Bat Survey and Assessment

Proposed Residences

Deerpark

Killarney

Co. Kerry

Report prepared for Gene McCarthy

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1 Introduction

This report has been prepared by Karen Banks, Greenleaf Ecology, on behalf of Gene McCarthy. Planning permission is being sought from Kerry County Council for 2 no. residences at Deerpark, Killarney, Co. Kerry.

A protected species survey of the proposed site, comprising a bat survey, was undertaken of the existing buildings in response to a request for further information from Kerry County Council (Ref: 22/1272).

The site is located in the townland of Deer Park, Killarney, as illustrated in Figure 1-1.

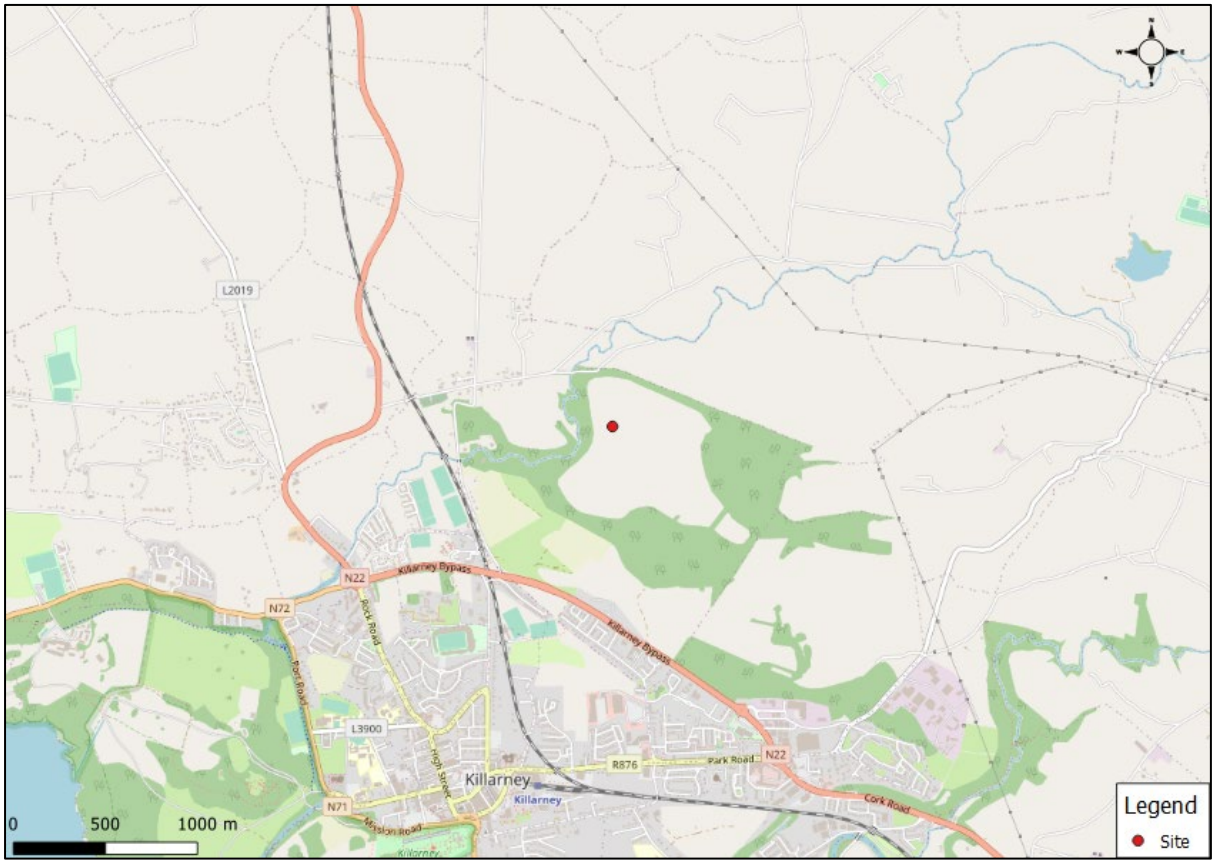

Figure 1-1: Site Location

1.1 Site Summary and Context

The proposed development is located in Deerpark, to the north of Killarney. The site comprises an old abattoir located in a courtyard with dwellings and agricultural outbuildings. The wider landscape around the site comprises agricultural grassland bound by hedgerows and treelines, with parcels of mixed broadleaved and conifer woodland. The Deenagh River, a 4th order watercourse, is located c.0.17km to the west of the proposed site. The Deenagh River and its associated broadleaved woodland form part of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC at its location to the west of the proposed site (see Section 3.1.1 for further details).

1.2 Description of the Proposed Project

Permission for: (a) change use, alter and extend existing building from use as an abbatoir to 2 no. one bedroom residences (b) remove existing septic tank which currently serves two existing dwelling

houses (c) install Tricel Novo Treatment system with soil polishing filter to serve the existing dwellings on site and the proposed 2 no. residences at Deerpark, Killarney, Co. Kerry.

1.3 Legislative Context

All Irish bats are protected under the Wildlife Acts. Also, the EU Habitats Directive, and Irish implementing legislation, seeks to protect rare species, including bats, and their habitats, and requires that appropriate monitoring of populations be undertaken. Moreover, the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all bat species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) protects migrant bat species across all European boundaries. Ireland has ratified both these conventions.

All bats are listed in Annex IV to the Habitats Directive (92/43/EC) and the Lesser Horseshoe bat is further listed under Annex II to the same Directive.

Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence. Any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by the NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "*Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences*".

1.4 Objectives

The objectives of the bat and bird survey were to assess:

- The potential suitability of the proposed site for roosting bats;
- Whether or not bats are roosting within the existing building present within the site and how many bats these roosts support (i.e. size and importance);
- Make an assessment of the potential impacts of the proposed works to the building at the site on bats; and
- To provide appropriate mitigation measures to remove or reduce impacts.

2 Methodology

2.1 Desk Study

A pre-survey data search was conducted in order to collate existing information from the footprint of the site and its surrounding area on bat activity, roosts and landscape features that may be used by bats. The data search comprised the following information sources:

- Collation of known bat records from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie);
- Review of Ecology Reports completed for other developments in the environs of the site; and
- Review of Ordnance Survey mapping and aerial photography of the site and its environs.

2.2 Field Survey

This bat survey and assessment was undertaken in accordance with the following guidelines:-

- Bat Conservation Ireland, (2010). Guidance notes for Planners, Engineers, Architects, and Developers;
- BTHK. (2018). Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK;
- Collins, J. (ed.) (2016). Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd ed.). The Bat Conservation Trust, London;
- Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland; and
- NRA (2006). Guidelines for the Treatment of Bats During the Construction of National Road Schemes.

2.3 Surveyor Information

The survey was undertaken by Karen Banks, MCIEEM.

Karen is an ecologist with 17 years' experience in the field of ecological assessment. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS (Ref: DER/BAT 2023-55). Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes.

2.4 Bat Roost Inspection Survey

On 31st May 2023 the existing building at the site was surveyed for potential roost sites and signs of bats. The survey utilised a high-powered torch, close focussing binoculars and an endoscope (Explorer Premium 8803 with 9mm camera) where required. The external inspection involved looking for bat droppings on the ground, stuck to walls, windowsills or in crevices in the stonework and recording suitable entry and exit points.

The internal inspection involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

The following criteria were used to determine the potential suitability of the site for bats (Table 2-1)[1].

Table 2-1: Criteria for Assessing the Potential Suitability of the Proposed Development Site for Bats

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only- the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.5 Emergence Roost Survey

Dusk surveys of the buildings were undertaken on 31st May 2023 and 21st June 2023 in order to watch and listen for bats exiting bat roosts to determine the presence or absence of bats at the time of survey. The dusk emergence surveys commenced approximately 15 minutes before sunset and ended approximately 90 minutes after sunset. The surveys were undertaken in suitable weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below (10°C)). Two people surveyed the structures (Karen Banks and Cathál MacPartholan), one

[1] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London

surveyor was located on the southern elevation and one surveyor was located on the northern elevation.

Anabat Walkabout detectors were utilised for the survey, which record bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data was then downloaded and all recordings were analysed by the Anabat Insight software analysis programme version 2.0.1.

In order to supplement the information gathered from the emergence survey, a passive monitoring system of bat detection was also deployed for this survey (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). Passive monitoring was completed using 2 no. Anabat Swift bat monitors, which were positioned inside the old abattoir and within the courtyard on the northern elevation of the building. The monitors were set to record from approximately 30 minutes before sunset and were left recording for 3 nights in May 2023 and 3 nights in June 2023.

The survey was aided by the use of the Guide TrackiR Pro 19mm thermal imaging scope.

2.6 Ecological Evaluation

The geographical reference used for ecological valuation is adapted from CIEEM (2018) as summarised in Table 2-2.

Table 2-2: Geographical Reference for Ecological Valuation (CIEEM, 2018)

Ecological Value	Geographical Scale of Importance
International	International or European scale
National	The Republic of Ireland or the island of Ireland scale (depending on the bat species)
Regional	Province scale
County	County scale
Local	Proposed/permitted site and immediate surroundings

3 Results

3.1 Existing Bat Data

The review of existing records of bat species in the area of the site indicates that eight of the ten known Irish species of bat have been recorded within a 4km radius of the proposed site (last checked July 2023). These bats include pipistrelle species (*Pipistrellus pipistrellus sensu lato*), soprano pipistrelle (*P. pygmaeus*), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), Daubenton's bat (*Myotis daubentonii*), whiskered (*M. mystacinus*), Natterer's bat (*M. nattereri*) and lesser horseshoe bat (*Rhinolophus hipposideros*) as shown in Table 3-1 below. Of these species, brown long-eared bat and lesser horseshoe bat have been recorded roosting within a 4km radius of the proposed site.

Table 3-1: NBDC bat records from within a 4km radius of the proposed site.

Common Name	Scientific Name	Present	Known Roost (to OS 1km Grid Square)	Date of Last Record
Pipistrelle sp.	*Pipistrellus pipistrellus sensu lato*	√	None	25/07/2013
Soprano Pipistrelle	*Pipistrellus pygmaeus*	√	None	14/05/2022
Nathusius's Pipistrelle	*Pipistrellus nathusii*	x	n/a	n/a
Leisler's Bat	*Nyctalus leisleri*	√	None	14/05/2022
Brown Long-eared Bat	*Plecotus auratus*	√	V9889	13/08/2007
Daubenton's Bat	*Myotis daubentoniid*	√	None	30/08/2012
Whiskered Bat	*Myotis mystacinus*	√	None	19/08/2005
Natterer's Bat	*Myotis nattereri*	√	None	20/05/2011
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	√	V9892, V9793, V9692, V9791, V9694, W0092, V9590, V9690, V9890.	29/01/2015
Brandt's Bat	*Myotis brandtii*	x	n/a	n/a

The bat landscape association model (Lundy *et al,* 2011) suggests that the proposed site is part of a landscape that is of moderate to high suitability for all Irish species of bat.

A bat impact assessment report undertaken for the development of a dwelling in the stables directly adjacent to the proposed site (Bat Eco Services, 2021) recorded a total of 4 individual bats roosting within the building, comprising a single brown long-eared bat, a single Daubenton's bat, a single lesser horseshoe bat and a single bat that was not identified to species level within the stables. Mitigation measures completed for the development included the provision of a bat house designed for lesser horseshoe bat with roosting provisions for Daubenton's bat and brown long-eared bat. The bat house was located in a small field to the south of the site with connecting treelines to suitable foraging habitat.

3.1.1 Designated Sites

The proposed site is located c.0.17km to the east of Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Lesser Horseshoe bat is a qualifying interest species for this SAC. According to the Conservation Objectives for Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (NPWS, 2017), the proposed site is located at the edge of the foraging range for lesser horseshoe bat colony site code 296, which roost within Killarney National Park to the south-west of Killarney.

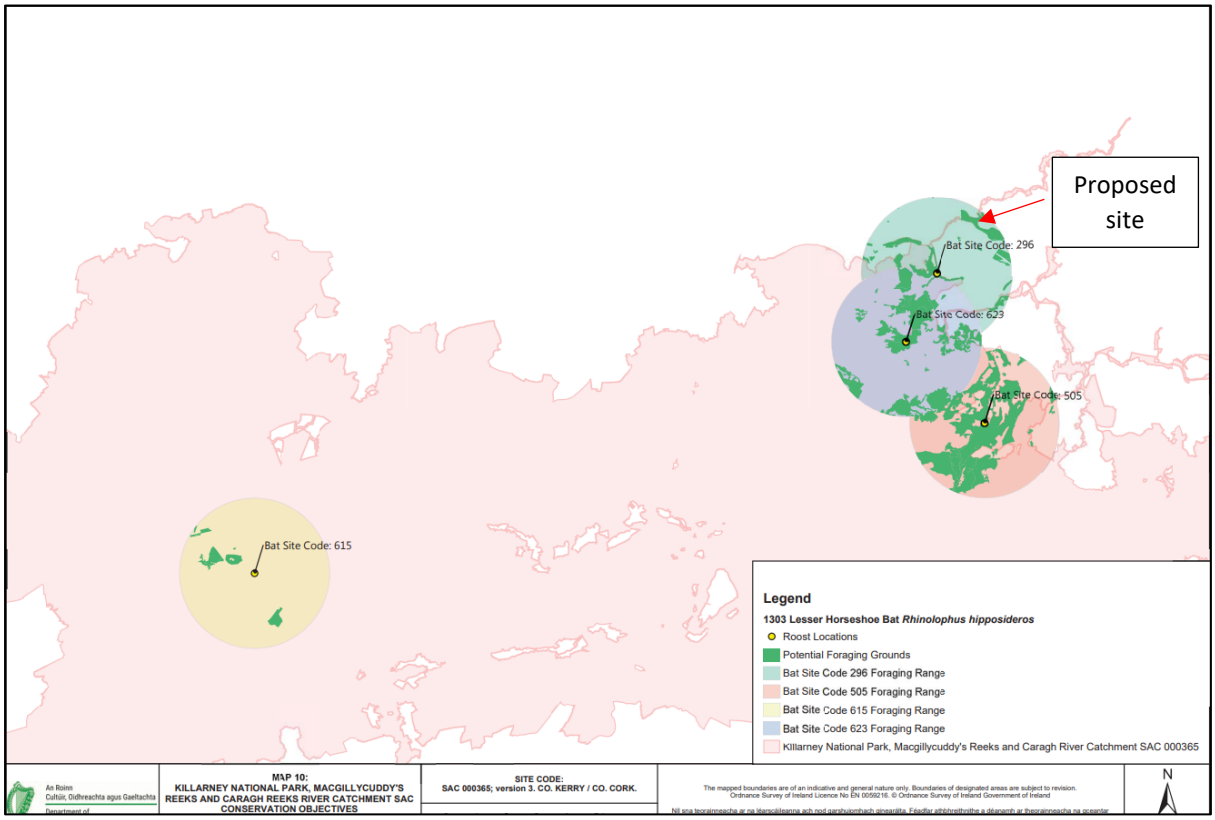

Figure 3-1: Location of lesser horseshoe bat colonies that are QI for Killarney National Park SAC[2] (location of proposed site annoted on map)

3.2 Habitat Description and Roost Survey

The proposed site comprises a single storey abattoir constructed of stone, with plaster applied to the walls internally and render externally. The corrugated roof supports a small loft space with sarking boards present internally. Several sarking boards are missing providing potential access to the roof space for bats (Figure 3-2). There are small gaps between the top of the wall and the roof on the southern elevation of the building, gaps between the corrugated roof sheets and the ridge and gaps at the bottom edge of the roof sheets on the northern elevation that may be used as entry/exit points by bats (Figure 3-2). The doors on the northern elevation of the building are kept open and the windows on the southern elevation are either open or have broken glass. The building is currently regularly used for storage and laundry and the door between the two rooms within the building is kept open. A small number (c.30) of scattered bat droppings were recorded on the surface of materials within the room (Figure 3-2).

[2] Map 10 of ConservationObjectives.rdl (npws.ie)

1. Potential entry/ exit locations on the southern elevation of building

2. Potential entry/exit points on northern elevation of building

3. Gaps in sarking boards internally

4. Scattered droppings present within the building

Figure 3-2: Proposed residences Deerpark- potential entry/ exit points for bats and evidence of bats

The building is of moderate suitability for roosting bats (in accordance with the criteria set out in Table 2-1).

As noted in Section 1.1, the proposed site is situated in a landscape comprising agricultural grassland (Fossit code GA1) bound by hedgerows (WL1) and treelines (WL2), with parcels of mixed broadleaved and conifer woodland (WN/WD). The Deenagh River, a 4th order watercourse (FW2) is located c.0.17km to the west of the proposed site; broadleaved woodland (WN) is located on the riverbank here.

Overall, the landscape is considered to be of high suitability for foraging and commuting bats (in accordance with Table 2-1).

3.2.1 Activity and Emergence Survey

Passive Monitoring

A total of five species of bat were recorded during the passive monitoring: soprano pipistrelle, common pipistrelle, Leisler's bat, lesser horseshoe bat and natterer's bat; *Myotis* species (unidentifiable to species level) were also recorded.

The passive monitor left within the building in May and June 2023 recorded soprano pipistrelle, common pipistrelle, Leisler's bat, lesser horseshoe bat, a single natterer's bat and low number of *Myotis* species. Of these species, soprano pipistrelle, common pipistrelle and Leisler's bat were recorded close to sunset and throughout the night on each night of monitoring. Pipistrelle social calls

were also recorded on this monitor. Lesser horseshoe bat was recorded within the building on 4 of the 6 nights of monitoring. The lesser horseshoe bat calls were recorded predominantly during the middle of the night (between midnight and 3am); however, calls were recorded at 03.59 and 22.43 on 30th May 2023. Natterer's bat and *Myotis* species of bat were recorded in the middle of the night on two occasions.

It is noted that pipistrelle species and Leisler's bat produce loud echolocation calls which travel long distances. The doors and windows to the building are kept open, therefore calls from bats outside the building can be recorded within the building even when bats are not flying or roosting within the building. Calls recorded by species that echolocate more quietly, such as lesser horseshoe bats, are more likely to be within the building when recorded.

The monitor recording in the yard adjacent to the northern elevation of the building recorded soprano and common pipistrelle, Leisler's bat, lesser horseshoe bat and a low number of *Myotis* species of bat.

A small number of calls that were not of sufficient quality to enable species identification were also recorded.

A summary of bat passes recorded during the monitoring completed in May and June 2023 is provided in Table 3-2.

Species	PM1: Recording within building 29/05/2023-31/05/2023	PM2: Recording in yard 29/05/2023-31/05/2023	PM1: Recording within building 21/06/2023-23/06/2023	PM2: Recording in yard 21/06/2023-23/06/2023
Soprano pipistrelle	230	233	664	491
Common pipistrelle	47	11	43	3
Pipistrelle species	9	5	0	0
Leisler's bat	10	0	88	12
Lesser horseshoe bat	46	4	8	10
Natterer's bat	0	0	1	0
***Myotis* species**	1	0	0	4
No ID	3	5	0	2
Total	346	258	804	522

Table 3-2: Proposed residences Deerpark- summary of passes recorded during monitoring in May and June 2023

Emergence Survey

Five soprano pipistrelle bats and a pipistrelle unidentified to species level (not echolocating on emergence) were recorded emerging from the roof of the old abattoir during the emergence surveys undertaken on 31st May 2023 and 21st June 2023.

Leisler's bat was recorded commuting overhead during the course of the emergence surveys and two common pipistrelle flew into the yard to forage. Both common and soprano pipistrelle were recorded foraging along the access track adjacent to the garden on the southern elevation of the building during the emergence surveys. No lesser horseshoe bats were recorded during either emergence/ activity survey.

3.3 Significance of the Site for Bats

The old abattoir is of moderate suitability for roosting bats as it provides shelter and suitable conditions for bats to roost within the roof space. A small number of scattered bat droppings were recorded within the building and 5 no. soprano pipistrelle and a pipistrelle species of bat were

recorded emerging from the roof of the building during the emergence surveys completed in May and June 2023.

One natterer's bat and one *Myotis* species of bat were recorded in the middle of the night on the passive monitor recording within the building, indicating the use of the building as an occasional night roost for natterer's/ *Myotis* species. Lesser horseshoe bat was recorded within the building on 4 nights out of the 6 nights of monitoring completed. The calls from this species were predominantly recorded between midnight and 3am, however calls were recorded c.1 hour 15 minutes before sunrise and c.1 hour 10 minutes after sunset on 30th May 2023, indicating that lesser horseshoe utilise the buildings as an occasional day and night roost in low numbers (see Table 3-2).

In summary, the old abattoir supports a daytime roost for a small number of soprano pipistrelle. The building is used as an occasional night roost for individual/ small numbers of natterer's bat/ *Myotis* species and is also a small day and night roost for lesser horseshoe bat.

Soprano pipistrelle is widespread and abundant in Ireland and the old abattoir supports a day roost for small numbers of this species. As such, the pipistrelle roost at the site is considered to be of low to moderate conservation significance in accordance with Marnell *et al* (2022) and is of Local Importance in accordance with CIEEM (2018) criteria (Section 2.6).

According to Roche *et al*. (2014), trends in the natterer's bat population in Ireland are unknown at present. While data on Natterer's bat is deficient, it is considered to be a less abundant species. As such, the roost for a single natterer's bat at the site is considered to be of low to moderate conservation significance and is of Local Importance.

Lesser horseshoe bat is an Annex II species under the EU Habitats Directive and is listed as a species of qualifying interest for Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. In accordance with Marnell *et al* (2022), the status of the roost at the proposed site is "*small numbers of rarer species, not a maternity site*". As such, the roost for a lesser horseshoe bat at the site is considered to be of moderate conservation significance and is of Local Importance.

The status of Irish bat species (Marnell *et al*., 2019) is summarised in Table 3-3. The bat species recorded at the site are all of Least Concern.

The conservation status of all the bats recorded at the site is Favourable, with the exception of lesser horseshoe bat, which is categorised as being of Inadequate conservation status (NPWS, 2019).

Table 3-3: Status of Irish Bat Fauna (Marnell et al., 2019).

Species: Common Name	Irish Status	European Status	Global Status
Resident Bat Species			
Daubenton's bat (*Myotis daubentonii*)	Least Concern	Least Concern	Least Concern
Whiskered bat (*Myotis mystacinus*)	Least Concern	Least Concern	Least Concern
Natterer's bat (*Myotis nattereri*)	Least Concern	Least Concern	Least Concern
Leisler's bat (*Nyctalus leisleri*)	Least Concern	Least Concern	Least Concern
Nathusius' pipistrelle (*Pipistrellus nathusii*)	Least Concern	Least Concern	Least Concern
Common pipistrelle (*Pipistrellus pipistrellus*)	Least Concern	Least Concern	Least Concern
Soprano pipistrelle (*Pipistrellus pygmaeus*)	Least Concern	Least Concern	Least Concern

Species: Common Name	Irish Status	European Status	Global Status
Brown long-eared bat (*Plecotus auritus*)	Least Concern	Least Concern	Least Concern
Lesser horseshoe bat (*Rhinolophus hipposideros*)	Least Concern	Near threatened	Least Concern
Possible Vagrants			
Brandt's bat (*Myotis brandtii*)	Not Assessed	Least Concern	Least Concern
Greater horseshoe bat (*Rhinolophus ferrumequinum*)	Not Assessed	Near threatened	Least Concern

4 Potential Impacts

Planning permission is being sought from Kerry County Council for alteration and extension of the old abattoir building at the proposed site. The results of surveys undertaken in May 2023 and June 2023 indicate that the building supports a day roost for a small number of soprano pipistrelle; the building is also used as an occasional night roost for individual/ small numbers of natterer's bat/ *Myotis* species and is also a small day and night roost for lesser horseshoe bat.

4.1 Loss of Roosting Habitat

There is potential for the proposed development to result in the loss of a day roost for a small number of soprano pipistrelle, an occasional night roost for individual/ low numbers of natterer's bat/ *Myotis* species and a day and night roost for a small number of lesser horseshoe bat.

The proposed development includes for the alteration and extension of this building. Should the works be undertaken during the active season for bats (April to September), there is potential for direct impacts on soprano pipistrelle, natterer's bat/ Myotis species and lesser horseshoe bat. In the absence of mitigation, this would be an adverse effect which would be significant at the local geographic level. This impact assessment is based on the fact that all three species recorded roosting within the building have a national status of "Least Concern"; soprano pipistrelle and natterer's bat/ Myotis species are considered to be of "Favourable" conservation status, while lesser horseshoe bat is of "Inadequate" status. The type of roosts recorded (i.e. small day and night roosts) are of less conservation significance than other roost types (e.g. maternity roosts or major hibernation roosts). It is further noted that Marnell *et al* (2022) consider the loss of a night roost to be a low scale of impact.

4.2 Disturbance

There is also potential for disturbance as a result of lighting during the construction and operational phase. When bats emerge from roosts they tend not to echolocate but rely on eyesight to fly from the roost to adjoining treelines or hedgerows. Various studies have shown that bats' eyesight works best in dim light conditions; where there is too much luminance bats' vision can be reduced resulting in disorientation. Too much luminance at bat roosts may cause bats to desert a roost. Light falling on a roost exit point can delay bats from emerging and miss peak levels of insect activity at dusk and any delays of emergence can reduce feeding periods.[3] In the absence of mitigation, disturbance of bats due to lighting would have an indirect, significant adverse impact at the local geographic level.

[3] Stone E.L. (2013) Bats and Lighting: Overview of current evidence and mitigation.

5 Mitigation

5.1 Bats

Bats utilise the old abattoir for roosting, therefore, safeguards are required to ensure the safety of these animals during works.

Application for a derogation licence

NB: Work on a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service before works on the roost can commence. Such a licence is required for the proposed works to the old abattoir and no works should be undertaken on the old abattoir before the licence is granted by the NPWS.

This application for derogation qualifies under Regulation 54(2)(C) of the European Communities (Birds and Natural Habitats) Regulations as the proposed development is required to fulfil a housing need and, as such, is of social and economic importance.

Alternative solutions considered included not completing the alteration and extension works to the old abattoir. However, that option is not feasible as the building is not fit for habitation in its current condition. The proposed development will require alterations to the building in order to make the it habitable; there is no suitable alternative to the proposed works. With the implementation of the mitigation measures outlined below, the proposed development and actions outlined within this report will not be detrimental to the maintenance of populations of bat species at favourable conservation status in their natural range (as required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations.

In accordance with Marnell *et al* (2022), the old abattoir supports bat roosts considered to be of low to moderate conservation significance. As stated in Figure 20, page 46, this necessitates:

"*the provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements*"

Measure 1: timing of works

In accordance with the *Bat Mitigation Guidelines for Ireland*, the optimum time for undertaking works to a building supporting a summer roost (not a proven maternity site) is between 1st September and 1st May.

The proposed development includes the alteration and extension of the old abattoir. To avoid disturbance to bats, works to the old abattoir shall occur between 1st September and 1st May.

Alteration and extension works shall only proceed under licence.

Measure 2: alteration and extension works

Prior to alteration and extension works, the old abattoir will be re-examined immediately prior to the commencement of works to assess whether bats are present. A dusk or dawn emergence/re-entry survey for evidence of bat usage immediately prior to the commencement of works will be undertaken and a passive monitor will be left recording within the abattoir all night. In the event that no evidence of bat usage is found during the survey, works can commence. Should bats be found within the building, works will be delayed until they are no longer present (i.e. they have naturally flown from the roost). The internal sarking boards shall be removed by hand and under supervision by a bat specialist. Prior to commencement of works the bat specialist will brief the contractors on the possible presence of bats on the site, the subsequent need to take appropriate care and attention whilst

carrying out the works and the steps to take should bats be discovered at the site at any time (i.e. stop works and inform the bat specialist). Active bats will usually keep out of the way of any operations, but torpid bats may need to be gently temporarily placed in a box until dusk and released on site.

Measure 3: provision of new roost facilities

In this instance, the proposed site is located directly adjacent to a building that has recently been converted from old stables to a dwelling. A dedicated bat house has been constructed to the south of the proposed site (Plate 5-1), which was designed as a roosting site for lesser horseshoe bat, incorporating roosting features for brown long-eared bat and Daubenton's bat (Bat Eco Services, 2021).

Plate 5-1: Bat house constructed to the south of the proposed development (proposed site just visible in the background)

In view of the presence of a dedicated bat house designed to accommodate lesser horseshoe bat to the south of the proposed site, no further new roosting provisions for this species are required.

As noted previously, features have been incorporated into the bat house for other species, including the provision of a woodstone bat box, which would be suitable for natterer's bat and pipistrelle species. Further to this, it is required that bat boxes are installed to mitigate for the loss of roosting habitat and for the general conservation of local bat populations. 4 no. summer bat boxes will be installed in consultation with a bat specialist. The Schwegler Woodcrete 1FF bat box is recommended[4] and these boxes shall be installed on buildings or trees in a known bat foraging area.

Measure 5: Lighting

Lighting within the site shall be installed with sensitivity for local wildlife while still providing the necessary lighting for human usage.

The following general principals will be followed in relation to the overall lighting plan for the site:

- Lighting design will be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting shall be used within the proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas.

[4] 1FF Schwegler Bat Box With Built-in Wooden Rear Panel | NHBS Practical Conservation Equipment

- Dark buffer zones will be used to separate habitats or features from lighting by forming a dark perimeter around them. This shall be used for habitat features noted as foraging areas for bats, for example the courtyard and access track to the south of the site. It is essential that a dark buffer zone is retained around the bat house.
- Buffer zones will be used to protect dark buffer zones and rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature or habitat that requires to be protected.

Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following will be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2018).

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins is recommended to reduce the blue light component of the LED spectrum).
- Luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- The use of specialist bollard or low-level downward directional luminaires shall be used in bat sensitive areas to retain darkness above.
- Column heights will be carefully considered to minimise light spill. The shortest practicable column height should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

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A: Description of Irish Bat Species

Ireland has ten known bat species from two distinct families. Each is briefly described below. For a more comprehensive overview see Roche *et al* (2014). The conservation status of each species is derived from NPWS (2019).

Vespertilionidae:

Common pipistrelle (*Pipistrellus pipistrellus*)

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*, which is detailed below (Barratt et al, 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland. The conservation status of this species is Favourable.

Soprano pipistrelle (*Pipistrellus pygmaeus*)

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. 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 but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer. The conservation status of this species is Favourable.

Nathusius' pipistrelle (*Pipistrellus nathusii*)

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, 2000) and also in Fermanagh, Longford and Cavan. It has also been recorded in Counties Cork and Kerry (Kelleher, 2005). However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The conservation status of this species is Favourable.

Leisler's bat (*Nyctalus leisleri*)

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. The conservation status of this species is Favourable.

Brown long-eared bat (*Plecotus auritus*)

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings. The conservation status of this species is Favourable.

Natterer's bat (*Myotis nattereri*)

This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.

Daubenton's bat (*Myotis daubentonii*)

This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.

Whiskered bat (*Myotis mystacinus*)

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The conservation status of this species is Favourable.

Brandt's bat (*Myotis brandtii*)

According to NPWS (2013), whiskered and Brandt's bats are cryptic species and can only be told apart using DNA techniques. Brand't bat has been confirmed only once from Ireland; a single specimen found in 2003 in Wicklow (Mullen, 2006). Following this discovery, an intensive re-survey, involving DNA testing, was undertaken of all known whiskered bat roosts in Ireland, by the Centre for Irish Bat Research. Woodland mist-netting was also conducted for the species. Despite the extensive survey-work, no further Brandt's bats were identified. The most recent Red Data List for Irish Mammals (Marnell *et al*. 2009) lists Brandt's bat as data deficient. There is no evidence of any roosts for this species in the country and at present the single record for the species is considered an anomaly. Boston et al (2010) concluded that "M. brandtii …. cannot currently be considered a resident species. This species is now considered a vagrant to the country and consequently, a detailed assessment has not been carried out.

<u>Rhinolophidae:</u>

Lesser horseshoe bat (*Rhinolophus hipposideros*)

This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of

Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Inadequate.