ROSS SWIFT ECOLOGY LTD.

ECOLOGICAL IMPACT ASSESSMENT

Garrykennedy Inner Harbour Upgrade
Garrykennedy,
Co. Tipperary

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1.0 INTRODUCTION

Ross Swift Ecology Ltd. has been appointed to prepare an Ecological Impact Assessment relative to the proposed development, which will allow the competent authority, to assess the ecological impact of the proposed development on sensitive receptors and in the vicinity of Garrykennedy Inner Harbour Upgrade, Garrykennedy, Co. Tipperary. See **Figures 1.1** for location.

The proposed development of consists of the construction of a riverside facilities centre comprising the following;

- Clearance of the Inner Harbour including removal of abandoned boats.
- Addressing safety concerns in relation to the existing boardwalk by removal of existing and replacement with new floating pontoons for 47 No small boat berths that include facilities to enable wheelchair users to access the water.
- Extension to existing welfare building to provide "changing places" facility.
- Alternations to existing parking to facilitate 4 No recreational vehicle parking spaces with power and water points and updated accessible parking.
- Provision of bike parking / charging facilities

This assessment is based on a review of available historical information, environmental and ecological records, site visit, consultations, relevant guidance information, and any additional reports from third parties. All information received has been taken as being true and representative of the site. This ecological survey has been prepared in line with best industry standards. The methodology adopted and the sources of information are outlined in this report.

1.1 STATEMENT OF AUTHORITY

This report and assessment were undertaken by Dr Ross Donnelly-Swift who has a BSc (Hons) in Biology from Maynooth University NUI, an MSc in Environmental Science from Trinity College Dublin, and a PhD in Biosystems Engineering from University College Dublin. In addition, Ross was a Research Fellow in the School of Natural Sciences at Trinity College Dublin. Ross has extensive ecological knowledge gained from academic research and field work, from protected and specialised species surveys. He has conducted targeted species-specific (including breeding and wintering birds) and protect species surveys for ecological reports (including Ecological Impact Assessments and

Biodiversity Chapters of EIAR) to support planning applications, compliance with legalisation, baseline and detailed ecological surveys that require detailed bat surveys. Projects range from small and large scale in areas such as industrial, commercial, agricultural, residential (small and LRD), amenity, and recreational developments. He has completed several ecological and environmental courses to continue his professional training and CPD with ecological and environmental institutions. In 2025 Ross completed an Advanced Diploma in Planning and Environmental Law at King's Inns (The Honorable Society of King's Inns).

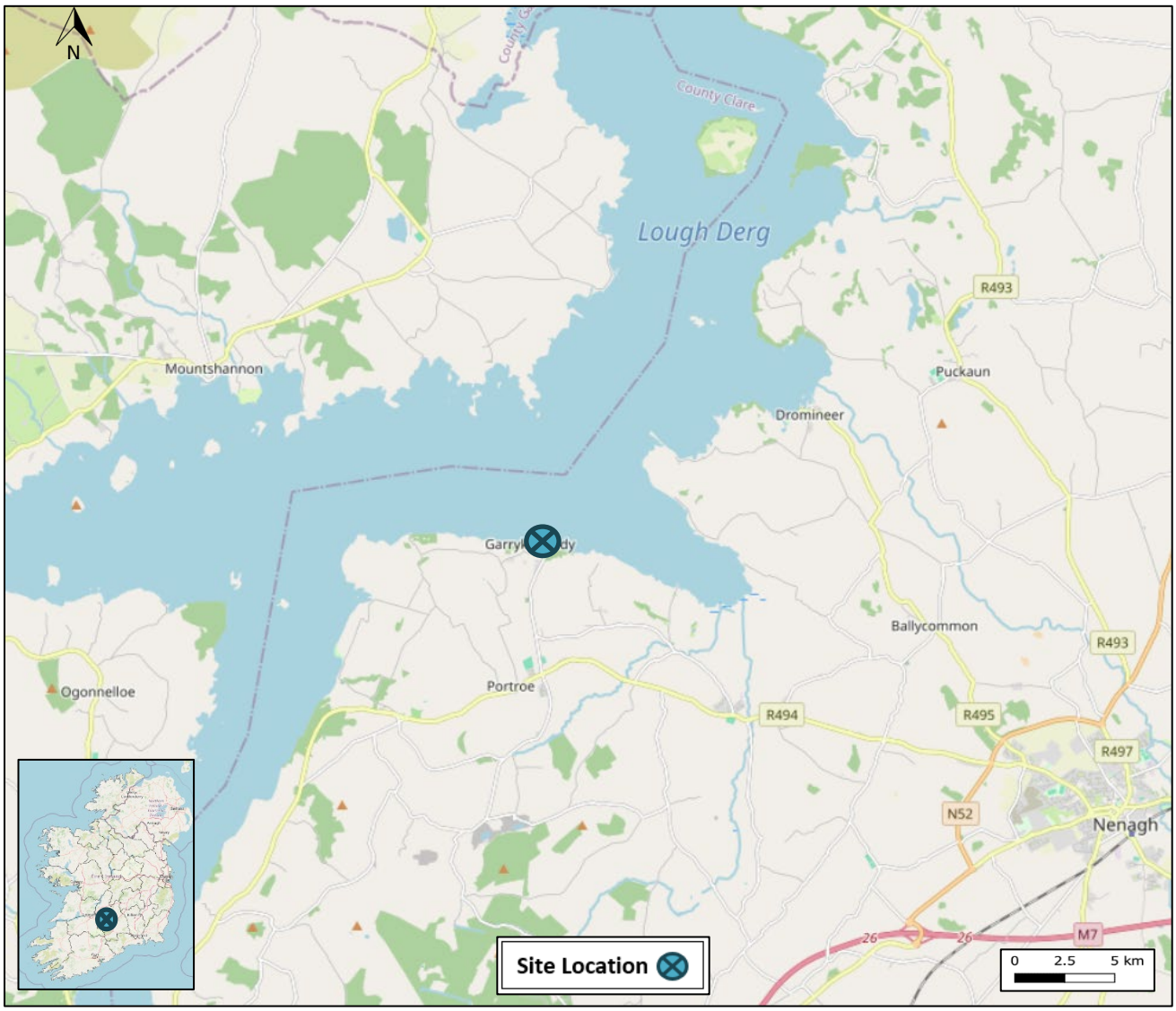


Figure 1.1: Location of proposed development site (Open Street Map ©)

2.0 LEGLISLATION AND POLICIES

The Wildlife Act is the primary piece of Irish legislation providing for the protection and conservation of wildlife and provides for the control of specific activities which could adversely affect wildlife, for example the regulation of hunting and wildlife trading. Under the Wildlife Act, all bird species, 22 other fauna species and 86 flora species in Ireland are afforded protected status. The Wildlife Act, 1976 allows for the designation of specific areas of ecological value such as Statutory Nature Reserves and Refuges for Fauna. The Wildlife (Amendment) Act, 2000 provides for greater protection and conservation of wildlife and also provides for the designation and statutory protection of Natural Heritage Areas (NHA). European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) and (Amendment) Regulations, 2015 (S.I. No. 355 of 2015), transposing the Habitats Directive 92/43/EEC (as amended) and Birds Directive 2009/147/EC.

The Flora (Protection) (S.I. No. 235 of 2022). This order provides statutory protection to flora listed in Section 21 of the Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000. Under the Order, it is illegal to wilfully cut, uproot or damage the listed species or interfere in any way with their habitats.

The Wildlife (Amendment) Act 2023 places new reporting obligations on public bodies whose statutory functions could have an impact on biodiversity. European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) and (Amendment) Regulations, 2015 (S.I. No. 355 of 2015), transposing the Habitats Directive 92/43/EEC (as amended) and Birds Directive 2009/147/EC. Wildlife (Amendment) Act 2023 places new reporting obligations on public bodies whose statutory functions could have an impact on biodiversity.

Water Framework Directive (2000/60/EC). The Water Framework Directive (WFD) aims to improve the water environment (including groundwater, rivers, lakes, estuaries, and coastal waters) of E.U. Member States. The aim of the WFD is for Member States to achieve and maintain “good status” in all water bodies.

Biodiversity Plan 2023-2030. Irelands forth National Biodiversity Plan 2023-2030 identifies actions towards understanding and protecting biodiversity with a vision that, “biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally”.

National Biodiversity Data Centre All-Ireland Pollinator Plan 2021-2025. This plan has six objectives (i) Making farmland pollinator friendly, (ii) Making public land pollinator friendly, (iii) Making private land pollinator friendly, (iv) All-Ireland Honeybee Strategy, (v) Conserving rare pollinators (vi) Strategic coordination of the Plan.

Tipperary County Council Development Plan 2022-2028. Under these development plans must include mandatory objectives for the conservation of natural heritage and for the conservation of European sites.

2.1 GUIDELINES FOR ECOLOGICAL IMPACT ASSESSMENT

This Ecological Impact Assessment has been carried with reference to the following guidelines:

- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester;
    - *Criteria used to evaluate ecological features;*
    - *Criteria used to assess the significance of effects arising from the impacts of the project;*
    - *Justification of methods used;*
    - *The identification of likely impacts (positive and negative) on ecological features together with an explanation of the significance of the overall effects for each important ecological feature;*
    - *Mitigation, compensation and enhancement measures;*
    - *Legal and policy consequences;*
    - *Identification of any limitations to the assessment, or the surveys which underpin it, and an explanation of the implications.*

ADDITIONAL GUIDANCE

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out EIA (DEHLG, 2018).
- Managing Natura 2000 sites – The Provisions of Article 6 of The Habitats Directive 92/43/EEC. European Commission, 2000.
- NRA (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority)
- The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (National Roads Authority (NRA), 2010);
- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (NRA, 2006a);
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2006b);

- Guidelines for the Treatment of Bats during the Construction of National Road Schemes (NRA, 2006c);
- Bat Mitigation Guidelines for Ireland (Kelleher and Marnell, 2006);
- Bats and Lighting– Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, 2010);
- Bats and Lighting in the UK – Bats and the Built Environment Series (Institute of Lighting Professionals, September 2018)
- Guidance Notes for the Reduction of Obtrusive Light GN01-21 (Institute of Lighting Professionals, 2021).

2.2 DATA AND DESKTOP REVIEW

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time and is limited by various factors such as the season, timing of the survey, climatic conditions, and species behaviour. Ecological surveys are therefore snapshots in time and should not be regarded as a complete study. Direct observations or evidence of protected species is not always recorded during ecological surveys. However, this does not indicate that the species is absent from the site. To ensure any limitations encountered did not significantly impact upon the findings of the ecological assessments, the ecological surveys undertaken also assessed the potential of the habitats to support protected species, and cognisance has been taken of available online baseline data (e.g. flora and fauna records from the NBDC, online review of published NPWS records regarding protected / threatened species, review of published Bat Conservation Ireland records, any previous ecological surveys undertaken and a precautionary approach taken.

Desktop research was carried out to gather information on the ecology of the site and surrounding areas. The locations of the Natura 2000 sites, Natural Heritage Areas (NHAs) and protected flora and fauna records for the proposed development within the grounds of Garrykennedy Inner Harbour, Co. Tipperary.

Water quality data from the EPA was reviewed for the assessment of biological and environmental data collected on waterbodies in Ireland as per the Water Framework Directive (WFD) Monitoring Programme of River Ecology Monitoring Results.

Biological records from the National Biodiversity Data Centre (NBDC) for the site and surrounding area (10km grid square/Hectad) were reviewed and account taken of notable species including any rare, protected, threatened and invasive species.

Information on the characteristics of the Natura 2000 sites within the potential zone of influence was reviewed from the conservation objectives documents, site synopses and additional Natura 2000 data available on the NPWS website. In addition, spatial data on protected flora and fauna was reviewed and mapped.

A Natura Impact Statement (NIS) has been undertaken for the proposed development (Document Ref: **NIS_RSE_010325**). This NIS took into consideration the locations of the Natura 2000 sites within the Zone of Influence of the proposed development.

2.3 ECOLOGICAL IMPACT ASSESSMENT METHODOLOGIES

Zone of Influence of works can impact areas outside of the immediate footprint of works. CIEEM (2018) guidelines states that the "Zone of Influence (ZoI) is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities" and that the "zone of influence will vary for different ecological features depending on their sensitivity to an environmental change".

The term **Significant Effect** as used in this report follows guidance (CIEEM, 2018) and is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. In the case of designated sites, a negative significant effect would be one that undermines the conservation objectives and targets for that site. The significance of impacts on habitats was determined with reference to the value of the feature being affected and the magnitude of the impact. Impacts are considered ecologically significant at a stated geographic scale or are considered not significant. Potential direct, indirect, or cumulative impacts on ecological features can be described in relation to their magnitude, extent, duration, reversibility, and timing/frequency, as outlined in the CIEEM (2018) guidelines. Depending on the type of impact and the sensitivities of the important ecological feature, the ecologist may determine that the impact would have a significant effect. "*A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project*, a significant negative effect is an effect that

undermines biodiversity conservation objectives for important ecological features or for biodiversity in general."

The term **Ecological Receptors** is used when impacts upon them are likely. The term **Ecological Value** is intended to refer to those that are judged to be of importance at a particular geographic scale. Actives during the construction phase and operational phase of a proposed development will each potentially give rise to changes in the natural environment that could have impacts upon resources of ecological value.

Survey Limitations

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time and is limited by various factors such as the season, timing of the survey, climatic conditions, and species behaviour. Ecological surveys are therefore snapshots in time and should not be regarded as a complete study. Direct observations or evidence of protected species is not always recorded during ecological surveys. However, this does not indicate that the species is absent from the site.

The ecological assessment was carried out in January and February 2025. The optimal flora survey period runs from April to September, the growing season for the majority of plants (Smith et al., 2011). However, this will also be determined by climate conditions such as sunlight, precipitation, and temperature. Most grass species will grow when the temperature is above 5℃ (Whitehead, 1995). To ensure any limitations encountered did not significantly impact upon the findings of the ecological assessments, the ecological survey undertaken also assessed the potential of the habitats to support protected species, and cognisance has been taken of available online baseline data and a precautionary approach taken. Weather conditions were favourable for surveys with some heavy showers on the 24th of February however this did not impact on the survey of wintering bird activity at the site. Where areas within a site cannot be accessed, this should be noted in the report as a constraint to the survey. The development site within Garrykennedy Inner Harbour, Co. Tipperary was fully assessable, with access to the harbour. A survey of the lough bed at the harbour was not done as part of this survey.

3.0 ECOLOGICAL SURVEYS

The Heritage Council's A Guide to Habitats in Ireland (Fossitt, 2000) is the standard habitat classification system used in Ireland (hereafter referred to as the Guide to Habitats). Habitats should be recorded as they are at the time of the site visit or survey. Habitats frequently merge or grade from one to another, or form complex mosaics, with the result that a continuum of variation often exists within and between different habitat types. This may be entirely natural but, in many cases, management, damage and disturbance blur the distinctions between habitats. The objectives of the habitat survey will determine the survey scale and the key pieces of information that must be gathered; these in turn will affect the resources that will be required to meet the survey objectives. How a particular habitat survey should be conducted to meet the desired objectives must be determined by those commissioning and carrying out the survey (The Heritage Council, 2011).

Table 3.1: Ecological Surveys

SURVEY	STUDY AREA	SURVEY DATES
Habitat Survey	Complete Site & Boundary Buffer	18th January 2025 23rd and 24th February 2025
Otter & Fauna Survey	Complete Site & along Lough Derg	18th January 2025 24th February 2025
Bird Survey	Complete Site & Boundary Buffer	18th January 2025 24th February 2025

3.1 FAUNA SURVEY

Fauna surveys were undertaken during bright and dry weather conditions. Direct observation methods were used for the survey of fauna, however, these methods may not be suitable for shy and nocturnal species. Therefore, indirect methods were also employed, focusing on evidence of fauna including tracks, burrows/setts/nests, droppings, food items and hair. The habitats on site were assessed for signs of usage by fauna, and the potential to support protected or red-listed species.

Badgers and their setts are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. The removal of badgers from affected setts and subsequent destruction of these setts must be conducted under licence by experienced badger experts or other suitably qualified personnel. Typically, the main setts

of a badger, which are the focus of the social groups, are usually larger than other setts, averaging seven entrances each (Smal, 1995). A badger sett is divided into different types with main setts used for breeding and have multiple entrances. With outliers usually have one entrance and lie towards the fringes of their territory (Lowen, 2016).

3.2 BAT SURVEY PRELIMINARY

Areas within the site with the potential to support bat roosts and / or foraging / commuting routes, and which have the potential to be impacted upon by the proposed development were the main focus of the survey outlined below.

The aims of a bat survey are to collect robust data following good practice guidelines to allow an assessment of the potential impacts of the proposed project on local bat populations. To facilitate the design of control measures, enhancement, and monitoring strategies for local bat populations recorded. Provide information to enable robust decisions with definitive outcomes that aid in the conservation of local bat populations. Depending on the type of site or habitats contained within the survey can concentrate on areas of suspected or potential bat roots such as buildings (with accessible features) and trees with cracks and crevices as noted below. This type of survey is done to determine if the building/tree is a bat roost. Transect surveys are carried out by walking the site with a bat detector to determine the level and type of bat activity at a site. Other more detailed surveys are carried out if a bat roost is suspected and if knowledge on the type of roost is required to determine the best conservation methods.

All bat species are listed in Annex IV of the Habitats Directive while the Lesser Horseshoe (*Rhinolophus hipposideros*) is afforded additional protection through its inclusion on Annex II of the EU Habitats Directive. As a result, SACs have been designated for this species throughout its European range, including in Ireland.

It is an offence under Section 23 of the Wildlife Act and under Section 51 of Habitat Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the Habitat Regulations, 2011 actions that intentionally or unintentionally harm, damage or destroy a bat or its roosting site are considered to be an offence. According to Section 54(2) of the Habitats Regulations 2011, a derogation licence to disturb bats or the breeding or resting places may be granted ‘where there is no satisfactory alternative, and the derogation is not detrimental to the

maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range. The assessment comprised of an external inspection of trees to identify potential roost features (PRFs) and evidence of bat activity. Any cracks or crevices were further inspected visually with the aid of a strong torch to look for bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. The criteria used to categorise the PRFs or suitability of trees as a potential roost are summarised in the table below, based upon the guidelines by Collins (2016) and Hundt (2012).
Examples of such features include;

- Natural holes;
- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities.

Climbing trees to look for roosts, using appropriate equipment and safety precautions, is a possible approach for small numbers of trees with a high probability of bats, but the results of radiotracking studies of some species suggest that bats may use cracks or crevices that are far from obvious Kelleher & Marnell, (2006).

Furthermore, as a signatory to the EUROBATS Agreement (Agreement on the Conservation of Populations of European Bats, 1994), Ireland is required to protect their habitats and important feeding areas from damage or disturbance. All Irish bat species are listed in Appendix II of the Bern Convention (1979), as species requiring protection.

The IUCN Red List categories and criteria are used as an easily understood system for classifying species by their risk of global extinction (IUCN 2012). Irish bats have most recently been categorised in the updated IUCN red list of terrestrial mammals in Ireland. All bats normally occurring on the island are listed as “Least Concern” (Nelson et al., 2019). The status of the Greater Horseshoe Bat (*Rhinolophus ferrumequinum*) is not yet determined in Ireland as only one record has been confirmed.
A bat activity survey with an Active Bat Detector was not undertaken as part of this ecological assessment as bats are hibernating until late March (weather dependent). No trees or buildings will be removed as part of the proposed development therefore no likely significant impact on roosting bats.

3.2.1 Assessment of Bat Roost Potential

A daytime assessment of the site and any trees within and along the boundary was undertaken on the 18th of January 2025 and 24th February 2025. The assessment comprised of an external inspection of trees to identify potential roost features (PRFs) and evidence of bat activity. The criteria used to categorise the PRFs or suitability of trees and buildings as a potential roost are summarised in the table below, based upon the guidelines by Collins (2016) and Hundt (2012). A great majority of roosts are used only seasonally, so there is usually some period when bats are not present. Although there are differences between species, maternity sites are generally occupied between May and September and hibernation sites between October and March, depending on the weather. A hibernation site will have a constant cool temperature and humidity. The majority of bat species do not hibernate in trees with the exception of Leisler's bat (*Nyctalus leisleri*) noted as "probably tree cavities" and Brown long-eared bat (*Plecotus auratus*) "tree holes". The probability of bats roosting in a tree decreases in coniferous plantations with no specimen trees and young trees with simple growth form and little damage (Kelleher & Marnell, 2006). Where bats are found, either individually or in groups in the winter months will have a constant cool temperature and humidity. The pipistrelles are the smallest and most often seen of our bats, flying at head height, and taking small prey such as midges and small moths. Summer roost sites are usually in buildings. Both Common pipistrelle and Soprano pipistrelle can hibernate in a variety of places, which may be quite exposed. Frequently in cavities in buildings, rarely underground. Brown long-eared bat can be found hibernating in roofs.

Table 3.2: Bat Roost Potential Categories

CATEGORY	DESCRIPTION
High Trees / buildings that are suitable for use by large numbers of bats on a regular basis	Features include holes, cracks or crevices that extend or appear to extend back to cavities suitable for bats. In buildings, examples include eaves, barge boards, gable ends and corners of adjoining beams, ridge and hanging tiles, behind roofing felt or within cavity walls. In trees, examples include hollows and cavities, rot holes, cracks/splits and flaking or raised bark which could provide roosting opportunities. Any ivy cover is sufficiently well-established and matted so as to create potential crevices beneath. Further survey work would be required to determine whether or not bats are present, and if so, the species present. Appropriate mitigation and potential licencing requirements may then be determined.
Moderate	From the ground, building / tree appears to have features (e.g. holes, cavities, cracks or dense ivy cover) that may extend back into a

CATEGORY	DESCRIPTION
Moderate potential is assigned to trees / structures with potential to support bat roosts but supports fewer features than a high potential building / tree and is unlikely to support a roost of high conservation value.	cavity. However, owing to the characteristics of the feature, they are deemed to be sub-optimal for roosting bats. Further survey work would be required to determine whether or not bats are present, and if so, the species present. Appropriate mitigation and potential licencing requirements may then be determined.
Low Low potential is assigned to structures and trees with features that could support individual bats opportunistically.	If no features are visible, but owing to the size, age and/or structure, hidden features, sub-optimal for roosting bats, may occur that only an elevated inspection may reveal. In respect of ivy cover, this is not dense (i.e. providing PRF in itself) but may mask presence of PRF features. Further survey work may be required for buildings only or works may proceed using reasonable precautions (e.g. controlled working methods, under license or supervision of a bat worker).
Negligible	Trees have no potential for bat roost.

3.3 BIRD SURVEY

Bird usage of the development site was assessed during each site visit. This survey comprises a series of watches (Vantage Point) from a fixed location to quantify the flight activity of birds at a proposed development site. In addition, while walking the development site, stops were undertaken on a regular basis during which time the area was scanned as far as the terrain or weather conditions allowed. Birds were identified by visual sightings and auditory identification of songs and calls. Birds flying overhead were also included as part of the survey. Birds observed while undertaking habitat and specific fauna surveys were also noted. Priority habitat/features such as trees, dense hedgerows or shrubs, reed beds, or small bodies of water are areas that surveying can concentrate on for shy species with low detection. Disturbance to the site should be kept to a minimum while undertaking a bird survey. Target species will be limited to those species which are afforded a higher level of legislative protection. Some species may also be selected as a result of their behaviour which makes them more likely to be subject to impact from the proposed development. There are three important species lists from which target species may be drawn;

- Annex I of the EC Birds Directive;
- Schedule 1 of the Wildlife Act;
- Red and Amber listed Birds of Conservation Concern

The harbour was assessed for wintering waterfowl. The Harbour was surveyed as per **Figure 3.1** below.

3.4 OTTER SURVEY

Otter is a protected species in Ireland, and it is an offence to deliberately capture or kill any otter, or to deliberately disturb this species particularly during the period of breeding. As per the NPWS "*Otter in Ireland*" the otter is a large carnivore with a long slim body, short legs and a tapered tail. Adult males can reach 1m in total length and 10kg in weight. The otter's feet are webbed, and it swims low in the water with only its head showing. However, you need to be lucky to see an otter, and the best way to discover whether otters frequent an area is by looking for tell-tale signs. Otters have two basic requirements: aquatic prey and safe refuges where they can rest. Otters maintain territories and will defend their stretches of riverbank or lake shore from other otters. In lowland rivers and fish-rich lakes otters only need to maintain small territories (1- 2km). An otter usually maintains numerous couches and holts within its territory. Couches are above ground resting places, often on islands, or hidden in extensive reed beds, or in dense scrub, brambles or nettles. Holts are underground and can take many forms such as among falls of rocks, in caves, excavated tunnels in peat banks, or within root systems of mature bank-side trees. Holts and couches may be found some distance from freshwater, but most are within the immediate area of riparian vegetation. In general otters exploit a narrow strip of habitat at the aquatic / terrestrial interface. With natal holts situated some distance from normal activity. The otter is an opportunistic predator with a broad and varied diet. In freshwater areas a variety of fish from sticklebacks to salmon and eels will be taken, while crayfish and frogs can be important locally or seasonally. Terrestrial prey is taken infrequently, with birds occurring in just 3% of spraints, and mammals occurring even more rarely. Otter cubs may be born at any time of year. They are born in natal holts. These tend to be especially well hidden, usually far from other otter traffic to avoid potential aggression. Otters mark their territories with their droppings which are known as spraints. These spraints are normally left in prominent places such as on rocks, ledges under bridges, mounds or short tufts of grass in prominent positions. Otter spraints are usually dark greenish, slimy and full of fish bones, scales and crayfish parts. These deposits are a form of messaging among the otters in the area as well as a way of claiming territory or resources resting sites) advertising to other otters that are not local or in the social group established within a given range of the rivers and related habitats (NPWS, 2012).

The presence / absence of otter and other fauna was surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings as well as by direct observation. In addition, the study area was surveyed for the presence of otter holts. There were no active or inactive holts observed at the locations examined along the site boundary. The site was assessed for signs of otter activity during each site visit by walking the riverbank and along boundary and looking for any otter activity. The surveys were conducted on a dry and calm days. Lough Derg was not in flood. During this assessment a Spypoint Trail Camera was fitted to a tree within the marginal zone of Lough Derg. The location of the trail camera and the area surveyed on foot is indicated by the blue line in **Figure 3.1** below. The woodland opposite the outer harbour was assessed from the pontoon with binoculars. The trail camera was left out for five weeks. The area assessed for a potential otter holt was greater than 150m radius of the proposed pontoon. See **Figure 3.2** below. Disturbance of otter can be up to 150m for some construction related activities.

Figure 3.1: General Outline of Survey Area of Harbour and Surrounding Areas (Google Images ©)

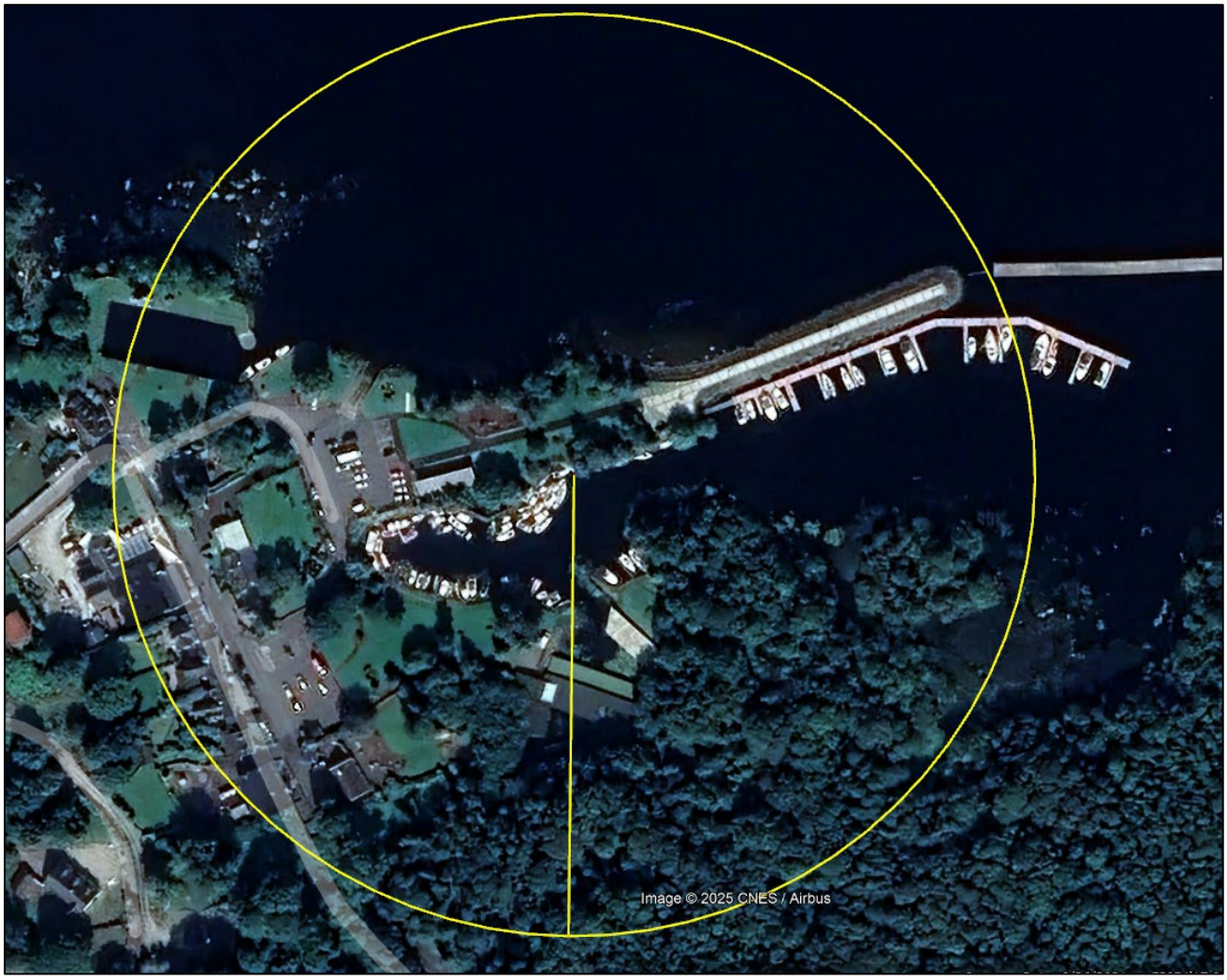


Figure 3.2: 150m radius (approx.) from location of proposed Pontoon (Open Street Map ©)

3.5 SURFACE WATERBODIES DESKTOP STUDY

The proposed development is located within the Shannon [Lower]_SC_070, which is part of the Lower Shannon Catchment. The proposed development is located along the shoreline and marginal zone of Garrykennedy Harbour which is within Lough Derg (Code: 25_191a). The closest mapped watercourse to the proposed development site is the Garranmore (EPA Code: 25G83 – Order 1) which flows into Lough Derg within Garrykennedy Harbour. The River Shannon (Segment Code: 25_191_88 – Order 7) flows through Lough Derg. See **Figure 3.3** below. The Environmental Protection Agency (EPA) undertakes surface water monitoring along the River Shannon. EPA comments on the most recent monitoring results for the Lower Shannon are as follows: "*Moderate ecological quality*

continues at Incherky Quay (station 2060) in August 2023. Density and diversity of macroinvertebrates was low at this station. **Table 3.1** below shows the Water Framework Directive (WFD) Status of the River Shannon and the Garranmore. **Table 3.2** shows the monitoring stations in proximity to the proposed development.

TABLE 3.2 SURFACE WATERBODIES AND WFD STATUS			
RIVER	**CODE**	**ORDER**	**WFD STATUS**
Garranmore	SHANNON (LOWER)_040	1	Review
Lough Derg	IE_SH_25_191a	-	At Risk

Figure 3.3: Mapped waterbodies within proximity to development site (Bing Images ©)

4.0 RESULTS OF ECOLOGICAL SURVEYS AND ASSESSMENTS

There is a mixture of habitats within the site boundary that are mesotrophic lakes (**FL4**) and modified such as buildings and artificial surfaces (**BL3**) and amenity grassland (**GA1**). There is scattered trees and parkland (**WD5**) around the harbour boundary and in Garrykennedy village. Riparian woodland (**WN5**) and mixed broadleaved/conifer woodland (**WD2)** is found surrounding the harbour. Along the shoreline further into the lough is reed and large sedge swamps (**FS1**) habitat. There are no EU Habitats Directive Annex I Habitats mapped at this location. The identified habitats at the proposed development site, as per the Fossitt habitat classification scheme, are summarised in **Table 4.1** below. See **Plates 4.1 – 4.** For photo log of main habitats found within and outside the redline boundary.

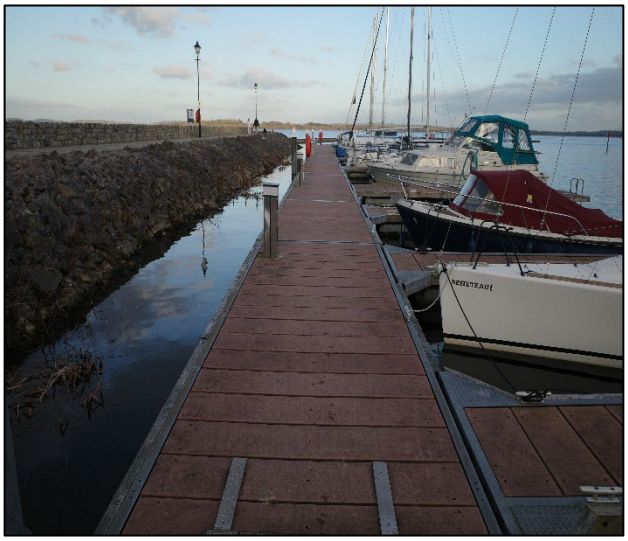
Table 4.1: Summary of Habitats Identified at the Proposed Development Site

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	**LEVEL 2**	**LEVEL 3**
F Freshwater	**FL** Lakes and ponds	**FL4** Mesotrophic lakes
	FS Swamps	**FS1** Reed and large sedge swamps
W Woodland and scrub	**WN** Semi–natural woodland	**WN5** Riparian woodland
	WD Highly modified / non- native woodland	**WD2** Mixed broadleaved/conifer woodland
		WD5 Scattered trees and parkland
	WS Scrub / transitional woodland	**WS3** Ornamental/non-native shrub
G Grassland and marsh	**GA** Improved grassland	**GA2** Amenity grassland
B Cultivated and built land	**BL** Built land	**BL3** Buildings and artificial surfaces

4.1 DETAILED DESCRIPTION OF EACH HABITAT

The following main habitats were found at the proposed development site;

Plate 4.1 Buildings and Artificial Surfaces

The buildings, harbour wall, boardwalk and footpaths are classified as building and artificial surfaces (**BL3**) habitat. The flora found at the **BL3** habitat was mainly Moss (Bryophyta). This habitat is found throughout the site.

Plate 4.2 Mesotrophic lakes

Garrykennedy Harbour and Lough Derg is classified Mesotrophic lakes (**FL4).** The flora found along the marginal zone of the harbour include Hemlock Water Dropwort (*Oenanthe crocata*), Lesser Water-parsnip (*Berula erecta*), Water mint (*Mentha aquatica*), Willowherb (*Epilobium* spp.), Branched Bur-reed (*Sparganium erectum*), Reeds (*Calamagrostis* spp.) and Water-cress (*Nasturtium officinale*). Aquatic flora observed were Pondweed (*Potamogeton natans*), Common Club-rush *(Schoenoplectus lacustris*), Yellow Water-lily (*Nuphas lutea*) and Arrowhead (*Sagittaria sagittifolia*). The shoreline further into the lough is reed and large sedge swamps (**FS1**) habitat, this habitat is dominated by Reeds (*Calamagrostis* spp.). This habitat is not abundant within the inner harbour.

Plate 4.3 Riparian Woodland

Mainly outside the red line boundary of the harbour and dominate along Lough Derg to the east is riparian woodland (**WD5**) habitat. The trees species here are predominantly Willow (*Salix* spp.), Alder (*Alnus* spp.), Ash (*Fraxinus excelsior*) and some Sycamore (*Acer pseudoplatanus*). The understory has Bramble (*Rubus fruticosus*), Ivy (*Hedera helix*), Willowherb (*Epilobium* spp.) and Sedges (*Carex* spp.).

Plate 4.4 Mixed broadleaved/conifer woodland

Outside the redline boundary and west of Garrykennedy Castle is mixed broadleaved/conifer woodland (**WD2**) habitat. Tree species include Pine (*Pinus* spp.), Fir (*Abies* spp.), Ash (*Fraxinus*

excelsior), Sycamore (*Acer pseudoplatanus*) and Beech (*Fagus sylvatica*). The understory has Bramble (*Rubus fruticosus*), Ivy (*Hedera helix*), Dogwood (*Cornus sanguinea*), Dog-rose (*Rosa canina* agg.), Nettle (*Urtica dioica*) and Elder (*Sambucus nigra*).

Plate 4.5 Scattered trees and parkland

Scattered trees and parkland (**WD5**) habitat is found around the harbour. The tree species found here are Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Alder (*Alnus* spp.), Birch (*Betula* spp.), Oak (*Quercus* spp.), Rowan (*Sorbus aucuparia*), White beam (*Sorbus aria*) Black cherry (*Prunus cerasifera*) and Horse-chestnut (*Aesculus hippocastanum*). With Bramble, Ivy and Winter Heliotrope (*Petasites fragrans*) found in the understory.

Figure 4.6 Ornamental/non-native shrub

Ornamental/non-native shrub (**WS3**) habitat is along the harbour with flora that includes Rose (*Rosa* spp.), Castor Oil Plant (*Fatsia Japonica*), Cabbage Palm (*Cordyline australis*), Hydrangea (*Hydrangea macrophylla*), Fuchsia (*Fuchsia magellanica*), Heather (*Erica* spp.) and Butterfly-bush (*Buddleja davidii*).

Plate 4.7 Amenity Grassland

Amenity Grassland (**GA2**) habitat is found around the harbour. This grassland habitat is managed and kept from flowering. The flora found here includes Ryegrasses (*Lolium* spp.), Buttercup (*Ranunculus* spp.), Clover (*Trifolium* spp.), Daisy (*Bellis perennis*), Dock (*Rumex* spp.), Dandelion (*Taraxacum* agg.), Daffodil (*Narcissus*) and Bent grasses (*Agrostis* spp.).

Figure 4.8 Main Habitats Map (Google Earth ©)

Table 4.2 Ecological Value of Identified Habitats at the Proposed Development

HABITAT TYPE	HABITAT RATING	KEY ECOLOGICAL RECEPTOR?
FL4 Mesotrophic lakes	National importance, higher value.	Yes. Protected aquatic habitat.
BL3 Buildings and artificial surfaces	Local importance, lower value	No. Comprised of artificial surfaces, low ecological value.
WS3 Ornamental/non-native shrub	Local importance, lower value	No. Modified habitat, low ecological value.
GA2 Amenity grassland	Local importance, lower value	No. Modified habitat, low ecological value.
FS1 Reed and large sedge swamps	Local importance, lower value	Yes. Will provide opportunities for bird nesting and foraging for other fauna.
WD5 Scattered trees and parkland	Local importance, lower value	Yes. May provide opportunities for bird nesting and foraging for bats.

HABITAT TYPE	HABITAT RATING	KEY ECOLOGICAL RECEPTOR?
WN5 Riparian woodland	Local importance, lower value	Yes. Will provide opportunities for bird nesting and foraging for bats.
WD2 Mixed broadleaved/conifer woodland	Local importance, lower value	Yes. Will provide opportunities for bird nesting and foraging for bats.

4.2 INVASIVE SPECIES

Under Regulation 49(2) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to any plant which is included in Part 1 of the Third Schedule shall be guilty of an offence. Materials containing high impact invasive species are considered "controlled waste", and, as such, there are legal restrictions on their handling and disposal. Under Regulation 49(7) of the European Communities (Birds and Natural Habitats) Regulations 2011, it is a legal requirement to obtain a license to move "vector materials" listed in the Third Schedule, Part 3.

Lough Derg records of Third Schedule invasive aquatic species; Zebra Mussel (*Dreissena polymorpha*), Asian Clam (*Corbicula fluminea*), Canadian Waterweed (*Elodea canadensis*) and Nuttall's Waterweed (*Elodea nuttallii*). There was no direct evidence of Third Schedule Invasive terrestrial flora at the harbour. The site assessment was done in January and February however given the modified habitats around the harbour (amenity grassland and scattered parkland trees) it is unlikely that Third Schedule invasive flora would be present without records or treatment plan in place. **Table 4.3** for National Biodiversity Data Centre (NBDC) records for R78 and **Table 4.4** for medium impact invasive species that can be treated without a licence if become problematic.

Table 4.3 Third Schedule Invasive Species	NBDC
Canadian Waterweed (*Elodea canadensis*)	R78
Nuttall's Waterweed (*Elodea nuttallii*)	R78
Rhododendron ponticum	R78
Japanese Knotweed (Fallopia japonica)	R78
Zebra Mussel (*Dreissena polymorpha*)	R78R
Asian Clam (*Corbicula fluminea*)	R78R

Other invasive species recorded within the site;

Table 4.4 Other Invasive Species	Habitat	Impact
Sycamore (*Acer pseudoplatanus*)	WN5/WD2/WD5	Medium
Butterfly-bush (*Buddleja davidii*)	WS3	Medium

4.3 BIRDS

Given the woodland and aquatic features of the surrounding area it would be expected that garden, hedgerow birds, woodland and waterfowl would be present in the area. Bird species noted during the site assessments are included in the **Table 4.5** below.

Table 4.5: Birds Observed at Site During Surveys

COMMON NAME	SCIENTIFIC NAME	BTO SPECIES CODES*	APPROX. NUMBERS	ANNEX I	BOCCI** RED LIST	BOCCI** AMBER LIST
Blackbird	*Turdus merula*	B.	8	-	-	-
Black-headed Gull	*Larus ridibundus*	BH	62	-	-	✓
Blue Tit	*Parus caeruleus*	BT	6	-	-	-
Cormorant	*Phalacrocorax carbo*	CA	1	-	-	✓
Chaffinch	*Fringilla coelebs*	CH	2	-	-	-
Dunnock	*Prunella modularis*	D.	1	-	-	-
Great Tit	*Parus major*	GT	2	-	-	-
Grey Heron	*Ardea cinerea*	H.	2	-	-	-
Grey Wagtail	*Motacilla cinerea*	GL	1	-	✓	-
Goldfinch	*Carduelis*	GO	10	-	-	-
Hooded Crow	*Corvus cornix*	HC	4	-	-	-
Jackdaw	*Corvus monedula*	JD	20	-	-	-
Kingfisher	*Alcedo atthis*	KF	1	✓	-	✓
Lesser Black-backed Gull	*Larus fuscus*	LB	6	-	-	✓
Long-tailed Tit	*Aegithalus caudatus*	LT	2	-	-	-
Magpie	*Pica pica*	MG	3	-	-	-
Mallard	*Anas platyrhynchos*	MA	30	-	-	✓
Moorhen	*Gallinula chloropus*	MH	1	-	-	-
Mute Swan	*Cygnus olor*	MS	2	-	-	✓
Pied Wagtail	*Motacilla alba yarrellii*	PW	6	-	-	-
Robin	*Erithacus rubecula*	R.	3	-	-	-
Rook	*Corvus frugilegus*	RO	30+	-	-	-
Song Thrush	*Turdus philomelos*	ST	2	-	-	-
Starling	*Sturnus vulagaris*	SG	4	-	-	✓
Treecreeper	*Certhia familiaris*	TC	1	-	-	-

Table 4.5: Birds Observed at Site During Surveys						
COMMON NAME	SCIENTIFIC NAME	BTO SPECIES CODES*	APPROX. NUMBERS	ANNEX I	BOCCI** RED LIST	BOCCI** AMBER LIST
Woodpigeon	*Columba palumbus*	WP	8	-	-	-
Wren	*Troglodytes troglodytes*	WR	4	-	-	-

**British Trust for Ornithology:* bto_bird_species_codes.pdf
***The BoCCI (Birds of Conservation Concern in Ireland) List classifies bird species into one of three lists (Red, Amber, or Green) based on their conservation status and conservation priority.*

All birds were observed flying over the site, along the treelines or along the Lough Derg. The crow family were observed foraging on the amenity grassland and roosting in the woodland (**WD2**) to west of the harbour. Heron was observed flying into this woodland. Black-headed gull, Mute Swan, Grey wagtail, Moorhen, Mallard, Cormorant and Lesser Black-backed Gull were observed foraging on open water or roosting on exposed rocks of Lough Derg in proximity to Garrykennedy Castle. Mallard was also observed in the harbour and foraging on the amenity grass. Kingfisher was observed flying along the open water east of the harbour boardwalk. Jackdaw, Hooded Crow, Pied Wagtail, Blackbird, Song Thrush, Robin and Starling were observed foraging at the amenity grassland, carparks or in the parkland trees. Woodpigeon, Wren, Dunnock, Magpie, Long-tailed Tit, Treecreeper, Great Tit and Blue Tit were observed in the trees foraging. Goldfinch flock was observed flying over the village.

Grey Wagtail is red listed. Black-headed Gull Lesser, Cormorant, Black-backed Gull, Mallard, Mute Swan, Starling and Kingfisher are amber listed under the BoCCI classification. Kingfisher is listed under Annex I of the E.U. Birds Directive. There is no suitable nesting habitat for Kingfisher at the proposed pontoon location as the bank is modified with no exposed muddy bank. See **Figure 4.13** below. Bird records for the previous thirty years were reviewed on the NBDC website for the 10km square in which the proposed development is located. Bird species of note recorded within the **R78** Hectad include;

TABLE 4.6 NBDC RECORDS FOR R78		
SPECIES	DATASET	BOCCI STATUS
Barn Swallow (*Hirundo rustica*)	Birds of Ireland	Amber List
Black-headed Gull (*Larus ridibundus*)	Birds of Ireland	Red List
Common Coot (*Fulica atra*)	Birds of Ireland	Amber List
Common Goldeneye (*Bucephala clangula*)	Bird Atlas 2007 - 2011	Amber List
Common Grasshopper Warbler (*Locustella naevia*)	Bird Atlas 2007 - 2011	Amber List
Common Kestrel (*Falco tinnunculus*)	Birds of Ireland	Amber List
Common Kingfisher (*Alcedo atthis*)	Birds of Ireland	Amber List

Common Linnet (*Carduelis cannabina*)	Birds of Ireland	Amber List
Common Pochard (*Aythya ferina*)	Birds of Ireland	Amber List
Common Snipe (*Gallinago gallinago*)	Birds of Ireland	Amber List
Common Starling (*Sturnus vulgaris*)	Birds of Ireland	Amber List
Common Swift (*Apus apus*)	Birds of Ireland	Amber List
Common Tern (*Sterna hirundo*)	Birds of Ireland	Amber List
Eurasian Teal (*Anas crecca*)	Birds of Ireland	Amber List
Eurasian Tree Sparrow (*Passer montanus*)	Bird Atlas 2007 - 2011	Amber List
Eurasian Woodcock (*Scolopax rusticola*)	Birds of Ireland	Amber List
Gadwall (*Anas strepera*)	Bird Atlas 2007 - 2011	Amber List
Goosander (*Mergus merganser*)	Birds of Ireland	Amber List
European Golden Plover (*Pluvialis apricaria*)	Birds of Ireland	Red List
Great Black-backed Gull (*Larus marinus*)	Birds of Ireland	Amber List
Great Cormorant (*Phalacrocorax carbo*)	Birds of Ireland	Amber List
Great Crested Grebe (*Podiceps cristatus*)	Birds of Ireland	Amber List
Greater Scaup (*Aythya marila*)	Bird Atlas 2007 - 2011	Amber List
Hen Harrier (*Circus cyaneus*)	Bird Atlas 2007 - 2011	Amber List
Herring Gull (*Larus argentatus*)	Bird Atlas 2007 - 2011	Red List
House Martin (*Delichon urbicum*)	Birds of Ireland	Amber List
House Sparrow (*Passer domesticus*)	Birds of Ireland	Amber List
Little Egret (*Egretta garzetta*)	Birds of Ireland	Green List
Little Grebe (*Tachybaptus ruficollis*)	Bird Atlas 2007 - 2011	Amber List
Mallard (*Anas platyrhynchos*)	Birds of Ireland	Amber List
Mew Gull (*Larus canus*)	Bird Atlas 2007 - 2011	Amber List
Mute Swan (*Cygnus olor*)	Birds of Ireland	Amber List
Northern Lapwing (*Vanellus vanellus*)	Bird Atlas 2007 - 2011	Red List
Red-breasted Merganser (*Mergus serrator*)	Bird Atlas 2007 - 2011	Amber List
Sand Martin (*Riparia riparia*)	Bird Atlas 2007 - 2011	Amber List
Spotted Flycatcher (*Muscicapa striata*)	Birds of Ireland	Amber List
Stock Pigeon (*Columba oenas*)	Birds of Ireland	Amber List
Tufted Duck (*Aythya fuligula*)	Birds of Ireland	Amber List
Water Rail (*Rallus aquaticus*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
White-tailed Eagle (*Haliaeetus albicilla*)	Birds of Ireland	Red List
Whooper Swan (*Cygnus cygnus*)	Bird Atlas 2007 - 2011	Amber List

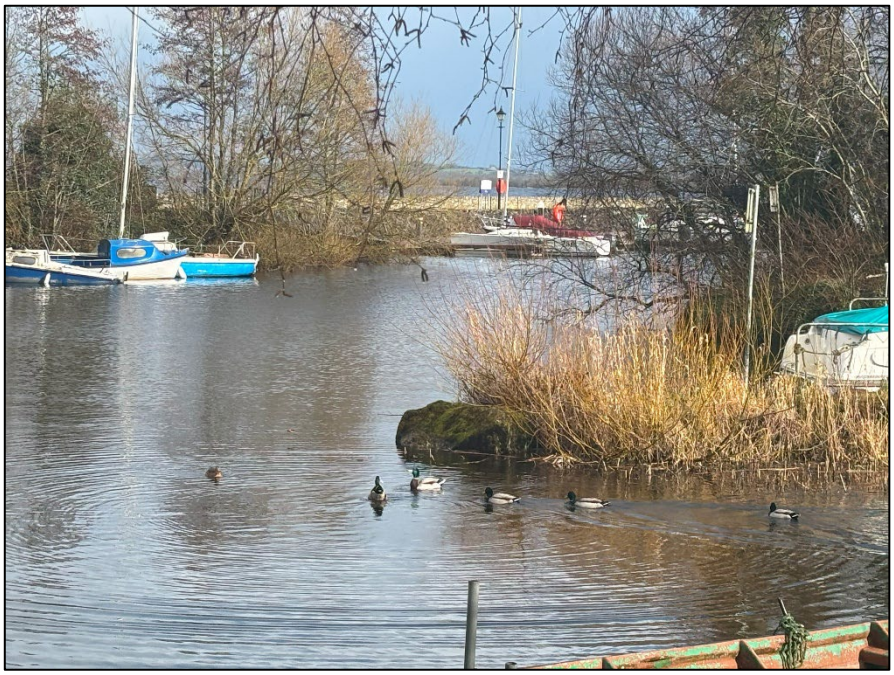


Plate 4.8.1: Mallard in Harbour

Plate 4.8.2: Mallard in Garrykennedy Castle Harbour

Plate 4.8.3: Mallard resting on exposed rocks near Garrykennedy Castle

Plate 4.8.4: Mute Swan preening on rocks near Garrykennedy Castle

Plate 4.8.5: Mute Swan at the outer harbour

Plate 4.8.6: Black-headed gull and Cormorant resting on exposed rocks near Garrykennedy Castle with Mute Swan foraging.

4.4 BATS

The development site is located outside of the current distribution, current range and favourable reference range of Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303] and Nathusius' Pipistrelle (*Pipistrellus nathusii*) [1317] but within current distribution, current range and favourable reference range of Soprano Pipistrelle (*Pipistrellus pygmaeus*) [5009], Daubenton's Bat (*Myotis daubentonii*) [1314], Leisler's Bat (*Nyctalus leisleri*) [1331] and Common pipistrelle (*Pipistrellus pipistrellus*) [1309]. Brown long-eared Bat (*Plecotus auratus*) [1326], Whiskered Bat (*Myotis mystacinus*) [1330] and Natterer's Bat (*Myotis nattereri*) [1322] are outside the current distribution but within the current range of the proposed development (NPWS, 2019b). The NPWS's National Lesser Horseshoe Bat Roost Database was consulted (Mar 2025) with regards any roost records for Lesser Horseshoe Bat (*Rhinolophus hipposideros*). The Lesser Horseshoe Bat is mainly confined to the west of Ireland, with the NPWS database indicating that the nearest record for this bat is located near Broadford (c.25km to the SW). NBDC has records (**Table 4.7**) for bats within the 10km and 2km squares at the proposed development.

TABLE 4.7 NBDC RECORDS FOR BATS

SPECIES	10KM
Daubenton's Bat (*Myotis daubentoniid*)	R78
Lesser Noctule (*Nyctalus leisleri*)	R78
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	R78
SPECIES	**2KM**
Lesser Noctule (*Nyctalus leisleri*)	R787
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	R787

In addition, Bat Conservation Ireland's habitat suitability index available to view on the NBDC online mapping portal, classifies the landscape, within which the site is located, as having a low habitat suitability for bats, with a score of **36.89** for the development site and surrounding landscape. The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The maps are constructed using spatial units of the OSI National Grid. The index presented is for all species combined, in addition to the individual species' indices (Lundy et al., 2011).

Table 4.8 Bat habitat suitability index for the proposed development site

BAT HABITAT SUITABILITY INDEX	
SPECIES	**INDEX**
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	45
Brown long-eared Bat (*Plecotus auratus*)	49
Common pipistrelle (*Pipistrellus pipistrellus*)	46
Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	17
Lesser Noctule (*Nyctalus leisleri*)	45
Whiskered Bat (*Myotis mystacinus*)	32
Daubenton's Bat (*Myotis daubentoniid*)	30
Nathusius's Pipistrelle (*Pipistrellus nathusii*)	20
Natterer's Bat (*Myotis nattereri*)	48

Plate 4.9.1: Trees around the harbour with low to moderate bat roost potential. Outside boundary and/or will not be removed as part of the proposed development.

Plate 4.9.2: Trees within Garrykennedy Harbour with low to negligible bat roost potential. Outside boundary and/or will not be removed as part of the proposed development.

Plate 4.9.3: Trees within Garrykennedy Harbour with low to negligible bat roost potential. Outside boundary and/or will not be removed as part of the proposed development.

4.5 OTTER & OTHER FAUNA

The majority of the site consisting of boardwalk, amenity grassland and artificial surfaces would not offer habitat for otter (*Lutra lutra*). Lough Derg will be in use by otter for breeding, commuting and foraging. Otter is unlikely to be breeding within the harbour of Garrykennedy given the lack of suitable habitats and high disturbance when the harbour is active. The amenity park has both recreational activity and also dogs can access the boardwalk and outer pontoon. The banks along the harbour and where the existing boardwalk is found has some riparian cover however this area has been artificially altered as part of the existing harbour. The embankment is either stone and covered by vegetation such as Bramble or marginal vegetation. Therefore, breeding otter will not be impacted within 150m of the proposed pontoon. Spraint was not found on any rock or on the pontoon at the harbour during any site assessment. A trail camera was left in a sheltered area of riparian woodland near Garrykennedy Castle. This location was chosen to monitor if otter were foraging in proximity to the harbour. The area was near a large grouping of exposed rocks that would capture foraging otter. The trail camera was left in place from the 18th of January to the 24th of February 2025. No otter was captured foraging in this area. No otter tracks were observed during any of the surveys of the marginal zone of the harbour, Lough Derg or along the location of the proposed pontoon or along the full ecological survey. See **Plate 4.10** for examples of marginal zone along this section of the harbour.

There was no evidence of Badger (*Meles meles*) along the marginal zone of Lough Derg or within the woodlands to the west. Badger is unlikely to forage within the harbour. Any badger activity is likely to be within the woodlands around Garrykennedy village or along Lough Derg.

Other fauna not observed but would be typically found throughout the rest of Ireland would be present in the wider area of the proposed development. These include the protected Pine Marten (*Martes martes*), Irish Hare (*Lepus timidus hibernicus*), Hedgehog (*Erinaceus europaeus*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Stoat (*Mustela erminea hibernica*) and Wood Mouse (*Apodemus sylvaticus*). Fauna records for the previous thirty years were reviewed on the NBDC website for the hectad **R78** include the following the species Red Deer (*Cervus elaphus*), Hedgehog (*Erinaceus europaeus*), Badger (*Meles meles*), Red Squirrel (*Sciurus vulgaris*), Pygmy Shrew (*Sorex minutus*), Pine Marten (*Martes martes*), Red Fox (*Vulpes vulpes*) Wood Mouse (Apodemus sylvaticus), Irish Hare (*Lepus timidus subsp. hibernicus*) and Irish Stoat (*Mustela erminea* subsp. *hibernica*).

Plate 4.10: Modified banks of the Garrykennedy Harbour

Table 4.10: Ecological Value of Species of the Proposed Development

SPECIES	SPECIES RATING	RATIONALE
Bats	Local importance, higher value	Yes. Bats will be present in the woodlands and forage over Lough Derg. Not likely to be roosting in trees along the harbour parkland.
Otter	Local importance, higher value	Yes. Otter is likely to be foraging in Lough Derg. Could potentially forage in harbour but unlikely to be breeding at harbour.
Other Terrestrial Fauna	Local importance, low to high value	No. Unlikely that harbour would offer suitable foraging or breeding habitat to other terrestrial fauna.
Birds	Local importance, higher value	Yes. All birds, their nests, eggs and young are protected under the Wildlife Act. Wintering birds associated with the SPA not observed within the harbour.
Aquatic Fauna	Local importance, lower value	Yes. Lough Derg will contain aquatic fauna of ecological importance.

5.0 DESIGNATED SITES

The development site is not located within or adjacent to any designated sites. Indirect impacts can occur if there is a viable pathway between the source (development site) and the receptor (the habitats and species for which a site has been designated). The most common pathway for impacts is surface water, e.g. if a pollutant is washed into a river and carried downstream into a designated site. Other potential pathways are groundwater, air (e.g. airborne dust or sound waves), or land (e.g. flow of liquids, vibration). The zone of effect for hydrological impacts can be several kilometres, but for air and land it is rarely more than one hundred metres.

Potential pathways to Natura 2000 sites;

- Potential impacts arising from the project;
- The location and nature of European sites;
- Pathways between the development and European sites.

A Zone of Influence (ZoI) for a project is established on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors within vicinity of the proposed development. The ZoI takes into account the potential for connectivity to ecological

receptors through the Source- Pathway-Receptor (S-P-R) model and assesses potential impacts of the proposed development on both immobile and mobile qualifying interests of identified European sites. Functional pathways can include the use of an application site for foraging by a QI/SCI species of an SAC or SPA;

Table 5.1: Natura 2000 Sites

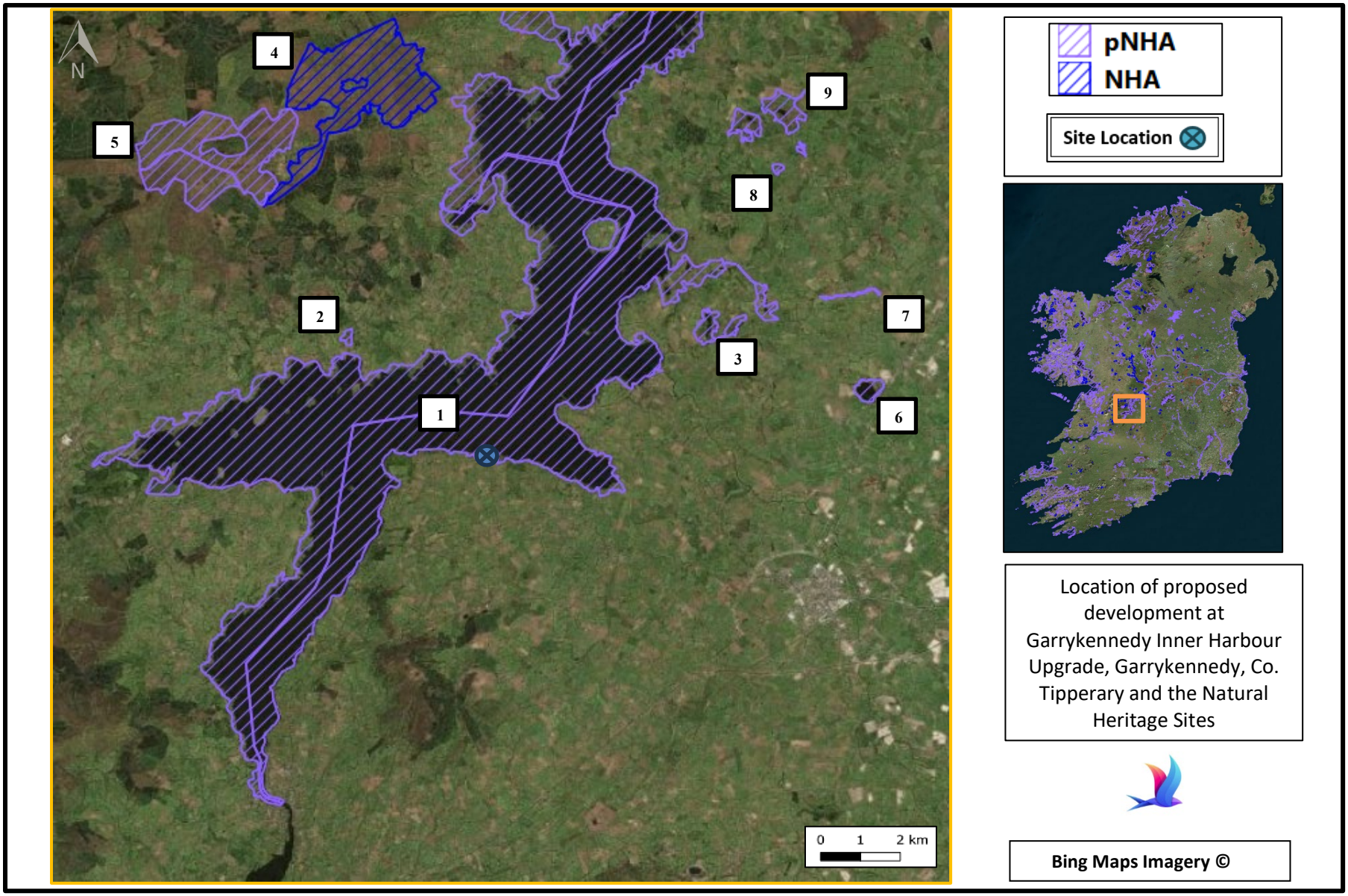
SITE NAME	DESIGNATION	SITE CODE	DISTANCE	S-P-R
Lough Derg (Shannon)	**SPA**	**004058**	**Within Boundary**	**Yes**
Lough Derg, North-east Shore	SAC	002241	6.8km NE	No
Lower River Shannon	SAC	002165	12.4km SW	No

See accompanying Natura Impact Statement (Document Reference: NIS_RSE_010325) for a complete assessment of the SAC and SPA in ZoI and their qualifying interests.

Table 5.2: Natural Heritage Areas

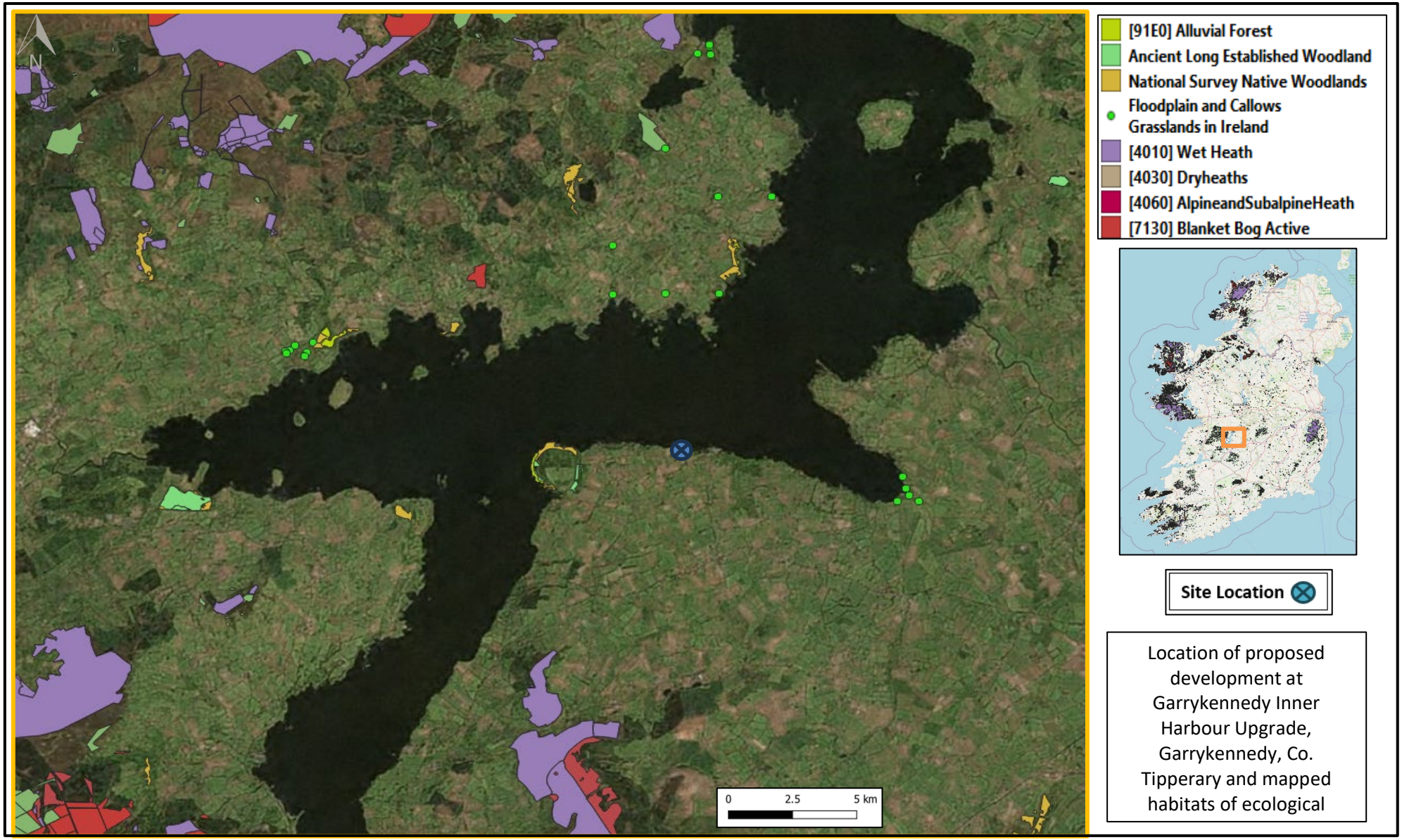
SITE NAME	DESIGNATION	SITE CODE	DISTANCE	S-P-R	FIGURE 5.1
Lough Derg	**pNHA**	**000011**	**Within Boundary**	**Yes**	**1**
Cloonamirran Wood	pNHA	001686	5.5km NW	No	2
Clareen Lough	pNHA	000929	7km NE	No	3
Derryoober Bog	NHA	002379	10.1km NW	No	4
Loughatorick South Bog	pNHA	000308	10.3km NW	No	5
Lough Ourna	pNHA	000650	11km E	No	6
Willsborough Esker	pNHA	000943	11km NE	No	7
Newchapel Turlough	pNHA	000653	12km NW	No	8
Lough Avan	pNHA	001995	12.1km NW	No	9

There is one direct connection to a proposed Natural Heritage Area, Lough Derg pNHA is located within the site boundary (Site Code: 000011). The potential impact to this pNHA will be addressed in the accompanying NIS for Lough Derg (Shannon) SPA. There is no other pNHA or NHA within the ZoI. See **Figure 5.1** for the location of Natural Heritage Areas and proposed Natural Heritage Areas. **Figure 5.2** below shows the location of the development site and mapped protected habitats within the wider area. There are no additional habitats of ecological significance found within the site boundary or in close proximity that are not addressed in the Natura Impact Statement. The closest habitat of high ecological importance is Lough Derg.



Location of proposed development at Garrykennedy Inner Harbour Upgrade, Garrykennedy, Co. Tipperary and the Natural Heritage Sites

Bing Maps Imagery ©



Location of proposed development at Garrykennedy Inner Harbour Upgrade, Garrykennedy, Co. Tipperary and mapped habitats of ecological

6.0 ECOLOGICAL IMPACT ASSESSMENT

Developments have the potential to impact upon terrestrial and aquatic biodiversity through destruction and loss of habitat, disturbance due to noise and dust, the potential introduction of invasive species and light pollution. The construction phase of the development will not result in a direct or permanent loss of habitats of high ecological value. The new floating pontoon will replace an existing boardwalk within the inner harbour. The marginal zone of the harbour is modified, and majority of the site is kept as a public amenity with landscaping and grass cutting. The majority of the trees around the harbour are ornamental or non-native species. There is Ash, Hawthorn, Alder, Willow and Oak found around the harbour. All tree species will not be removed as part of this development. The grass is modified amenity grass with low species diversity. The rest of the harbour is classified as artificial surfaces. The main area of high ecological value is Lough Derg which extends into the inner harbour. There will be no significant alterations to this waterbody with the floating pontoons to be placed on piles made of galvanised steel. The lakebed will not be significantly altered within the harbour as the piles will be drive by vibration into the lakebed at the harbour. There will be no coring or excavating of material from the lakebed. Therefore, the proposed works to this habitat is not considered to be significant. During the construction of the pontoon measures to protect water quality will be implemented. See accompanying **Natura Impact Statement** for complete list of mitigation measure on water quality (Document Reference **NIS_RSE_010325**). The marginal zone of the harbour will not be significantly altered therefore removal of existing vegetation is not required or formal planting will occur as part of the proposed development.

It is likely that birds are nesting along the marginal zone of the outer harbour (WN5/FS1) and in the mature parkland trees. Waterfowl are likely foraging along the marginal zone with direct observations (Mallard, Mure Swan, Kingfisher). Main waterfowl activity during the ecological surveys was on exposed rocks in Lough Derg in proximity to Garrykennedy Castle. Kingfisher is not breeding at the harbour (lack of muddy vertical banks). Cormorant nests in trees along waterbodies. It is unlikely to be directly disturbed by the works, with no trees for removal.

No potential bat roost was observed within the site boundary during the preliminary bat roost assessment. No trees with bat roosting potential will be removed as part of the proposed development. Minor dust emissions may arise during construction activities for the extension. Given the transient nature of the construction works and the small scale of the extension to the welfare building the potential impact to flora and fauna would not be considered significant with appropriate measures to protect the environment to be put in place during the construction phase.

6.1 BATS

Potential Impacts

Artificial lighting during the construction and operational phases has the potential to negatively impact upon bat species, as illumination can impact upon their roosting sites, commuting routes and foraging areas. Cutting down trees or disturbing potential roosting sites for bats. Occupation of roosts in trees or buildings by bats may be very transient. There is potential that the mature broadleaved trees in the wider area and along Lough Derg could be used as roosting or resting places by individual/small numbers of bats. The roosting potential of trees at the pontoon location and directly around the harbour are considered low/negligible. Lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for certain species such as *Myotis.*

Control Measures

Artificial Lighting during construction phase;

- Construction works in the hours of darkness, when bats are active (April – October), would be avoided and only done if necessary to reduce another higher ecological impact;
- Light spill onto Lough Derg must be avoided;
- Should lighting be required during construction works, it will be of a low height (without compromising safe working conditions) to ensure minimal light spill. Where possible and where practicable to do so, timers or motion sensors would be used;
- Directional lighting would be used where possible, by use of louvres or shields fitted to the lighting;
- White light emitting diode (LED) will be used where possible, which is considered to be low impact in comparison to other lighting types.

Artificial Lighting during operational phase;

A Lighting plan has been designed for the site to ensure that there will minimum impact on local bat/fauna populations. This will be implemented and complimented with the lighting plans for the Garrykennedy Harbour. Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).

The lighting design by **Moloney Fox Consulting Engineers** will include the following design measures:

- Lighting would be directed to where it is required only;
- Lighting of Lough Derg will be avoided;
- All lanterns calculated at 0° tilt;
- Lighting would be of sufficient height to minimise light spill;
- White LED or amber coloured LED outdoor lighting would be used which is considered to be low impact in comparison to other lighting types.

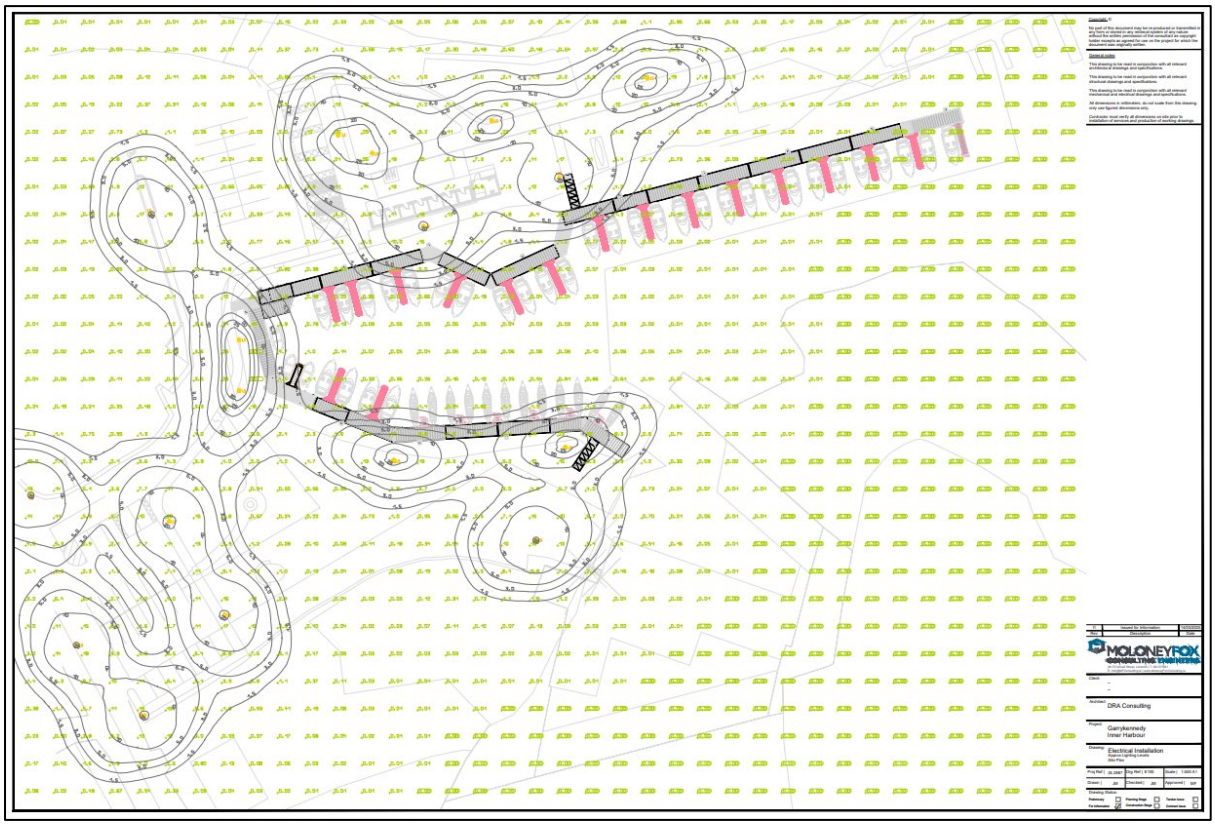


Figure 6.1: Light Plan of the proposed Inner Harbour

Residual Impacts

Given the urban location of the site and significant public lighting in the area it is unlikely that bats will utilise the location of the main building for significant foraging or roosting. Bat activity at the proposed pontoon will not be impacted during the operational phase as bats

already likely forage here and the surrounding environment. Public lighting schemes are now considerate of nocturnal fauna such as bats and utilise wavelengths that cause less disturbance within urban areas. The installation of sympathetic lighting at the site will enable particular bat species to forage in the area post construction.

6.2 BIRDS

Potential Impacts
It is not anticipated that there would be any significant impacts upon birds during the operational/construction phase of the development. The proposed development does not contain any suitable nesting habitat for Kingfisher, Cormorant, Tern or any other waterfowl of conservation concern.

Control/Monitoring Measures
No tree removal works to take place during the bird breeding season. Stormwater from the proposed extension would comprise of clean rainwater run-off and would be directed to a soakaway and percolate to ground.

Residual Impacts
The marginal zone will not require replanting and will be managed in the same manner which is predominately keeping vegetation low (health and safety reasons). Waterfowl along this section of Lough Derg will be accustomed to boat activity at the harbour. The operational water activities will not cause significant disturbance to nesting birds or foraging birds. Given the location waterfowl such as Mute Swan, Moorhen and Mallard will not be significantly impacted by recreational activities (Hill, 1992). Other sensitive waterfowl will likely prefer other aquatic locations given the disturbance from general urban activities and the more densely vegetated marginal zone both further along Lough Derg (east and west) of the inner harbour.

6.3 OTTER

Potential Impacts
It is not anticipated that there would be any significant impacts upon otter during the operational phase of the development. The proposed development site (inner harbour) does not contain an otter holt. Measures to protect otter during construction phase will be put in place.

Control/Mitigation/Monitoring Measures
No construction works within the Lough Derg or along the marginal zone between dusk and dawn (at least 1 hour before dusk and not commence again until at least 1 hour after sunrise).

Residual Impacts

The marginal zone will be altered but if some vegetation is required then it should be replanted with native species and a semi- natural management of this area will be done during the operational phase. The operational activities will not cause significant disturbance to otter as the pontoon will used to moor boats which is likely to be done predominately during the day. Otter is mainly active at night as they are largely nocturnal creatures. Light will be sensitive and not cause significant light spill onto the main waterbody of Lough Derg.

6.4 OTHER TERRESTRIAL FAUNA

Potential Impacts

It is not anticipated that there would be any significant impacts upon other terrestrial fauna during the operational/construction phase of the development.

Control/Monitoring Measures

Only required vegetation to be removed along the marginal zone of the harbour. The banks will be let to reseed naturally or replanted with native species. No construction works within the Lough Derg or along the marginal zone between dusk and dawn, at least 1 hour before dusk and not commence again until at least 1 hour after sunrise.

Residual Impacts

There will be no residual impact on other terrestrial fauna from the proposed development.

6.5 AQUATIC FAUNA

Potential Impacts

It is not anticipated that there would be any significant impacts upon aquatic fauna during the operational phase of the development with mitigation measures. Measures to protect water quality during construction phase will be put in place.

Control/Mitigation/Monitoring Measures

Daily visual inspections would be undertaken of Lough Derg during the construction phase. Silt mats will be placed on any manholes or drains located on access road and they must be inspected daily and only removed when there is no significant risk of sediments from construction machinery. Silt fencing (comprising of a porous filter fabric which detains sediment) will be along the boundary of the extension site and will remain in place until the completion of construction works. For works at the inner harbour weather will be monitored daily if there is a risk of flooding the site must be secured and all potential pollutants remove from flood impact. Biosecurity measure to prevent the spread of aquatic pathogens such as Crayfish plague will be put in place throughout the construction phase. Check all equipment

and remove of any plant and animal matter before leaving a site and again before entering a new site. Disinfect all equipment with an approved disinfectant, this must not be done beside a waterbody. Items difficult to soak can be sprayed or wiped down with disinfectant. Ensure equipment is allowed to dry before entering a new site and any residual water is drained from boats etc before leaving a site. Footwear to be disinfected and dried before use within the Lough Derg and other watercourses. If clothing worn previously at a different waterbody it must be washed at 65℃ and/or disinfected;

Residual Impacts
During the operational phase of the welfare building the site will not discharge surface runoff directly to the Lough Derg but will percolate to ground via a soakaway. Signs to inform users of the pontoon the importance of stopping the spread of aquatic pathogens should be put in place.

6.6 INVASIVE SPECIES

Potential Impacts
During construction works, there is potential for invasive species to be spread from the site as there are aquatic invasive species such as *Elodea* sp. and Molluscs.

Mitigation/Monitoring Measures
The following mitigation measures are included in the NIS

- The existing structure of the boardwalk (metal structure) must be treated to prevent the spread of invasive molluscs such as Zebra Mussel and Asian Clam;
- Inspect boardwalk, equipment and machinery for adult Zebra Mussels/Asian Clam and remove them;
- Clean boardwalk with hot water and allow it to dry after every trip. If you have removed your boat from Zebra Mussel/Asian Clam infested waters, you should allow the boat to dry out for 1 month or steam clean;
- Remove plant life from the boardwalk and all equipment since zebra mussels may be attached to the plants.
- Dry out or disinfect coarse angling keep-nets that may have been in contact with infected water bodies

Residual Impacts
Signs to inform users of the pontoon the importance of stopping the spread of invasive flora and fauna. In particular the importance of preventing the spread of Third Schedule species.

7.0 CUMULATIVE IMPACTS

The residual impact of this proposed development is anticipated to be minor at local level. Cumulative effects from a development in general can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018).

Considering the nature of the development within an existing harbour, the main potential cumulative impact upon biodiversity would be minimal. There would be no significant disturbance to nocturnal species and / or significant loss or fragmentation of natural habitat. The habitats within the majority of the site boundary are of low ecological value (apart from the waterbody). The works within the inner harbour will be done over six months, this will also include the extension to the welfare building. The proposed works will not significantly alter the modified banks at this location. It is not anticipated that there would be any significant impact upon water quality during the operational phase, given that stormwater from the welfare building would be directed to a percolation area.

With regards potential habitat loss or fragmentation of habitat, the proposed development is not anticipated to result in a significant impact upon habitat loss / fragmentation during either the construction or operational phases, given that the majority of the harbour is comprised of modified boundary habitats of low ecological value, if required any marginal replanting will be in compliance with Tipperary County Development Plan biodiversity requirements. Therefore, there would be no cumulative habitat loss or fragmentation impacts which could pose a significant risk to biodiversity. The habitats of high ecological value (Lough Derg) will not be significantly impacted by the proposed development given the construction mitigation measures and the improvement of the inner harbour structure. There will be no potential lighting impacts as the lighting plan design (lux levels) will not significantly spill onto Lough Derg therefore cumulative impacts as a result of external lighting should not arise.

During the operational phase measures to prevent the spread of invasive aquatic species will be done through education and information for all users of the harbour.

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	CONTROL MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
Habitat Loss	Construction & Operational	Slight significance	• Any planting to use of native and pollinator species where appropriate.	Minor	Neutral
Introduction of Invasive Flora Species	Construction	Slight significance	• Construction plant would be inspected and washed prior to arriving and leaving site; • Regular site inspections for the presence of invasive species would be undertaken; • Measures to prevent the spread of Third Schedule aquatic species will be put in place by the contractor.	Moderate	Minor
Fauna Disturbance	Construction	Moderate significance	• Where possible, no construction works would be conducted outside of normal working hours; • All plant machinery and equipment would be maintained in good working order and regularly inspected; • Where possible, vehicles would be equipped with mufflers to suppress noise; • No works to take place after dusk or before dawn.	Minor	Minor
	Operational	Not significant	None required	Imperceptible	Neutral
Fauna Mortality	Construction	Moderate significance	• Ensure no fauna are within the working areas.	Minor	Minor
	Operational	Moderate significance	• Biosecurity measures to prevent spread of Crayfish plague.	Minor	Minor
Bats – Disturbance / Severance of Habitat	Construction	Moderate significance	• Lighting measures have been implemented to reduce the potential for light pollution; • Construction works in the hours of darkness would not be allowed;	Minor	Neutral

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	CONTROL MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
	Operational	Moderate significance	• Lighting design measures to be implemented to reduce the potential for light pollution;	Minor	Neutral
Otter – Disturbance / Severance of Habitat	Construction	Moderate significance	• Lighting measures have been implemented to reduce the potential for light pollution; • Construction works in the hours of darkness would not be allowed; • Measure to prevent an impact on water quality and disturbance will be put in place;	Minor	Neutral
	Operational	Moderate significance	• Lighting design measures to be implemented to reduce the potential for light pollution;	Minor	Neutral
Birds – Disturbance / Severance of Habitat	Construction	Moderate significance	• If any tree removal is required (not planned) it can only occur outside bird nesting season (1st March to 31st August) or with prior consultation and agreement with biodiversity officer. • Measure to prevent an impact on water quality will be put in place; • No works from dusk to dawn to prevent an impact on roosting birds.	Minor	Neutral
Surface Water Quality Deterioration	Construction	Moderate significance	• Standard construction control measures for the protection of surface waters would be implemented; • Concrete works would be supervised; • Appropriate storage and handling of fuels and oils; • Provision of spill kits.	Minor	Neutral
	Operational	Not significant	• Ensure maintenance of soakaway.	Minor	Neutral

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	CONTROL MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
Designated Sites	Construction	Moderate significance	• Standard construction control measures for the protection of surface waters will be implemented; • Concrete works must be supervised by experience personnel; • Appropriate storage and handling of fuels and oils; • Provision of spill kits; • No works after dusk or before dawn to prevent disturbing roosting birds.	Minor	Neutral
	Operational	Moderate significance	Ensure the spread of aquatic invasives does not occur	Minor	Neutral

8.0 CONCLUSION

It is the conclusion of this report that there would be no potential for any significant impact on protected species as a result of the proposed development. The site has low bat roost potential and low potential for nesting waterfowl. The proposed development should proceed with full and proper implementation of nocturnal lighting measures during operational and construction phase, the proposed development would not have a significant impact on local bird, bat and otter populations. The lighting design will be sensitive to the environment and avoid upward lighting of trees or excessive lighting at the pontoon or onto the open waterbody of Lough Derg. There will be no significant impact to waterfowl or to aquatic fauna in the harbour. There are no habitats of note along the harbour banks. The site will be monitored for the spread of Third Schedule invasive species and biosecurity measures will be put in place. The drainage design will allow stormwater to percolate to ground, or rainwater will naturally runoff the pontoon. The project is recommended to proceed as proposed with inclusions of the protection measures as outlined in this report that will ensure there is no potential for significant effects to the protected habitats and species of Lough Derg and surrounding environment.

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APPENDIX – SITE LAYOUT