southern scientific services ltd

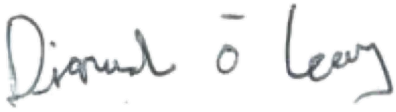
South Kerry Greenway

Lesser Horseshoe Bat Roost Enhancement Report

In Support of Derogation Licence Application for 2025

(With particular reference to Section 10 and Sections 11.1 - 11.4)

Requested For:	**National Parks and Wildlife Service**
Prepared By:	**Diarmuid O Leary B.Sc.** **Southern Scientific Services Ltd**
Our Reference:	**SSS-SKG-094**

Report Prepared By	Diarmuid O Leary	
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1. Introduction

Kerry County Council proposed the development of the South Kerry Greenway (SKG) comprising the construction of a 31.93Km greenway from Reenard, southwest of Caherciveen, to Glenbeigh in the northeast.

The SKG proposal was approved by An Bord Pleanála (ABP) (ref; ABP Order – 302450 - 18) subject to 11 conditions. Conditions 1, 2, 6, 7 & 8 are relevant in the context of the Works proposed here and condition 8 in particular is relevant in the preparation of this derogation license.

Condition 8 of the **ABP Board Order – 302450 - 18** specifies the following:

'The services of a suitably qualified and experienced Ecologist shall be retained to undertake pre-construction surveys at the various project elements immediately prior to commencement of works in order to check for the presence of protected species in the vicinity (including Badger, Otter, Lesser horseshoe bat, Kerry slug, Freshwater pearl mussel, St. Patrick's cabbage and Camomile). Any specimens shall be removed and relocated to a similar, suitable, undisturbed nearby habitat under the direct supervision of the Ecologist and subject to a Derogation Licence where required.'

***Reason**: In the interest of protecting ecology and wildlife in the area.*

This document is being submitted in support of the **Application for a Derogation Licence under the European Communities (Birds and Natural Habitats) Regulations 2011 - 2022 - No 54 (SI No 477 of 2011).** It has been prepared by the Southern Scientific Services Ecology Team under the direction of the SKG Project Ecologist.

2. Background

Investigations carried out in the preparation of the EIAR and NIS for the South Kerry Greenway (SKG) identified issues regarding protected species, one of which was the Lesser Horseshoe Bat (LHB) (*Rhinolophus hipposideros*).

One site was identified as a maternity roost occupied by c. 45 LHB in a disused house located adjacent to the N70 and on the originally proposed track of the SKG. The route of the greenway was adjusted to avoid any impact on the building or disturbance of the bat roost. Refer to site photos in **Appendix A**.

Surveys undertaken in 2017 and again in 2019 confirmed the presence of the bats during the summer period and that the building was not occupied in the period from October to April.

Additional surveys were undertaken by Southern Scientific Services ecologists with an NPWS Conservation Ranger in July 2023, and they have confirmed that the site was still being used as a LHB Roost. The surveys identified young bats on the site, therefore, upgrading the site to a maternity roost.

Bat survey work was undertaken in spring and summer of this year, 2024, by Dr. Tina Aughney of Bat Eco Services. This survey work included internal inspections of Griffins Cottage and counts of the roosting Lesser Horseshoe Bats on 10 separate occasions. Bat emergence surveys were carried out and static detectors were also deployed in strategic locations during spring and summer months. The full survey is presented in **Appendix C** of this report.

In addition, one of the 3 nearby Drung Hill Tunnels (made up of one retaining shed to the east and two tunnels) which are located between ITM X460064 Y588997 and ITM X459640 Y589099, approximately 2km west along the greenway route, have been confirmed by NPWS as being used intermittently as hibernation roosts by a single LHB in the past. Refer to map in **Appendix B** and site photos in **Appendix A**. All 3 tunnels have the potential for use as LHB hibernation sites.

The following sections summarise the relevant investigations and findings pertaining to LHB as presented in the Natura Impact Statement (NIS) and the Environmental Impact Assessment Report (EIAR).

2.1 Summary of Relevant Content from the South Kerry Greenway NIS Documents

2.1.1 General

The Lesser Horseshoe Bat (LHB) (*Rhinolophus hipposideros*) is a Qualifying Interest species of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365). The results of surveys for this species are described in Section 3.5.5.1 to Section 3.5.5.3 of the NIS. The results of the surveys, as they pertain to this species, are outlined in Section 3.7.3.

Evidence of roosts was searched for as per NRA (2006), Aughney et al. (2008) and Collins (2016).

A survey of the Drung Hill Tunnels was conducted, on February 19th, 2014, by two ecologists with extensive experience in bat roost habitat and bat activity surveying, to determine if suitable hibernation roosting habitat for LHB was available. A similar survey was repeated in July and September 2014.

A significant constraint on seasonal roost site selection is the fact that LHB needs flight space and flying access, ideally, an opening of 300mm (wide) x 200mm (high), so that they can fly (instead of crawl) directly into the roost (BCT,2012).

During ecological surveys along the route corridor, conducted on the 28th of August 2017, an unoccupied house (referred to as Griffin's cottage) adjacent to the footprint of the proposed route, was identified as having low moderate potential as a summer roost site for LHB, owing to its condition and due to the presence of broken windows and a broken door which allowed access to the building and its location adjacent to a small area of immature deciduous woodland which extends westwards along the N70 for approximately 600m. Further inspection of the interior of the house was undertaken to determine whether the house was of potential value to bats. The building is located approximately 1.35 km to the east of the Drung Hill Tunnels and located approximately 335m outside of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC site boundary. At the time of the survey, the house was in a dilapidated state and was in a state of disrepair and it appeared that upgrading works had ceased and remain incomplete. The house was reinspected on November 30th, 2017.

In Ireland, LHB distribution is strongly linked with broadleaved and mixed woodland, and it usually forages in woodland and scrub where it feeds on craneflies, caddis flies, lacewings, midges and moths. Tall hedgerows or woodland edges delimiting pastures grazed by cattle tend to be favoured core foraging areas (Ransome et al., 2000) and the species actively avoid bog habitats (Lundy et al., 2011). It is the only Irish bat species capable of exploiting Doppler-shifted echoes, and it emits calls between 105 kHz and 115 kHz, higher than the other bats. However, one disadvantage of such high-frequency calls is that they do not travel far from the bat, so this species cannot detect distant objects. As a result, it must commute between roosts and foraging habitats by closely following linear features, such as hedgerows, stone walls, earth banks and tree lines.

LHB preferentially selects buildings for maternity roosts. Maternity roosts may be evacuated periodically throughout the summer as bats avail of a number of roosts during the summer (there is rarely only one roost used for the entire summer for most species of bat (NRA, 2006)).

During hibernation, the species has an almost exclusive association with underground sites, and it is rarely found in any other type of site (Kelleher et al., 2006)

1.1.1 Unoccupied House (Griffin's cottage)

1.1.1.1 Hibernation Roost Evaluation

This building was found not to provide the conditions suitable for hibernation and on inspection on November 30th the house was no longer occupied. As a result, it was not considered to constitute a hibernation site. However, its occupancy during the summer months means that there was potential for adverse impacts as a result of the proposed SKG.

1.1.1.2 Summer Roost Site Evaluation

This building was inspected on the 28th of August 2017. A total of 35 Lesser Horseshoe Bats (LHB) were recorded inside the house. A second visit to the house in the company of NPWS local ranger and DCO was undertaken on the 4th of September 2017, where a similar number of bats were recorded inside the house. A subsequent survey was undertaken on the 29th of November 2017 in the company of the NPWS local ranger, where it was found that all bats had vacated the building.

Based on the precautionary principle, and because the boundary of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC is situated approximately 300m to the southeast of the building, the bats present are considered to be part of this Natura 2000 site's resident population. Because roosting bats were recorded, NPWS was informed immediately and NPWS management are aware of the specific location.

1.1.2 Mitigation

Measures to ensure that the roost site within this building will be protected are outlined in Section 3.11.5 of the NIS. As this is an active roost site adverse disturbance or displacement impacts could ensue should the timing of the construction works coincide with occupancy of the roost site. The main potential source of disturbance would comprise the amount of rock breaking that will be required to the rear of the house to facilitate the construction of the Greenway (approximately 843m3). There will be no requirement for rock blasting. However, disturbance impacts will only ensue if the activities that could cause disturbance were to occur in proximity to the roost site and then only if the site is occupied. Mitigation measures to prevent this are outlined in Section 3.11.4 and residual impacts are assessed in Section 3.12 of the NIS.

1.1.3 Surveys prior to works

Prior to the works commencing at Griffin's cottage an emergence survey will be undertaken and the roost will be inspected to confirm that the roost is unoccupied.

Prior to works commencing in the Drung Hill Tunnels each tunnel will first be inspected for any hibernating LHB.

1.2 Summary of Relevant Content from the South Kerry Greenway EIAR Documents

1.2.1 Appendix 1.3 of EIAR - Schedule of mitigation measures

The building in which the LHB roost was recorded was initially due to be demolished to facilitate the Greenway route. Through consultation with NPWS, the alignment was revised, and the building was retained. It is proposed to enhance the roost for bats and to utilise this building as an educational tool to highlight this important ecological feature and to emphasise the biodiversity value of the area.

1.1.1.3 Appendix 3.7 of EIAR - Outline Construction and Environmental Management Plan
Bats pre-construction roost surveys will be undertaken to identify any use of trees or structures along the route by bats in the event that individual bats may utilise structures as temporary roosts, or in the event that bats have begun to roost in a previously surveyed feature. If individual bats need to be removed from a structure to allow work to continue, this must be carried out by an appropriately qualified person under a Wildlife Licence from National Parks and Wildlife Service (NPWS).

If a maternity or hibernation roost is found to be present, advice will be sought from the NPWS and Bat Conservation Ireland before works will be allowed to advance and additional surveys/enabling works will only be undertaken under the appropriate NPWS licence. During the felling of trees, soft felling should be carried out, where tree limbs are cut and left grounded overnight to allow any bats to make their way out of cracks, crevices, or dense ivy.

The proposed rock-breaking procedure to facilitate circumnavigating the LHB roost at Griffins cottage will only be carried out during the optimum time period for carrying out works at a Maternity site – 1st September – 1st May. Rock breaking to facilitate the construction of the Greenway route will ensure the use of modern rock-breaking units with integrated sound suppression. Rock blasting will not be permitted.

Bats:

- Native plant species (including hawthorn, blackthorn, hazel, willow, and oak) will be planted along the route in consultation with KCC and landowners, to increase the value of the Greenway as a foraging habitat to bats. Native species offer higher quality habitat for invertebrates, the main prey item for bat species. All planting and hedgerow creation will be carried out following the guidelines and recommended methodology referenced in Knowles, (1995) and JNCC, (2001).
- Bat boxes shall be erected at suitable locations along the route as instructed by the project ecologist.
- The LHB roost will be enhanced by providing suitable partitioned void space and unobstructed entrances and fly space within the existing building. LHB roost enhancement works shall only take place during the optimal time period - 1st September–1st May - in consultation with NPWS and BCI. All roost enhancement work will follow NPWS Bat Mitigation Guidelines for Ireland12 and the Joint Nature Conservation Committee (JNCC) Bat Work Manual13.

1.1.1.4 Appendix 11.1 Ecological Field Surveys Report
LHB roost:
During 2017 ecological surveys along the route corridor, a building was identified as having potential suitability for roosting bats, owing to its location within a well-vegetated commuting corridor and its obvious disused nature. Further inspection of the interior of the house was undertaken on the 28th of August 2017, to determine whether the house may be used by bats. A total of 35 LHB were recorded inside the house. A second visit to the house in the company of NPWS local ranger and DCO was undertaken on the 4th of September 2017, where a similar number of bats were recorded inside the house. A subsequent survey was undertaken on the 29th of November 2017 in the company of the

NPWS local ranger, where it was found that all bats had vacated the building. The overall suitability of this house for bats in general is considered low owing to exposure, disturbance, and light influences.

3. Current License Application for 2025

3.1 Site Location

The sites for which the Derogation Licence is being applied is a disused cottage and 3 existing tunnels. The Grid Reference for this building 'Griffin's Cottage' is ITM X461493 Y588914 and the Drung Hills Tunnels is ITM X459760 Y589030.

See **Appendix B** showing the location of this building and tunnels relative to the SKG and N70

1.1 Summary of Results of Summer 2023 Bat Surveys

Surveys in July 2023 carried out by local NPWS ranger have again confirmed the presence of LHB at the site in Griffins Cottage. On inspection, the building was found to have a number (approximately 45) of LHB hanging from the apex of the pitched roof. As mentioned previously young bats were observed and therefore the site is a confirmed LHB maternity roost.

1.2 Summary of Results of Spring and Summer 2024 Bat Surveys

Surveys in 2024 carried out by Dr. Tina Aughney confirmed the continued occupancy of LHB at the site. The interior of the building was inspected on 10 occasions between 1/2/2024 and 7/9/2024. A minimum of one Lesser Horseshoe bat was recorded during each survey with a maximum of 73 individual bats roosting during a visit in July (see table 1 below). The full report is presented in **Appendix C**.

Table 1: LHB observed within the building

No.	Date	Observed LHB
1	1/2/2024	1
2	15/2/2024	2
3	10/4/2024	3
4	17/4/2024	4
5	7/6/2024	35
6	13/6/2024	29
7	14/6/2024	27
8	20/6/2024	46
9	21/6/2024	43
10	7/9/2024	73

1.2 Proposed Mitigation

The following sections present the proposed bat mitigation measures based on:

- NIS mitigation (these are outlined previously in Sections 1.1.3, 1.1.4 and 1.2.1.)
- EIAR mitigation, and
- Additional recommendations proposed by Dr. Tina Aughney (refer to Appendix D for full report).

3.1.1 Seasonal Timing of Works Adjacent to the LHB Roost at Griffins cottage

The main potential source of disturbance would comprise the rock breaking that will be required to the rear of the house to facilitate the construction of the Greenway (approximately 850m^3). Given that the roost site is a proven maternity site, in order to ensure that disturbance or displacement impacts on roosting bats are avoided, works in proximity to the bat roost will be timed to occur during the optimum period for carrying out works These works to the cottage should be undertaken in the months of September, October and November or the spring months of March and April. If no bats are recorded hibernating in December (i.e. the weather is mild) then works can proceed into this month. However caution is required during December to February due to high potential of hibernating bats being present. Additional timing constraints are presented below in Section 3.1.3 as follows:

- Proposed works on the cottage to improve it as a roost for Lesser Horseshoe bats is undertaken prior to rock breaking operations and construction access works west of the cottage. This will ensure that the structure is stable and suitable for roosting bats with appropriate exit/ entrance points in place.
- Rock breaking is undertaken outside of the maternity season and the prime activity period for bats in the months May to August.

3.1.2 Conservation and Enhancement of the LHB Roost at Griffins cottage

The LHB summer roost site at Griffins cottage will be protected and enhanced during the winter months when bats have vacated the structure to hibernate underground. Enhancement of the house will be undertaken under direction from and in consultation with the NPWS and Bat Conservation Ireland (BCI) with the view to optimising the roost and encouraging LHB to return annually.

A meeting took place on the 15th of July 2023 with a NPWS Conservation Rangers and District Conservation Officer at the LHB Maternity Roost and the following enhancement measures for the roost were discussed:

- Install flooring on the existing first-floor beams to create a loft space for the bats.
- Darken the interior of the building by blocking up all windows, including the skylights, but leaving a letterbox entrance in the window at the rear of the house where bats are currently emerging.
- Install a new secure door with a letterbox opening.
- The minimum area for the letter box opening should ideally have an area of 2500cm^2 this can be a square opening of 50 cm x 50 cm or a rectangular opening with a minimum height of 20 cm but maintaining the same overall area.
- Install a wooden baffle inside the doorway and behind the rear exit window to further reduce light spill into the building. See the image of the baffle below taken from the Vincent Wildlife Trust LHB Conservation Handbook.
- Repair and secure internal walls.
- Install plywood (or other suitable material) on the upper floor of the chimney wall to further the compartmentalise the house.
- Remove any overhanging vegetation adjacent to the house to minimise risk of rats entering.
- For building maintenance, the gutters should be cleared of dead vegetation.

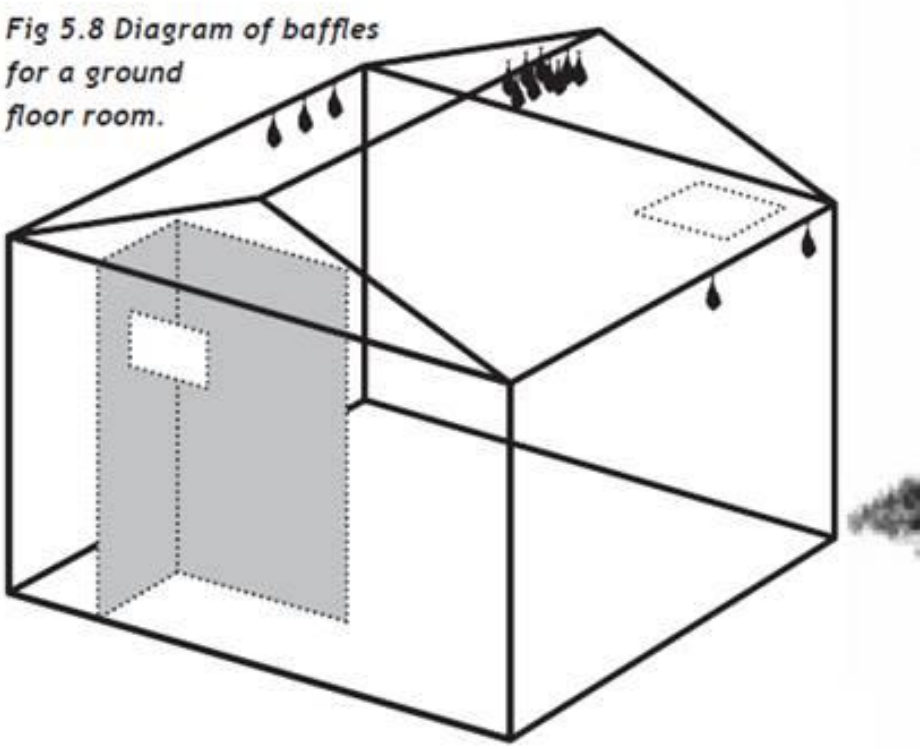


Figure 1: Recommendations provided by NPWS:

In addition to these and following a survey in February 2024, Dr. Tina Aughney proposed the following measures to enhance the cottage as a LHS bat roost aided by the figure below. Refer to **Appendix D** for the full recommendations report.

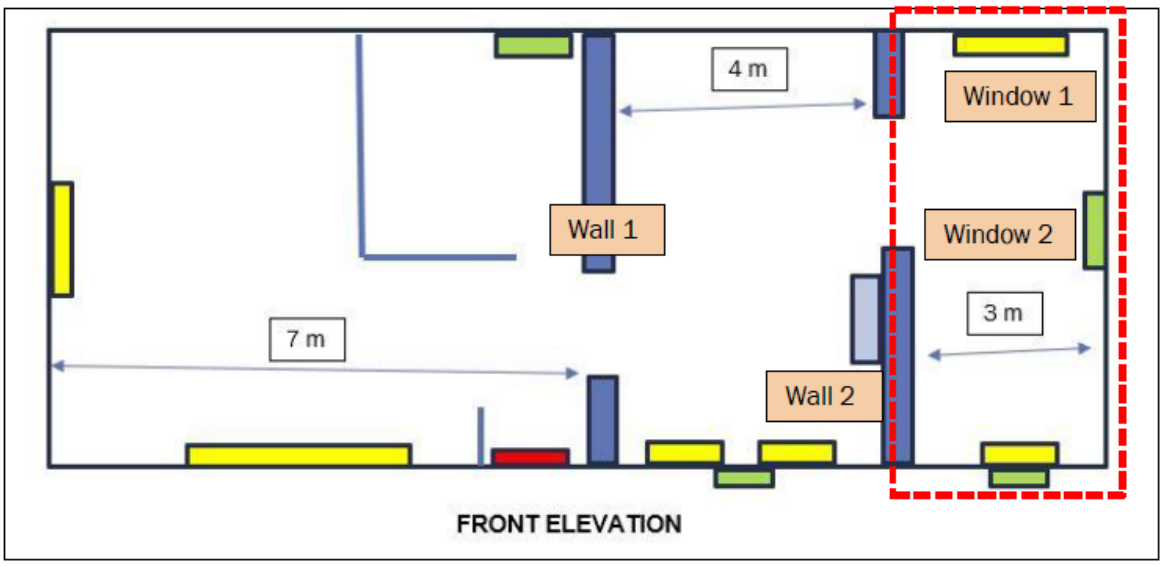


Figure 2: Drawing of internal layout (approximate) with Gable room highlighted by red dash box.

1. Internal wall (Wall 1) is required to be made stable and new door lintel inserted. The existing doorway gap should remain open post works.

2. All existing ground floor window frames (apart from one labelled as Window 1 – this will require a set of different works) should be removed and the space should be built up with modern concrete blocks and any gaps around the window frames should be filled to ensure that there are no drafts).
3. Advice is required on the best way to ensure that all of the existing dormer windows (apart from one labelled as Window 2 – this will require a different set of works) are draft free and blocked to prevent light entering. At a minimum, the internal area of the dormer windows should be covered with 1 inch plywood internally to reduce any light shining into the internal space of the building.
4. The existing front door (Red rectangle outline in blue) should be replaced with a more secure door and the base of the floor should be built up to prevent predators entering the cottage via the existing gap below the current door frame.
5. The upper sections of the 2nd original wall (wall 2 – where the chimney breast is located) should be built up to the rafters to create a separate room. This can be completed using a stud wall or concrete blocks. A door with a post box opening (dimensions of opening in door = 50cm X 50cm) should be positioned in the existing door area of this wall. This post box opening should be located near the upper section of the door, and this will allow bats to fly from the "Gable Room" to the rest of the cottage's internal space. This "Gable room" has been highlighted with a red dash box.
6. As per NPWS recommendations, existing timber beams (i.e. section of the cottage where loft floor timber beams are currently in place) should be floored with timber in order to create a loft space. The flooring should be strong enough to allow a surveyor to enter the loft space in order to count bats and to undertake maintenance works (e.g. removal of bat droppings). In order to reduce timber rotting as a result of bat dropping accumulation, it is recommended that the floor surface has 1-inch marine timber plywood or similar in order to increase durability for the decades to come (this could be a 2nd layer to the loft floor).
7. It is recommended that there are two lesser horseshoe entrances for bats into the internal space of the cottage. NPWS recommended that these two areas are the ground floor window named window 1 and the front door. However, I have reservations about using two ground floor exit/entrance points due to potential predation. Therefore, I propose that the gable window (Labelled as window 2 in the Gable room) which is located approximately 4m off the ground, should replace the proposed exit/entrance in the front door. As both of these exit/entrance points will be located in the new Gable room of the cottage (see point 5), it will reduce the degree of potential wind and light entering via the new exits/entrances throughout the building while ensuring that the rest of the cottage remains in darkness.
8. The existing window frame of window 1 (see plate 4) should be removed and built up with concrete blocks but leaving a post box opening (dimensions = 50cm X 50cm) and this opening needs to be located at the highest point of the existing window frame opening. Externally the new post box opening will need to be made predator proof and the easiest way to achieve this is to fix steel sheeting, securely, for 1m below the entrance and for a minimum of 50cm either side and above the exit/entrance with steel sheets. Fix an additional steel plate at an angle to the bottom of the exit/entrance creating a windowsill to prevent cats jumping directly through the opening.
9. For the 2nd exit/entrance point the dormer window in gable end of cottage (Red dash box in figure 2) will be used as the 2nd exit/entrance point for the Lesser Horseshoe bat colony. To complete this step, this window will be removed, and the opening will be built up the frame with concrete blocks but ensuring, again, that there is a post box opening (dimensions = 50cm X 50cm) within the space. This will also require predator proofing externally by placing steel sheeting around the post box opening.
10. A cooler room is to be provided on the ground floor for bats to move to during extreme temperature days. This is the ground floor room where there is currently a partially constructed modern concrete walls (below the existing timber beams). The first wall is a small 3 block high wall to the left-hand side of the front door entrance (as you enter the cottage). This should be built up

to the existing timber beams. In addition, the 2nd modern concrete wall that is currently built to within 30cm from the timber beams should also be finished.
11. Bat specialist is to liase with the construction contractor to ensure that the measures described above are strictly followed.
12. No internal plaster works are required. A rough finish is recommended to allow other bat species to roost within the cottage.
13. It is recommended that rubbish etc is cleared from the internal space of the cottage and externally gutterings and down pipes are fixed and cleared of vegetation.

3.1.3 Works in the vicinity of the LHB roost at Griffins cottage

In addition to conservation and enhancement works at the cottage, the following measures were recommended in relation to construction timing and works, cottage environs, and bat monitoring (refer to **Appendix D** for the full recommendations report):

1. Proposed works on the cottage to improve it as a roost for Lesser Horseshoe bats is undertaken prior to rock breaking operations and construction access works west of the cottage. This will ensure that the structure is stable and suitable for roosting bats with appropriate exit/ entrance points in place.
2. Rock breaking is undertaken outside of the maternity season and the prime activity period for bats in the months May to August.
3. A panel with noise insulation or sound blocking boards (to reduce the passage of sound between the rock breaking operations and the rear walls of the cottage) is erected to the rear of the cottage. As there is little space available to the rear of the cottage the insulation panel may need to be erected directly to the rear wall of the cottage. Sound blocking boards are typically acoustic plasterboard.
4. It is recommended that no temporary lighting is permitted to the rear of the cottage during rock-breaking works and that any lighting used during the construction of the greenway is turned off when daytime operations are completed.
5. A passive static detector (set to record 24 hrs/day) is to be deployed throughout the rock breaking works coupled with a temperature data logger to monitor potential impacts of noise and vibration on roosting bats. A minimum of monthly visits are recommended to undertake an internal count of roosting Lesser Horseshoe Bats and to download SD cards and re-deploy static unit. However, during the rock- breaking phase, this should be increased to a site visit once every 2 weeks but if monitoring results highlight the need for more regular visits, this should be set as a precautionary recommendation.
6. It is recommended that a minimum amount of vegetation removal is undertaken to reduce potential impacts, and this should be undertaken under supervision by the project ecologist.
7. It is recommended that temporary planting and/or hoarding is recommended on either side of the cottage where vegetation removal has been undertaken and where it is planned to be undertaken to ensure that there is a tall structure to mimic tall vegetation. This will ensure the integrity of existing commuting routes. This is required until new planting is satisfactorily established.
8. Monitoring of the Lesser Horseshoe Bat colony is recommended during renovations works and during the construction phase of the project by the project bat specialist.

3.1.4 Landscaping and Other Measures

Following bat surveys completed in the cottage environs in 2024, the following additional measures were recommended in relation to fencing, access, landscaping, planting and monitoring (refer to **Appendix D** for the full recommendations report):

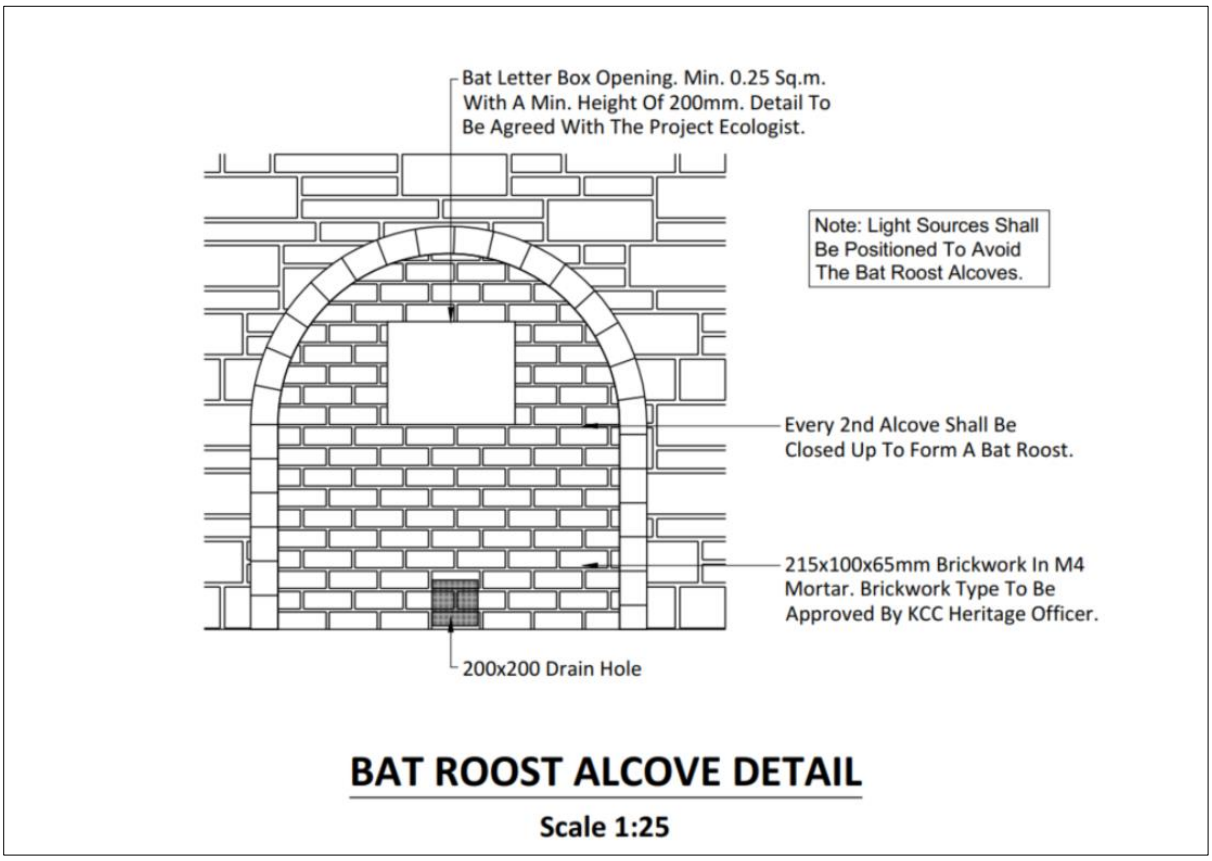
1. A 2.5m/8ft tall timber fence should be constructed around the rear and gables of Griffins Cottage during the construction phase of the project. This is recommended to buffer the cottage from greenway usage, potential maintenance works and protecting the ground floor exit/entrance for bats. This fence should be constructed 1m from the walls of the cottage and will provide a dark corridor around the cottage for bat usage. The final colour of this fence should be matt black to increase a dark corridor effect.
2. A canopy enclosure is required for the section of the proposed 2.5m fence. This canopy will be an enclosed cover fitted on top to the 2.5m fence and connected to the wall of the cottage. Thereby creating a "roofed corridor" directly over the exit/entrance point at rear of the cottage. The length of this roof should be 5m, with exit point in the centre of the "roofed corridor" it is recommended that these works are undertaken as soon as it is possible to build the 2.5m fence around the cottage post-rock-breaking phase.
3. A locked gate should be inserted in the fence (front or gable of the cottage) to allow NPWS staff etc access to the cottage for monitoring purposes. This should be undertaken as part of the greenway construction phase in vicinity of the cottage as soon as physically possible (i.e. once 3m timber fence is in place, locked gate should also be put in place).
4. It is important to ensure that there is restricted access to the cottage by greenway users in order to reduce any disturbance.
5. It is recommended that summer (in liaison with NPWS, a minimum of two counts is required during the Lesser Horseshoe Bat Monitoring Summer season) and winter counts (in liaison with NPWS, a minimum of two counts is required during the Lesser Horseshoe Bat monitoring Winter season) of roosting bats is undertaken annually until the greenway construction in vicinity of the cottage is completed.
6. The perimeter of the greenway along the N70 requires a buffer of vegetation and/or temporary timber hoarding panels. It is recommended that the panels extend 2m beyond vegetation removal. This buffer is required from the existing bridge (east of the cottage) to west of the cottage for the length of existing linear woodland. This buffer should be 1.5m high.
7. It is recommended that static surveillance surveys are undertaken annually during the construction of the greenway to ensure that any buffers used are working (Spring and Summer, minimum of 1 week surveillance to compare to such surveys undertaken in 2024).
8. Planting is to be undertaken under the supervision of the project ecologist and exact planting protocols (i.e. splitting of planting during and post-construction) to be determined by the project ecologist.
9. The southern perimeter of the greenway should be replanted with native trees and shrubs. Species such as alder, grey willow, hazel and holly are to be used. Project ecologist is to be consulted regarding planting mix. This planting should be undertaken in the appropriate planting season (November to March) post-greenway construction. This planting should be undertaken from the existing bridge (east of the cottage) to west of the cottage for the length of existing linear woodland.
10. N70 perimeter of greenway, where permitted, should have a minimum of 2m vegetation buffer of planting to provide commuting habitat for bats and to buffer such habitat from road traffic and maintenance works. Where there are gaps for vegetation these should also be planted. It is recommended that the wall height is increased to 1.5m to reduce vehicle noise disturbance and potential disturbance from vehicle lights during the night. The extent of the buffer will be determined in consultation with the proposed ecologist to ensure that there are no gaps in roadside vegetation.
11. The planting mix is to be approved by the project ecologist.
12. No lighting is recommended along the greenway.
13. An information board is recommended to be erected on the fence around Griffins Cottage to provide information on Lesser Horseshoe Bats.

3.1.5 Drung Hill Tunnels

The Drung Hill Tunnels are located between 1.6km and 2km Southwest of the Griffins Cottage LHB Maternity Roost. NPWS have confirmed that LHBs have used the tunnels as hibernation roosts in the past. Following a meeting on-site on the 15th of July 2023 with two NPWS staff the following mitigation measures for the tunnels were recommended to create potential roosting space for bats:

- Approximately every second alcove in the tunnels will be bricked up to create undisturbed and dark roosting places for LHB. As the alcoves are shallow, the bricks should be a maximum of 6 inches in width to maintain sufficient space for bats to fly in and land. A letter box opening should be placed in the centre of the bricked-up area (see Appendix B);
- The minimum area for the letter box opening should ideally have an area of 2500 cm^2. This can be a square opening of 50 cm x 50 cm or a rectangular opening with a minimum height of 20 cm but maintaining the same overall area.
- A gap will be left at the bottom of each alcove to clear any inappropriate material that may be put through letter box openings (e.g. waste from Greenway users).
- As per the EIAR, there should be no lighting in the tunnels at nighttime.
- SSSL will conduct monthly surveys of the tunnels to check for roosting bats during hibernation months.

Enhancement works in the Drung Hill Tunnels should be carried out during the summer months at the tunnels to avoid the winter hibernation period – 1st May to 1st September (Kelleher et al., 2006). NPWS propose to survey the tunnels next Jan / Feb 2024 to identify the most suitable alcoves in each tunnel for enhancement.



4. Clarifications In Respect Of Sections 10 & 11 Of The Derogation Licence Application Form

4.1 Clarification

The Derogation Licence being applied for here is a renewal of license number (DER/BAT 2023 -107) dated 28th of September 2023. This license was only granted until the end of the calendar year. The license was previously renewed for the 2024 calendar year and an amended version reflecting this was issued on 18/01/2024. However the works on the South Kerry Greenway are envisioned to last until 2026/2027 at a minimum.

1.1 Section C10 of the Derogation Licence Application Form

Section C 10 of the Derogation Licence Application form requests the following information:

Please tick which reason below explains how this Application Qualifies under Regulation 54(2)(A-E) of the European Communities (Birds and Natural Habitats) Regulations:

Kerry County Council and Southern Scientific Services regard Sub-section C 10 is indicated as the most relevant sub-Section and state the following:

In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.

The SKG development is seen to be a perfect fit in respect of the interests outlined as follows:

- Public Health
- Public Safety
- Social Benefit
- Economic Benefit
- Environmental/Ecological Benefits

1.2 Section C11 of the Derogation Licence Application Form

Section C 11 is a Report Checklist including 4 sub-sections. A detailed report is required of the applicant to support the Derogation Licence Application that addresses each of the following reasons**:**

11.1	Explanation as to why the derogation licence sought is the only available option for works and no suitable alternative exists as per Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations.	☒
11.2	Evidence that actions permitted by a derogation licence will not be 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 as is required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations.	☒
11.3	Details of any mitigation measures planned for the species affected by the derogation at the location, along with evidence that such mitigation has been successful elsewhere.	☒
11.4	As much information as possible to allow a decision to be made on this application.	☒

Question 11.1 Explanation as to why the derogation licence sought is the only available option for works and no suitable alternative exists as per Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations.

The following are the most pertinent reasons in respect of Question 11.1:

The original plan would have seen Griffin's cottage demolished as it lay on the preferred route of the SKG. When a LHB roost was discovered in the cottage it was necessary to retain the cottage and find an alternative route. At the location where the SKG approaches Griffin's Cottage (LHB Maternity Roost) the options open to KCC in the selection of alternatives to the route approved by An Bord Pleanala (ABP). The cottage is directly adjacent to the N70 and the possibility of sharing this road with the SKG was not possible for health and safety reasons. The path chosen is situated between Griffins cottage on the northern boundary and an occupied house on the southern boundary. The SKG corridor passes between the two houses in woodland. The retention of the cottage as a summer maternity roost will be used to enhance the environment for the LHB.

Question 11.2 Evidence that actions permitted by a derogation licence will not be 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 as is required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations.

The following are the most pertinent reasons in respect of Question 11.2:

The approach being taken in the surveying of the site and the mitigation measures to be employed are designed to enhance the environment of the area as a maternity roost for LHB in Griffin's cottage. Construction works as described in the Method Statement for this section of the SKG will be designed to minimise any possible impact. Indeed, efforts will be made to enhance the area surrounding the cottage for LHB foraging in accordance with best practices under the guidance of bat experts.

Question 11.3 Details of any mitigation measures planned for the species affected by the derogation at the location, along with evidence that such mitigation has been successful elsewhere.

The following are the most pertinent reasons in respect of Question 11.1:

As described in the NIS and EIAR, significant effort has gone into finding the most appropriate and beneficial mitigation and habitat enhancement methods in dealing with Griffin's Cottage. This includes the following:

- Consultation with NPWS.
- LHB surveys to monitor activity and find the most appropriate time for works with most recent surveys and recommendation report completed in spring and summer 2024 by Dr. Tina Aughney, bat specialist;
- Employment of least impactful construction methods;
- Close supervision of all works by KCC or contractor Project Ecologist;
- Enhancement of LHB Roost in terms of enhancement modifications to and upkeep of Griffin's Cottage primarily as a bat roost (as described previously).

Question 11.4 As much information as possible to allow a decision to be made on this application.

The following are the most pertinent reasons in respect of Question 11.1:

The extracts included above from the comprehensive NIS and EIAR documents submitted in the application to ABP for approval show the level of detail that was explored across all environmental and ecological issues showing the commitment of all involved in this project to care for the environment and biodiversity. This ranges from managing invasive species and protection of Annex II & IV Species including the HB. Dr. Tina Aughney, bat specialist, has been employed to complete further surveys and a recommendation report and will be employed for the duration of the construction phase of the project.

5. References

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National Roads Authority (NRA) (2006) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes, Published by the National Roads Authority

Pekins, C. E. 2011. Microclimate and bat occupation trends at Gorman Cave, Colorado Bend State Park, San Saba county, Texas during 2010-2011. Unpublished report to Texas.

Roche, N; Aughney, T; Marnell, F and Lundy, M (2014) Irish Bats in the 21st Century. Bat Conservation Ireland. Virginia. Parks and Wildlife Department, Colorado Bend State Park, Texas, USA.

Appendix A – Site Photos

Plate 1 – Photograph of Griffins Cottage c.2019

Plate 2 – Photograph of Griffins Cottage July 2023 – view west from N70

Plate 3 – Photograph of Drung Hill Tunnels (view east to middle tunnel).

Plate 4 – Photograph of Drung Hill Tunnels (View west to westernmost tunnel).

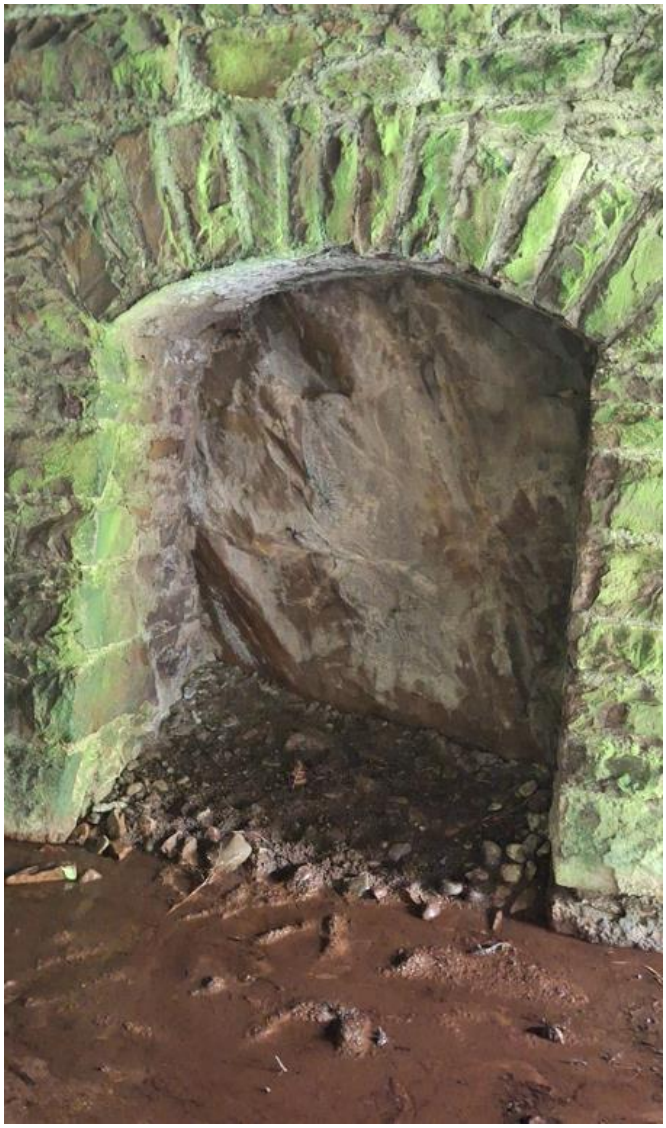
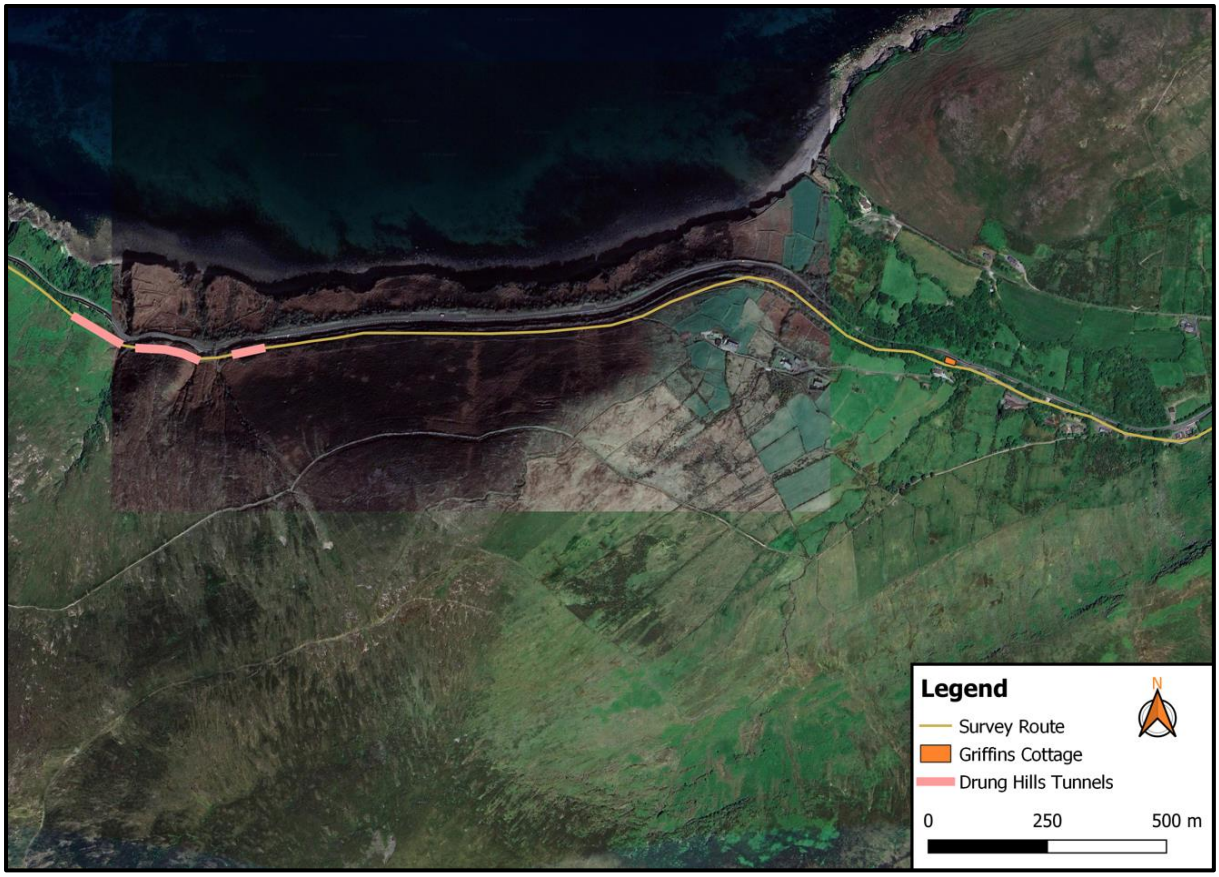


Plate 5 – Photograph of alcove in one of the tunnels.

Appendix B –

Map showing location of Griffins Cottage and Drung Hill Tunnels.


Legend
N
Survey Route
Griffins Cottage
Drung Hills Tunnels
0
250
500 m

Appendix C –

Spring and Summer Bat Surveys, 2025, Dr. Tina Aughney

2024

Lesser Horseshoe Bat Roost (Griffin's Cottage), South Kerry Greenway, Co. Kerry – Bat Surveys

Dr Tina Aughney

Bat Eco Services

Bat Eco Services, Ulex House, Drumheel, Lisduff, Virginia, Co. Cavan. A82 XW62.

Licenced Bat Specialist: Dr Tina Aughney (tina@batecoservices.com, 086 4049468)
NPWS licence C17/2023 (Licence to handle bats, expires 23rd January 2026);
NPWS licence 27/2023 (Licence to photograph/film bats, expires 31st December 2024);
NPWS licence DER/BAT 2022-36 (Survey licence, expires 24th March 2025).

Statement of Authority: Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She was a monitoring co-ordinator and trainer for Bat Conservation Ireland for 20 years. She is a co-author of the 2014 publication *Irish Bats in the 21st Century.* This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015.

All analysis and reporting is completed by Dr Tina Aughney. Data collected and surveying is completed with the assistance of a trained field assistant.

Mr. Shaun Boyle (Field Assistant) NPWS licence DER/BAT 2022-37 (Survey licence, expires 24th March 2025).

Client: Kerry Co. Co.

Project Name & Location: Lesser Horseshoe Bat Roost (Griffin's Cottage), South Kerry Greenway, Co. Kerry

Report Revision History (Report – New Format)

Date of Issue	Draft Number	Issued To (process of issuing)
23rd April 2024	Draft 1	By email to Monica Kane
2nd July 2024	Draft 2	By email to Monica Kane
14th September 2024	Final	By email to Monica Kane

Purpose
This document has been prepared as a Report for Kerry Co. Co. Only the most up to-date report should be consulted. All previous drafts/reports are deemed redundant in relation to the named site.

Bat Eco Service accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

Carbon Footprint Policy
It is the policy of Bat Eco Services to provide documentation digitally in order to reduce carbon footprint. Printing of reports etc. is avoided, where possible.

Bat Record Submission Policy
It is the policy of Bat Eco Services to submit all bat records to Bat Conservation Ireland database one year post-surveying. This is to ensure that a high level bat database is available for future desktop reviews. This action will be automatically undertaken unless otherwise requested, where there is genuine justification.

Citation: Bat Eco Services (2024) Bat Surveys of Lesser Horseshoe Bat Roost (Griffin's Cottage), South Kerry Greenway, Co. Kerry. Unpublished report prepared for Kerry Co. Co.

Contents

1. Introduction

Bat Eco Services was commissioned by Kerry Co. Co. to undertake the bat surveys to determine the usage of Griffin's Cottage by Lesser horseshoe bats *Rhinolophus hipposideros,* an Annex II species under the EU Habitats Directive.

The aim of the project is:

- To determine the exit points for lesser horseshoe bats;
- To document the usage of the building by lesser horseshoe bats in Spring 2024;
- To determine if other bat species are roosting in the building;
- To document commuting routes from the cottage for lesser horseshoe bats;
- To document foraging habitats for local bat populations.

Bat Eco Services designed a bat survey approach, principally, with reference to Marnell *et al.* (2022) and Collins (2023). An array of bat survey methods were used to compile data during bat surveys. This report will detail the bat survey results and along with a desktop study is used to provide advice on the future conservation of the cottage for local lesser horseshoe bat populations and the mitigation measures required in relation to the proposed South Kerry Greenway.

1.1 Relevant Legislation & Bat Species Status

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Acts (2000 and 2010). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat *Rhinolophus hipposideros* is further listed under Annex II. Across Europe, they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

Also, under existing legislation, the destruction, alteration or evacuation of a known bat roost is an offence. The most recent guidance document is "Guidance document on the strict protection of animal species of Community interest in the Habitats Directive (Brussels, 12.10.2021 C(2021) 7391 final".

Regulation 51(2) of the 2011 Regulations provides –

("(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under *Regulation 54,* a person who in respect of the species referred to in *Part 1* of the *First Schedule*—
(*a*) deliberately captures or kills any specimen of these species in the wild, (*b*) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,
(*c*) deliberately takes or destroys eggs of those species from the wild,
(*d*) damages or destroys a breeding site or resting place of such an animal, or
(*e*) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive, shall be guilty of an offence."

The grant of planning permission does not permit the commission of any of the above acts or render the requirement for a derogation licence unnecessary in respect of any of those acts.

Any works interfering with bats and especially their roosts, may only be carried out under a derogation licence granted by National Parks and Wildlife Service (NPWS) pursuant to Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (which transposed the EU Habitats Directive into Irish law).

There are eleven recorded bat species in Ireland, nine of which are considered resident on the island. Eight resident bat species and one of the vagrant bat species are vesper bats and all vespertilionid bats have a tragus (cartilaginous structure inside the pinna of the ear). Vesper bats are distributed throughout the island. Nathusius' pipistrelle *Pipistrellus nathusii* is a recent addition while the Brandt's bat has only been recorded once to-date (Only record confirmed by DNA testing, all other records has not been genetically confirmed). The ninth resident species is the lesser horseshoe bat *Rhinolophus hipposideros*, which belongs to the Rhinolophidea and has a complex nose leaf structure on the face, distinguishing it from the vesper bats. This species' current distribution is confined to the western seaboard counties of Mayo, Galway, Clare, Limerick, Kerry and Cork. The eleventh bat species, the greater horseshoe bat, was only recorded for the first time in February 2013 in County Wexford and is therefore considered to be a vagrant species. A total of 41 SACs have been designated for the Annex II species lesser horseshoe bat (1303), of which nine have also been selected for the Annex I habitat 'Caves not open to the public' (8310).

The following species list (Table 1a) identifies the range of bat species (resident and vagrant) whose presence has been confirmed in Ireland along with their current status. According to the Bat Conservation Ireland databases, all nine resident bat species have been recorded in Co. Limerick.

Table 1a: Status of the Irish bat fauna (Marnell *et al.*, 2019 & NPWS, 2022).

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
Brown long-eared bat *Plecotus auritus*	Least Concern	Least Concern	Least Concern
Lesser horseshoe bat *Rhinolophus hipposideros*	Inadequate	Least Concern	Least Concern
Possible Vagrants ^			
Brandt's bat Myotis brandtii	Data deficient	Least Concern	Least Concern
Greater horseshoe bat *Rhinolophus ferrumequinum*	Data deficient	Near threatened	Near threatened

^ Roche *et al.,* 2014

1.1.1 NPWS Article 17 Reporting

NPWS (2019) provides details on the conservation status for each of Ireland's bat species along with distribution maps (See appendices for such maps). The following table summarises the conclusions of Article 17 assessment of conservation status at the end of the most recent reporting period. Additional information for each of the bat species provides some clarifying notes in relation to the conservation status conclusions. Such information, where appropriate to the current project, will be drawn on in the project assessment section.

Table 1b: NPWS Article 17 Conservation Status of Irish Bat Species (Adapted from NPWS, 2022).

	Range	Population	Habitat	Future Prospects	Conservation Status Assessment	Conservation Status Trend
Lesser horseshoe bat	Inadequate	Favourable	Inadequate	Inadequate	Inadequate	Deteriorating
Common pipistrelle	Favourable	Favourable	Favourable	Favourable	Favourable	Improving
Soprano pipistrelle	Favourable	Favourable	Favourable	Favourable	Favourable	Improving
Nathusius' pipistrelle	Unknown	Unknown	Favourable	Unknown	Unknown	Not applicable
Natterer's bat	Favourable	Favourable	Favourable	Favourable	Favourable	Stable
Daubenton's bat	Favourable	Favourable	Favourable	Favourable	Favourable	Improving
Whiskered bat	Favourable	Favourable	Favourable	Favourable	Favourable	Improving
Brown long-eared bat	Favourable	Favourable	Favourable	Favourable	Favourable	Improving
Leisler's bat	Favourable	Favourable	Favourable	Favourable	Favourable	Improving

1.1.2 Irish Bat Monitoring Programme – Population Trends

The Irish Bat Monitoring Programme provides information on monitoring schemes managed by Bat Conservation Ireland:

● Car-Based Bat Monitoring (All Ireland) – monitors common pipistrelle, soprano pipistrelle, Leisler's bats with limited information for Nathusius' pipistrelle and *Myotis* species.
● All Ireland Daubenton's Bat Waterway Monitoring
● Brown Long-eared Bat Roost Monitoring
● Lesser Horseshoe Bat Monitoring

This provides population trend data for seven bat species: common pipistrelle, soprano pipistrelle, Leisler's bat, Nathusius' pipistrelle, Daubenton'bat, brown long-eared bat and lesser horseshoe bat (some limited data for *Myotis* species). There is currently no systematic monitoring surveys for Natterer's bat and whiskered bat.

Annual reporting is undertaken and the most recent report (Aughney *et al.,* 2023) is referenced for this report. In summary, the population trends for each bat species are as follows:

- Trends of the three common bat species (common pipistrelle, soprano pipistrelle and Leisler's bat) continued to increase in 2022, although the yearly estimates of common

pipistrelle levelled out a little. Confidence intervals of these three bat species were all above their baseline indices indicating they each show a significantly increasing trend.

- Nathusius' pipistrelle trends are still unclear due to low encounter rates but decreased a little in 2022 compared to previous years.
- The yearly estimate for the *Myotis* spp. group steadied out a little but overall the smoothed trend for this group is still well below the baseline.
- Daubenton's bat numbers trend line appears to be fairly steady from year to year with error bars consistently encompassing the baseline.
- Brown long-eared bat shows a fluctuating trend around the baseline and is considered to be currently stable.
- Lesser horseshoe bat continue to increase in 2022 for the summer counts while low winter counts caused a slight downward trend in 2022. But overall, this species has increased over the last 20 years of monitoring.

1.1.3 Proposed Project

Griffin's Cottage is an unused cottage located along the proposed route for the South Kerry Greenway. It is located 7km approximately west of Glenbeigh, Co. Kerry.

During database search of Bat Conservation Ireland records this structure was identified as a roost for lesser horseshoe bats and subsequent ecological surveys undertaken for the greenway confirmed occupancy for this species of bat. Due to its close proximity to the proposed greenway route, structural works are required adjacent to the cottage as part of the construction of the greenway. As a consequence, a bat survey was requested to monitor the extent of usage of the cottage by this species of bats and potential commuting routes in immediate vicinity of the cottage.

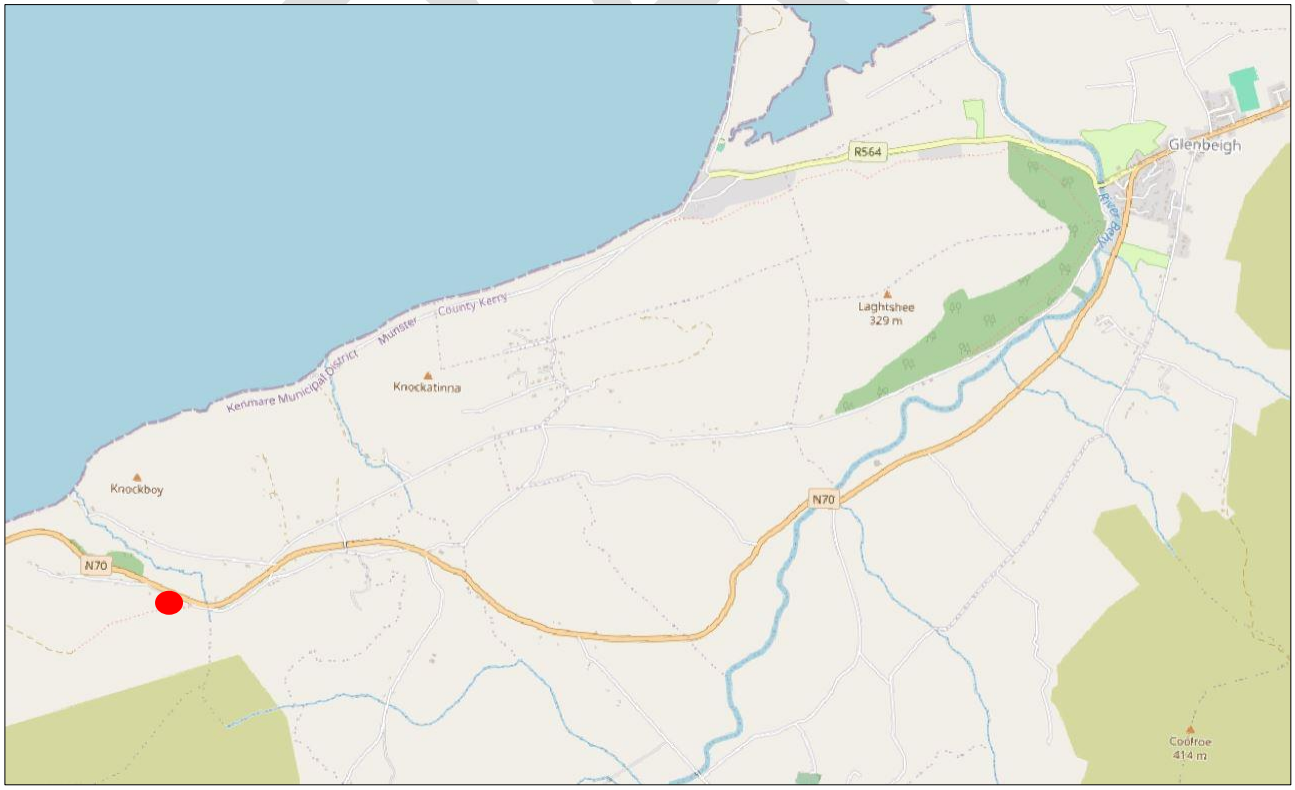


Figure 1: Approximate location of Griffin's Cottage relative to Glenbeigh, Co. Kerry (cottage is located in Red Circle).

2. Methodology

2.1 Guidance Document

This report will draw on guidelines already available in Europe and will use the following documents:

- Collins, J. (Editor) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). Bat Conservation Trust, London. *(Updated in September 2023)*
- NPWS & VWT (2022) Lesser Horseshoe Bat Species Action Plan 2022- 2026. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.
- 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 (Version 1: Kelleher & Marnell, 2006).
- The status of EU protected habitats and species in Ireland: Conservation status in Ireland of habitats and species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.
- Bat Conservation Trust (2023) Bats and artificial lighting at night. Guidance Note GN08/23. BCT, London & Institution of Lighting Professionals (ILP), Warwickshire.
- Guidance document on the strict protection of animal species of Community interest un the Habitats Directive (Brussels, 12.10.2021 C(2021) 7391 final.
- EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Collins (2023) was the principal document used to provide guidance in relation to bat survey effort required but the level of surveying is assessed on a case-by-case basis, by the principal surveyor, taking into consideration the historical bat records for the survey area, presence of built, structures and trees potentially suitable for roosting bats and the presence of suitable bat habitats for foraging and commuting. Additional reference is made to this document in relation to determining the value of buildings, trees etc. as bat roosts. The tables referred to from this document are described in the Appendices.

Marnell *et al.* (2022) is referred to for guidance in relation to survey guidance (timing and survey design), derogation licences and mitigation measures.

2.2 Daytime Inspections

2.2.1 Building Surveys

The cottage was inspected during the daytime for evidence of bat usage during each site visit. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicate that bat usage of a crevice, for example, has occurred in the past. Inspections were undertaken of the cottage visually with the aid of a strong torch beam (LED Lenser P14.2) and endoscope (General DC5660A Wet / Dry Scope).

Internal inspections were completed on ten dates since February 2024 (See Results Section for more details).

2.3 Night-time Bat Surveys

An array of night-time bat surveys were completed. The methodology for each these bat surveys is presented below. The following handheld bat detectors were used:

Surveyor 1: Anabat Walkabout Full Spectrum Bat Detector
Surveyor 2: Elekon Bat Logger M2 Full Spectrum Bat Detector

The Night Vision Aids (NVAs) were used to support dusk surveys. The following NVAs were used coupled with Anabat Scout Full Spectrum bat Detector (attached to thermal imagery scope) and Magenta 4 Heterodyne Bat Detector (attached to IR camera and tuned to 110 kHz to indicate the presence of lesser horseshoe bats):

A Guide TrackIR Pro25 thermal imagery scope
A Guide TrackIR Pro19 thermal imagery scope
Sony FDR camcorder with night-shot capability coupled with IR illuminator (Dedolight)

2.3.1 Dusk Bat Surveys

Dusk surveys started 15 minutes prior to sunset and were undertaken for a minimum of 2 hours of surveying. Surveys were completed during mild and dry weather conditions with air temperature of >8oC.

Preparation for dusk survey started 60 minutes prior to sunset and the following actions were undertaken:

- Re-inspection of building to be surveyed to determine surveyor and filming locations.
- Internal inspection of building to document any visible bats.
- Positioning of filming equipment and surveyors.
- Completion of dusk survey.
- Post surveys, a repeat internal inspection of the surveyed building was undertaken to document any visible bats within the structure.

All audio files recorded by full spectrum bat detectors were analysed using Wildlife Acoustics Kaleidoscope Pro and validation of bat records was completed by the principal bat surveyor prior to mapping. This data was then entered onto an Excel file for mapping. All filming was watched post surveys and any emerging bats were noted and compared to audio recordings also recorded by surveyors.

A dusk surveys were completed on 17th April, and 20th June 2024.

2.3.2 Static Surveillance

A Passive Static Bat Surveys involved leaving a static bat detector unit (with ultrasonic microphone) in a specific location and set to record for a specified period of time (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 analysis post surveying). The bat detector was effectively used as a bat activity data logger. This results in a far greater sampling effort over a shorter period of time. Bat detectors with ultrasonic microphones were used as the ultrasonic calls produced by bats cannot be heard by human hearing.

The microphone of the unit was positioned horizontally to reduce potential damage from rain. The static units deployed use Real Time recording as a technique to record bat echolocation calls and using specific software, the recorded calls are identified. It is these sonograms (2-d sound pictures) that are digitally stored on the SD card (or micro SD cards depending on the model) and downloaded for analysis. These results are depicted on a graph showing the number of bat passes per species per night. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some species such as the pipistrelles will continuously fly around a habitat and therefore it is likely that a series of bat passes within a similar time frame is one individual bat. On the other hand, Leisler's bats tend to travel through an area quickly and therefore an individual sequence or bat pass is more likely to be indicative of individual bats.

Recordings were analysed using Wildlife Acoustics Kaleidoscope Pro. Manual validation was undertaken by the principal bat specialist and the following rules were followed:

- Validation that the auto-id function was checked for at least 20% of *Pipistrellus* spp. and Leisler's bat calls apart from Nathusius' pipistrelle calls.
- All Nathusius' pipistrelles calls were manually verified. The reasoning for this is due to frequently misidentification of low 40kHz calls, by auto-id tools, as this species, which may in fact be low frequency common pipistrelle calls.
- All brown long-eared bat calls should be manually verified. The reasoning for this due to frequently misidentification of social calls of *Pipistrellus* spp. frequently identified as this bat species.
- Manual verification of *Myotis* spp., where possible, to species level in order to increase the accuracy of the dataset. Where such calls cannot be identified to species level, they are reported as *Myotis* spp.
- Manual validation was undertaken for all "Unidentified" calls and for approximately 20% proportion of "Noise" calls.

Each audio file was noted as a bat pass to indicate level of bat activity for each species recorded. This was expressed as the average number of bat passes per survey night (no. of nights was the total number successful nights of deployment).

The following static units were deployed during this static bat detector survey:

Table 2a: Static Bat Detectors deployed during Static Bat Detector Surveys.

Static Unit Code	Bat Detector Type	Recording Function	Microphone
SM Mini Bat 2 units	Wildlife Acoustics SongMeter Mini Bat 2 FS	Passive Full Spectrum	SMM-U2

The design of the static surveillance was determined by the following criteria:

- A unit located in the ground floor was deployed to document lesser horseshoe bat activity within the cottage and to determine if other bat species were present;
- Units located on trees around the perimeter of the cottage were deployed to document commuting routes from the cottage to adjacent habitats;
- Units located in the adjacent woodland were deployed to document foraging areas adjacent to the cottage.
- Static units were set to start recording 30 minutes before sunset and end recording 30 minutes after sunrise as per Collins (2023).
- Static units were deployed for 1 week.
- An additional two statics were deployed to document bat usage of the Drung Hill Tunnels (2 units)

Preliminary static surveillance was undertaken from 1st to the 15th February 2024 and this consisted on one static unit located inside Griffins Cottage.

Spring static surveillance was undertaken from 10th to 18th April 2024 (7 nights). A total of 15 units were deployed during this period.

Summer static surveillance was undertaken from 7th June 2024 (7 nights). A total of 15 units were deployed during this period at the same ITM grid reference locations as per Spring Static Surveillance.

Table 2b: Location of Static Bat Detectors deployed during Spring and Summer Static Bat Detector Surveys.

Static Code	Location	ITM Easting	ITM Northing
Static 1	Internal space of the bat house	461503	588932
Static 2	To rear of the bat house	461504	588910
Static 3	Upstream of bridge, east of bat house	461547	588912
Static 4	Treeline above and west of bridge	461538	588908
Static 5	Treeline above and west of bat house	461477	588935
Static 6	Treeline above and west of bat house	461452	588939
Static 7	Treeline along N70 west of bat house	461402	588956
Static 8	Treeline along N70 west of bat house	461452	588949
Static 9	Treeline directly east of bat house	461526	588915
Static 10	Downstream of bridge	461549	588931
Static 11	Treeline downstream of bridge	461550	588942
Static 12	Treeline downstream of bridge	461559	588976
Static 13	Treeline downstream of bridge	461589	588980
Static 14	Drung Hill Tunnel 1	459805	589013
Static 15	Drung Hill Tunnel 2	459761	589025

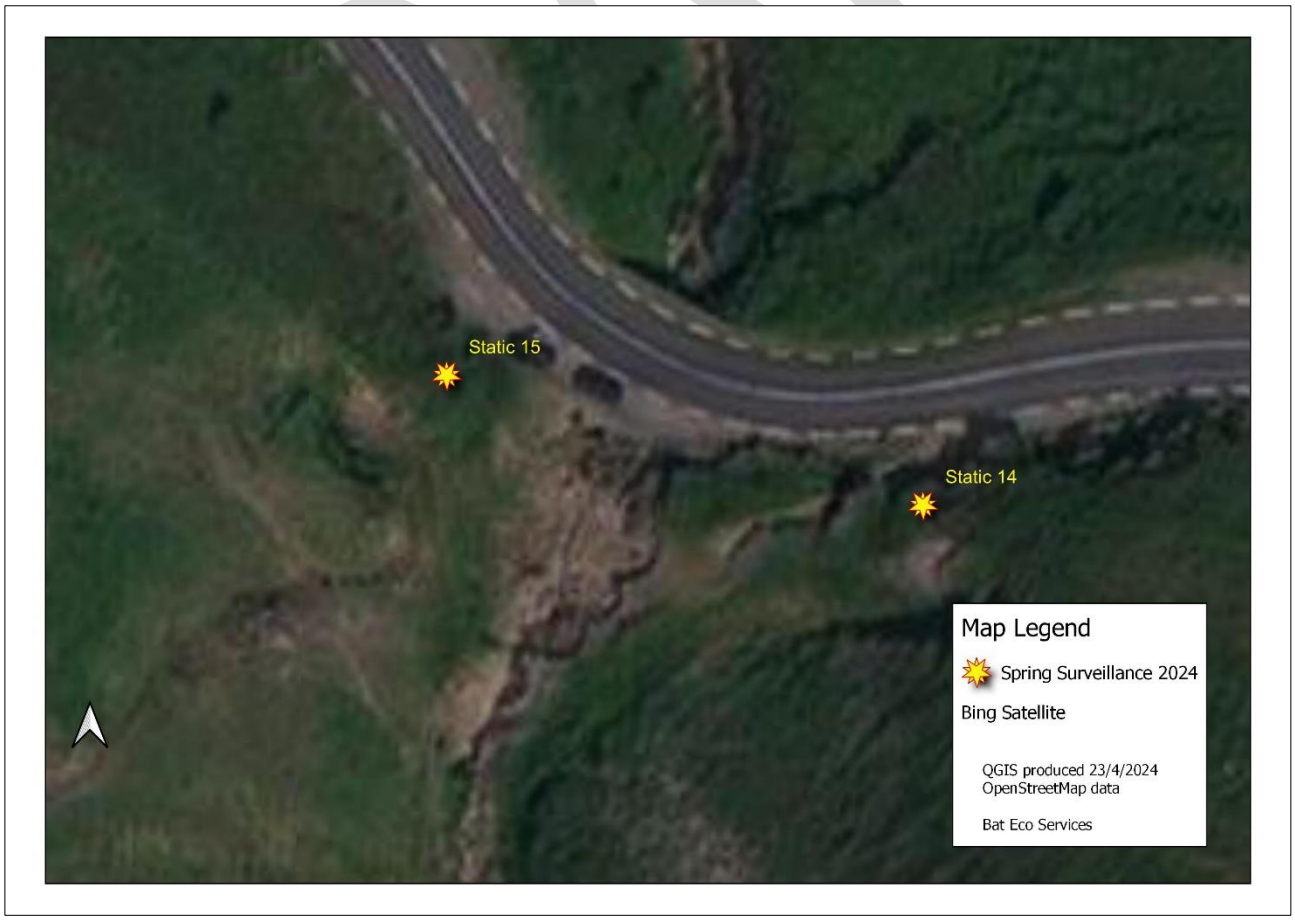


Figure 2a & b: Location of static units deployed during the Spring (and Summer) Static Surveillance in vicinity of Griffin's Cottage, Co. Kerry and further west at Drung Hill Tunnels, Co. Kerry.

3. Bat Survey Results

The results of the array of bat surveys are presented below.

3.1 Building Surveys

Griffin's Cottage was the principal location for bat surveys (ITM 461503,588932). The cottage was originally a railway building which was renovated in recent years. There is a new roof but the internal structure is unfinished. There is a large degree of light entering the building.

Plate 1: Location of Griffin's Cottage adjacent to the N70, Glenbeigh, Co. Kerry.

Table 3: Details of Griffin's Cottage, Glenbeigh, Co. Kerry.

Building No.	Description	Survey Details	Survey Results
Griffin's Cottage	Old railway building with modern extension. Mixed materials.	Series of daytime inspections, static surveillance and dusk surveys	Roosts for the following bat species: Lesser horseshoe bats Common pipistrelles Natterer's bats Soprano pipistrelles Brown long-eared bats

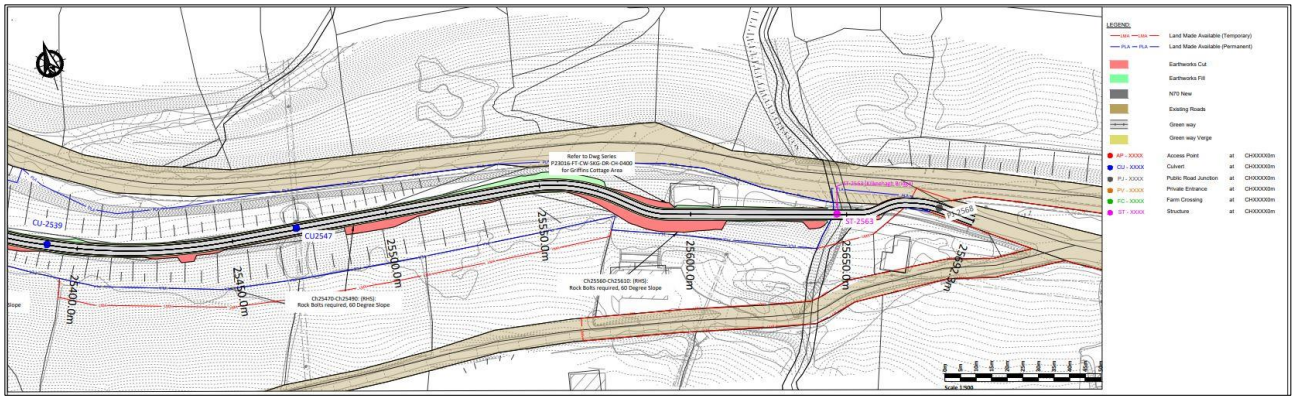


Figure 3a: Griffin's Cottage located adjacent to the proposed route of the South Kerry Greenway.

The following drawing is a rough sketch of the internal space of the cottage (Figure 3b).

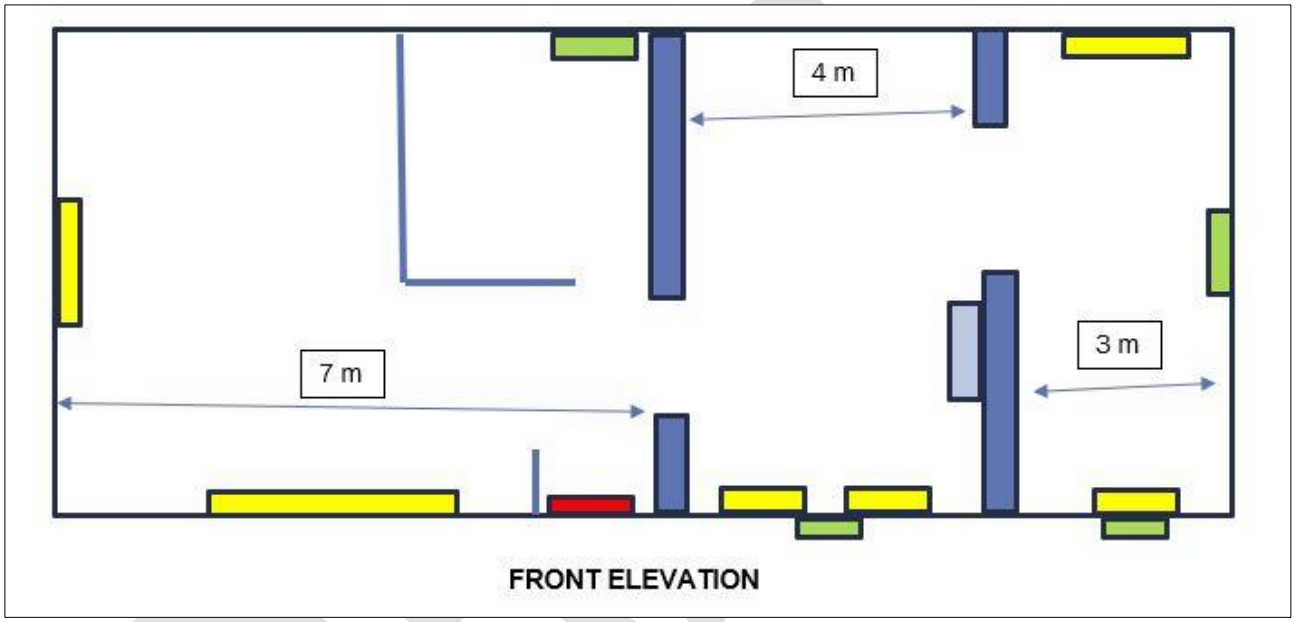


Figure 3b: Internal layout of Griffin's Cottage.

Blue – internal walls (thicker lines are older natural stone walls approx. 40cm thick). Thinner lines are concrete block walls (not built to ceiling level, approx. 20cm space to timber beams).
Yellow – ground floor windows
Green – dormer windows (not all represented)
Red – front door
Light Blue – chimney breast

3.1.1 Daytime Inspections

The number of lesser horseshoe bats were counted in the cottage during each site visit is presented in the table below. This species of bat was recorded during each site visit. During the summer survey dates, the bats tended to be clustered in a tight formation within the space of one dormer window area (in the most western half of the cottage, adjacent to the chimney).

During the site visit on the 10th April 2024, the author took the opportunity to place sheets of plywood available within the cottage to block ground floor windows in the western half of the cottage. During the site visit on the 14th June 2024, the remaining ground floor windows and accessible dormer windows were also blocked with material available within the cottage. As a result, the degree of light within the cottage has greatly decreased. Light continues to enter the cottage through the front door and ground floor window and these are not to be blocked as they are the exit points currently used

by the colony of lesser horseshoe bats roosting within the cottage. These works are temporary until recommended renovation works are completed outside the maternity season. While the September count is likely to consist of juveniles, 73 lesser horseshoe bats were counted during this site visit and this may indicate that the exclusion of daylight into the internal space o the cottage improved the conditions for roosting bats. Therefore more permanent works proposed to be undertaken may improve conditions further.

Table 4: Visual counts of Lesser horseshoe bats in Griffin's Cottage.

No.	Date	Observed LHB
1	1/2/2024	1
2	15/2/2024	2
3	10/4/2024	3
4	17/4/2024	4
5	7/6/2024	35
6	13/6/2024	29
7	14/6/2024	27
8	20/6/2024	46
9	21/6/2024	43
10	7/9/2024	73

3.1.2 Static Surveillance

No lesser horseshoe bats were recorded on the static unit deployed inside the cottage in February 2024. However three soprano pipistrelle calls were recorded (2/2/24 @ 17:47 hrs; 4/2/24 @ 17:47 hrs and 6/2/204 @17:55 hrs – indicative of one individual occasionally roosting in the bat house).

Comment: Lesser horseshoe bats have a narrow echolocation call and in order to be recorded on the static unit, individual bats need to fly within 4m of the microphone. For future surveillance, better placement and more than one unit is required to effectively record the presence of this species in the cottage.

3.1.2.1 Spring Static Surveillance

During the Spring Static Surveillance period (10th to 18th April 2024), the static unit located inside the cottage recorded a total of 305 lesser horseshoe bat calls over a seven night period (Figure 4). The following graph presents the number of bat passes per date. This static unit also recorded the following additional bat species: common pipistrelle, soprano pipistrelle, brown long-eared bats and Natterer's bats (Table 5). The details of this is presented in the Appendices.

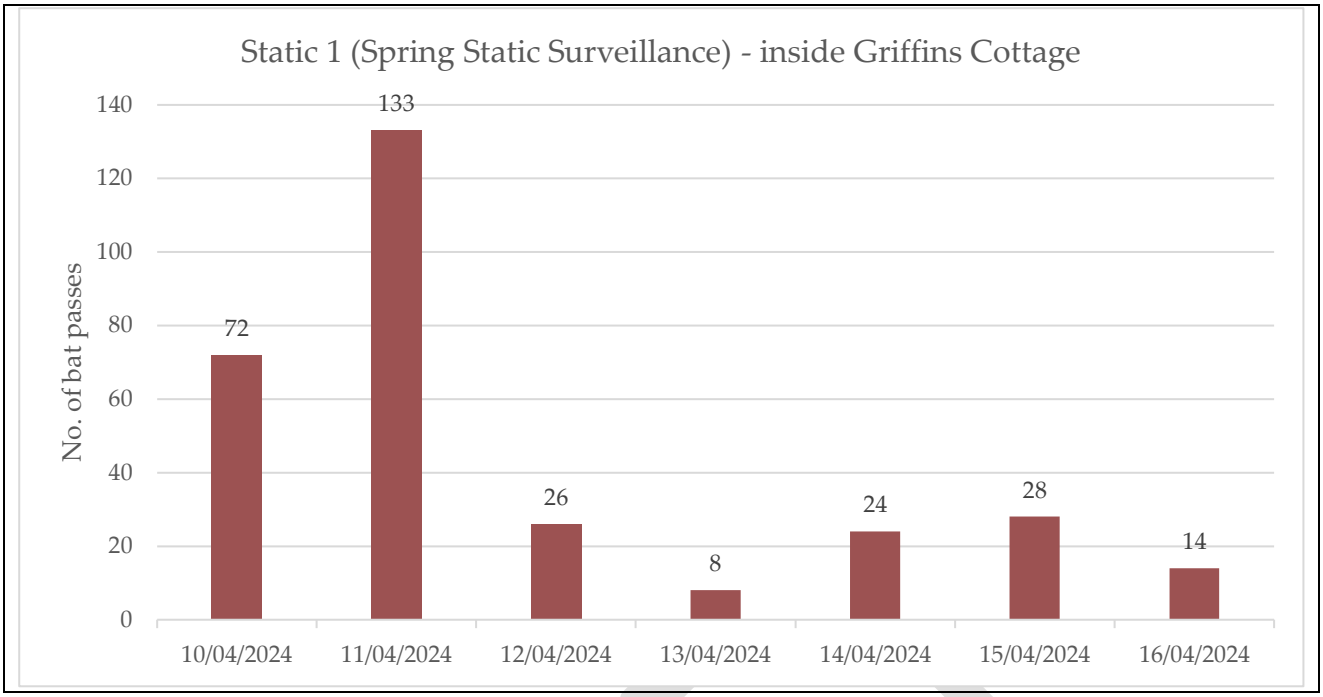


Figure 4: Number of bat passes recorded on Static 1 (inside Griffin's Cottage) during Spring Static Surveillance.

Table 5: Total number of bat passes for each species of bat recorded on static units deployed during the Spring Static Surveillance.

Static Code	LHB	CP	SP	Leis	Natt	Daub	Whis	Myotis	BLE
Static 1	305	82	83	0	16	0	0	3	2
Static 2	23	255	198	0	3	0	0	2	4
Static 3	0	43	26	0	1	0	0	0	0
Static 4	1	122	65	0	0	0	0	0	0
Static 5	28	101	81	15	4	0	3	0	1
Static 6	41	147	67	18	5	4	0	0	1
Static 7	2	14	34	0	0	0	0	1	2
Static 8	4	156	67	10	3	6	0	1	3
Static 9	1	113	113	4	5	5	0	0	3
Static 10	0	0	0	0	0	0	0	0	0
Static 11	0	23	3	0	0	0	0	0	0
Static 12	0	5	14	1	2	5	0	0	0
Static 13	42	698	60	4	2	4	0	3	2
Static 14	8	15	1	0	9	0	0	0	0
Static 15	11	17	1	0	27	0	0	3	0

LHB: = lesser horseshoe bat; CP = common pipistrelle; SP = soprano pipistrelle, Leis = Leisler's bat, Natt = Natterer's bat, Daub = Daubenton's bat, Whis = whiskered bat, Myotis = Myotis species & BLE = brown long-eared bat.

A total of 15 static units were deployed during the Spring Static Surveillance. Lesser horseshoe bats were recorded on 11 of the 15 units deployed (Figure 5a & b). In addition the following bat species were recorded: common pipistrelle, soprano pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, whiskered bat and brown long-eared bat. The total number of bat passes for each of the recorded bat species recorded over the 7 nights of surveillance is presented in the table above.

Figure 5a & b: Location of static units deployed during the Spring Static Surveillance in vicinity of Griffin's Cottage, Co. Kerry and further west at Drung Hill Tunnels, Co. Kerry where LHB were recorded.

Static 14 and Static 15 were located at the entrances of the Drung Hill tunnels. Lesser horseshoe bats were recorded in vicinity of the tunnels as well as a number of other bats species. Natterer's bats were recorded in the greatest number of bat passes over the surveillance periods in the second tunnel. Please note: both tunnels were flooded and unsafe for access during the spring surveillance surveys.

3.1.2.2 Summer Static Surveillance

The Summer Static Surveillance was a repeat of the surveillance completed in spring. A total of 15 static units were deployed at the exact same locations as the Spring Static Surveillance. However one unit failed to record (Static 7) while only one audio file was recorded on Static 14. The highest level of lesser horseshoe bat activity was recorded on Static 8 which was located within the linear woodland west of the cottage and along the N70 national road. This provides evidence that this linear woodland is an important commuting route for lesser horseshoe bats roosting in the cottage.

Lesser horseshoe bats were recorded on 10 of the 14 units that recorded successfully (Figure 5a & b). In addition the following bat species were recorded: common pipistrelle, soprano pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, whiskered bat and brown long-eared bat. The total number of bat passes for each of the recorded bat species recorded over the 7 nights of surveillance is presented in the table below.

Table 6: Total number of bat passes for each species of bat recorded on static units deployed during the Summer Static Surveillance.

Static Code	LHB	CP	SP	Leis	Natt	Daub	Whis	Myotis	BLE
Static 1	100	3	5	0	1	0	0	2	2
Static 2	25	38	156	0	0	0	0	0	8
Static 3	1	71	50	2	1	9	0	6	2
Static 4	0	16	19	0	0	0	0	0	1
Static 5	3	102	143	1	0	1	0	0	10
Static 6	6	130	151	1	0	3	2	1	18
Static 7	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Failed
Static 8	175	491	377	0	4	83	152	51	2
Static 9	7	58	152	0	4	3	2	0	10
Static 10	0	1	5	0	1	0	0	0	0
Static 11	3	99	1	1	0	0	0	0	1
Static 12	0	0	3	0	0	0	0	0	0
Static 13	2	134	6	0	1	5	0	0	0
Static 14	0	1	0	0	0	0	0	0	0
Static 15	10	1243	0	1	84	8	12	1	2

LHB: = lesser horseshoe bat; CP = common pipistrelle; SP = soprano pipistrelle, Leis = Leisler's bat, Natt = Natterer's bat, Daub = Daubenton's bat, Whis = whiskered bat, Myotis = Myotis species & BLE = brown long-eared bat.

Static 14 and Static 15 were located at the entrances of the Drung Hill tunnels but only Static 15 is considered to have recorded accurately (due to the low level of calls recorded on Static 14). Lesser horseshoe bats were recorded in vicinity of the tunnels as well as a number of other bats species. Natterer's bats, again, were recorded in a high number of bat passes over the surveillance period in the second tunnel while a high level of common pipistrelle bat activity was also recorded during this surveillance. Please note: both tunnels remain flooded and unsafe for access during the summer surveillance surveys.

Figure 6a & b: Location of static units deployed during the Summer Static Surveillance in vicinity of Griffin's Cottage, Co. Kerry and further west at Drung Hill Tunnels, Co. Kerry where LHB were recorded.

3.1.2.3 Static Surveillance - Summary

As a result of 2024 Spring and Summer Static Surveillance, lesser horseshoe bats were recorded on 13 of the 15 locations surveyed. It was recorded on both locations at Drung Hill Tunnels and 11 of the 13 locations in vicinity of Griffin's Cottage (Figure). Only Static 10 and Static 12 (both located across the N70 in scrub/wooded area) did not recorded lesser horseshoe bats. However, as lesser horseshoe bats were recorded on Static 11 and Static 13 which were also located in this area, this provides evidence that lesser horseshoe bats are commuting and foraging in this area.

3.1.3 Dusk Bat Survey 17th April 2024

Two thermal imagery scopes (19mm and 25mm) and one IR camcorder were deployed to determine potential exit points for lesser horseshoe bats and commuting routes. The 19 mm thermal scope was positioned at the front door while the IR camcorder was set-up to the rear of the cottage.

Six lesser horseshoe bats emerged from the rear window of the cottage. Five of these bats commuted up the rock face and into the vegetation while one bat commuted around the cottage and potentially flew towards the roadway (N70). An additional two lesser horseshoe bats emerged from the front door exit (the direction of flight was not determined during the filming). Additional survey work in the summer will determine if bats are commuting across the N70.

Table 7: Total number of Lesser horseshoe bats roosting in Griffin's Cottage, Co. Kerry.

No.	Date	Observed LHB	Additional LHB	Total LHB
1	17/04/2024	4	4	8

The second thermal imagery scope (25mm) was positioned downstream of the bridge (located east of the cottage) to determine if lesser horseshoe bats were commuting under the bridge to foraging habitat on the opposite side of the N70. No bats (i.e. non-lesser horseshoe bats) were recorded emerging from the arches of the bridge and no lesser horseshoe bats were recorded commuting under the bridge from the direction of the cottage.

As a result of the dusk survey and static surveillance, potential commuting routes are likely to be those presented on the map below. An important potential commuting route (represented as a Dashed Red Line on Figure 7) indicates there is a potential of lesser horseshoe bats commuting across the road directly in line with the front door exit point of the cottage and/or gable of cottage facing west. This was due to the visual sighting of bats commuting from the back around to the west gable of the cottage and exiting from the front door exit point. The summer dusk survey was designed to determine if this is true.

Figure 7: Potential commuting routes (Red arrows) in vicinity of Griffin's Cottage, Co. Kerry for lesser horseshoe bats.

3.1.4 Dusk Bat Survey 20th June 2024

Two thermal imagery scopes (19mm and 25mm) were deployed to determine if lesser horseshoe bats cross the N70 in vicinity of the cottage during emergence. One unit was located on the opposite side of the road to the cottage further west while the 2nd scope was locate on the same side of the road as the cottage adjacent to the river bank above the exiting road bridge (Figure 8).

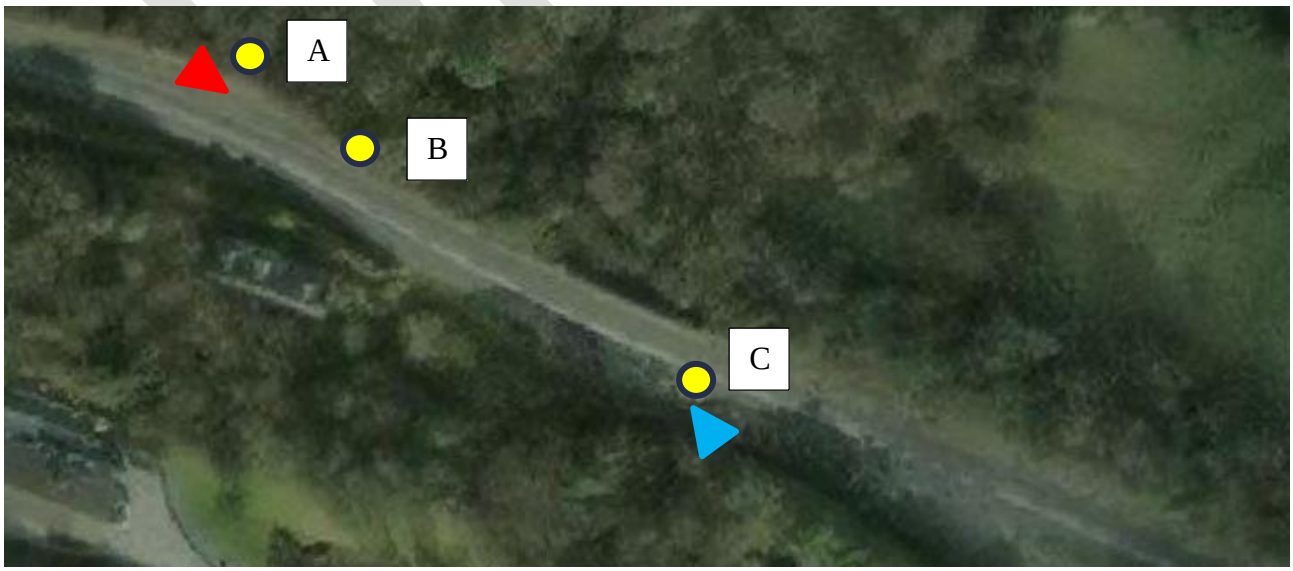


Figure 8: Dusk survey design: Red Triangle - location of 19mm thermal scope, Blue Triangle location of 25mm thermal scope and Yellow Circles - location of Anabat Scout Full Spectrum Bat Detectors.

Plate 2: Thermal Imagery Scope (19 mm) filming from west of cottage at Location A (Red Triangle, Figure 8) (please note surveyor vehicle located at road bridge). Cottage is outline in Red.

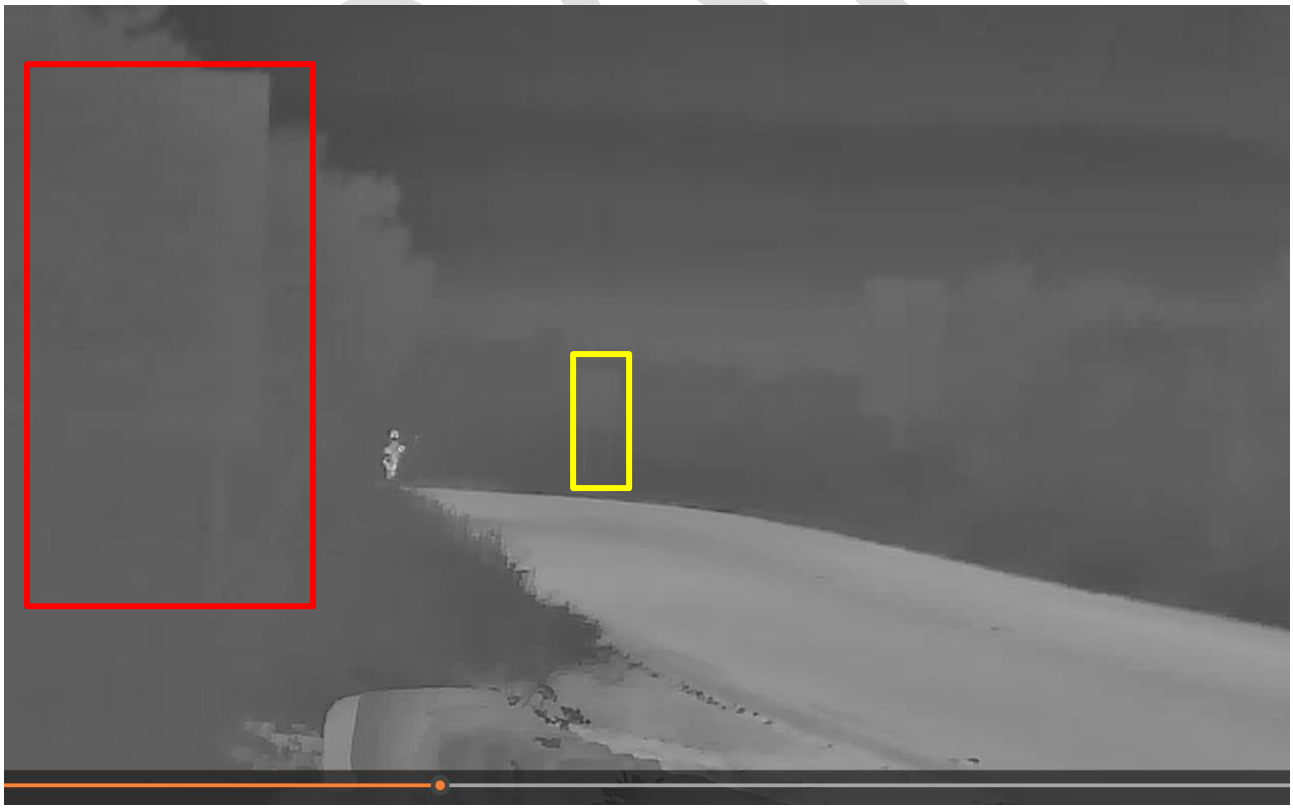


Plate 3: Thermal Imagery Scope (25 mm) filming from bridge to west of cottage at Location C (Blue Triangle, Figure 8) (please note surveyor located at position of Thermal Imagery Scope). Cottage is outline in Red. Road sign where Anabat Scout B is located (positioned directly across from front door exit of cottage) is outlined in Yellow.

No bats were recorded crossing the N70 from Griffin's Cottage. This was confirmed also by the fact the no lesser horseshoe bats were recorded on Anabat Scout A & B. A single lesser horseshoe bat was recorded crossing the N70 adjacent to the bridge where vegetation clearance has occurred. This was noted on the thermal imagery filming and on Anabat Scout C. Surveyor 1 located west of the cottage also noted lesser horseshoe bats flying from the cottage and commuting along the existing greenway track west of the cottage. There was numerous sightings of commuting bats during the dusk survey.

As a consequence, the following figure presents the commuting routes for the colony of Lesser horseshoe bats roosting in Griffin's Cottage with the road crossing represented by a Red Dash Line.

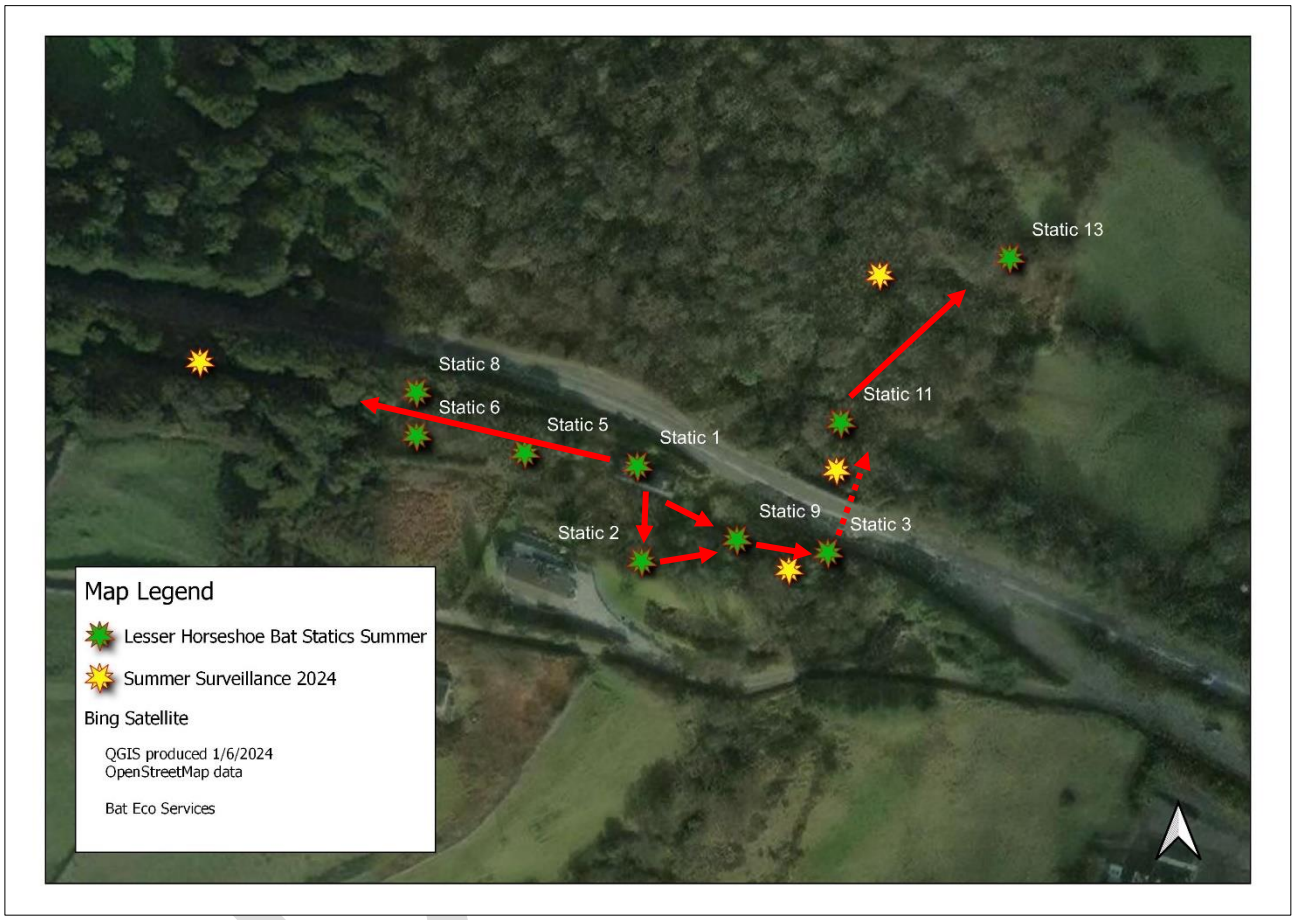


Figure 9: Confirmed commuting routes (Red arrows) in vicinity of Griffin's Cottage, Co. for lesser horseshoe bats.

Post Dusk Survey, Surveyor 1 re-entered the cottage and recorded a single lesser horseshoe bat still present in the roost and a single pup was noted attached to this individual. This confirms that the colony in Griffins Cottage is a maternity roost.

4. Preliminary Conclusions

Results indicate that lesser horseshoe bats roosting in Griffin's Cottage emerge from two exit points (rear ground floor window and front door missing panel). The majority of the individuals commuted to the rear of the cottage and fly both east and west of the cottage. The linear woodland to the west of the cottage is the primary commuting route for the lesser horseshoe bat colony in Griffin's Cottage.

The colony roosting in Griffin's Cottage is confirmed to be a maternity roost.

During the June Dusk Survey, a single lesser horseshoe bat commuted across the N70 to additional foraging areas across the N70 from the cottage. As 45 individuals emerged from the cottage during emergence, this represents that 2.2% of the colony was confirmed flying across the N70 within the survey area. At this "crossing" point, vegetation clearance has occurred and may have resulted in the bat commuting across the road. This emphasises the importance of ensure that replanting of vegetation is required in immediate vicinity of the cottage.

The results of these surveys will be used to make recommendations in relation to the renovation of the cottage as lesser horseshoe bat roost and to mitigate for potential impacts as a result of development of the proposed South Kerry Greenway. These recommendations are presented in a separate document and issued to Kerry Co. Co.

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6. Appendices

Table A: Natterer's bat, Myotis species and brown long-eared bats recorded on static unit located in Griffin's Cottage during Spring Surveillance.

DATE	TIME	HOUR	AUTO ID*	MANUAL ID
14/04/2024	00:03:17	0	MYONAT	MYONAT
14/04/2024	00:03:01	0	MYONAT	MYONAT
14/04/2024	05:32:53	5	MYONAT	MYONAT
16/04/2024	22:17:50	22	MYONAT	MYONAT
17/04/2024	00:45:40	0	MYONAT	MYONAT
14/04/2024	01:28:32	1	NoID	MYONAT
10/04/2024	21:15:15	21	Noise	MYONAT
10/04/2024	21:15:30	21	Noise	MYONAT
14/04/2024	04:23:26	4	Noise	MYONAT
14/04/2024	02:41:14	2	Noise	MYONAT
14/04/2024	05:35:51	5	Noise	MYONAT
14/04/2024	23:08:10	23	Noise	MYONAT
15/04/2024	00:58:26	0	Noise	MYONAT
15/04/2024	23:32:09	23	Noise	MYONAT
17/04/2024	02:19:27	2	Noise	MYONAT
17/04/2024	04:52:12	4	Noise	MYONAT
12/04/2024	23:37:42	23	NoID	Myotis
13/04/2024	00:23:35	0	NoID	Myotis
13/04/2024	00:35:54	0	NoID	Myotis
16/04/2024	21:18:12	21	Noise	PLEAUR
16/04/2024	21:18:03	21	Noise	PLEAUR

Table B: Common pipistrelle recorded on static unit located in Griffin's Cottage during Spring Surveillance.

DATE	TIME	HOUR	AUTO ID*	MANUAL ID
11/04/2024	21:22:44	21	NoID	PIPPIP
13/04/2024	00:23:55	0	NoID	PIPPIP
12/04/2024	00:20:53	0	Noise	PIPPIP
13/04/2024	00:30:31	0	Noise	PIPPIP
13/04/2024	00:24:21	0	Noise	PIPPIP
11/04/2024	00:03:14	0	PIPPIP	PIPPIP
13/04/2024	02:11:55	2	PIPPIP	PIPPIP
11/04/2024	00:04:30	0	PIPPIP	PIPPIP
11/04/2024	00:04:04	0	PIPPIP	PIPPIP
13/04/2024	03:23:23	3	PIPPIP	PIPPIP
11/04/2024	00:02:58	0	PIPPIP	PIPPIP
13/04/2024	00:20:48	0	PIPPIP	PIPPIP
13/04/2024	00:34:53	0	PIPPIP	PIPPIP
11/04/2024	00:03:29	0	PIPPIP	PIPPIP
12/04/2024	00:13:23	0	PIPPIP	PIPPIP
13/04/2024	04:49:18	4	PIPPIP	PIPPIP
13/04/2024	02:03:30	2	PIPPIP	PIPPIP
11/04/2024	23:54:05	23	PIPPIP	PIPPIP
13/04/2024	02:03:15	2	PIPPIP	PIPPIP
10/04/2024	20:52:42	20	PIPPIP	PIPPIP
10/04/2024	23:32:30	23	PIPPIP	PIPPIP
13/04/2024	02:12:10	2	PIPPIP	PIPPIP

11/04/2024	21:22:08	21	PIPPIP	PIPPIP
13/04/2024	04:48:05	4	PIPPIP	PIPPIP
12/04/2024	00:13:38	0	PIPPIP	PIPPIP
13/04/2024	00:21:03	0	PIPPIP	PIPPIP
13/04/2024	04:48:15	4	PIPPIP	PIPPIP
11/04/2024	00:04:19	0	PIPPIP	PIPPIP
11/04/2024	22:00:35	22	PIPPIP	PIPPIP
11/04/2024	23:24:45	23	PIPPIP	PIPPIP
11/04/2024	23:03:25	23	PIPPIP	PIPPIP
11/04/2024	23:17:00	23	PIPPIP	PIPPIP
11/04/2024	01:23:15	1	PIPPIP	PIPPIP
13/04/2024	00:23:10	0	PIPPIP	PIPPIP
13/04/2024	04:49:28	4	PIPPIP	PIPPIP
15/04/2024	02:08:47	2	PIPPIP	PIPPIP
11/04/2024	22:35:19	22	PIPPIP	PIPPIP
13/04/2024	00:35:08	0	PIPPIP	PIPPIP
11/04/2024	21:29:40	21	PIPPIP	PIPPIP
13/04/2024	05:20:05	5	PIPPIP	PIPPIP
13/04/2024	04:42:51	4	PIPPIP	PIPPIP
10/04/2024	21:33:59	21	PIPPIP	PIPPIP
15/04/2024	02:08:14	2	PIPPIP	PIPPIP
13/04/2024	03:48:32	3	PIPPIP	PIPPIP
13/04/2024	00:22:54	0	PIPPIP	PIPPIP
11/04/2024	23:18:21	23	PIPPIP	PIPPIP
15/04/2024	00:24:02	0	PIPPIP	PIPPIP
11/04/2024	22:01:55	22	PIPPIP	PIPPIP
11/04/2024	21:21:53	21	PIPPIP	PIPPIP
13/04/2024	04:48:58	4	PIPPIP	PIPPIP
13/04/2024	05:20:13	5	PIPPIP	PIPPIP
12/04/2024	00:21:08	0	PIPPIP	PIPPIP
11/04/2024	23:55:13	23	PIPPIP	PIPPIP
13/04/2024	00:21:19	0	PIPPIP	PIPPIP
10/04/2024	20:52:57	20	PIPPIP	PIPPIP
13/04/2024	00:21:56	0	PIPPIP	PIPPIP
15/04/2024	02:08:06	2	PIPPIP	PIPPIP
15/04/2024	02:08:41	2	PIPPIP	PIPPIP
17/04/2024	03:43:00	3	PIPPIP	PIPPIP
11/04/2024	22:41:21	22	PIPPIP	PIPPIP
13/04/2024	05:19:52	5	PIPPIP	PIPPIP
11/04/2024	00:42:21	0	PIPPIP	PIPPIP
13/04/2024	03:48:26	3	PIPPIP	PIPPIP
11/04/2024	23:30:20	23	PIPPIP	PIPPIP
12/04/2024	23:33:14	23	PIPPIP	PIPPIP
12/04/2024	23:33:28	23	PIPPIP	PIPPIP
11/04/2024	23:04:34	23	PIPPIP	PIPPIP
13/04/2024	03:00:01	3	PIPPIP	PIPPIP

13/04/2024	03:48:18	3	PIPPIP	PIPPIP
13/04/2024	04:49:54	4	PIPPIP	PIPPIP
13/04/2024	05:19:46	5	PIPPIP	PIPPIP
16/04/2024	07:08:32	7	PIPPIP	PIPPIP
15/04/2024	02:07:59	2	PIPPIP	PIPPIP
13/04/2024	22:06:34	22	PIPPIP	PIPPIP
12/04/2024	00:19:47	0	PIPPIP	PIPPIP
17/04/2024	06:18:21	6	PIPPIP	PIPPIP
13/04/2024	03:57:29	3	PIPPIP	PIPPIP
16/04/2024	00:30:36	0	PIPPIP	PIPPIP
16/04/2024	06:28:05	6	PIPPIP	PIPPIP
11/04/2024	00:03:59	0	PIPPIP	PIPPIP
16/04/2024	07:08:21	7	PIPPIP	PIPPIP
12/04/2024	23:33:21	23	PIPPIP	PIPPIP

Table C: Soprano pipistrelle recorded on static unit located in Griffin's Cottage during Spring Surveillance.

DATE	TIME	HOUR	AUTO ID*	MANUAL ID
10/04/2024	20:58:10	20	NoID	PIPPYG
11/04/2024	01:10:52	1	NoID	PIPPYG
12/04/2024	23:35:04	23	NoID	PIPPYG
12/04/2024	23:43:59	23	NoID	PIPPYG
12/04/2024	23:44:27	23	NoID	PIPPYG
12/04/2024	23:56:53	23	NoID	PIPPYG
13/04/2024	00:21:34	0	NoID	PIPPYG
13/04/2024	02:27:00	2	NoID	PIPPYG
13/04/2024	22:15:41	22	NoID	PIPPYG
12/04/2024	23:34:00	23	Noise	PIPPYG
12/04/2024	23:41:56	23	Noise	PIPPYG
13/04/2024	00:22:38	0	Noise	PIPPYG
13/04/2024	06:40:01	6	PIPPYG	PIPPYG
13/04/2024	06:40:20	6	PIPPYG	PIPPYG
13/04/2024	00:26:59	0	PIPPYG	PIPPYG
13/04/2024	04:48:42	4	PIPPYG	PIPPYG
13/04/2024	06:35:16	6	PIPPYG	PIPPYG
13/04/2024	22:08:23	22	PIPPYG	PIPPYG
15/04/2024	20:55:00	20	PIPPYG	PIPPYG
12/04/2024	23:42:15	23	PIPPYG	PIPPYG
15/04/2024	00:52:50	0	PIPPYG	PIPPYG
13/04/2024	01:49:55	1	PIPPYG	PIPPYG
11/04/2024	21:22:48	21	PIPPYG	PIPPYG
13/04/2024	04:38:37	4	PIPPYG	PIPPYG
12/04/2024	05:15:05	5	PIPPYG	PIPPYG
12/04/2024	23:44:14	23	PIPPYG	PIPPYG
11/04/2024	01:08:48	1	PIPPYG	PIPPYG
13/04/2024	22:08:02	22	PIPPYG	PIPPYG

11/04/2024	01:08:26	1	PIPPYG	PIPPYG
17/04/2024	06:18:11	6	PIPPYG	PIPPYG
13/04/2024	06:35:24	6	PIPPYG	PIPPYG
15/04/2024	02:23:08	2	PIPPYG	PIPPYG
16/04/2024	02:29:21	2	PIPPYG	PIPPYG
13/04/2024	06:32:29	6	PIPPYG	PIPPYG
13/04/2024	06:33:17	6	PIPPYG	PIPPYG
13/04/2024	22:08:09	22	PIPPYG	PIPPYG
13/04/2024	22:16:25	22	PIPPYG	PIPPYG
14/04/2024	22:46:45	22	PIPPYG	PIPPYG
11/04/2024	01:09:07	1	PIPPYG	PIPPYG
13/04/2024	22:07:56	22	PIPPYG	PIPPYG
16/04/2024	03:46:01	3	PIPPYG	PIPPYG
12/04/2024	23:57:00	23	PIPPYG	PIPPYG
13/04/2024	22:20:19	22	PIPPYG	PIPPYG
14/04/2024	22:12:15	22	PIPPYG	PIPPYG
17/04/2024	06:21:46	6	PIPPYG	PIPPYG
15/04/2024	02:31:27	2	PIPPYG	PIPPYG
11/04/2024	01:10:28	1	PIPPYG	PIPPYG
12/04/2024	21:01:44	21	PIPPYG	PIPPYG
12/04/2024	23:33:42	23	PIPPYG	PIPPYG
12/04/2024	23:38:33	23	PIPPYG	PIPPYG
12/04/2024	23:54:46	23	PIPPYG	PIPPYG
13/04/2024	01:10:50	1	PIPPYG	PIPPYG
16/04/2024	06:20:56	6	PIPPYG	PIPPYG
13/04/2024	00:26:13	0	PIPPYG	PIPPYG
16/04/2024	02:31:02	2	PIPPYG	PIPPYG
17/04/2024	06:23:33	6	PIPPYG	PIPPYG
10/04/2024	20:58:41	20	PIPPYG	PIPPYG
13/04/2024	03:52:30	3	PIPPYG	PIPPYG
12/04/2024	23:34:55	23	PIPPYG	PIPPYG
12/04/2024	23:56:44	23	PIPPYG	PIPPYG
16/04/2024	00:33:12	0	PIPPYG	PIPPYG
10/04/2024	20:55:39	20	PIPPYG	PIPPYG
13/04/2024	06:35:39	6	PIPPYG	PIPPYG
17/04/2024	06:35:24	6	PIPPYG	PIPPYG
13/04/2024	03:43:37	3	PIPPYG	PIPPYG
11/04/2024	04:21:40	4	PIPPYG	PIPPYG
12/04/2024	02:26:42	2	PIPPYG	PIPPYG
12/04/2024	23:35:14	23	PIPPYG	PIPPYG
13/04/2024	06:33:58	6	PIPPYG	PIPPYG
13/04/2024	06:34:32	6	PIPPYG	PIPPYG
14/04/2024	22:02:14	22	PIPPYG	PIPPYG
17/04/2024	06:22:06	6	PIPPYG	PIPPYG
17/04/2024	06:23:51	6	PIPPYG	PIPPYG
12/04/2024	00:44:49	0	PIPPYG	PIPPYG

12/04/2024	00:51:47	0	PIPPYG	PIPPYG
12/04/2024	01:21:19	1	PIPPYG	PIPPYG
12/04/2024	22:24:01	22	PIPPYG	PIPPYG
13/04/2024	05:06:00	5	PIPPYG	PIPPYG
13/04/2024	06:35:08	6	PIPPYG	PIPPYG
13/04/2024	06:35:31	6	PIPPYG	PIPPYG
17/04/2024	06:23:57	6	PIPPYG	PIPPYG
12/04/2024	02:40:14	2	PIPPYG	PIPPYG
15/04/2024	23:58:10	23	PIPPYG	PIPPYG

Table D: Lesser horseshoe bats recorded on static unit located in Griffin's Cottage during Spring Surveillance.

DATE	TIME	HOUR	AUTO ID*	MANUAL ID
10/04/2024	20:28:20	20	RHIHIP	RHIHIP
10/04/2024	20:39:26	20	RHIHIP	RHIHIP
10/04/2024	20:40:29	20	Noise	RHIHIP
10/04/2024	20:40:46	20	RHIHIP	RHIHIP
10/04/2024	20:41:02	20	Noise	RHIHIP
10/04/2024	20:41:18	20	RHIHIP	RHIHIP
10/04/2024	20:42:19	20	RHIHIP	RHIHIP
10/04/2024	20:42:50	20	RHIHIP	RHIHIP
10/04/2024	20:43:06	20	RHIHIP	RHIHIP
10/04/2024	20:43:21	20	RHIHIP	RHIHIP
10/04/2024	20:43:37	20	RHIHIP	RHIHIP
10/04/2024	20:44:56	20	Noise	RHIHIP
10/04/2024	20:45:13	20	RHIHIP	RHIHIP
10/04/2024	20:45:28	20	RHIHIP	RHIHIP
10/04/2024	20:45:58	20	Noise	RHIHIP
10/04/2024	20:46:14	20	RHIHIP	RHIHIP
10/04/2024	20:46:29	20	RHIHIP	RHIHIP
10/04/2024	20:46:44	20	Noise	RHIHIP
10/04/2024	20:47:47	20	RHIHIP	RHIHIP
10/04/2024	20:48:03	20	RHIHIP	RHIHIP
10/04/2024	20:48:33	20	RHIHIP	RHIHIP
10/04/2024	20:48:48	20	RHIHIP	RHIHIP
10/04/2024	20:49:04	20	RHIHIP	RHIHIP
10/04/2024	20:51:24	20	Noise	RHIHIP
10/04/2024	20:51:55	20	Noise	RHIHIP
10/04/2024	20:55:55	20	Noise	RHIHIP
10/04/2024	20:56:10	20	Noise	RHIHIP
10/04/2024	20:56:26	20	Noise	RHIHIP
10/04/2024	20:57:38	20	RHIHIP	RHIHIP
10/04/2024	20:57:54	20	RHIHIP	RHIHIP
10/04/2024	20:58:25	20	NoID	RHIHIP
10/04/2024	21:31:16	21	Noise	RHIHIP

10/04/2024	21:40:02	21	NoID	RHIHIP
10/04/2024	21:53:29	21	RHIHIP	RHIHIP
10/04/2024	21:55:13	21	RHIHIP	RHIHIP
10/04/2024	21:55:28	21	RHIHIP	RHIHIP
10/04/2024	21:55:44	21	RHIHIP	RHIHIP
10/04/2024	21:56:01	21	RHIHIP	RHIHIP
10/04/2024	22:09:06	22	RHIHIP	RHIHIP
10/04/2024	22:13:48	22	RHIHIP	RHIHIP
10/04/2024	22:29:41	22	RHIHIP	RHIHIP
10/04/2024	22:29:56	22	RHIHIP	RHIHIP
10/04/2024	22:30:11	22	RHIHIP	RHIHIP
10/04/2024	22:31:20	22	RHIHIP	RHIHIP
10/04/2024	22:36:53	22	RHIHIP	RHIHIP
10/04/2024	22:37:43	22	RHIHIP	RHIHIP
10/04/2024	22:38:01	22	RHIHIP	RHIHIP
10/04/2024	22:38:17	22	RHIHIP	RHIHIP
10/04/2024	22:38:33	22	RHIHIP	RHIHIP
10/04/2024	22:39:29	22	Noise	RHIHIP
10/04/2024	22:41:47	22	RHIHIP	RHIHIP
10/04/2024	22:44:40	22	RHIHIP	RHIHIP
10/04/2024	22:44:55	22	RHIHIP	RHIHIP
10/04/2024	23:37:13	23	RHIHIP	RHIHIP
11/04/2024	00:00:30	0	Noise	RHIHIP
11/04/2024	00:03:44	0	PIPPIP	RHIHIP
11/04/2024	00:13:40	0	RHIHIP	RHIHIP
11/04/2024	00:23:33	0	Noise	RHIHIP
11/04/2024	00:48:05	0	RHIHIP	RHIHIP
11/04/2024	00:51:02	0	NoID	RHIHIP
11/04/2024	00:51:36	0	RHIHIP	RHIHIP
11/04/2024	01:00:39	1	RHIHIP	RHIHIP
11/04/2024	01:28:33	1	RHIHIP	RHIHIP
11/04/2024	01:28:49	1	RHIHIP	RHIHIP
11/04/2024	01:29:13	1	RHIHIP	RHIHIP
11/04/2024	01:29:29	1	RHIHIP	RHIHIP
11/04/2024	01:36:58	1	RHIHIP	RHIHIP
11/04/2024	03:49:30	3	RHIHIP	RHIHIP
11/04/2024	03:49:40	3	RHIHIP	RHIHIP
11/04/2024	03:56:14	3	RHIHIP	RHIHIP
11/04/2024	03:56:36	3	RHIHIP	RHIHIP
11/04/2024	06:25:20	6	RHIHIP	RHIHIP
11/04/2024	20:02:23	20	RHIHIP	RHIHIP
11/04/2024	20:02:38	20	RHIHIP	RHIHIP
11/04/2024	20:18:25	20	NoID	RHIHIP
11/04/2024	20:22:34	20	RHIHIP	RHIHIP
11/04/2024	20:22:52	20	RHIHIP	RHIHIP
11/04/2024	20:23:19	20	RHIHIP	RHIHIP

11/04/2024	20:23:37	20	RHIHIP	RHIHIP
11/04/2024	20:34:05	20	RHIHIP	RHIHIP
11/04/2024	20:42:34	20	RHIHIP	RHIHIP
11/04/2024	20:42:49	20	RHIHIP	RHIHIP
11/04/2024	20:43:11	20	RHIHIP	RHIHIP
11/04/2024	20:45:58	20	RHIHIP	RHIHIP
11/04/2024	20:46:09	20	RHIHIP	RHIHIP
11/04/2024	20:46:24	20	RHIHIP	RHIHIP
11/04/2024	20:46:54	20	RHIHIP	RHIHIP
11/04/2024	20:47:56	20	RHIHIP	RHIHIP
11/04/2024	20:48:42	20	RHIHIP	RHIHIP
11/04/2024	20:49:18	20	RHIHIP	RHIHIP
11/04/2024	20:50:39	20	RHIHIP	RHIHIP
11/04/2024	20:50:47	20	RHIHIP	RHIHIP
11/04/2024	20:51:35	20	RHIHIP	RHIHIP
11/04/2024	20:53:19	20	RHIHIP	RHIHIP
11/04/2024	20:53:34	20	RHIHIP	RHIHIP
11/04/2024	20:53:49	20	RHIHIP	RHIHIP
11/04/2024	20:54:05	20	RHIHIP	RHIHIP
11/04/2024	20:54:19	20	RHIHIP	RHIHIP
11/04/2024	20:54:34	20	RHIHIP	RHIHIP
11/04/2024	20:54:49	20	RHIHIP	RHIHIP
11/04/2024	20:55:51	20	RHIHIP	RHIHIP
11/04/2024	20:56:37	20	RHIHIP	RHIHIP
11/04/2024	20:56:54	20	RHIHIP	RHIHIP
11/04/2024	20:58:17	20	RHIHIP	RHIHIP
11/04/2024	21:00:13	21	RHIHIP	RHIHIP
11/04/2024	21:01:03	21	RHIHIP	RHIHIP
11/04/2024	21:01:19	21	NoID	RHIHIP
11/04/2024	21:02:12	21	RHIHIP	RHIHIP
11/04/2024	21:04:56	21	RHIHIP	RHIHIP
11/04/2024	21:38:26	21	Noise	RHIHIP
11/04/2024	21:53:55	21	RHIHIP	RHIHIP
11/04/2024	21:54:43	21	Noise	RHIHIP
11/04/2024	22:00:20	22	RHIHIP	RHIHIP
11/04/2024	22:03:45	22	Noise	RHIHIP
11/04/2024	22:19:12	22	Noise	RHIHIP
11/04/2024	22:19:33	22	Noise	RHIHIP
11/04/2024	22:20:19	22	Noise	RHIHIP
11/04/2024	22:30:52	22	Noise	RHIHIP
11/04/2024	22:32:20	22	Noise	RHIHIP
11/04/2024	22:35:35	22	NoID	RHIHIP
11/04/2024	22:41:51	22	RHIHIP	RHIHIP
11/04/2024	22:51:21	22	RHIHIP	RHIHIP
11/04/2024	22:51:38	22	RHIHIP	RHIHIP
11/04/2024	23:32:07	23	RHIHIP	RHIHIP

11/04/2024	23:37:52	23	RHIHIP	RHIHIP
11/04/2024	23:38:07	23	RHIHIP	RHIHIP
11/04/2024	23:45:45	23	RHIHIP	RHIHIP
11/04/2024	23:46:01	23	RHIHIP	RHIHIP
11/04/2024	23:49:19	23	RHIHIP	RHIHIP
11/04/2024	23:49:45	23	RHIHIP	RHIHIP
11/04/2024	23:56:30	23	RHIHIP	RHIHIP
11/04/2024	23:57:53	23	Noise	RHIHIP
12/04/2024	00:07:42	0	RHIHIP	RHIHIP
12/04/2024	00:09:17	0	RHIHIP	RHIHIP
12/04/2024	00:10:44	0	NoID	RHIHIP
12/04/2024	00:15:01	0	RHIHIP	RHIHIP
12/04/2024	00:16:17	0	RHIHIP	RHIHIP
12/04/2024	00:17:25	0	Noise	RHIHIP
12/04/2024	00:17:42	0	RHIHIP	RHIHIP
12/04/2024	00:18:29	0	RHIHIP	RHIHIP
12/04/2024	00:18:45	0	Noise	RHIHIP
12/04/2024	00:19:16	0	Noise	RHIHIP
12/04/2024	00:19:31	0	RHIHIP	RHIHIP
12/04/2024	00:21:24	0	RHIHIP	RHIHIP
12/04/2024	00:22:07	0	RHIHIP	RHIHIP
12/04/2024	00:22:33	0	RHIHIP	RHIHIP
12/04/2024	00:25:16	0	Noise	RHIHIP
12/04/2024	00:31:01	0	Noise	RHIHIP
12/04/2024	00:31:17	0	Noise	RHIHIP
12/04/2024	00:32:56	0	RHIHIP	RHIHIP
12/04/2024	00:33:11	0	RHIHIP	RHIHIP
12/04/2024	00:33:26	0	RHIHIP	RHIHIP
12/04/2024	00:42:09	0	RHIHIP	RHIHIP
12/04/2024	00:42:24	0	RHIHIP	RHIHIP
12/04/2024	00:42:47	0	RHIHIP	RHIHIP
12/04/2024	00:43:03	0	NoID	RHIHIP
12/04/2024	00:43:36	0	RHIHIP	RHIHIP
12/04/2024	00:45:06	0	Noise	RHIHIP
12/04/2024	00:46:08	0	Noise	RHIHIP
12/04/2024	00:46:23	0	Noise	RHIHIP
12/04/2024	00:47:54	0	RHIHIP	RHIHIP
12/04/2024	00:51:04	0	Noise	RHIHIP
12/04/2024	00:52:33	0	Noise	RHIHIP
12/04/2024	00:56:29	0	Noise	RHIHIP
12/04/2024	00:57:18	0	RHIHIP	RHIHIP
12/04/2024	01:01:18	1	RHIHIP	RHIHIP
12/04/2024	01:02:51	1	RHIHIP	RHIHIP
12/04/2024	01:03:07	1	Noise	RHIHIP
12/04/2024	01:10:50	1	RHIHIP	RHIHIP
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12/04/2024	06:18:07	6	RHIHIP	RHIHIP
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13/04/2024	21:00:46	21	RHIHIP	RHIHIP
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16/04/2024	00:29:44	0	RHIHIP	RHIHIP
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16/04/2024	01:04:04	1	Noise	RHIHIP
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17/04/2024	06:35:59	6	Noise	RHIHIP
17/04/2024	06:39:14	6	NoID	RHIHIP

Table E: All bat species recorded on static unit located in Griffin's Cottage during Summer Surveillance.

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09/06/2024	23:53:50	23	PIPPIP	PIPPIP
09/06/2024	00:24:41	0	PIPPIP	PIPPIP
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09/06/2024	00:27:11	0	Noise	PIPPYG
09/06/2024	00:48:08	0	Noise	PIPPYG
11/06/2024	03:13:08	3	PIPPYG	PIPPYG
08/06/2024	23:48:11	23	PIPPYG	PIPPYG
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08/06/2024	22:15:33	22	PIPPYG	RHIHIP
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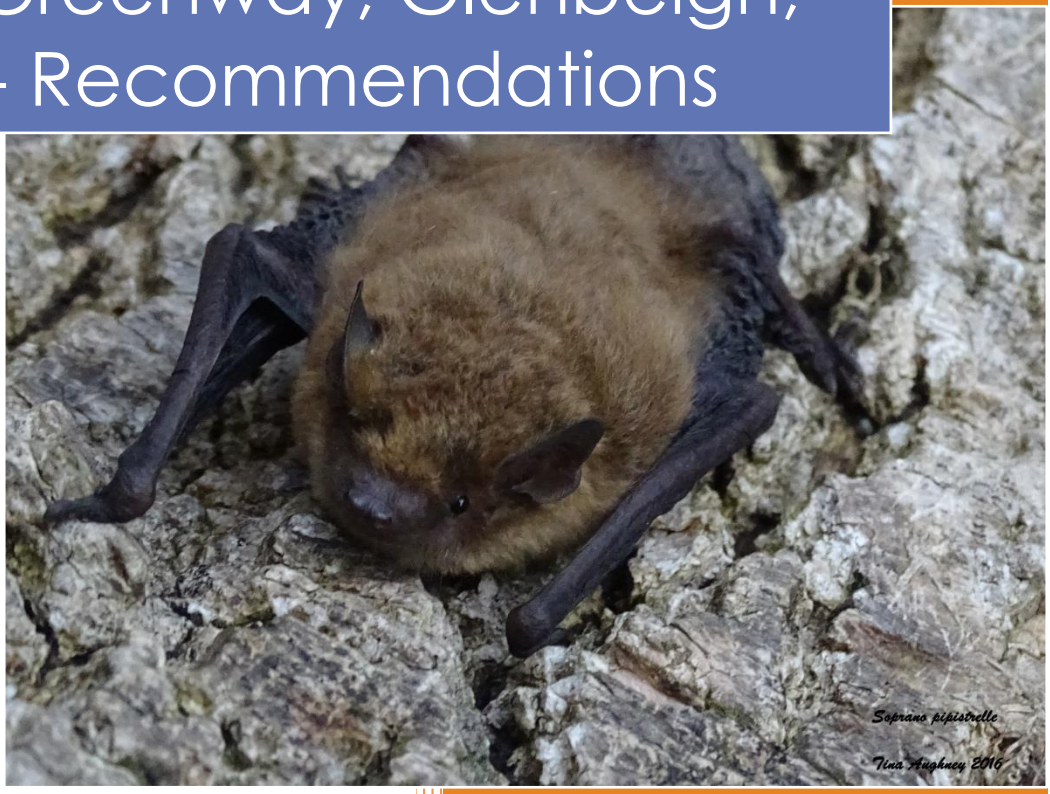
10/06/2024	22:06:24	22	RHIHIP	RHIHIP
07/06/2024	22:04:06	22	RHIHIP	RHIHIP
08/06/2024	22:05:07	22	RHIHIP	RHIHIP

Appendix D –

South Kerry Greenway Recommendations Report for Lesser horse-shoe bat derogation licence application, Dr. Tina Aughney

2024

LETTER: Griffin's Cottage Bat House, South Kerry Greenway, Glenbeigh, Co. Kerry - Recommendations



Dr Tina Aughney

Bat Eco Services

Bat Eco Services, Ulex House, Drumheel, Lisduff, Virginia, Co. Cavan. A82 XW62.

Licensed Bat Specialist: Dr Tina Aughney (tina@batecoservices.com, 086 4049468)
NPWS licence C17/2023 (Licence to handle bats, expires 23rd January 2026);
NPWS licence 27/2023 (Licence to photograph/film bats, expires 31st December 2024);
NPWS licence DER/BAT 2022-36 (Survey licence, expires 24th March 2025).

Statement of Authority: Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She was a monitoring co-ordinator and trainer for Bat Conservation Ireland for twenty years. She is a co-author of the 2014 publication *Irish Bats in the 21st Century.* This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015.

All analysis and reporting is completed by Dr Tina Aughney. Data collected and surveying is completed with the assistance of a trained field assistant.

Mr. Shaun Boyle (Field Assistant) NPWS licence DER/BAT 2022-37 (Survey licence, expires 24th March 2025).

14th September 2024

To whom it may concern:

Bat Eco Services was requested to provide additional advice in relation to potential impacts of proposed works for the South Kerry Greenway on lesser horseshoe bats roosting in Griffins Cottage. Site visits were undertaken on 1st and 15th February 2024. During the first site visit, representatives of Kerry Co. Co., Fehily Timoney and Southern Scientific Services provided an overview of the proposed works required in vicinity of the cottage with NPWS Regional staff input.

A series of surveys have been undertaken to-date to inform recommendations presented in this letter. The survey results are presented in a separate report prepared for Kerry Co. Co. Additional survey work will be undertaken during the Summer 2024 to provide additional baseline information.

This letter provides the following (with review of reports and previous consultations kindly provided by Monica Kane, Ecologist):

- recommendations to improve the cottage as a “Bat House” and protection measures during proposed works (e.g. rock breaking), which are to be included in the tender document for the proposed works;

- high-level recommendations in relation to proposed rock-breaking works, vegetation and soil removal works and landscaping in vicinity of Griffin’s Cottage as part of the South Kerry Greenway construction.

If you require any further information, please do not hesitate to contact me.

Yours sincerely,

Dr Tina Aughney.

a) Griffin's Cottage Bat House

i) Bat Usage

A separate report has been prepared in relation to surveys completed to date. The information collated by these surveys have been used to design the recommendations presented in this letter.

ii) Current Condition

The following drawing is a rough sketch of the internal space of the cottage.

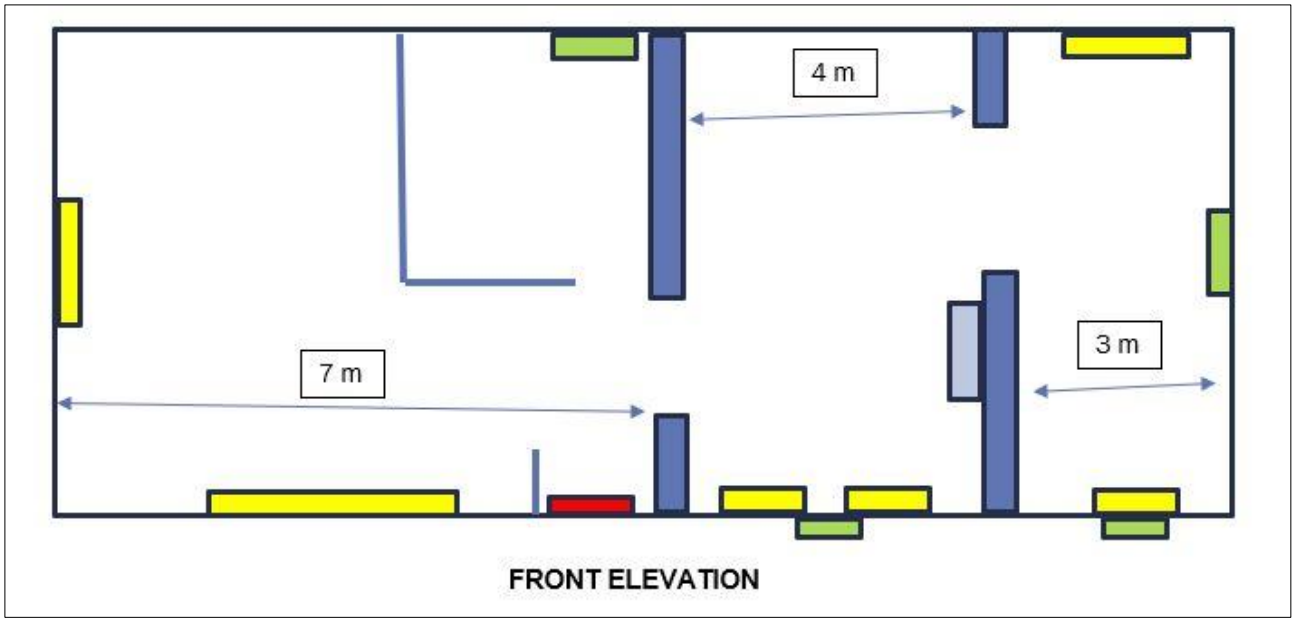


Figure 1: Drawing of internal layout of cottage (approximate).

Blue – internal walls (thicker lines are older natural stone walls approx. 40cm thick). Thinner lines are concrete block walls (not built to ceiling level, approx. 20cm space to timber beams).

Yellow – ground floor windows

Green – dormer windows (not all represented)

Red – front door

Light Blue – chimney breast

The current state of Griffin's Cottage is as follows:

- Dormer bungalow where the internal layout is unfinished.
- There are numerous windows inserted both at ground floor level and at dormer level, but these are not finished (i.e. numerous gaps around the windows in the concrete block work). Some windows are blocked with ply wood or vegetation while others have broken glass panes.
- The internal roof is felted and in good condition.


Plate 1a,b: Example of windows in cottage.

- Timber beams are in position in one section of the internal space but there is no loft floor. There are some sheets of ply wood stacked on the timber beams.


Plate 2a,b: Unfinished floor of loft space.

- There are two internal walls that would have been part of the original cottage structure prior to modern extension. One of which is missing a door lintel and this leaves it structurally unsafe. The second wall is where the original chimney breast is located.

Plate 3a,b: Chimney structure inside the cottage.

- There is some concrete block walls constructed adjacent to the front door entrance but these are also unfinished.
- Externally there is a narrow line of vegetation located at the front of the cottage along the roadside of the N70.
- To the rear of the cottage, there are large rock faces, which are proposed to be partially removed as part of the South Kerry Greenway. Above the rock face is a linear woodland that extends from the bridge to the south-east of the cottage and continues along the N70 to the north-west for approximately 500m on either side of the N70.

iii) Conservation Works

The following renovation recommendations were provided by NPWS (and these were included in the report that issued by Southern Scientific Services Ltd. to support the original NPWS Derogation Licence Application):

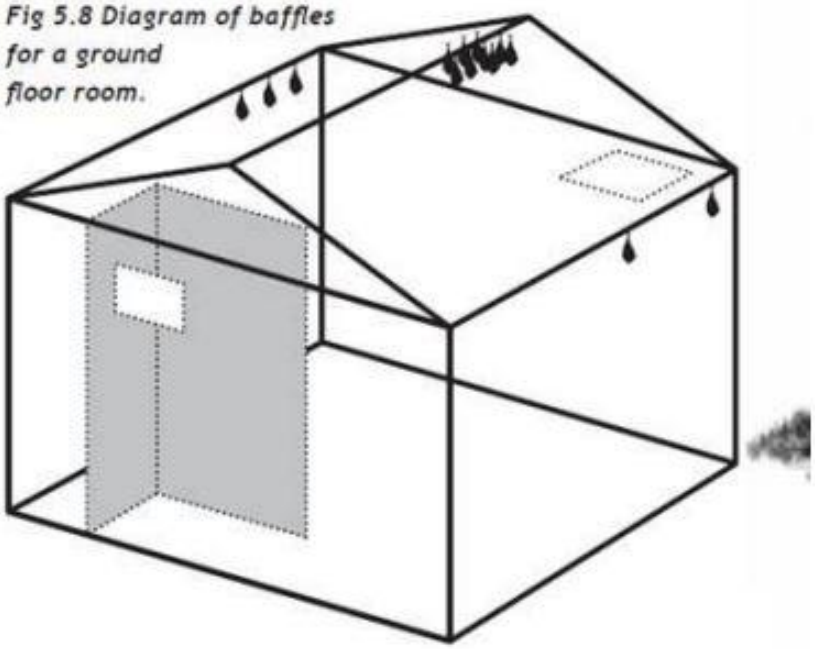
Conservation of the Lesser Horseshoe Bat Roost

The LHB summer roost site at the building identified in the NIS will be protected and enhanced during the winter months when bats have vacated the structure to hibernate underground. Enhancement of the house will be undertaken under direction from and in consultation with the NPWS and BCI with the view to optimising the roost and encouraging lesser horseshoe bats to return annually.

A meeting took place on the 15th of July 2023 with two NPWS Conservation Rangers at LHB Maternity Roost and the following enhancement measures for the roost were discussed:

- Install flooring on the existing first-floor beams to create a loft space for the bats;
- Darken the interior of the building by blocking up all windows, including the skylights, but leaving a letterbox entrance in the window at the rear of the house where bats are currently emerging;
- Install a new secure door with a letterbox opening;
- The minimum area for the letter box opening should ideally have an area of 2500cm^2 this can be a square opening of 50 cm x 50 cm or a rectangular opening with a minimum height of 20 cm but maintaining the same overall area.
- Install a wooden baffle inside the doorway and behind the rear exit window to further reduce light spill into the building. See the image of the baffle below taken from the Vincent Wildlife Trust Lesser Horseshoe Bat Conservation Handbook;

Fig 5.8 Diagram of baffles for a ground floor room.



- For building maintenance, the gutters should be cleared of dead vegetation.

Figure 2: Recommendations provided by NPWS.

To build on NPWS recommendations and in consideration of the occupation of the cottage by lesser horseshoe bats in winter, presence of soprano pipistrelles (February 2024 static surveillance) and future proofing of the cottage for long-term occupancy, I propose the following specific renovation works for Griffins Cottage (i.e. more details are provided to assist works required for renovation of the cottage as part of tender document):

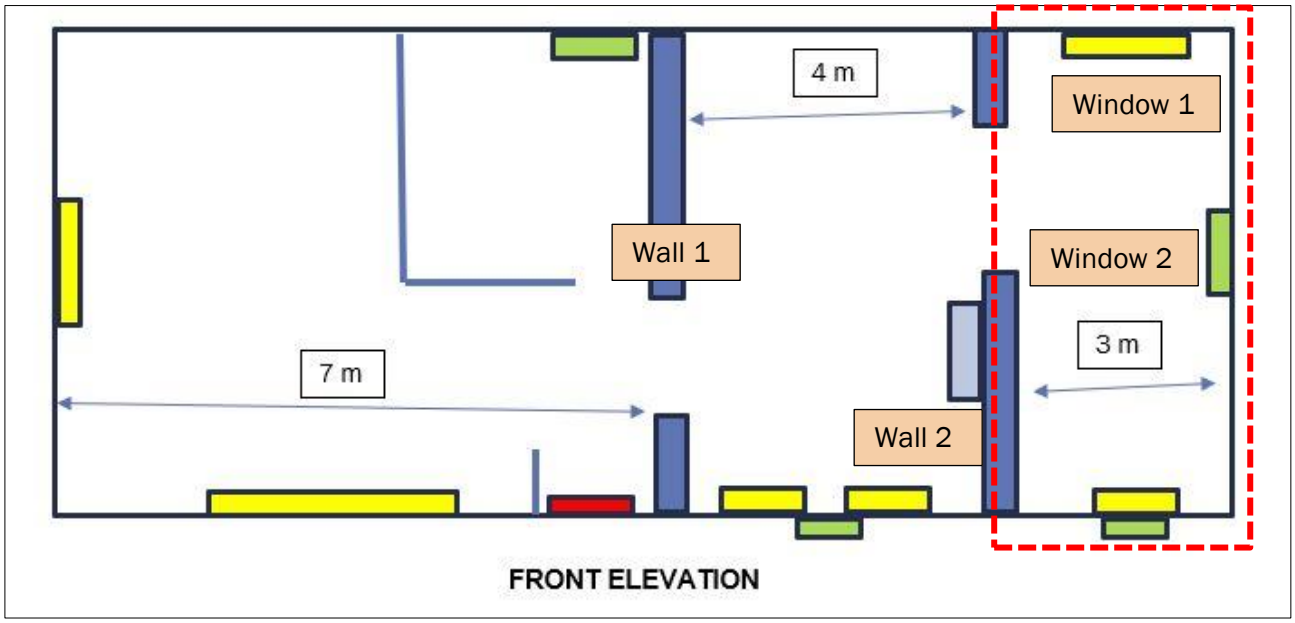


Figure 3: Drawing of internal layout (approximate) with Gable Room highlighted by Red Dash box.

1. Internal Wall (Wall 1) is required to be made stable and new door lintel inserted. The existing doorway gap should remain open post works.
2. All existing ground floor window frames (apart from one labelled as Window 1 – this will require a set of different works) should be removed and the space should be built up with modern concrete blocks and any gaps around the window frames should be filled to ensure that there are no drafts).
3. Advice is required on the best way to ensure that all of the existing dormer windows (apart from one labelled as Window 2 – this will require a different set of works) are draft free and blocked to prevent light entering. At a minimum, the internal area of the dormer windows should be covered with 1 inch ply wood internally to reduce any light shining into the internal space of the building.
4. The existing front door (Red Rectangle outline in blue) should be replaced with a more secure door and the base of the floor should be built up to prevent predators entering the cottage via the existing gap below the current door frame.
5. The upper sections of the 2nd original wall (Wall 2 - where the chimney breast is located) should be built up to the rafters to create a separate room. This can be completed using a stud wall or concrete blocks. A door with a post box opening (dimensions of opening in door = 50cm v 50 cm) should be positioned in the existing door area of this wall. This post box opening should be located near the upper section of the door and this will allow bats to fly from the “Gable Room” to throughout the rest of the cottage’s internal space. This “Gable Room” has been highlighted with a Red Dash Box.
6. As per NPWS recommendations, existing timber beams (i.e. section of the cottage where loft floor timber beams are currently in place) should be floored with timber in order to create a loft space. The flooring should be strong enough to allow a surveyor to enter the loft space

in order to count bats and to undertake maintenance works (e.g. removal of bat droppings). In order to reduce timber rotting as result of bat dropping accumulation, it is recommended that the floor surface has 1 inch marine timber ply wood or similar in order to increase durability for the decades to come (this could be a 2nd layer to the loft floor).

7. It is recommended that there are two lesser horseshoe entrances for bats into the internal space of the cottage. NPWS recommended that these two areas are the ground floor window named Window 1 and the front door. However, I have reservations about using two ground floor exit/entrance points due to potential predation. Therefore I propose that the gable window (Labelled as Window 2 in the Gable Room), which is located approx. 4m off the ground, should replace the proposed exit/entrance in the front door. As both of these exit/entrance points will be located in the new Gable Room of the cottage (See Point 5), it will reduce the degree of potential wind and light entering via the new exits/entrances throughout the building but leave a large area for the bats to light sample at dusk before existing the building while ensuring that the rest of the cottage remains in darkness.
8. The existing window frame of Window 1 (See Plate 4) should be removed and built up with concrete block but leaving a post box opening (dimensions = 50cm x 50 cm) and this opening needs to be located at the highest point of the existing window frame opening. Externally the new post box opening will need to be made predator proof and easiest way to achieve this is to fix steel sheeting, securely, for 1m below the entrance and for a minimum of 50cm either side and above the exit/entrance with steel sheets. Fix an additional steel plate at an angle to the bottom of the exit/entrance creating a window sill (similar to the photograph Plate 5a to prevent cats jumping directly through the opening).

Plate 4: Ground floor window labelled as Window 1 (Figure 1) and proposed to continue to be one of the exit/entrance points for the lesser horseshoe bat colony post renovation works.

Plate 5a: Example of predator proofing of exit/entrance point.

9. For the 2nd exit/entrance point (Window 2 – no photograph currently available) the dormer window in gable end of cottage (Red Dash box on Figure 3) will be used as the 2nd exit/entrance point for the lesser horseshoe bat colony. To complete this step, this window will be removed and the opening will be built up the frame with concrete block but ensuring, again, that there is a post box opening (dimensions = 50cm x 50 cm) within the space. This will also require predator proofing externally by placing steel sheeting around the post box opening similar to that in the photograph below.

Plate 5b: Predator proofing on external wall around entrance point.

10. Due to climate change, over the last number of years, there have been days where temperatures have risen in excess of 40oC in bat roosts across the country. While bats seek out warm spaces during the summer months, extremes temperatures are dangerous for bats. Therefore, it is proposed to future proof the cottage by providing a cooler room on the ground floor for bats to move to during extreme temperature days. This is the ground floor room where there is currently a partially constructed modern concrete walls (below the existing timber beams). The first wall is a small 3 block high wall to the left hand side of the front door entrance (as you enter the cottage). This should be built up to the existing timber beams. In addition, the 2nd modern concrete wall that is currently built to within 30cm from the timber beams should also be finished to the timber beams. This is hereafter named the Ground Floor Room.

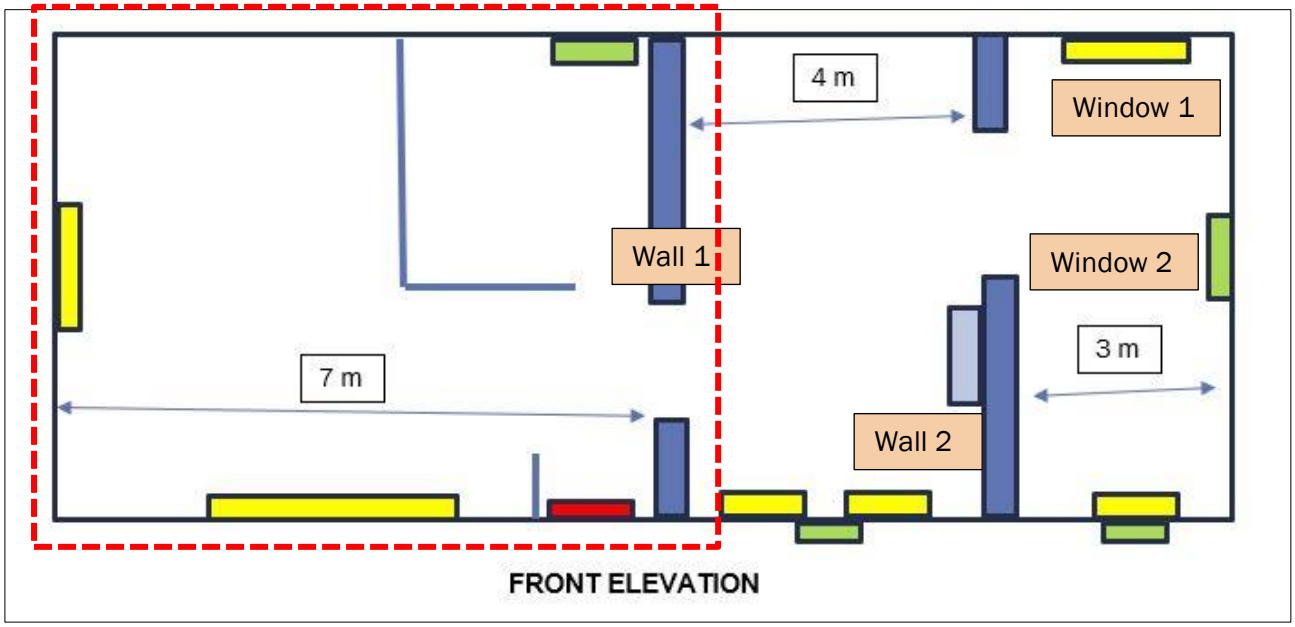


Figure 4: Drawing of internal layout (approximate) with Ground Floor Room highlighted by Red Dash box.

11. As requested by NPWS, guttering and down pipes should be checked, cleaned of vegetation and fixed, if required.
12. These works to the cottage should be undertaken in the months of September, October and November or the spring months of March and April. If no bats are recorded hibernating in December (i.e. the weather is mild) then works can proceed into this month. However caution is required during December to February due to high potential of hibernating bats being present. It is recommended that works are started in September when the bats have left after the maternity season and are undertaken as quickly as possible. As the proposed contract is to start in October 2024, it is recommended that the cottage works are undertaken as one of the first tasks to ensure that the space is safe and secure for the bat colony during the remainder of the construction period of the South Kerry Greenway.
13. It is important that the bat specialist liaises with the construction contractor to ensure that the measures described above are strictly followed. Depending on the duration of works, a site meeting is recommended once every two weeks.
14. No internal plaster works are required. A rough finish is recommended to allow other bat species to roost within the cottage.
15. It is recommended that rubbish etc. is cleared from the internal space of the cottage.

Cold Room (OPTIONAL) as a future conservation measure

There is an option to undertake further works to the Cool Room (i.e. Ground Floor Room previously mentioned in Point 10) to improve it as a hibernation site and therefore categorise it as a Cold Room. In addition to the works above, the following can be undertaken:

1. Fix insulation board below the timber joists of the Loft/Cool Room space.
2. Fix chicken wire below the insulation boards to provide roosting grip for hanging lesser horseshoe bats.
3. Fix a solid door at the entrance of the Cool Room ensuring that there is a post box hole in the upper part of the door to allow bats to access the Cool Room from the internal space of the structure. Post box entrance is 50cm x 30cm.
4. Ensure that the upper sections of the walls built-up in No. 10 above are sealed to reduced air circulation from other sections of the building into the Cool Room.

Further recommendations are proposed for when the greenway works are completed in vicinity of the cottage. These additional works are presented below and aim to provide “buffering” to permit maintenance works of the greenway and N70 in vicinity of the cottage.

Plate 6: Example of post box entrance in door to allow bat movement between rooms.

b) South Kerry Greenway route adjacent to Griffin's Cottage Bat House

The proposed works, relating to the greenway and in vicinity of the cottage (See Figure for location of cottage in relation to new greenway route), are as follows:

- Vegetation and soil removal between the bridge and towards the rear of the cottage (Plate 3) approximately 6m wide.
- Vegetation removal to the rear of the cottage (Plate 4 and Plate 5) along with sections of the bank to allow a greenway corridor to the rear of the cottage.
- Rock breaking at a 60^{o} angle for approximately 30 to 40m to the rear of the cottage (Plate 6) to allow for a greenway corridor. This will required a minimum of 4m width of rock breaking. The current design indicates that there is approximately 850m3 of rock to be removed, this is similar to the previous estimate.
- Rock breaking at a 70^{o} angle for approximately 50 to 60m beyond the cottage along the N70 (Plate 7).

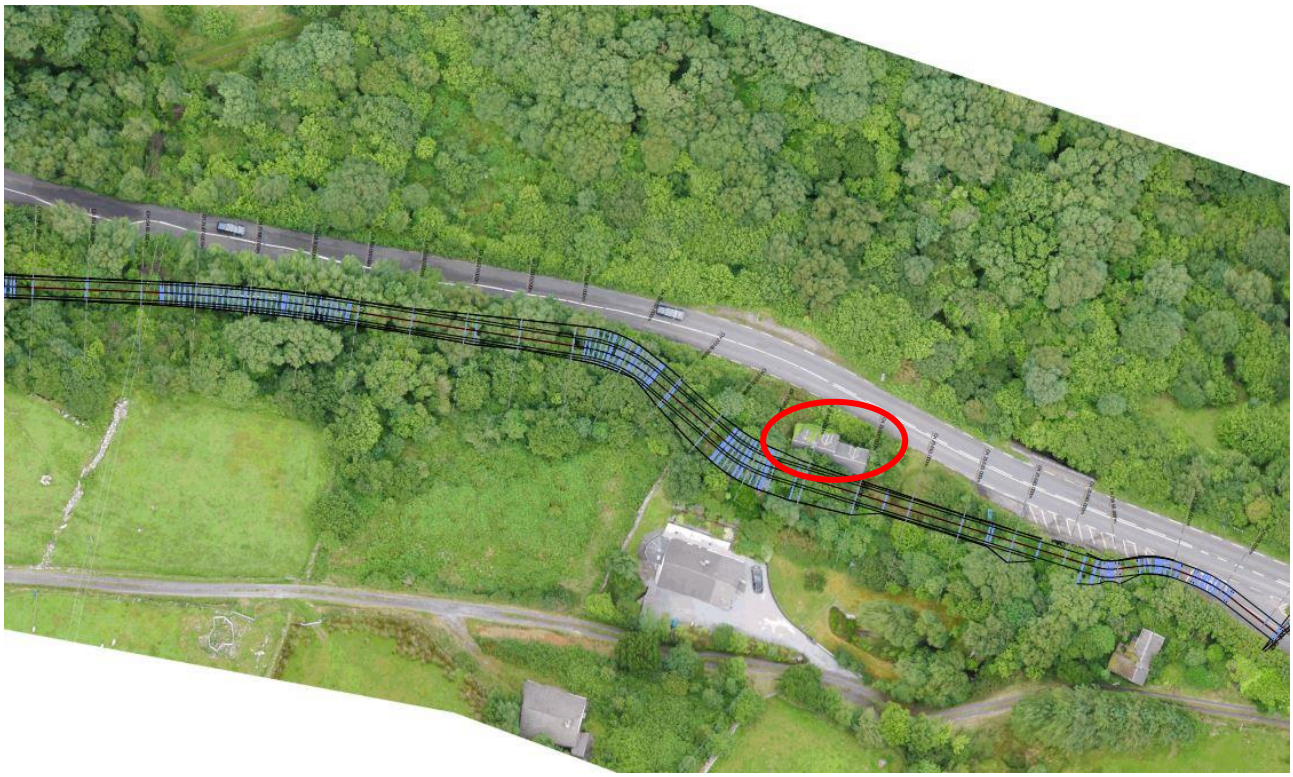


Figure 5: Proposed greenway route, cottage is located in Red Circle.

- The bulk of the rock breaking is from the eastern side of the cottage, heading west until the greenway route is online with the old railway track again (See Figure 2 below). It is estimated, that if the rock is favourable for rock breaking, that the procedure will take 6-8 weeks followed by another 6-8 weeks of soil nailing/slope stabilisation.
- Final landscaping will be completed by the contractor and advise will be provided by the bat survey work (summer 2024).

The proposed Scope of Works)provided by Kerry Co. Co.) is:

- Topsoil removal
- Rock Breaking
- Soil Nailing/Rock Anchoring
- Drainage Works
- Road pavement capping and 804
- Laying of Asphalt – Note this would be done with laying asphalt on the rest of the project at a later time.

Figure 6: Extent of rock breaking works in vicinity of cottage is located in Red Line drawing.

Plate 4: Blue line marks the proposed area of soil removal west of the existing bridge.

Plate 5 & 6: Vegetation removal proposed for the rear of the cottage.


Plate 7a: Blue line marks the proposed area of rock breaking to the rear of the cottage.
Plate 7b: Blue line marks the proposed area of rock breaking west of the cottage.

There is concern that the proposed works (i.e. rock breaking noise) will impact on the lesser horseshoe bat colony. In preparation for suggesting mitigation measures, a brief literature review was undertaken.

It is generally understood that anthropogenic noise impacts on bat activity. One such paper includes Hooker *et al.* (2023) who reported the negative impact of festival music on bat activity but this differed for different species of bat. Activity of Nyctalus/Eptesicus species was reduced along woodland edge habitats while there was no impact was report for *Myotis* species, *Pipistrellus pipistrellus* and *P. pygmaeus*. Simmons *et al.* (2016) reported that big brown bats are less likely to be susceptible to noise-induced hearing losses than compared to other mammals. Hage *et al.* (2014) investigated the impacts of ambient noise on horseshoe bats on the production of their different echolocation call components and showed that the bats altered the CF and FM component of their calls depending on the type of anthropogenic noise and therefore could impact on their ability to detect prey items. Cory-Toussaint & Taylor (2022) investigated the potential impact of anthropogenic lighting, noise and vegetation removal on local bat populations of opencast mines in South Africa. The study reported that there was a significant negative impact of increased lighting and vegetation removal on bats while anthropogenic noise had no significant impact on bat activity and species richness. However, the impact of noise may vary depending on the seasonal activity of bats. Lou *et al.* (2014) reported that bats in torpid rapidly habituated to repeated and prolonged anthropogenic noise exposure (e.g. traffic). This study also found that bats become more sensitive to noise as dusk approaches suggesting that the time of the day affects the response bats will have to external noise sources with responses noted as bat prepare to wake in preparation for foraging prior to dusk.

Therefore in light of this, it recommended that the following is undertaken:

1. It is recommended that the proposed works on the cottage to improve it as a roost for lesser horseshoe bats is undertaken prior to rock breaking operations and construction access works west of the cottage. This will ensure that the structure is stable and suitable for roosting bats with appropriate exit/entrance points are in place.
2. Rock breaking is undertaken outside the maternity season and the prime activity period for bats in the months (i.e. no works to be undertaken in May to August) to reduce potential activity on lactating females and foraging/commuting bats.

3. It is recommended that a panel with noise insulation or sound blocking boards (to reduce the passage of sound between the rock breaking operations and the rear walls of the cottage) is erected to the rear of the cottage. As there is little space available to the rear of the cottage, the insulation panel may need to be erected directly to the rear wall of the cottage. However, if the two exit/entrances are in position (as a result of completed roost works), the exit/entrance at the gable will be the primary exit/entrance point (i.e. Window 2 in the gable – dormer window) during the rock breaking works as the ground floor exit/entrance (Window 1 – ground floor window) maybe blocked, temporarily, by the insulation panel. Sound blocking boards is typically acoustic plasterboard.
4. It is recommended that no temporary lighting is permitted to the rear of the cottage during rock-breaking works and that any lighting used during the construction of the greenway is turned off when daytime operations are completed.
5. It is recommended that a passive static detector (set to record 24 hrs/day) is deployed throughout the rock breaking works coupled a temperature data logger to monitor potential impact of noise and vibration on roosting bats. A minimum of monthly visits are recommended to undertake an internal count of roosting lesser horseshoe bats and to download SD cards and re-deploy static unit. However during the rock-breaking phase, this should be increase to a sit visit once every 2 weeks but if monitoring results highlight the need for more regular visits, this should be set as a precautionary recommendation.
6. It is recommended that a minimum amount of vegetation removal is undertaken to reduce potential impacts and this should be undertaken under supervision by the project ecologist.
7. It is recommended that temporary planting and/or hoarding is recommended on either side of the cottage where vegetation removal has been undertaken and where it is planned to be undertaken to ensure that there is a tall structure to mimic tall vegetation. This will ensure the integrity of existing commuting routes. This is required until new planting is satisfactorily established.
8. Monitoring of the lesser horseshoe bat colony is recommended during renovations works and during construction phase of the project by the project bat specialist.
9. Additional bat mitigation measures may be required during construction/operation depending on the result of future surveys.

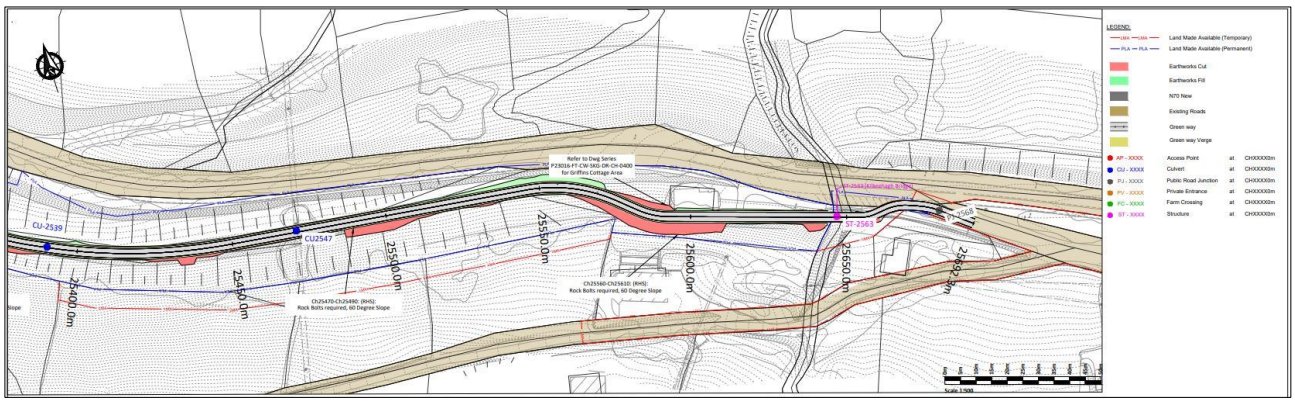


Figure 7: Griffin's Cottage located adjacent to the proposed route of the South Kerry Greenway.

Plate 8: Wall and vegetation currently in place of the cottage.

c) South Kerry Greenway – Landscaping & Conservation Measures

It was proposed to undertake surveys in Spring (completed in April 2024) and Summer 2024 (to be completed in June 2024) of how lesser horseshoe bats commute to and from Griffins Cottage to provide information on the pattern of usage in the area between the bridge east of the cottage, Griffins Cottage, greenway route, N70 and Drung Hill Tunnels. Preliminary information from the Spring Surveillance indicates that the following is required:

1) A 3m tall timber fence should be constructed around the rear and gables of Griffins Cottage (similar to that show in Plate 9) during the construction phase of the project. This is recommended to buffer the cottage from greenway usage, potential maintenance works and protecting the ground floor exit/entrance for bats. This fence should be constructed 1m from the walls of the cottage and will provide a dark corridor around the cottage for bat usage. The final colour of this fence should be matt black to increase a dark corridor effect.

   A canopy enclosure (to the rear of the cottage where the ground floor exit is currently used by bats and will be retained post-renovation works – See Plate 4) is required for the section of the proposed 3m wall. This canopy will be an enclosed cover fitted on top to the 3m wall and connected to the wall of the cottage. (To explain this further – if we take the partition wall that was constructed in from of the entrance of Drim Bat House (presented in Plate 9) and fit a solid sheet of suitable material on top of the partition wall and connect to the external wall of the cottage (sealed to prevent water seeping through). Thereby creating a “roofed corridor” directly over the exit/entrance point of Plate 4. The length of this roof should be 5m, with exit point in the centre of the “roofed corridor”. This is required because bats were recorded, during 2024 bat surveys (please see separate report) night sampling in this area. At the moment, due to the rock face and scrub vegetation, this corridor to the rear of the cottage is equivalent to a shelter canopy and therefore replacement “like-for-like” is recommended. As there is not enough space to provide tall vegetation post greenway works directly between the cottage and the greenway, using the 3m fence and creating a canopy enclosure along the section on ether side of the widow (Plate 4) will achieve a similar sheltered effect for light-sampling lesser horseshoe bats post greenway construction works. It is recommended that these works are undertaken as soon as it is possible to build the 3m wall around the cottage post-rock-breaking phase.

   A locked gate should be inserted in the fence (front or gable of the cottage) to allow NPWS Regional Staff etc to enter the cottage for monitoring. This should be undertaken as part of the greenway construction phase in vicinity of the cottage as soon as physically possible (i.e. once 3m timber fence is in place, locked gate should also be put in place).

   It is important to ensure that there is restricted access to the cottage by greenway users in order to reduce any disturbance.

   It is recommended that summer (in liaison with NPWS, a minimum of two counts is required during the Lesser Horseshoe Bat Monitoring Summer season) and winter counts (in liaison with NPWS, a minimum of two counts is required during the Lesser Horseshoe Bat Monitoring Winter season) of roosting bats is undertaken annually until the greenway construction in vicinity of the cottage is completed.

Plate 9: Partition wall constructed in front of entrance of Drim Bat House in County Clare – a similar structure is recommneded around Griffins Cottage.

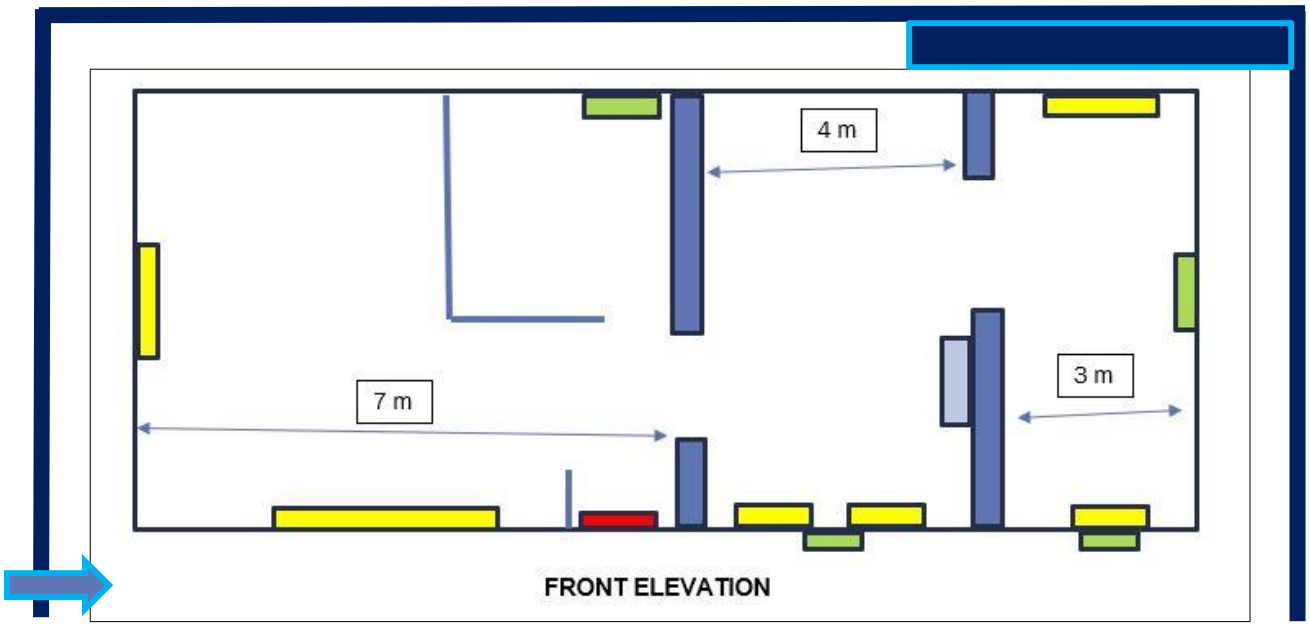


Figure 8: Drawing of internal layout (approximate) of cottage with external partition wall and canopy (outline in light blue) shown in Navy. Arrow represents potential location of gate access for NPWS staff.

Landscaping Requirement during and post- South Greenway Construction:

2) The perimeter of the greenway along the N70 requires a buffer of vegetation and/or temporary timber hoarding panels (the extent of this will be determined by the extent of vegetation proposed to be removed. It is recommended that the panels extent 2m beyond vegetation removal). An alternative to timber panels is Heras fencing with hessian material covering on both sides of the Heras material to create a dark corridor on the greenway side of the Heras fencing. This buffer is required from the existing bridge (east of the cottage) to west of the cottage for the length of exiting linear woodland. This buffer should be 1.5m high.

   This buffer will ensure that there is a corridor for commuting and foraging lesser horseshoe bats. This is important as the Spring Static Surveys have shown that bats commute in the exiting vegetation west of the cottage.

   It is recommended that static surveillance surveys are undertaken annually during the construction of the greenway to ensure that any buffers used are working (Spring and Summer, minimum of 1 week surveillance to compare to such surveys undertaken in 2024).

   Planting is to be undertaken under the supervision of the project ecologist and exact planting protocols (i.e. splitting of planting during and post-construction) to be determined by the project ecologist.

Landscaping Requirement Post South Greenway Construction:

3) The southern perimeter of the greenway should be replanted with native tree and shrubs species such as alder, grey willow, hazel (fast growing – 90cm whips) interspaced with holly (for all year round dense vegetation) (Project ecologist should be consulted with regards to planting mix). This planting should be undertaken in the appropriate planting season (November to March) post-greenway construction. This planting should be undertaken from the existing bridge (east of the cottage) to west of the cottage for the length of exiting linear woodland.

   The N70 perimeter of greenway, where permitted, should have a minimum of 2m vegetation buffer of planting to provide commuting habitat for bats and to buffer such habitat from road traffic and maintenance works. Planting should consist of native trees and shrub species (e.g. 6-8 ft old alder trees). Where there are gaps in vegetation, these gaps should also be planted. This is the same for the front of the cottage, however, there may not be space for planting here and therefore an increase in the height of the exiting wall should be considered. It is recommended that the wall height is increased to 1.5m to reduce vehicle noise disturbance and potential disturbance from vehicle lights during the night. The extent of the buffer will be determined in consultation with the project ecologist to ensure that there are no gaps in roadside vegetation.

   The planting mix is to be approved by the project ecologist.

   No lighting is recommended along the greenway.

   An information board is recommended to be erected on the fence around Griffins Cottage to provide information on lesser horseshoe bats.

TIME FRAME FOR WORKS (To be confirmed once a contractor is appointed).

The time frame of this section will be finalised once a time frame of propose works are provided for the bat specialists to examine and comment. The following is a guide:

October 2024	Renovation Works on Griffins Cottage
TBC	Prior to rock breaking phase, ensure that sound insulation panels (etc) are in place.
TBC	Rock breaking works (depending on renovation works) etc.
TBC	Prior to construction of Kerry Greenway in vicinity of cottage, ensure that timber panels/Heas fencing is put in place.
TBC	Once renovation works are completed on cottage, post-rock breaking works and prior to con construction of Kerry Greenway in vicinity of cottage, construct the timber panels and canopy proposed for the perimeter of the cottage. Where possible, constructed the extra height for the front wall of the cottage along the N70 road during this period.
TBC	Landscaping – time frame in consultation with the Project Ecologist.

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