reviewed includes the Site Synopses for designated sites for their conservation importance compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht (DCHG), bird and plant distribution atlases and other research publications.

5.3.1.1 Designated Sites

Using the GIS software, MapInfo (Version 10.0), designated sites within a radius of 15 kilometres of the proposed development were identified. The designated sites are listed in Table 5.1. The location of all European Sites are displayed in Figure 5.1 with nearby EU designated sites shown in Figure 5.1a. All Nationally designated sites displayed in Figure 5.2.

Table 5-1: Designated sites within 15 kilometres of the proposed development.

Designated Site	Distance from Proposed Development
Special Areas of Conservation (SAC)	
Galway Bay Complex SAC	1.3km
Lough Corrib SAC	2.5km
Connemara Bog Complex SAC	10km
Ross Lake And Woods SAC	12.2km
East Burren Complex SAC	13.8km
Moneen Mountain SAC	14.9km
Special Protection Area (SPA)	
Inner Galway Bay SPA	1.5km
Lough Corrib SPA	3.3km
Cregganna Marsh SPA	10.8km
Connemara Bog Complex SPA	14.4km
Natural Heritage Areas (NHA)	
Moycullen Bogs NHA	1.6km
Cregganna Marsh NHA	10.8km
Proposed Natural Heritage Areas (pNHA)	
Galway Bay Complex	1.3km

Lough Corrib	2.5km
Ballycurke Lough	6.6km
Furbogh Wood	8.1km
Killarainy Lodge, Moycullen	9.1km
Galway Bay Complex	9.4km
Connemara Bog Complex	10km
Drimcong Wood	10.1km
Kiltullagh Turlough	10.3km
Ross Lake And Woods	12.2km
East Burren Complex	13.8km
Moneen Mountain	15km

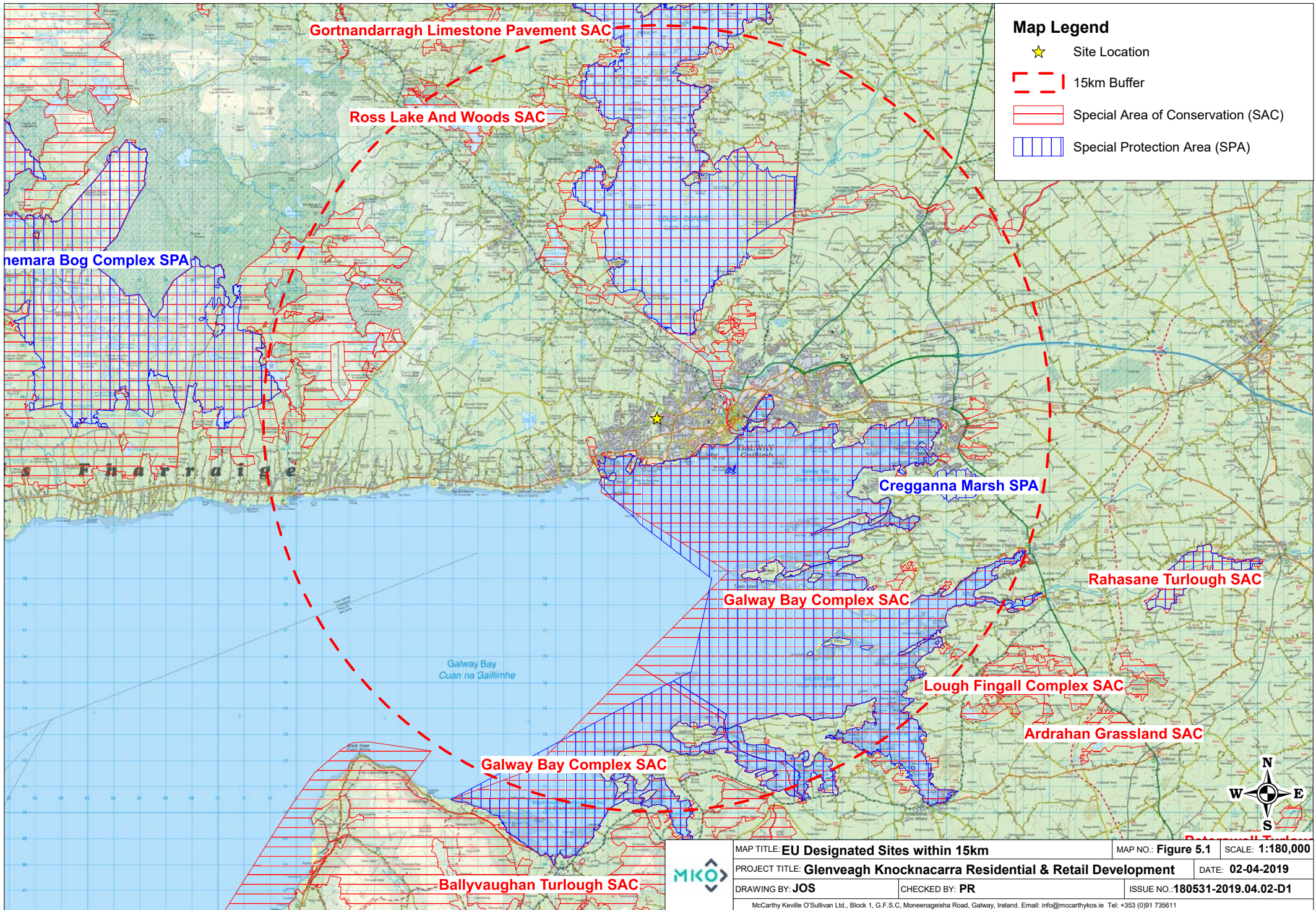
The European Sites have been assessed in a Natura Impact Statement that has been prepared separately. They are also considered in Section 5 of this report.

Surface water connectivity was identified between the development site and Galway Bay Complex SAC and Inner Galway Bay SPA via the Knocknacarra stream. The Knocknacarra Stream rises to the north of the site at Letteragh and flows southward over a distance of 3km to the sea.

A large portion of the lower reach of the Knocknacarra Stream is culverted almost to its sea outfall at near Blakes Hill at Salthill. The stream which formerly ran through the site was culverted and realigned to form the surface water network as part of a nearby development in 1996.

This surface water sewer system ultimately discharges to Rusheen Bay and thus has connectivity to the Inner Galway Bay SPA and Galway Bay Complex SAC, in excess of 1.8km downstream (surface water distance) and Galway Bay Complex pNHA.

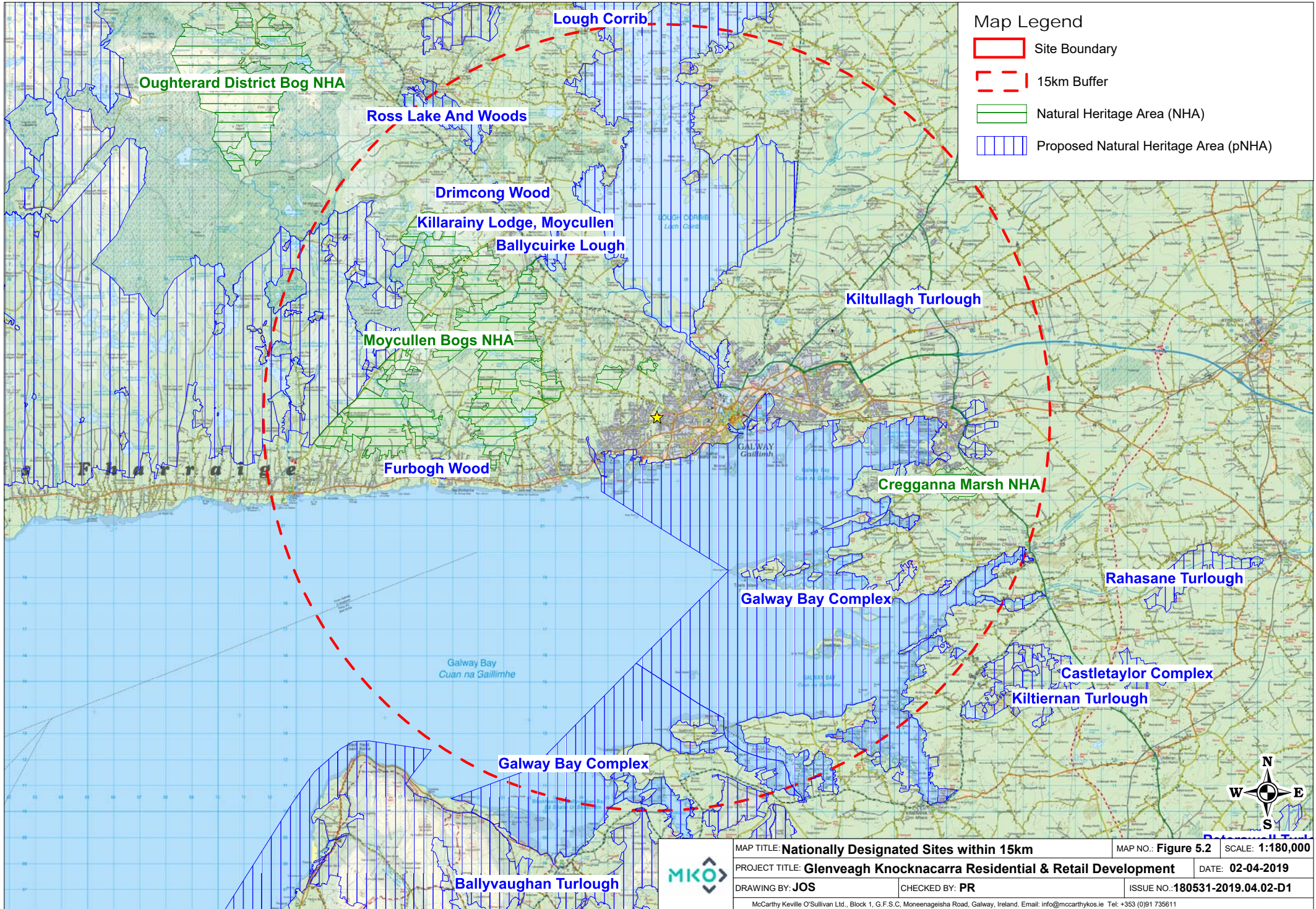
None of the remaining NHAs or pNHAs within the ZOI were considered as ecological receptors in their own right due to the lack of any identifiable pathway for direct or indirect effects.



Map Legend

- ★ Site Location
- - - 15km Buffer
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

	MAP TITLE: EU Designated Sites within 15km		MAP NO.: Figure 5.1	SCALE: 1:180,000
	PROJECT TITLE: Glenveagh Knocknacarra Residential & Retail Development			DATE: 02-04-2019
	DRAWING BY: JOS		CHECKED BY: PR	
	ISSUE NO.: 180531-2019.04.02-D1			
McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C. Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611				



Map Legend

- Site Boundary
- 15km Buffer
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)

MAP TITLE: Nationally Designated Sites within 15km	MAP NO.: Figure 5.2	SCALE: 1:180,000
PROJECT TITLE: Glenveagh Knocknacarra Residential & Retail Development	DATE: 02-04-2019	
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McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C. Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611		

5.3.1.2 Vascular plants

A search was made in the New Atlas of the British & Irish Flora (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2015) had been recorded in the relevant 10km squares in which the study site is situated (M22). Each hectad contains 100 whole one kilometre squares containing terrestrial habitats. Species of conservation concern are given in Table 5.2.

Table 5-2: Plant species of conservation concern recorded within hectad M22

Common name	Latin name	Designation
Slender cottongrass	<i>Eriophorum gracile</i>	FPO, RL – Endangered (EN)
Small-white orchid	<i>Pseudorchis albida</i>	FPO, RL – Endangered (EN)
Wood bitter vetch	<i>Vicia orobus</i>	FPO, RL - Vulnerable (VU)
Awlwort	<i>Subularia aquatica</i>	RL - Vulnerable (VU)
Fragrant agrimony	<i>Agrimonia procera</i>	RL - Near Threatened (NT)
Moonwort	<i>Botrychium lunaria</i>	RL - Near Threatened (NT)
Spiked sedge	<i>Carex spicata</i>	RL - Near Threatened (NT)
Greater knapweed	<i>Centaurea scabiosa</i>	RL - Near Threatened (NT)
Frog orchid	<i>Coeloglossum viride</i>	RL - Near Threatened (NT)
Sea kale	<i>Crambe maritima</i>	RL - Near Threatened (NT)
Pipewort	<i>Eriocaulon aquaticum</i>	RL - Near Threatened (NT)
Spring gentian	<i>Gentiana verna</i>	RL - Near Threatened (NT)
Autumn gentian	<i>Gentianella amarella</i>	RL - Near Threatened (NT)
Field gentian	<i>Gentianella campestris</i>	RL - Near Threatened (NT)
Yellow horned-poppy	<i>Glaucium flavum</i>	RL - Near Threatened (NT)
Corn marigold	<i>Chrysanthemum segetum</i>	RL - Near Threatened (NT)
Rock-rose	<i>Helianthemum oelandicum</i>	RL - Near Threatened (NT)
Henbane	<i>Hyoscyamus niger</i>	RL - Near Threatened (NT)
Yellow bird's-nest	<i>Monotropa hypopitys</i>	RL - Near Threatened (NT)
Gromwell	<i>Lithospermum officinale</i>	RL - Near Threatened (NT)
Dense-flowered orchid	<i>Neotinea maculata</i>	RL - Near Threatened (NT)
Tubular water-dropwort	<i>Oenanthe fistulosa</i>	RL - Near Threatened (NT)

Common name	Latin name	Designation
Fly orchid	<i>Ophrys insectifera</i>	RL - Near Threatened (NT)
Brackish water-crowfoot	<i>Ranunculus baudotii</i>	RL - Near Threatened (NT)
Brown beak-sedge	<i>Rhynchospora fusca</i>	RL - Near Threatened (NT)
Least bur-reed	<i>Sparganium natans</i>	RL - Near Threatened (NT)
Autumn lady's-tresses	<i>Spiranthes spiralis</i>	RL - Near Threatened (NT)
Green field-speedwell	<i>Veronica agrestis</i>	RL - Near Threatened (NT)

5.3.1.3 Habitats

The available NPWS Article 17 habitats datasets were reviewed along with data received from the NPWS scientific data unit, following a formal data request. There were no records for EU Annex I habitats recorded within or immediately adjacent to the proposed development site as part of this study. In addition, available information suggests that none of the lands within the site have been mapped as part of any NPWS Article 17 assessment.

5.3.1.4 Birds

A number of sources were assessed to determine the likely usage of the site by both breeding and wintering bird species, including Bird Atlases, National Biodiversity Data Centre (NBDC), BirdWatch Ireland and Conservation Objectives Supporting Documents from the National Parks and Wildlife Service (NPWS) for nearby Special Protection Areas (SPAs). The following sub sections provide a breakdown of the sources used and results obtained.

5.3.1.4.1 Breeding and Wintering Bird Atlases

The *Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland* (Balmer *et al.*, 2013) provides the most up-to-date information regarding the distribution and relative abundance of bird species in Britain and Ireland, based on surveys carried out between 2007 and 2011.

The atlases show data for breeding and wintering birds respectively in individual 10 km x 10 km squares (hectads). Table 5.3 shows those species found in the relevant hectad (M22), which are recorded as breeding in the most recent atlas. It also provided species that have been recorded within the relevant hectad on National Biodiversity Data Centre (NBDC) datasets as well as those listed in Annex I of the EU Birds Directive recorded on the BoCCI Red List. Birds listed under Annex I are offered special protection by the EU Birds Directive. Those listed on the Birds of Conservation Concern in Ireland (BoCCI) Red List meet one or more of the following criteria:

- IUCN: Global conservation status (Critically Endangered (CE), Endangered (E) or Vulnerable (V), but not Near Threatened. These species are recognised as the highest priorities for action at a global scale and are thus priorities at an all-Ireland level.
- European conservation status. The conservation status of all European species was assessed most recently by Birdlife International (2004), one of the main changes in the revision being to include the IUCN criteria. These species are those of global conservation concern (including those classified as Near Threatened) and are Red-listed.
- The Irish breeding population has undergone significant historical decline since 1800.

- › The Irish breeding population or range has declined by 50% or more in the thirteen years from 1998-2011 (BDp1) or the 25 years from 1980-2013 (BDp2).
- › The Irish non-breeding population has undergone a significant decline of 50% in the last 25 years.
- › The Irish breeding range has undergone a decline of 70% or more in the last 25 years.

Species listed under Annex I of the EU Birds Directive and red-listed birds of conservation concern that have been recorded within the relevant hectad (M22) are listed in Table 5.3.

Table 5-3 - Bird Atlas Data records for (hectad M22)

Common name	Scientific name	Designation
Arctic tern	<i>Sterna paradisaea</i>	Protected EU Birds Directive Annex I species
bar-tailed godwit	<i>Limosa lapponica</i>	
black-throated diver	<i>Gavia arctica</i>	
common kingfisher**	<i>Alcedo atthis</i>	
common tern	<i>Sterna hirundo</i>	
great northern diver	<i>Gavia immer</i>	
dunlin	<i>Calidris alpina</i>	
Greenland white-fronted goose	<i>Anser albifrons flavirostris</i>	
hen harrier	<i>Circus cyaneus</i>	
little egret	<i>Egretta garzetta</i>	
little gull	<i>Larus minutus</i>	
little tern*	<i>Sternula albifrons</i>	
Mediterranean gull	<i>Larus melanocephalus</i>	
merlin	<i>Falco columbarius</i>	
peregrine falcon	<i>Falco peregrinus</i>	
red-throated diver	<i>Gavia stellata</i>	
sandwich tern	<i>Sterna sandvicensis</i>	
snowy owl	<i>Bubo scandiaca</i>	
whooper swan**	<i>Cygnus cygnus</i>	
corn crane*	<i>Crex crex</i>	Protected EU Birds Directive Annex I Bird Species & Birds of Conservation Concern in Britain and Ireland - Red List
European Golden Plover	<i>Pluvialis apricaria</i>	
yellowhammer	<i>Emberiza citrinella</i>	Birds of Conservation Concern in Britain and Ireland - Red List
barn owl	<i>Tyto alba</i>	
black-headed gull	<i>Larus ridibundus</i>	
common redshank	<i>Tringa totanus</i>	
common scoter	<i>Melanitta nigra</i>	

Eurasian curlew	<i>Numenius arquata</i>	
grey partridge*	<i>Perdix perdix</i>	
herring gull	<i>Larus argentatus</i>	
northern lapwing	<i>Vanellus vanellus</i>	
northern pintail	<i>Anas acuta</i>	
northern shoveler*	<i>Anas clypeata</i>	
red grouse	<i>Lagopus lagopus</i>	
red knot	<i>Calidris canutus</i>	
twite	<i>Carduelis flavirostris</i>	
Eurasian Wigeon	<i>Anas penelope</i>	
Eurasian Woodcock	<i>Scolopax rusticola</i>	
meadow pipit	<i>Anthus pratensis</i>	
tufted duck	<i>Aythya fuligula</i>	
common pochard	<i>Aythya ferina</i>	

* Date of last record 1972 ** Date of last record 1984

Nineteen species listed under Annex I of the EU Birds Directive, two of which are also red listed birds of conservation concern, have been recorded within the relevant hectad. An additional nineteen red listed birds of conservation concern have been recorded within the relevant hectad.

5.3.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) records for the relevant hectad, M22, provided details on a number of fauna species of conservation concern. These are provided in Table 5.4. Species reported in the preceding sections are not included in this Table. Marine species are also excluded from this table.

Table 5-4 - NBDC records for species of conservation interest in hectad M22

Common Name	Scientific Name	Designation
Otter	<i>Lutra lutra</i>	HD, WA
Common frog	<i>Rana temporaria</i>	HD, WA
Marsh fritillary	<i>Euphydryas aurinia</i>	HD
Sea Lamprey	<i>Petromyzon marinus</i>	HD

Brown Long-eared Bat	<i>Plecotus auritus</i>	HD, WA
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	HD, WA
Daubenton's bat	<i>Myotis daubentonii</i>	HD, WA
Leisler's bat	<i>Nyctalus leisleri</i>	HD, WA
Natterer's Bat	<i>Myotis nattereri</i>	HD, WA
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	HD, WA
Pipistrelle spp.	<i>Pipistrellus pipistrellus sensu lato</i>	HD, WA
Pine marten	<i>Martes martes</i>	HD, WA
Red squirrel	<i>Sciurus vulgaris</i>	WA
Smooth newt	<i>Lissotriton vulgaris</i>	WA
Common Lizard	<i>Zootoca vivipara</i>	WA
Pygmy shrew	<i>Sorex minutus</i>	WA
Badger	<i>Meles meles</i>	WA
Hedgehog	<i>Erinaceus europaeus</i>	WA

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland).

5.3.1.6 Bat Records

A search of the Bat Conservation Ireland (BCI) Database for all bat records for the area within and surrounding the proposed development was conducted on the 04th of April 2019. The BCI database can be searched in relation to identified *Roosts, Survey Transects and Other Observations*. Searches can be conducted for refined areas e.g. 1km buffer of a specific location or for wider areas including hectads and entire grid squares. *Roost* data details identified roosts and bat species recorded utilising the roost sites. *Transect* survey data include results of the BCI Car Based Bat Monitoring Scheme, All Ireland Daubenton's Bat Waterways Survey and additional surveys completed by private organisations and individuals.

A search of a 1km buffer from the proposed development site returned no records. A search of a 10km buffer from the proposed development site resulted in the following records; 4 roost records, 14 transect records and 20 ad hoc observations for bat species. Roosts were found to contain lesser horseshoe bat (*Rhinolophus hipposideros*) and Leislers' Bat (*Nyctalus leisleri*).

Fourteen transect records were returned with records for Daubenton's bat (*Myotis daubentonii*), Soprano pipistrelle (*Pipistrellus pygmaeus*) and unidentified bats.

Twenty ad-hoc observations were returned with records for Common pipistrelle (*Pipistrellus pipistrellus*) and Soprano pipistrelle (*Pipistrellus pygmaeus*). Daubenton's bat (*Myotis daubentonii*), Myotis spp., Leisler's bat (*Nyctalus leisleri*), Natterer's bat (*Myotis nattereri*), lesser horseshoe bat (*Rhinolophus hipposideros*) and brown long-eared bat (*Plecotus auritus*). The information provides for

a good baseline understanding of bat species in the area and indicates that the region has been previously surveyed for bats.

5.3.1.7 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) was consulted during the desk study. The proposed development site does not lie within any freshwater pearl mussel (*Margaritifera margaritifera*) sensitivity area. The nearest known population of the species occurs in excess of 4.5km, west of the proposed development. There are no watercourses within the proposed development site that have suitability for freshwater pearl mussel.

5.3.1.8 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectad. Records of ‘high impact’ invasive species for hectad M22 are provided in Table 5.5.

Table 5.5 NBDC records for invasive species (Hectad M22)

Common Name	Scientific Name
Ruddy duck	<i>Oxyura jamaicensis</i>
Canadian waterweed	<i>Elodea canadensis</i>
Wireweed	<i>Sargassum muticum</i>
Knotweed	<i>Fallopia japonica x sachalinensis = F. x bohemica</i>
Giant knotweed	<i>Fallopia sachalinensis</i>
Japanese knotweed	<i>Fallopia japonica</i>
Rhododendron	<i>Rhododendron ponticum</i>
Giant-rhubarb	<i>Gunnera tinctoria</i>
Indian balsam	<i>Impatiens glandulifera</i>
American mink	<i>Mustela vison</i>
Brown rat	<i>Rattus norvegicus</i>

5.3.1.9 NPWS Records

Data on rare and protected species in the hectad M22 was received from the NPWS scientific data unit, on the 12th of April 2019, following a formal data request. NPWS records provided details on a number of fauna species of conservation concern, presented in Table 5.6.

Table 5-6 NPWS records for Hectad M22.

Common Name	Scientific Name
Chives	<i>Allium schoenoprasum</i>
Musk thistle	<i>Carduus nutans</i>
Slender cottongrass	<i>Eriophorum gracile</i>
Alder buckthorn	<i>Frangula alnus</i>
Rock-rose	<i>Helianthemum oelandicum subsp. piloselloides</i>
Henbane	<i>Hyoscyamus niger</i>
Small-white orchid	<i>Pseudorchis albida</i>
Sphagnum	<i>Sphagnum denticulatum</i>
Hedgehog	<i>Erinaceus europaeus</i>
Irish hare	<i>Lepus timidus subsp. hibernicus</i>
Otter	<i>Lutra lutra</i>
Badger	<i>Meles meles</i>
Irish stoat	<i>Mustela erminea subsp. hibernica</i>
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>
Eurasian pygmy shrew	<i>Sorex minutus</i>
Sea lamprey	<i>Petromyzon marinus</i>
Common seal	<i>Phoca vitulina</i>
Common porpoise	<i>Phocoena phocoena</i>
Viviparous lizard	<i>Lacerta vivipara</i>
Smooth newt	<i>Lissotriton vulgaris</i>
Common frog	<i>Rana temporaria</i>
Barn owl	<i>Tyto alba</i>
Shag	<i>Phalacrocorax aristotelis</i>

5.3.1.10 Water Quality

The site is situated within the Galway Bay North catchment. The EPA Envision map viewer was consulted on 29th of April 2019 regarding the water quality status of the watercourses within and downstream of the Study Area. The EPA Map viewer indicates that a small stream flows in a south westerly direction along the eastern boundary of the site, discharging to the Knocknacarra stream, 57m south of the site. This stream is culverted and was relocated outside the site boundary as part of the construction work associated with the school to the north of the site.

According to the flood risk assessment the EPA historic watercourses no longer exist having been replaced and realigned by a surface water network as part of a nearby development in 1996. The location of the Knocknacarragh Stream correlates with the location of the 1500mm diameter surface water sewer which appears to have culverted this stream.

This surface water sewer system ultimately discharges to Rusheen Bay and thus has connectivity to the Inner Galway Bay SPA and Galway Bay Complex SAC, in excess of 1.8km downstream (surface water distance).

The following water quality status results were determined from the online EPA Envision map viewer. The water quality of Rusheen Bay to which the culverted stream discharges has a Coastal Waterbody Status of 'good' and a coastal waterbodies risk projection of 'not at risk'. Groundwater in the study area has a ground waterbody status of 'good'.

5.3.1.11 N6 Galway City Transport Project (GCTP) Ecology Surveys

The route selection report for the proposed N6 Galway City Transport Project was consulted in order to determine whether the site had been surveyed as part of the route selection for the N6 ring road project. A review of the available information from the N6 Galway City Transport Project (GCTP) shows that the site is within the ecological study areas and the habitats on site have been assessed as part of the project (GCTP, 2015), available at <http://www.n6galwaycityringroad.ie/>. The habitats within the proposed development site have been classified as Dense Bracken (HD1), Recolonising Bare Ground (ED3), Wet Grassland (GS4) and Scrub (WS1) and assigned a value of non-annex habitat of local importance. No rare or protected plant species were recorded within the proposed development site during the surveys.

The site has been surveyed for bats as part of this study, including walked transects routes and car transect routes. No bat roosts or foraging/commuting bats were recorded within the development site. Leisler's bat, common pipistrelle and soprano pipistrelle were recorded in the wider area.

5.3.1.12 Conclusions of the Desktop Study

The desktop study has provided good information about the existing environment in hectad M22, within which the proposed development site is located.

The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland (Marnell et al 2009) and are likely to be recorded frequently throughout Ireland. A review of bat roost records for the area did not identify any roosts within or immediately adjacent to the proposal. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visit.

The desk study also provided useful information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impact on sensitive ecological receptors. No records of protected species were identified within the site boundary during the desk study.

5.3.2 Ecological Walkover Survey Results

5.3.2.1 Description of Habitats and Flora within the Study Area

This section of the EcIA provides a detailed description of the findings of a multidisciplinary walkover survey conducted on 29th of April 2019. The survey was undertaken in line with NRA (2009) guidelines (*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*) by David McNicholas (B.Sc., M.Sc.) of McCarthy Keville O’Sullivan Ltd. All habitats within and adjacent to the works area were readily identifiable during the site visit. Habitats recorded within and adjacent to the development site are listed in Table 5.8. The habitat classifications and codes correspond to those described in ‘*A Guide to Habitats in Ireland*’ (Fossitt 2000). Figure 5.3 provides a habitat map of the proposed development site, and Figure 5.3a provides a habitat map with the development overlain.

In addition to the habitat survey a tree survey was conducted on the 22nd of March 2019 by James Owens (B.Sc., M.Sc.). The tree survey report provides information on the tree species, the arboricultural, landscape and cultural value of the identified trees or groups of trees and is provided as Appendix 5-1.

Table 5-7 - Habitats recorded on the proposed development

Habitat	Code
Scrub	WS1
Spoil and bare ground	ED2
Recolonising bare ground	ED3
Dry Meadows and Grassy Verges	GS2
Amenity Grassland	GA2
Scattered trees and parkland	WD5
Building and artificial surfaces	BL3



Map Legend

Site boundary

Habitat Legend

- Wet Heath (HH3)
- Buildings and Artificial Surfaces (BL3)
- Spoil and Bare Ground (ED2)
- Amenity Grassland (GA2)
- Dry Meadows and Grassy Verges (GS2)
- Dense Bracken (HD1)
- Scattered Trees and Parkland (WD5)
- Scrub (WS1)

Indicative site layout



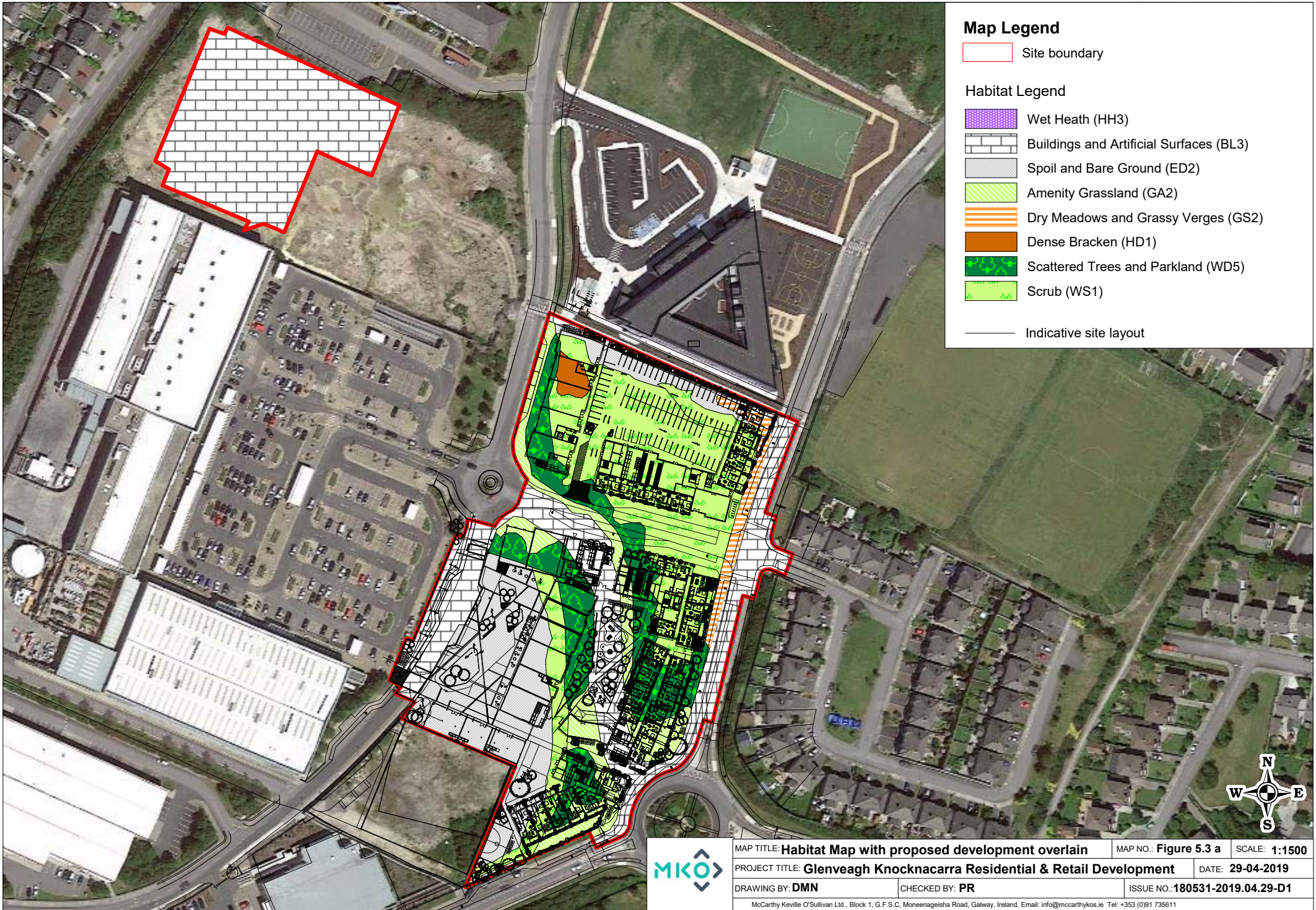
MAP TITLE: **Habitat Map** MAP NO.: **Figure 5.3** SCALE: **1:1500**

PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development** DATE: **29-04-2019**

DRAWING BY: **DMN** CHECKED BY: **PR** ISSUE NO.: **180531-2019.04.29-D1**

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C. Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611






Map Legend

 Site boundary

Habitat Legend

-  Wet Heath (HH3)
-  Buildings and Artificial Surfaces (BL3)
-  Spoil and Bare Ground (ED2)
-  Amenity Grassland (GA2)
-  Dry Meadows and Grassy Verges (GS2)
-  Dense Bracken (HD1)
-  Scattered Trees and Parkland (WD5)
-  Scrub (WS1)

 Indicative site layout



MAP TITLE: Habitat Map with proposed development overlain	MAP NO.: Figure 5.3 a	SCALE: 1:1500
PROJECT TITLE: Glenveagh Knocknacarra Residential & Retail Development	DATE: 29-04-2019	
DRAWING BY: DMN	CHECKED BY: PR	ISSUE NO.: 180531-2019.04.29-D1
<small>McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C. Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611</small>		

5.3.2.1.3 Scrub (WS1) and Dense bracken (HD1)

The northern half of the site is primarily Scrub (WS1) habitat, dominated by gorse (*Ulex europeus*), dense bramble (*Rubus fruticosus agg.*) and nettle (*Urtica dioica*) (Plate 5.1). Other species recorded in this habitat include willow (*Salix sp.*), bracken (*Pteridium aquilinum*), rosebay willowherb (*Chamerion angustifolium*), hedge bindweed (*Calystegia sepium*), pineappleweed (*Matricaria discoidea*), wavy bittercress (*Cardamine flexuosa*), common rampion (*Fumaria muralis*), ivy (*Hedera helix*), cleavers (*Galium aparine*), lesser celandine (*Ficaria verna*), creeping buttercup (*Ranunculus repens*), hogweed (*Heracleum sphondylium*), colt's-foot (*Tussilago farfara*), marsh thistle (*Cirsium palustre*), common ragwort (*Senecio jacobaea*), broadleaved dock (*Rumex obtusifolius*), greater plantain (*Plantago major*), dandelion (*Taraxacum vulgaria*), common mouse-ear (*Cerastium fontanum*) and sow thistle (*Sonchus spp.*). A stand of **Dense bracken (HD1)** (*Pteridium aquilinum*) occurs to the north west of the site, see Plate 5.2.



Plate 5-1: Scrub (WS1) habitat in the northern sections of the site.



Plate 5-2 Dense bracken (HD1) within the north of the site

5.3.2.1.4 Spoil and bare ground (ED2) and Buildings and artificial surfaces (BL3)

The southern half of the site is dominated by an area of **Spoil and bare ground (ED2)** which is currently used as a construction compound, see Plate 5.3. The site is bisected by a public access road into the Gateway Retail Park. The road and surrounding footpaths are categorised as **Buildings and artificial surfaces (BL3)**.



Plate 5-3: Spoil and Bare Ground (ED2)

5.3.2.1.5 Amenity Grassland (GA2) and Scattered trees and parkland (WD5)

Either side of the public road are small areas of Amenity Grassland (GA2) and Scattered trees and parkland (WD5). Species recorded in the amenity grassland habitat include perennial rye-grass (*Lolium perenne*), annual meadow-grass (*Poa annua*), daisy (*Bellis perennis*) and dandelion (*Taraxacum officinale agg.*). The Scattered trees and parkland (WD5) habitat was been planted for landscaping sometime within the past twenty years and consisted of clusters of semi-mature and immature trees which included beech (*Fagus sylvestris*), ash (*Fraxinus excelsior*), maple (*Acer sp.*), birch (*Betula sp.*) and hawthorn (*Crataegus monogyna*).



Plate 5-4: Amenity Grassland (GA2) and Scattered Trees and Parkland (WD5) fringing the road that bisects the site.

5.3.2.1.6 Dry Meadows and Grassy Verges (GS2)/ Recolonising bare ground (ED3)

A narrow strip of **Dry Meadows and Grassy Verges (GS2)/recolonising bare ground (ED3)** fringes the scrub habitats to the north and west of the site, see Plate 5.4. Grassy verges contain black medick (*Medicago lupulina*), creeping cinquefoil (*Potentilla reptans*), red fescue (*Festuca rubra*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*) and birds foot trefoil (*Lotus corniculatus*). Species recorded in the recolonising bare ground habitat include bramble (*Rubus fruticosus agg.*), creeping buttercup (*Ranunculus repens*), common ragwort (*Senecio jacobaea*), broadleaved dock (*Rumex obtusifolius*), greater plantain (*Plantago major*), clovers (*Trifolium spp.*), Yorkshire fog (*Holcus lanatus*), ribwort plantain (*Plantago lanceolata*), birds foot trefoil (*Lotus corniculatus*), common knapweed (*Centaurea nigra*), scarlet pimpernel (*Anagallis arvensis*), cut leaved cranes bill (*Geranium dissectum*), ladsys bedstraw (*Galium verum*), daisy (*Bellis perennis*) and herb-robert (*Geranium robertianum*).



Plate 5-5: Dry Meadows and Grassy Verges (GS2) occurring adjacent to existing footpaths within the south of the site

5.3.2.1.7 Buildings and artificial surfaces (BL3)

The site is immediately bordered by roads and other buildings which are all categorised as **Buildings and artificial surfaces (BL3)**, see Plate 5.5. No watercourses were recorded within or adjacent to the proposed development site. The Knocknacarra Stream is known to be culverted under the site.

No invasive species were recorded within or adjacent to the development site. None of the habitats within the development site correspond to those listed on Annex I of the EU Habitats Directive.



Plate 5-6: Road that bisects the site, classified as Buildings and artificial surfaces (BL3).

5.3.2.1.8 Invasive species

No invasive species were recorded within the proposed development site.

5.3.2.1.9 Significance of Habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). The habitats within and adjacent to the development site were evaluated in accordance with the criteria developed by the NRA (2009b), which classifies sites in terms of their ecological importance, i.e. 'international importance', 'national importance', 'county importance', 'local importance (higher value)' or 'local importance (lower value)'.

The majority of habitats on the site are of low ecological importance. Spoil and bare ground (ED2), Recolonising bare ground (ED3), Buildings and artificial surfaces (BL3), Amenity Grassland (GA2), Bracken (HD1), Dry Meadows and Grassy Verges (GS2)) cover the majority of the site and have been categorised as *Local Importance (Lower value)*. These habitats are highly modified and are of low ecological value. For this reason, these habitats have not been identified as a KER.

The Scattered trees and parkland (WD5) and Scrub (WS1) within the site are categorized as *Local Importance (higher value)* as they potentially provide cover for a variety of local flora and fauna, as well as being of local biodiversity importance. However, there is limited ecological connectivity with the surrounding landscape due to the site being surrounded by urban development.

There are no Annex I habitats listed under the EU Habitats Directive present within the Proposed development site boundary. No botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site. All species recorded are common in the Irish landscape.

5.3.2.2 Fauna in the receiving environment

The walkover survey was designed to detect the presence, or likely presence, of a range of protected species, including bats, otter and badger. Potential suitable habitats were investigated for signs of animal presence. The following subsections provide a breakdown of the species recorded within the proposed development boundary during the site visit and assessment.

5.3.2.2.1 Birds

A total of 11 bird species were recorded within or immediately adjacent to the proposal on the 29th of April 2019 (Table 5.9).

Table 5-8 Bird species observed during field visit

Common Name	Scientific Name	Conservation Status
Pied wagtail	<i>Motacilla alba yarrellii</i>	Green Listed
Blackbird	<i>Turdus merula</i>	Green Listed
Chaffinch	<i>Fringilla coelebs</i>	Green Listed
Willow warbler	<i>Phylloscopus trochilus</i>	Green Listed
Blackcap	<i>Sylvia atricapilla</i>	Green Listed
Wren	<i>Troglodytes troglodytes</i>	Green Listed
Goldfinch	<i>Carduelis carduelis</i>	Green Listed
Rook	<i>Corvus frugilegus</i>	Green Listed
Swallow	<i>Hirundo rustica</i>	Amber listed
Robin	<i>Erithacus rubecula</i>	Amber Listed
Starling	<i>Sturnus vulgaris</i>	Amber Listed

Eight of the bird species observed are green-listed and are common in Ireland. Three of the bird species recorded are amber listed in Ireland.

The species recorded on site are typical of the urban and scrub habitats in the area. Overall, the site does not provide significant habitat for breeding or wintering bird species.

5.3.2.2.2 Bats

Soprano pipistrelle and Leisler's bat were the only species recorded within or adjacent to the site during the site survey. Bats were recorded in low numbers with only six individual bat passes recorded during the survey. Bats were not recorded foraging within the site. Vegetation to be removed, was visually assessed for potential as bat roosting habitat using a protocol set out in BCT *Bat Surveys for Professional Ecologists: good practice Guidelines (3rd edn)* (Collins, J (ed.), 2016). Table 5.1 of the 2016 Guidelines identifies a grading protocol for assessing structures, trees and commuting/foraging habitat

for bats. The protocol is divided into four Suitability Categories: High, Moderate, Low and Negligible. The linear features on site have been assessed as providing low to moderate suitability in relation to providing foraging and commuting habitat for bats and are considered to be of high local value as they provide connectivity to the wider area for commuting and foraging bat species.

No roosts were identified and no built structures with the potential to support roosting bats were identified. No trees with features with the potential to support significant bat roosts were identified.

5.3.2.2.3 Other Fauna

No watercourses suitable for feeding, breeding or commuting otter were recorded within the study area. No evidence of badger (*Meles meles*) was recorded and no badger setts were located within the development site. No ponds likely to support breeding populations of common frog were identified within the study area.

No evidence of other species such as Irish hare, pygmy shrew and Irish stoat protected species under the Irish Wildlife Act 1976-2017, were recorded during the site visit but these species are likely to occur in the wider area, at least on occasion. However, these species have widespread and favourable ranges in Ireland and suitable habitats are widespread in the area.

No suitable habitat for other taxa protected under the EU Habitats Directive, or other invertebrate species of conservation concern was identified within the boundaries of the proposed development site

5.3.2.2.4 Significance of Fauna

Low numbers of bats were recorded feeding/commuting within the proposed development site. Thus, bat species have been assessed as of local importance (lower value).

None of the bird species recorded within the site during the site visit are Red listed under the Birds of Conservation Concern in Ireland (BoCCI) or in Annex I of the EU Birds Directive. Bird species recorded within the site boundaries during the site visit were an assemblage of common birds, likely to be common and widespread in the area. Thus, bird species have been assessed as of local importance (lower value).

Overall, it is considered that the proposed study area is of relatively low value to faunal species due to the nature of the habitats identified at the site which are dominated by scrub and the highly modified habitats, Spoil and Bare Ground and Buildings and Artificial Surfaces. Assessment of likely disturbance to faunal species has been considered in Section 5 from a precautionary point of view. In addition, other potential impacts such as clearing of vegetation during the nesting bird season has also been considered, following best practice, in Section 5 of this report.

5.4 ECOLOGICAL IMPACT ASSESSMENT

This section of the report considers the potential for effects on the ecological receptors that were identified during the desk and field studies. The effect on ecological receptors is considered during all stages of the proposed development, namely; construction, operational and decommissioning.

5.4.1 Do Nothing Effect

If the proposed development were not to go ahead, it is likely that the development site would remain as it is in its current form, with areas of managed amenity grassland, unmanaged greenfield areas dominated by scrub, and an area of brownfield land of buildings and artificial surfaces.

5.4.2 Impacts During Construction Phase

5.4.2.1 Floral Habitat Loss

Spoil and bare ground, Recolonising bare ground, Buildings and artificial surfaces, Amenity Grassland, Bracken, Dry Meadows and Grassy Verges

Permanent negative effect of slight magnitude on features of Local importance (lower value)

The development footprint will be primarily confined to habitats of *local importance (lower value)*, including spoil and bare ground, recolonising bare ground, buildings and artificial surfaces, amenity grassland, bracken and dry meadows and grassy verges, covering a total area of 1.27ha. Loss of these habitats to the footprint of the proposal is considered to be a permanent *slight* negative impact, at a local geographic scale. The habitats are highly managed or modified, widespread in the locality and have a low biodiversity value.

Scrub and Scattered Trees and Parkland

Permanent negative impact of slight magnitude on features of Local importance (higher value)

The development will involve the loss of planted scattered trees and parkland and scrub habitat. The total area of Scrub lost will be 0.69ha. The total area of scattered trees and parkland lost will be 0.34ha. The scattered trees and parkland and scrub with the site are of local importance (higher value) as they comprise semi natural habitat. However, they have very limited ecological connectivity with the surrounding landscape given that the site is surrounded by urban development and no hedgerows or significant treelines border the site.

The loss of these habitats to the footprint of the proposal is considered to be a *Permanent slight negative effect at a local geographic scale*.

Mitigation

The landscaping drawings prepared for the proposed project show the additional planting proposed within public amenity areas and associated landscaping. This landscaping plan has been submitted as part of the planning application documentation (Ait Urbanism + Landscape Ltd, 019). Approximately 0.23ha of amenity space will be created as part of the proposal. The planting schedule will include the native trees Scots pine (*Pinus sylvestris*), oak (*Quercus robur*), silver birch (*Betula pendula*), strawberry tree (*Arbutus unedo*) and wild cherry (*Prunus avium*). Specimen semi mature tree planting along the site boundary will include oak (*Quercus robur*) and silver birch (*Betula pendula*).

Additional planting, including amenity grassland and planting beds with sensory planting mix and ornamental grasses and herbaceous mix, will be incorporated into the development in the over podium garden and amenity spaces to the northern site boundary, amenity spaces to the south of the site and within the plaza.

Planting within the amenity areas will include the following pollinator friendly species as recommended in the Pollinator friendly planting code (All Ireland Pollinator Plan 2015-2020) – *Allium* sp., *Lavandula angustifolia* (English lavender), *Rosmarinus officinalis* (Rosemary), *Salvia* sp., *Mahonia* sp. Such measures will maintain the local biodiversity in the area.

Residual effect

The proposal will result in a permanent ‘*Not Significant*’ effect, at any geographic scale, on habitats of local importance (lower value) i.e. Spoil and bare ground, Recolonising bare ground, Buildings and artificial surfaces, Amenity Grassland, Bracken, Dry Meadows and Grassy Verges.

The proposal will result in a permanent ‘*Not Significant*’ effect, at any geographic scale, on habitats of local importance (higher value) i.e. Scrub and Scattered trees and parkland, as measures have been incorporated into the landscaping plan to maintain biodiversity.

5.4.2.2 Disturbance/Disruption to Fauna

5.4.2.2.1 Mammal species

Short term slight negative effect at a local (lower) scale

No signs of significant mammal activity were recorded on the site. The construction phase could result in some disturbance effects on bat species, if works are undertaken at night.

Best Practice

All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crepuscular or nocturnal species, including bat species.

Residual Impact

No significant disturbance effects are predicted at any geographic scale

5.4.2.2.2 Birds

Temporary negligible negative effect at a local (lower) scale

Given the lack of significant bird assemblages recorded within or adjacent to the site and the nature of the construction phase of the proposal, significant impacts as a result of disturbance or displacement are not anticipated on bird species.

Mitigation

Vegetation clearance will be undertaken in line with the provisions of the Wildlife Acts (As Amended), 1976-2017.

Residual impact

No significant disturbance effects are predicted at any geographic scale

5.4.2.2.3 Impacts of Habitat Loss on Faunal Species

Permanent not significant negative effect at a local scale

A total area of 0.69ha of scrub habitat and 0.34ha of scattered trees and parkland habitat will be lost as a result of the proposed development. These habitats are common in the wider area and the loss of this habitat within the development boundary is assessed as being of permanent slight negative impact. The loss of such commuting and foraging habitat providing connectivity to the wider area has been assessed as of permanent slight negative impact in the absence of mitigation.

Mitigation

The landscaping drawings prepared for the proposal outline the additional planting within public amenity areas and associated landscaping (drawing number 18GY03-DR-200, Appendix 3-2 of this report). The planting schedule will include the native trees Scots pine (*Pinus sylvestris*), oak (*Quercus robur*), silver birch (*Betula pendula*), strawberry tree (*Arbutus unedo*) and wild cherry (*Prunus avium*). Specimen semi mature tree planting along the site boundary will include oak (*Quercus robur*) and silver birch (*Betula pendula*). This planting has been outlined in the landscape management plan. This will maintain foraging and commuting habitat for bats. Additional measures, for biodiversity enhancement are provided in a Biodiversity Management Plan for the site, see Appendix 5-2.

Residual Impact

Permanent *Not Significant* negative effect at any geographic scale

5.4.2.2.4 Impacts on water quality during construction phase

Short-term moderate negative effect at a local scale

The construction of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. Taking a precautionary approach, the works have potential, in the absence of mitigation, to impact on groundwater and surface water quality.

Mitigation

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in the following subsections. In addition, the *Construction and Environmental Management Plan* (DBFL Consulting Engineers, 2019), (see Appendix 3-3) includes measures for the avoidance of impact on groundwater and surface water during construction. The following pollution control measures will be put in place:

- Sediment and Erosion – Adjacent drainage systems/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from site will be managed and controlled for the duration of the construction works until the permanently surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.
- Accidental Spills and Leaks – All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any drainage systems. A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.

- › Concrete – Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings are not to be discharged into surface water drains.
- › Disposal of Wastewater from Site – Discharge from any vehicle wheel wash areas is to be directed to on-site settlement tanks/ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.
- › Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

The following guidelines and documents will inform the detailed planning of the works phase:

- › Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA) in particular;
- › C532 Control of water pollution from construction sites: guidance for consultants and contractors (Masters-Williams et al, 2001); and
- › SP156 Control of water pollution from construction sites - guide to good practice (Murnane et al, 2002).

Residual Effect

No adverse residual impacts on water quality or the hydrological regime during construction are anticipated following the implementation of the measures and best practice described in the preceding paragraph and in ‘*Preliminary Construction Waste Management Plan*’, (DBFL Consulting Engineers, 2019).

5.4.3 Impacts During the Operational Phase

5.4.3.1 Change of habitat use

There will be no additional habitat loss associated with the operational phase of the proposed development.

5.4.3.2 Disturbance to Faunal Species

Permanent not significant negative impact at a local scale

The operational phase of the proposed development will be permanent. This will result in increased activity including increased lighting and noise. The proposed development is surrounded by existing residential and commercial developments on all sides and is also bordered /intersected by existing local roads.

No significant faunal populations were recorded on the site during the surveys undertaken. Low numbers of bats were recorded within the site during the bat survey. Lighting associated with the proposed development will avoid the planted treeline along the northern boundary of the site. All lighting used will be LED, with peak wavelengths greater than 550nm (~3000°K), as recommended by Bat Conservation Trust Guidelines on bats and artificial lighting (BCT, 2018).

Therefore, the operational phase of the proposed development is unlikely to result in any significant increase in disturbance to local bat species. Potential impacts on local bat species as a result of disturbance/displacement has been assessed as a *Not Significant* effect, at a local geographic scale.

Mitigation

None required.

Residual Impact

Permanent *Not Significant* negative impact at any geographic scale.

5.4.3.3 Impacts on water quality during operational phase

Permanent moderate negative impact on downstream watercourses.

5.4.3.3.1 Production of Foul Sewage

The operational phase of the proposed project will result in the production of foul sewage. If not adequately treated, there is potential for indirect impacts on ground water and surface water quality.

Mitigation

All foul water will be discharged to the public sewer and will be treated at the Galway Mutton Island Wastewater Treatment Plant before discharges to Galway Bay. Irish Water have upgraded the Mutton Island Wastewater Treatment facility under the Capital Investment Plan 2014-2016 (Galway Sewerage Scheme Phase 3 – Network Upgrade Contract No.1 Volume D). The upgrade increases the capacity of the plant from 92,000 to 170,000 p.e. (Reference City Plan).”

Treatment process includes the following:

- › Preliminary Treatment (Screening & Grit Removal)
- › Primary Treatment (Upward Flow Settlement Tanks)
- › Secondary Treatment (Activated Sludge)

There is full agreement with Irish Water that there is adequate capacity and capability to fully treat all sewage generated by the proposed project in the public sewage treatment system. Correspondence with Irish Water, Reference No 1000850255, is provided in Appendix F of the Infrastructure design report, Appendix 3-4 of this EIAR. The proposed project, as assessed for the confirmation of feasibility, is a standard connection, requiring no network or treatment plant upgrades or water or wastewater by either the customer or Irish Water. Given that waste will be appropriately treated to EPA standards; no potential for adverse impact on water quality exists.

Residual Effect

No residual impacts on water quality as a result of the production of foul sewage as the proposed project will be connected to the public system, which has adequate capacity and capability to effectively treat all sewage arising from the development.

5.4.3.3.2 Surface water runoff

Permanent moderate negative impact on downstream watercourses.

The operational phase of the proposed project will result in the production of surface water runoff. If not adequately treated, there is potential for indirect impacts on surface water quality.

Mitigation

The surface water drainage design is described in the ‘Infrastructure Design Report’ (DBFL Consulting Engineers, 2019), provided in Appendix 3-4 of the EIAR.

It is proposed to divert the existing surface water sewers within the site to align the drainage layout with the proposed diversion of the existing access road to the Gateway Retail Park. Both the northern portion of the site (Site 2) and the southern area of the site (Site 1) of the proposed development will be provided with a surface water drainage network to collect surface water flows from the apartment blocks and commercial units. The Site 2 storm drainage will be constructed in the ground floor car park and attenuated outflows will connect with the existing 375mm diameter sewer to the north-west of the site. The Site 1 storm drainage will discharge attenuated outflows to the existing 450mm diameter sewer to the south-west of the site. The surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and SUDs elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible.

Run-off from roofs and any additional run-off from the landscaped courtyard podium slab is designed to be conveyed to the surface water drainage network at ground floor level. Two underground surface water attenuation tanks will be provided for the development to attenuate surface water flows for the 100 year critical storm + 10% allowance for climate change. One concrete attenuation tank will be located beneath the ground floor car park in Site 2, and one 'Stormtech' attenuation system will be located beneath the civic plaza in Site 1.

The podium (landscaped courtyard) consists mainly of green areas, soft landscaped areas and raised planters providing interception storage and treatment. The hard-standing area of the podium, which is of a north-south pedestrian link will consist of impermeable paving. A number of gullies at podium slab level will drain any residual runoff from the landscaped courtyard to the surface water network at ground level.

The surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and SUDs elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible.

As outlined in the '*Infrastructure Design Report*' (DBFL Consulting Engineers, 2019), all run-off from roofs and areas of hardstanding will be conveyed to the surface water drainage network at ground floor level. Sustainable urban drainage system (SUDS) elements will be incorporated in to the design and will include the following:

- › Porous asphalt paving on part of civic plaza to provide treatment, storage and reduce run-off rates.
- › Green podium with landscaped areas and raised planters to reduce run-off rates and total impermeable area.
- › Two off-line attenuation storage systems for the attenuation of flood water up to the 100 year storm event + 10% allowance for climate change.
- › A Class 1 Bypass Separators to be provided on the outfall from each network.
- › Surface water run-off from the overall development will be attenuated to greenfield runoff rates.
- › To prevent pollutants or sediments discharging into water courses, interception storage will receive the run-off for rainfall depths of 5mm up to 10mm. The SUDS features include porous asphalt and landscaped podium will provide the necessary interception volume.

Residual Impact

Given the proposed treatment of stormwater on the site, adverse effects on ground waters and other downstream receptors are not anticipated and there will be no residual effects.

5.4.4 Impacts on Designated Sites

5.4.4.1 Impacts on National/European Sites

No Impact

Where a nationally designated site overlaps with the boundary of a European designated site the potential for impacts has been considered under the European designation (e.g. Galway Bay pNHA/SAC). None of the remaining NHAs or pNHAs within the ZOI were considered as ecological receptors in their own right due to the lack of any identifiable pathway for direct or indirect effects.

Potential indirect impacts on European Designated sites (SACs and SPAs) are assessed within a separate Natura Impact Statement. This Natura Impact Statement objectively concluded that the proposal would not be likely to have adverse effects on the Conservation Objectives or ecological integrity of any European site.

Surface water connectivity was identified between the development site and Galway Bay Complex SAC and Inner Galway Bay SPA via the culverted Knocknacarra stream which now forms the surface water network. The Knocknacarra stream which formerly ran through the site was culverted and realigned to form the surface water network as part of a nearby development in 1996. This surface water sewer system ultimately discharges to Rusheen Bay and thus has connectivity to the Inner Galway Bay SPA and Galway Bay Complex SAC, in excess of 1.8km downstream (surface water distance).

The potential for the proposed works to result in indirect effects on these designated sites as a result of deterioration in surface water quality during the operational phase of the development was considered. No European Sites were considered to be at risk given the nature and scale of the proposed works, and the implementation of the preventative measures to avoid effects outlined in Section 2 of this report and in the construction management plan.

The NIS report concludes that:

“All identified potential pathways for impact are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report. The measures ensure that the construction and operation of the proposed development does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site”.

Residual impact

No Impact.

5.4.5 Cumulative impact

A search and review in relation to plans and projects that may have the potential to result in cumulative and/or in-combination impacts on European Sites was conducted. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

5.4.5.1 Plans

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

- › Galway County Development Plan 2015-2021
- › Galway City Council Development Plan 2017-2023

The review focused on policies and objectives that relate to Natura 2000 sites and natural heritage. Policies and objectives relating to sustainable land use were also reviewed.

Table 5-9 Assessment of Plans

Plans	Key Policies/Issues/Objectives Directly Related to European Sites In The Zone of Influence	Assessment of Potential Impact on European Sites
	Land Use and Spatial Plans	
Galway County Development Plan 2015 - 2021	<p>Policy NHB 1 – Natural Heritage and Biodiversity</p> <p>It is the policy of Galway County Council to support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries and Connemara National Park (and other designated sites including any future designations) and the promotion of the development of a green/ecological network within the plan area, in order to support ecological functioning and connectivity, create opportunities in suitable locations for active and passive recreation and to structure and provide visual relief from the built environment.</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on water quality, as outlined in section 2 of this report. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality.</p>
	<p>Objective NHB 1 – Protected Habitats and Species</p> <p>Support the protection of habitats and species listed in the Annexes to and/or covered by the <i>EU Habitats Directive (92/43/EEC)</i> (as amended) and the <i>Birds Directive (2009/147/EC)</i>, and regularly occurring-migratory birds and their habitats and species protected under the <i>Wildlife Acts 1976-2000</i> and the <i>Flora Protection Order</i>.</p>	<p>No annex I habitats were identified within or in proximity to the proposed development site.</p>
	<p>Objective NHB 2 – Biodiversity and Ecological Networks</p> <p>Support the protection and enhancement of biodiversity and ecological connectivity within the plan area, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, stonewalls,</p>	

Plans	Key Policies/Issues/Objectives Directly Related to European Sites In The Zone of Influence	Assessment of Potential Impact on European Sites
	Land Use and Spatial Plans	
	geological and geo-morphological systems, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of <i>Article 10 of the Habitats Directive</i> .	
Variation No.1 to the County Development Plan 2015 - 2021	<p>Objective DS 6 – Natura 2000 Network and Habitats Directive Assessment</p> <p>Protect European sites that form part of the Natura 2000 network (Including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC), the Planning and Development (Amendment) Act 2010, the European Communities (Birds and Natural Habitats) Regulations 2011(SI No.477 of 2011) (and any subsequent amendments or updated legislation) and having due regard to the guidance in the Appropriate Assessment Guidelines 2010 (and any updated or subsequent guidance). A plan or project (e.g. proposed development) within the plan area will only be authorised after the competent authority (Galway County Council) has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and/or a Habitats Directive Assessment where necessary, that:</p> <p>a) The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or</p> <p>b) The plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest,</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on water quality, as outlined in section 2 of this report. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality. There will be no impact on nationally designated sites as a result of the proposed development.</p> <p>No annex I habitats were identified within or in proximity to the proposed development site.</p>



Plans	Key Policies/Issues/Objectives Directly Related to European Sites In The Zone of Influence	Assessment of Potential Impact on European Sites
	<p>Land Use and Spatial Plans</p>	
	<p>including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or</p> <p>c) The plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.</p>	
	<p>Objective DS 10 – Impacts of Developments on Protected Sites Have regard to any impacts of development on or near existing and proposed Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries, Salmonoid Waters, Refuges for Flora and Fauna, Conamara National Park, shellfish waters, freshwater pearl mussel catchments and any other designated sites including future designations.</p>	
<p>Galway City Council Development Plan 2017-2023</p>	<p>Policy 4.2 Protected Spaces: Sites of European, National and Local Ecological Importance</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for</p>

Plans	Key Policies/Issues/Objectives Directly Related to European Sites In The Zone of Influence	Assessment of Potential Impact on European Sites
	Land Use and Spatial Plans	
	<p>Protect European sites that form part of the Natura 2000 network (including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC) and associated national legislation.</p> <p>Protect, conserve and promote the nationally designated sites of ecological importance, including existing and proposed Natural Heritage Areas (NHAs and pNHAs) in the city.</p> <p>Policy 4.4.1 Green Spaces: Urban Woodlands and Trees</p> <p>Integrate existing trees and hedgerows on development sites where appropriate and require tree planting, as part of landscaping schemes for new developments.</p>	<p>cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on water quality, as outlined in section 2 of this report. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality. There will be no impact on nationally designated sites as a result of the proposed development.</p> <p>No annex I habitats were identified within or in proximity to the proposed development site.</p>

5.4.5.2 Other projects considered in the wider area

The proposed development was considered in-combination with other plans and projects in the area that could result in cumulative impacts on designated Sites. The online planning system for Galway County Council was consulted on the 05/10/2019. Additional projects identified in the area from the last 5 years include;

- › Extension of duration on Pl. Ref. No. 08/506 - Permission for a mixed-use development on site of 0.65 hectares (1.6 acres) (Planning reference: 14228)
- › Permission for development which will consist of: Phase 2 of Knocknacarra District Centre comprising a mixed-use 2 storey development (with plant areas at roof level) of c. 11,969.3 sq. m as follows: 6 no. retail units (units 12-17, c. 9,688.6 sq. m GFA); crèche (unit 11, c. 444.4 sq. m) with an external play area; café/restaurant (unit 9, c. 197 sq. m); first floor gym (unit 18, c. 678.1 sq. m) as well as offices (units 7, 8 & 10, c. 786.5 sq. m); provision of new east/west pedestrian link; signage zones c. 143.68 sq. m, canopies on southern elevation; 129 no. basement and 22 no. surface car parking spaces; 116 no. cycle spaces (at surface level); all located to the north of existing Dunnes Stores and surface car park. Permission is also sought for associated ancillary development comprising service yards, refuse areas, hard and soft landscaping, single storey ESB substation (58.2 sq. m), basement entrance, vents, revised surface circulation in south east corner of site; basement level plant, attenuation areas (& foul pump), works and build out of basement area (to also tie in with existing basement), and all associated site development & drainage works (Planning reference: 17158)
- › Permission for development which will consist of the construction of a new 2 storey Primary School building with a section of the building rising to 3 storey and comprising of 24 no. general classrooms, General Purpose Hall with servery area, staff room, Library and Resource Room, Special Educate Tuition Rooms, offices, staff areas, sanitary and ancillary accommodation with a total floor area of C. 3982m.sq. Proposed site works to include provision for 36no. surface car parking spaces including accessible parking via new internal vehicular and pedestrian access from Distributor Road, new internal access road to include bus turning circle, drop-off and pick-up facilities. A new pedestrian access route to the south of the site. External works to include bicycle parking, formation of 3 no. basketball courts, junior play areas, external bin store, ESB sub-station and associated site engineering works (Planning reference: 1511)
- › Retention permission for existing bus park at Ragoon, Galway. The works consist of, a) Retention for demolition of two agricultural sheds 291sqm. b) Retention for revised site boundary and additional area 400sq (Planning reference: 15232).
- › Permission for extension to Pure Skill within Millars Hall for additional amenity use. The works to include: i) Provide 617.85 sqm of existing ground floor area to be used for amenity use previously permitted amenity as Unit 7, Pl. Ref. 04/573 and Unit 3, Pl. Ref. 1066/03. ii) Provide 475.0 sqm of New First Floor Area to be used for amenity use and to allow balcony overview of existing ground floor amenity areas. iii) Enclosure of an entrance lobby of 32.5 sqm, under the existing roof canopy granted under 362/99 to allow dual access to the extended facility with related minor variations to existing South Western elevation. This requires the change of the existing industrial high delivery entrance door to an additional personnel access door and to relocate it forward by 6m into the revised front elevation and existing building line. iv) Retention of additional existing 41.40 sqm of first floor ancillary office, viewing area and coffee shop whereby 105.70 sq.m of first floor was permitted and occupied under Pl. Ref. 153/02 v) Form 108 sqm of new road surface within the existing site to link existing front and rear carparking areas, while retaining 15% of the site area as open space. vi) Erect 4 No. building name signs, Millars Hall on the front and side elevations of Millars Hall and 3 No. business name signs over personnel access doors. vii) Erect 3 No. free standing name board sign frames one at each of the two entrances to Millars Hall and one at the junction with Botháir Stiofáin for the respective business therein. The works to connect to existing

services and parking permitted and constructed under Pl. Ref. 362/99 (Planning reference: 15274).

- › Permission for construction of two storey dwelling house, domestic garage and all associated site works and services (Planning reference: 15373)
- › Permission to construct a two-storey house with attic storage space, a separate domestic garage and all associated works at a site accessed from the Linn Bhui estate (Planning reference: 1583).
- › Permission for development is being sought for an extension within Millars Hall to include: a) 165.3sqm of first floor loft within Millars Hall to be used for amenity use. B) Enclosure of an entrance lobby of 35.4sqm under the existing roof canopy. C) Minor renovations to existing elevations. The works to connect to existing services & parking permitted & constructed under Pl. Ref. 362/99 for Millars Hall. (16136)
- › Extension of duration on Pl. Reg. Ref. No. 10/285 - Permission for amendments/modifications to the restaurant part of the District Centre development previously permitted under Reg. Ref. 04/141 (Bord Ref. PL 61.210888). The proposed development will modify the restaurant previously granted under the above permission and provide for a fast food restaurant and drive thru, with a gross internal floor area of 455m.sq over two levels plus associated corporate signage of 20m.sq to the external façade and surrounds. It is also proposed to provide an off street loading bay to the main estate road for servicing the unit plus all associated site development works for the proposed development (1683)
- › Permission for development to construct a new dwelling house, with connection to the existing services, and accessed via the Linn Bhui housing estate (Planning reference: 1696)
- › Permission for development which will consist of: Phase 2 of Knocknacarra District Centre comprising a mixed-use 2 storey development (with plant areas at roof level) of c. 11,969.3 sq. m as follows: 6 no. retail units (units 12-17, c. 9,688.6 sq. m GFA); crèche (unit 11, c. 444.4 sq. m) with an external play area; café/restaurant (unit 9, c. 197 sq. m); first floor gym (unit 18, c. 678.1 sq. m) as well as offices (units 7, 8 & 10, c. 786.5 sq. m); provision of new east/west pedestrian link; signage zones c. 143.68 sq. m, canopies on southern elevation; 129 no. basement and 22 no. surface car parking spaces; 116 no. cycle spaces (at surface level); all located to the north of existing Dunnes Stores and surface car park. Permission is also sought for associated ancillary development comprising service yards, refuse areas, hard and soft landscaping, single storey ESB substation (58.2 sq. m), basement entrance, vents, revised surface circulation in south east corner of site; basement level plant, attenuation areas (& foul pump), works and build out of basement area (to also tie in with existing basement), and all associated site development & drainage works. Primary vehicular access to the proposal will be from new entrance (at northern boundary) from internal access road, all on a site of c. 1.56 hectares (planning ref: 17158).
- › Permission to construct a dwelling house and domestic garage with all associated site works and services (Planning reference: 1798)
- › Permission to construct a dwelling house and domestic garage with all associated site works and services (Planning reference: 17327)
- › A single storey "Ionad Gaeilge" "Arás Mhic Amhlaigh" in order to provide pre school and after school facilities for the school community. The facilities comprise: 3 no. classrooms for naionra and after school facilities, a multi- purpose room, offices, staff areas and ancillary accommodation with a total floor area of c. 485sqm. The proposed site works to include provision of 21 no. surface car parking spaces with accessible parking spaces driveway/car turing area and drop off pick up area; footpath and landscaped area; secured outdoor play area; connection to existing services and associated site works at Gaelscoil Mhic Amhlaigh Campus, Rahoon, Knocknacarra, Galway (Planning reference: 18134).
- › Permission for construction of dwelling house shed and all associated site works and services at site (Planning reference: 1842).

- › Permission for construction of dwelling house with self contained granny flat and all associated site works and services (Planning reference: 18122)
- › E.O.D on Pl. Ref 13/268: Permission for development will consist of full permission to construct a dormer dwelling house, garage and all associated site development works (Planning reference: 18346).
- › Permission for development which consists of a pair of semi-detached houses, garden sheds, and all associated site works and services at site (Planning reference: 1967)

Whilst the N6 Galway City Ring Road is not permitted, the planning application is under consideration by An Bord Pleanála and the proposed route is located to the north of the proposed project. The documentation that was submitted with that planning application was thoroughly reviewed in the context of this cumulative assessment along with all the information available from the route selection report for the Galway City Transport Project (previously used name for the consideration of the Galway City Ring Road) and all available information on that project was considered in the planning and assessment of the current project. Ecological information available from the assessments conducted for the projects listed above were taken into account as part of the assessment.

All foul water will be discharged to the public sewer and will be treated at the Galway Mutton Island Wastewater Treatment Plant before discharges to Galway Bay. Irish Water have upgraded the Mutton Island Wastewater Treatment facility under the Capital Investment Plan 2014-2016 (Galway Sewerage Scheme Phase 3 – Network Upgrade Contract No.1 Volume D). The upgrade increases the capacity of the plant from 92,000 to 170,000 p.e. (Reference City Plan).” There is full agreement with Irish Water that there is adequate capacity and capability to fully treat all sewage generated by the proposed project in the public sewage treatment system. The proposed project, as assessed for the confirmation of feasibility, is a standard connection, requiring no network or treatment plant upgrades or water or wastewater by either the customer or Irish Water.

5.4.5.3 Conclusion of in-combination impact assessment

The proposed development has been assessed, taking full consideration of the cumulative and in-combination effects acting together with effects from past, present or reasonably foreseeable projects. The proposed development will not result in any significant residual effects on any ecological receptors or Designated Sites. Therefore, there is no potential for the proposal to contribute to any potential for cumulative impacts in this regard when considered in-combination with other plans and projects. Similarly, the proposed development will not result in significant effects in relation to water quality, given the lack of watercourses within the site and the design and layout of the proposal and the best practice construction measures outlined in section 2 of this report.

In the review of the projects that was undertaken, no connection between the site, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development. Taking into consideration the reported residual effects from other plans and projects in the area and the predicted effects with the current proposal, no residual cumulative effects have been identified.

5.5

CONCLUSION

The proposed development is confined to low value habitat including building and artificial surfaces, amenity grassland, dry meadows and grassy verges, spoil and bare ground and recolonising bare ground, considered to be of local importance (lower value) and scrub and scattered trees and parkland considered to be of Local importance (higher value).

No significant habitat for bird species, including wintering or breeding habitat for Annex I or BoCCI red-listed species, occurs within the proposed development site.

Potential negative effects on water quality and downstream designated sites have been mitigated through a constraint led design process. With the implementation of best practice measures there will be no impact on water quality. Therefore, residual effects on designated sites have been assessed as Not significant.

Taking the above information into consideration and having regard to the precautionary principle, it is considered that the proposed development will not result in the loss of habitats or species of high ecological significance and will not have any significant effects on the ecology of the wider area.

Provided that the development is constructed in accordance with the design and best practice that is described within this application, significant effects on ecology are not anticipated at any geographic scale.