Ecological Impact Assessment (EcIA)

Fort Dunree, Dunree Head, Buncrana, Co. Donegal

GGA
GARETH GRINDLE ASSOCIATES

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1. Introduction

1.1 Fort Dunree at Dunree Head, Buncrana, Co. Donegal is proposed for comprehensive redevelopment to provide a tourism landscape and attractions site. This report provides the Ecological Impact Assessment (EcIA); Screening for Appropriate Assessment (AA) is provided under separate cover.[1]

Personnel

1.2 Site surveys and assessments have been conducted and reported by Mr Gareth Grindle B.Sc. (Hons.) M.Sc. L.L.M. M.I.Env.Sc. M.C.I.E.E.M.

1.3 Mr Grindle is the Principal of Gareth Grindle Associates (GGA). He holds an Honours degree in Environmental Science (B.Sc. (Hons.), University of Stirling, 2000), a Master of Science in Environmental Change (M.Sc., King's College, London 2001) and a Master of Laws in Environmental Law (L.L.M., Queen's University, Belfast 2014). He has over 20 years of professional experience in the public, private and voluntary sectors, including 5 years with the Northern Ireland Environment Agency (NIEA) and 10 years as a consultant and director at Corvus Consulting. He is a full member of the Chartered Institute of Ecology & Environmental Management (M.C.I.E.E.M.) and the Institution of Environmental Sciences (M.I.Env.Sc.), organisations requiring peer-review for membership and a high standard of professional conduct, and has recently been appointed to the panel of Specialist Consultants for *An Bord Pleanála*.

Terms of Use

1.4 This report is provided to the project design team headed by TMKM JV, and to our clients, Donegal County Council, for their exclusive use and reliance. Once marked *final,* this report can be disseminated and published as necessary but cannot be relied upon by any party for anything other than the original intended purpose without the agreement and express written confirmation and consent of the author (no reliance can be placed on any report marked as *draft*).

1.5 This report has been prepared, with diligence and care, based upon the author's professional experience and understanding of current and pending legislation, case law, and best practice guidance. Neither GGA nor the author can be held responsible for any consequences which may arise from changes to legislation etc. made after this report is marked *final* which may render its content or conclusions outdated or invalid.

Site & Surroundings

1.6 Fort Dunree is a large (c. 26ha)[2] coastal and upland site at Dunree Head on Lough Swilly, Inishowen, Co. Donegal. The site includes all of the buildings, structures, roads/paths and other infrastructure associated with the current uses (tourism, military museum, peace centre, public amenity) and the former, long-standing military uses (historically a Napoleonic fort, a strategic defensive position during WW1 and through WW2, and some use as a training facility until the 1980s), the adjacent lighthouse, and the surrounding heathlands and enclosing sea cliffs [Figure 1a; Plates 1.1-1.6]. Heathland, at one time likely much more extensive at Fort Dunree (in Irish, *Dún Fhraoigh* meaning 'Fort of Heather'), still dominates the elevated sections despite encroaching grasslands, scrub, and dense bracken.

[1] *'Screening for Appropriate Assessment (AA): Fort Dunree, Dunree Head, Buncrana, Co. Donegal'* (GGA-2022-043-1 final v5, October 2023)

[2] The site comprises contiguous lands at Dunree Head owned/controlled by Donegal County Council, Commissioner of Irish Lights & Dunree Military Museum – the red-line boundary has been drawn to enclose the entire ownership rather than indicate the limits of proposed new development and redevelopment.

Figure 1a: The Site in Local Context

Plate 1.1: The Site – typical view of the developed area taken from a walking path close to the High Fort [August 2023]

Plate 1.3: The Site – the Lower Fort and vegetated sea cliffs to Lough Swilly [August 2023]

Plate 1.2: The Site – typical wider view of the lower parts of the site, taken from a walking path close to the High Fort [August 2023]

Plate 1.4: The Site – the typical view of the upper parts of the site and the main walking path to the High Fort [June 2022]

Plate 1.5: The Site – typical view of Lough Swilly taken from the summit at the High Fort [August 2023]

Plate 1.6: The Site – typical view of rough grasslands and sea cliffs to Lough Swilly, taken from the Lower Fort [June 2022]

1.7 Vegetation comprises three broad habitat types – the dry heathland and acid grassland mosaic that dominates the elevated sections to the north and east, the overgrown scrub and non-native/ornamental complex that surrounds the developed areas to the south and west, and the rocky sea cliffs (both exposed and vegetated) around the coastal boundaries to the north and west. The site is dominated by these semi-natural habitats and vegetation complexes but long-standing development, and particularly the more recent history of partial disuse and abandonment, has interrupted the natural habitat transitions from the rocky shore through exposed and vegetated sea cliffs to terrestrial dry acid grassland and upland dry heath. The composition of coastal and terrestrial habitats has been significantly altered in places, particularly close to the roads, carparks, paths, and buildings/structures, where the vegetation communities are dominated by non-native and ornamental plants (including some low and medium impact invasives) that have spread from former gardens and more recently landscaped areas.

1.8 The site is bordered by similar upland habitat and rough grazing to the east and south and by Lough Swilly to the north and west, and retains strong physical and functional ecological connectivity with Lough Swilly and the wider rural and upland landscape, but this is an open and exposed coastal site with limited structurally diversity, very little woodland/tree cover, and no appreciable linear habitat network (hedgerows, stream corridors etc.). Native botanical diversity is reasonably high in places but is much more limited in the areas affected by development where natural complexes are compromised by enrichment, encroachment, and other edge effects.

Development Proposals

1.9 The Fort Dunree Project aims to deliver a modern, creative, and holistic visitor experience and secure a sustainable future for this historic and unique site and create a landmark 'must see' attraction on the Wild Atlantic Way. The project seeks to retain the essential character and structure of the site as it is now, and as it was previously, and maintain the high environmental and landscape quality of the area through revitalized historic landscapes and structures, conservation of habitats and biodiversity, and new distinctive insertions that will enhance the existing infrastructure and visitor experience. As per the project objectives, annual visitor numbers are expected to grow from current 14,250 to 114,191 in ten years.

1.10 The proposals include new development and comprehensive redevelopment in places; improvements, renovations, and refurbishment in others; new and upgraded infrastructure and services; and landscaping where necessary. However, in general terms, new development and redevelopment is confined to previously-developed parts of the site [Figure 1b] – the surrounding and enclosing natural/semi-natural upland and coastal areas will be largely unaffected.

Figure 1b: The Site & Proposed Development Locations

Figure 1c: The Site & Proposed Development

proposed overall layout overlay courtesy Park Hood Chartered Landscape Architects

1.11 The proposed development is formally described in the Planning Statement.[3] For the purposes of ecological assessment and ease of reference the project proposals can be divided into discrete sub-projects, summarised as follows from information set out in the Design Statement,[4] the Planning Statement, and various proposed layout and engineering drawings:

- High Fort / Redoubt
  - extensive refurbishment and restoration including new and reinstated pathways around the internal and external perimeters and repairs to the blockhouses/watchtowers;
  - significant restoration of the entrance pavilion including partial demolition of the non-original first floor structure and construction of a new viewing building and event space to include ground floor events space, first floor exhibition area, toilets, staff room, lift, external viewing platform and including the restoration of the existing stairs.
- High Guns
  - light-touch refurbishment focused on one underground ammunition store and one gun platform;
  - repairs to the steps, appropriate handrails, and guarding around the gun platform, light internal repairs, lighting and electricity, upgrades to the existing pathways.
- Lough Swilly Walkway (Lower Fort)
  - construction of an open cliff-top walkway (92m in length) fully accessible from the Lower Fort;
  - replacement of the existing drawbridge with ramped access;
  - materials variously concrete and perforated metal balustrade and flooring with a glass floor and balustrades in the central section;
  - existing galvanised balustrades to be removed and replaced where required with either glass infill panels or perforated metal balustrades;
  - the walkway does not overhang the cliff edges and does not project beyond high water mark;
  - the evolution of design and positioning is set out in the Design Statement and detailed design and construction methodology is set out in a dedicated report.[5]
- Lighthouse Walkway
  - construction of an open and fully accessible cliff-top projecting walkway (28m in length, including a 12m cantilevered section) with supporting steel structure below;
  - balustrade and flooring to be constructed of perforated metal or equivalent;
  - accessed from the existing cliff-top walking path to the north-east of the lighthouse;
  - the walkway does not project beyond high water mark;
  - the evolution of design and positioning is set out in the Design Statement.
- Lighthouse
  - repairs and upgrades to the existing lighthouse building, which has remained vacant for a number of years and fallen into disrepair, to preserve into the future – minimum intervention.
  - series of repairs to the existing fabric, roof replacement and electrical upgrades;
  - some soft landscaping within the curtilage.
- Car Park & Road Access
  - the car park is to be relocated closer to the site entrance allowing the green at the centre of the site to be reinstated;
  - the new location is predominantly hard-standing – this is a brownfield development – some demolition (tarmacadam, old foundations etc.), vegetation clearance, earthworks and re-profiling will be required;
  - the new car park will provide 110 spaces including – 11 accessible spaces, 5 EV charging spaces, 5 minibus/campervan spaces, 5 bus/coach spaces (including an accessible drop off point) & cycle parking;
  - minor carriageway widening and vegetation clearance works at the site entrance to achieve sight lines;
  - patch repairs and upgrades to the internal access roads;

[3] *'Planning Statement – Development by a Local Authority – The Fort Dunree Project, Co. Donegal'* (Turley, October 2023).

[4] *'The Fort Dunree Project Design Statement'* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

[5] *'Fort Dunree, Co. Donegal – Lower Fort – Lough Swilly Walkway – Planning'* (Design ID, August 2023).

  - construction of a new access road (160m) from the Welcome Buildings to tie-in with the existing High Fort Access Road and 400mm widening of the High Fort Access Road (for the provision of a wheelchair-accessible EV bus mobility bus to transport visitors from the Welcome Buildings to the High Fort, Low Fort and Saldanha Suite;
  - the evolution of proposals and design are set out in the Design Statement.
- The Square
  - the area currently used as the car park is to be restored and landscaped to a green area, and re-purposed as an information and orientation space, a spill-out space from the cafeteria, and for general amenity;
  - soft landscaping including native vegetation, new surface materials, and interpretative displays etc.;
  - earthworks and re-profiling will be required – excess excavated and unused material from other aspects of development will be used as fill.
- Existing Buildings – Billet Buildings
  - aim to protect the last surviving corrugated-metal buildings, retaining as much of the existing fabric as possible, but it is not possible to restore all – strategy is to restore the worst affected buildings and stabilise the rest (to preserve for potential future restoration).
  - restoration of four metal clad billet buildings (structure refs. 7.01, 7.05, 17.01 & 18.01);
  - maintenance of nine billet buildings to a suitable safety standard (structure refs. 7.02, 7.03, 7.04, 7.06, 7.08, 7.09, 8, 10 & 19);
  - maintenance of four brick buildings (structure refs. 18.03, 26.04, 26.05 & 13) – involves removal of dangerous debris, fixing loose roof tiles, installation of doors to restrict access etc.;
  - removal of two billet building which have already collapsed (structure refs. 7.07 & 24.02);
  - full restoration of four brick buildings (structure refs. 5.01, 6.01, 20 & 29) – see below;
  - several buildings (structure refs. 3.16, 11, 12, 14 & 15) are not part of the project proposals – fencing or hoarding will be required to restrict access.
- Existing Buildings – Welcome Buildings & Cafeteria etc.
  - the four brick buildings that are to be fully restored (structure refs. 5.01, 6.01, 20 & 29) will be repurposed as follows:
  - two buildings (structure refs. 5.01 & 6.01) will function as Welcome Buildings to facilitate a ticket/pay station, souvenir shop, toilets, retail store, cleaning store & changing places facilities;
  - the existing cafeteria is to be upgraded and extended (structure ref. 29) with an enlarged area of external hard-standing;
  - the former gymnasium (structure ref. 20) will be made structurally sound and will continue to be used for storage by the Fort Dunree staff.
  - possible additional refurbishment of one further building (structure ref. 27.01) for staff accommodation.
- Existing Buildings – Blockhouses
  - upgrade of four blockhouses along with the two blockhouses at the High Fort (the five additional blockhouses at Dunree site are not part of the project proposals).
- Walkways/Trails & Accessibility
  - new connecting pathways and repairs to the existing network to include:
  - new pathway forming a looped walk from the lighthouse;
  - reinstated pathway to the High Fort (currently inaccessible to many due to topography);
  - new pathway connecting the Welcome Buildings to the existing High Fort Access Road;
  - new accessible routes to the Cafeteria, Lower Fort & Lough Swilly Walkway;
  - improved drop off zone outside the Saldanha Suite;
  - new accessible route to the Cafeteria and Lower Fort;
  - pathway for visitors arriving on foot or by cycle (to futureproof and promote sustainable transport – the proposed Buncrana to Carndonagh Greenway Project will run past Fort Dunree);
  - general repairs to the existing pathways and steps throughout the site and the provision of handrails.
- General Infrastructure – Drainage & Foul Disposal
  - new and upgraded infrastructure for surface drainage and foul disposal (see below for details).

- General Infrastructure – Lighting
  - new external amenity lighting is restricted to the lower part of the site and confined to the car park, the village road and the square, and follows responsible lighting practices;
  - all installations are 'dark skies' approved – low-level illumination, less than 5lux, directed downwards to avoid spillage etc.;
  - lighting will only be on when absolutely necessary and activated by motion sensors with an override for management control (lighting for the upper section of the car park will be on a separate circuit).
- General Infrastructure (anciliary)
  - ancillary works include mains water and electricity supplies, connections to services/utilities, toilet facilities, landscaping, fencing, signage & interpretation panels, general repairs to pathways and steps, provision of handrails, regrading of existing profiles, display of military artefacts etc.

1.12 Collectively, the area around The Square, the Billet Buildings, the Welcome Buildings and the Cafeteria, and including the Saldanha Suite and other currently occupied/in-use structures, is known as 'The Village.'

1.13 A construction-phase drainage strategy is set out in the Drainage Report, an outline construction methodology for the Lough Swilly Walkway is provided,[6] and the locations of construction compounds to serve the various sub-projects have been identified.[7]

1.14 Most of the works associated with the project require planning permission and are the subject of a planning application under Part 8 of the Planning and Development Regulations 2001, as amended (for determination by DCC). Certain minor aspects of the project, e.g. repairs to existing buildings on an exactly 'like-for-like' basis, do not required planning permission.

Surface Water Drainage & Foul Disposal

1.15 The following is summarised from relevant technical reports and engineering drawings provided with the planning application.[8]

Surface Drainage

1.16 Currently, surface water is collected and moved across the developed parts of the site by a series of gullies, ditches, and pipework to discharges directly to Lough Swilly. Channels and ditches draining most of the existing trails across the site have been recorded, again routing surface water towards Lough Swilly. The existing underground gravity infrastructure and trenches will be refurbished and re-used where possible (e.g. where existing buildings are redeveloped) and outfall drains will use the existing drains or follow the same route. Any existing sewers, drains or pipework that is superfluous and will not be incorporated into the new/refurbished infrastructure will be fully decommissioned to prevent the creation of preferential pathways.

1.17 The SuDS[9] approach to surfacewater management and disposal seeks to emulate the natural drainage behaviour of surface water from this clifftop site by overland flows and discharge to Lough Swilly, at pre-development rates and volumes, utilising a variety of common drainage systems that are regularly used in development sites. The existing network of roads, paths and trails will continue to drain as established – upgrades and extensions will aim to replicate the natural drainage behaviour. Surface

[6] *'Fort Dunree, Co. Donegal – Lower Fort – Lough Swilly Walkway – Planning'* (Design ID, August 2023).

[7] Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

[8] *'Fort Dunree, Co. Donegal – Drainage and Water Supply Report'* (Design ID, August 2023). Tecsoil Site Assessment Ltd. memorandum re. Fort Dunree Tourism Project dated 16th August 2023. Drawing Nos. 22130-DID-XX-XX-DR-C-5051-P03, 22130-DID-XX-XX-DR-C-5052-P03, 22130-DID-XX-XX-DR-C-5053-P03 & 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheets 1 – 4* (Design ID, July 2023).

[9] *'The SuDS Manual'* (Construction Industry Research and Information Association (CIRIA), 2015, Report No. C753).

drainage is considered to be 'clean water' and is routinely discharged directly to coastal waterbodies such as Lough Swilly, which already receives surface drainage arising from much of northern Donegal, including the Fort Dunree site.

1.18 A SuDS attenuation system is proposed for the new car park, using permeable pavement to re-establish a more natural hydrological balance by increasing the time of concentration and reducing peak runoff rates – the permeable pavements trap precipitation and release slowly, reducing peak rates and preventing large, fast pulses. The infrastructure has been designed to cope with a 1–100–year rainfall event, with an appropriate uplift to account for climate change. In this case, as infiltration is not possible, a tanked system will be used with a flow control device.

1.19 The subbase of the parking areas will be formed with crushed clean stone and wrapped with impermeable geotextiles – this approach also breaks down hydrocarbons and is used in lieu of a petrol interceptor (hydrocarbon contamination is expected to be insignificant and will decrease with time as more electric vehicles come into use).

1.20 Surface drainage at the Lighthouse is entirely separate and, it is assumed, direct to Lough Swilly. No new infrastructure or alterations are proposed.

Foul Disposal

1.21 Currently, there are at least two sewage plants within the site – an operational package treatment plant (*FM Environmental, Model 3 STD*) located to the south of the cafeteria which deals with all foul effluents generated from the various occupied/in-use buildings in the lower part of the site; and a disused/obsolete septic tank at the high fort. It has been determined that the capacity of the existing operational infrastructure is not sufficient for projected/expected increases in annual visitor numbers.

1.22 It is proposed that 2 no. new package treatment plants will be installed to and ensure compliance with Donegal Country Council emissions requirements. The new treatment plants will be installed in the same locations as the existing infrastructure [Figure 2c] to minimise excavation and surface disturbance – most of the site (i.e. all except the facilities at the High Fort) will be routed to a new treatment plant close to the southern corner of the site; the facilities at the High Fort will fort will gravitate to a separate treatment plant a short distance to the north. All foul effluents will be collected and moved in systems entirely separate from the surface water drainage systems and again any existing sewers, drains or pipework that is superfluous and will not be incorporated into the new/refurbished infrastructure will be fully decommissioned to prevent the creation of preferential pathways.

1.23 Due to the extreme groundwater vulnerability and the lack of infiltration at both locations (and across the site), traditional drainage field soakaways are inappropriate. It is proposed therefore that material for the disposal of effluents will be imported. At both plants, cleaned effluents will be pumped intermittently from the pumping chamber to mono-grade raised sand polishing filters enclosed by impermeable panels and placed on slopes directing effluent away from the treatment plants and developed areas more generally – as is set out in detail in the Drainage Report, this approach meets with Environmental Protection Agency (EPA) and Donegal County Council (DCC) standards, but Licences to Discharge will be required from DCC Environment Section.

1.24 The existing treatment plant will be decommissioned and removed prior to the connection and commissioning of the new infrastructure; all existing connections will be diverted to the new plant and any potentially contaminated land within the drainage field will be remediated or disposed of by a competent and licensed contractor. As the existing septic tank is currently not in use it will be removed to facilitate the installation of the new treatment plant. In both cases and surrounding disturbed ground will be made good.

1.25 It seems likely that there is also a septic tank at the Lighthouse which will be recommissioned to allow for the occasional use of the toilet facilities. No new infrastructure or significant alterations (other than necessary to recommission) are proposed.

Recommendations

1.26 It is noted that the drainage layout drawings have notation labelled as *'existing foul water system to be re-purposed as a surface water system'* – it is recommended that instances where this will occur are clarified and a methodology for the safe disconnection, cleaning, and repurposing of any such sewers established.

1.27 As the current arrangements for the Lighthouse are not known with any certainty it is recommended that existing arrangements are established and that firm operational proposals are brought forward.

Ecological Context for Development

1.28 The following text, included in early reports, has been adopted as an overarching strategy or philosophy for the iterative ecological assessment and design process:

> *Dunree Head is a special place. It is defined by the natural environment, transitioning very quickly from the dynamic coast through steep, vegetated sea cliffs to upland dry heath in a manner characteristic of the northern Inishowen coast. The diversity of natural habitats in a relatively small area is notable. However, Dunree Head is also defined by its history of development and long-standing military activity which has interrupted the natural transitions in places, altered the composition of some areas of coastal and terrestrial habitat, and has influenced the range of wildlife present at and utilising the site. In particular, the vegetation at and close to the areas that have been developed historically, and where the bulk of new development and redevelopment is now proposed, is heavily dominated by non-native and ornamental plants and cultivars, predominantly former garden plants that are now growing in the wild (to the exclusion of native vegetation in some areas).*
>
> *This project is not driven by nature conservation but is heavily influenced by it. The best, most sustainable outcomes are achieved through iterative design and assessment. All too often, projects are made to squeeze past constraints and regulations, almost as an afterthought, which is simply not good enough in this this singular landscape which is so rich in biodiversity. Ecological constraints and opportunities were identified and integrated early in the design process. The ecological assessment and review process was then employed in an iterative manner to develop project aspirations, and now firm development proposals and outcomes, with minimum impact where unavoidable. As the proposals are finalised in advance of a planning application, we are realising opportunities where tangible benefits for the natural environment can be delivered.*

1.29 A comprehensive assessment of ecological resources, constraints and opportunities was provided to the design team at an early stage in the process and several office/on-line and site meeting were convened to discuss the project proposals and mitigation etc. Opportunities have been taken to microsite new development to avoid areas of higher-value natural/semi-natural habitat and deliver significant improvements. The project benefits greatly from the reuse of existing structures and previously developed/disturbed areas and proposals for the more sensitive parts of the site, such as the cliff edges/faces and heathland, were screened for acceptability and feasibility at an early stage. Iterative ecological assessment and review has resulted in final project proposals and outcomes with minimal impact and tangible benefits for the natural environment.

Resources & Information

1.30 Data and information were sourced from the author's research, site inspections and site surveys (June 2022 – August 2023); various proposed layout and engineering drawings[10] (drawings specific to the

[10] Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL000 *Location Map* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL001 *Overall Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL101 *Overall Proposed*

individual aspects are referenced appropriately) and technical reports;[11] pre-application consultations and discussions with the design team and Donegal County Council; information published by NPWS; and various guidance/reference documents and online resources. All sources are referenced within the text as appropriate.

1.31 This report and the AA Screening Report[12] are interrelated – for a full understanding of the overall ecological assessment of the project and the protection of ecological receptors during the construction and operational phases the two reports must be read together.

Report Structure

1.32 This report is structured to reflect the fact that the greater part of this extensive site will be unaffected by new development. Section 2 sets out a broad appraisal of designated sites and the detailed results of the various taxa-specific surveys and investigations (habitats & flora, bats, marine wildlife, otters, badgers, wintering birds, breeding birds, invertebrates), to establish ecological baseline conditions. The Ecological Impact Assessment (EcIA) for each of the discrete project elements, and for the project as a whole, is then set out in Section 3.

1.33 The assessments broadly follow the methodologies for Preliminary Ecological Appraisal (PEA) and Ecological Impact Assessment (EcIA) established by CIEEM[13] – the proposals are assessed in terms of likely ecological impact (change with respect to baseline conditions) and acceptability (change with respect to standards and targets) in the context of ecological mitigation, where required. EcIA is informed by the AA Screening and *vice versa*.

Legislation & Policy

Wildlife & Nature Conservation Legislation

1.34 Much of Ireland's environmental legislation, and various aspects of planning policy, originate in international conventions but are primarily derived from EU law. The CMS or Bonn Convention,[14] a UNEP intergovernmental treaty concerned with the conservation of wildlife and habitats on a global scale, was adopted in 1979. Migratory species threatened with extinction are listed on Appendix I and migratory species that need or would significantly benefit from international co-operation are listed in Appendix II. Several agreements which aim to conserve specific taxa or populations have been concluded. The Berne Convention,[15] adopted in 1979 imposes legal obligations which require

Site Plan (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing Nos. 22130-DID-XX-XX-DR-C-5051-P03, 22130-DID-XX-XX-DR-C-5052-P03, 22130-DID-XX-XX-DR-C-5053-P03 & 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheets 1-4* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1001-01, 7543-PHL-SW-XX-DR-L-1002-01, 7543-PHL-SW-XX-DR-L-1003-01, 7543-PHL-SW-XX-DR-L-1004-01, 7543-PHL-SW-XX-DR-L-1005-01, 7543-PHL-SW-XX-DR-L-1006-01 & 7543-PHL-SW-XX-DR-L-1007-01 *Landscape Softworks – Sheets 1-7* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-4-ZZ-ZZZ-DR-KXH-CE-PL002 *Proposed Access Road* (KH Chartered Engineers, March 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

[11] *'The Fort Dunree Project Design Statement'* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). *'Planning Statement – Development by a Local Authority – The Fort Dunree Project, Co. Donegal'* (Turley, October 2023). '*Fort Dunree, Co. Donegal – Drainage and Water Supply Report'* (Design ID, August 2023). Tecsoil Site Assessment Ltd. memorandum re. Fort Dunree Tourism Project dated 16th August 2023. *'Fort Dunree, Co. Donegal Accessibility – Planning'* (Design ID, August 2023). *'Fort Dunree, Co. Donegal – Lower Fort – Lough Swilly Walkway – Planning'* (Design ID, August 2023). *'Outdoor Lighting Report'* (Lighting Reality, July 2023).

[12] *'Screening for Appropriate Assessment (AA): Fort Dunree, Dunree Head, Buncrana, Co. Donegal'* (GGA-2022-043-1 final v5, October 2023)

[13] *'Guidelines for Preliminary Ecological Appraisal'* (Chartered Institute of Ecology and Environmental Management (CIEEM), 2nd Edition, 2017, Winchester). '*Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine'* (Chartered Institute of Ecology and Environmental Management; September 2018).

[14] The Convention on the Conservation of Migratory Species of Wild Animals (Bonn, Germany, 1979)

[15] The Convention on the Conservation of European Wildlife and Natural Habitats (Bern, Switzerland, 1979)

the protection of over 500 species of wild plants and over 1000 species of wild animals. The principal aims are to ensure the conservation and protection of species and their natural habitats (Appendices I and II); increase co-operation between contracting parties; and regulate exploitation, including migratory species (Appendix III). The European Community is a contracting party to both. Ireland is also a signatory to several other international conventions including OSPAR,[16] CITES,[17] the Ramsar Convention,[18] the UN Convention on Biological Diversity (CBD)[19] which seeks to promote the conservation and sustainable use of biological diversity, and the comprehensive strategy for sustainable development agreed at the same 1992 Earth Summit in Rio de Janeiro.

1.35 The most important pieces of legislation underpinning biodiversity and nature conservation in Ireland are the Wildlife Acts 1976 to 2023[20] and the European Communities (Birds and Natural Habitats) Regulations 2011-2015. The early legislation provided a solid basis for species protection and pre-empted many requirements of later EU Directives. The Wildlife Acts established protection for certain species of wild flora and fauna identified on Schedules 3, 4 & 5 and provided for Natural Heritage Areas (NHA), the primary national designation for the protection of wildlife and natural habitats. A range of species including seals, badger, pine marten, red squirrel, hedgehog, stoat, pygmy shrew, hares, bats, deer, lizards, newts, frogs and toads receive protection. The means by which this protection is implemented in practice varies from species to species and by situation depending on the specific requirements of species ecology. Wildlife licenses are required in many situations. The Wildlife Acts also provide for general and specific levels of protection for wild birds and fish. However, habitat and site protection measures remained relatively weak.

1.36 In response to the ratification of various international conventions, treaties and agreements, the European Community adopted the Birds Directive[21] in 1979, followed by the Habitats Directive[22] in 1992 – they provide *inter alia* for the protection of certain species and habitats of species, and the establishment of a coherent network of European protected areas known as Natura 2000.

1.37 The Birds Directive sets out special measures to conserve wild birds, with an overall purpose of providing for the protection, management and control of all naturally occurring species and requires the identification of Special Protection Areas (SPA).

1.38 The Habitats Directive covers habitats and non-avian species of fauna that are of nature conservation importance and in danger of disappearance, and for which the EC has particular responsibility given the proportion of their global range. It requires the identification and protection of Special Areas of Conservation (SAC) for Annex I habitats and Annex II species and establishes the Natura 2000 network of designated sites (SPAs and SACs) and includes a presumption in favour of conserving Annex I habitats and Annex II species wherever they occur. Articles 12 to 16 establish a regime of strict protection for the species of flora and fauna listed on Annex IV (European Protected Species – EPS), wherever they occur. Several species native to Ireland, including cetaceans, bats and otters, are included in Annex IV and are therefore subject to the regime of strict protection. European Commission guidance[23] has been produced, intended to ensure a common understanding of the

[16] The Convention for the Protection of the Marine Environment of the North-East Atlantic (Paris, France, 1992)

[17] The Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington D.C., USA, 1973)

[18] The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, Iran, 1971).

[19] The Convention of Biological Diversity (Rio de Janeiro, Brazil, 1992)

[20] The Wildlife Acts 1976 to 2023 is a collective citation for the Wildlife Act 1976 (no. 39 of 1976), Wildlife (Amendment) Act 2000 (no. 38 of 2000), Wildlife (Amendment) Act 2010 (no. 19 of 2010), Wildlife (Amendment) Act 2012 (no. 29 of 2012), Heritage Act 2018 (no. 15 of 2018), Part 3 and the Wildlife (Amendment) Act 2023 (yet to be commenced).

[21] Council Directive 79/409/EEC on the conservation of wild birds (now codified as 2009/147/EC)

[22] Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

[23] *'Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC'* (European Commission; February 2007).

respective provisions among national and regional authorities, conservation bodies and other structures responsible for or involved in the implementation of the Habitats Directive.

1.39 The original transposing legislation, The European Union (Natural Habitats) Regulations 1997, was updated, amended and revised on several occasions before being consolidated as the European Communities (Birds and Natural Habitats) Regulations 2011, known as the Birds and Natural Habitats Regulations.

1.40 The Third Schedule to the Birds and Natural Habitats Regulations lists non-native species that are subject to certain restrictions (Regulations 49 & 50). EU Regulation 1143/2014 on Invasive Alien Species is aimed at the prevention or management of the introduction or spread of non-native invasive alien species and introduces new offences and penalties. The EU IAS Regulation applies to a specified list of *Invasive Species of Union concern* (there is considerable overlap between this list and the third schedule list).

1.41 Various other statutory instruments, such as the Planning and Development Act 2000, as amended; the Planning Act 2010; the Flora (Protection) Order 2022; the European Communities (Quality of Shellfish Waters) Regulations S.I. 268/2006; the European Communities (Quality of Salmonid Waters) Regulations, 1988; the Freshwater Fish Directive 78/659/EEC; the Surface Water Regulations, 2009; the Planning and Development (Amendment) (No, 3) Regulations 2011 (S.I. No 476/2011) influence wildlife and nature conservation and are also relevant.

Wildlife, Nature Conservation & Planning Policy

1.42 Various policy instruments and local, regional and national strategic plans, guidance, and action plans etc. are also relevant, including:

- National Planning Framework (Government of Ireland, 2018)
- National Development Plan 2018-2027 (Government of Ireland, 2018)
- National Biodiversity Action Plan 2017-2021 (DCHG, 2017)
- County Donegal Development Plan 2018-2024 (as varied) (Donegal County Council, 2018)
- Draft County Donegal Development Plan 2024-2030 (Donegal County Council, 2023)
- Biodiversity Species List for County Donegal (with priorities) (Donegal County Council, 2009)
- Threat Response Plans (NPWS, 2005-2013)
- All-Ireland Species Action Plans (All-Ireland SAP: NIEA/NPWS, 2005-2011)
- Ireland's National Strategy for Plant Conservation (National Botanical Gardens of Ireland & NPWS, 2019)
- Birds of Conservation Concern in Ireland (BirdWatch Ireland & RSPB NI; BoCCI 2020-2026)
- All-Ireland Pollinator Plan 2015-2020 (National Biodiversity Data Centre, 2015)
- Biodiversity Code of Practice for Planning and Development. (British Standard 42020:2013, 2013)

1.43 *Project Ireland 2040,* which includes the National Planning Framework (NPF) and the National Development Plan (NDP), is the Government's high-level strategic plan for shaping future growth and development in Ireland to the year 2040. The NPF sets out the new approach to spatial planning in Ireland which, along with regional and local development plans and strategies, establishes the policy context for planning and sustainable development.

1.44 The County Donegal Development Plan is the principal statutory land use plan for Co. Donegal. It sets out a strategic vision for growth and development over the 6-year life of the plan and beyond, setting out the overall strategy for proper planning, land-use and sustainable development. The CDP contains chapters and policies dedicated to biodiversity, natural heritage, the marine resource, coastal management, and environmental services (surface drainage, flooding, wastewater, pollution etc.). Similarly, the Draft County Donegal Development Plan, recently published for public consultation, sets out an overall strategy for the proper planning and sustainable development 2024-2030.

1.45 Ireland's 3rd National Biodiversity Action Plan (2017-2021) sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's '*Vision for Biodiversity.'* Developed in line with EU and international biodiversity strategies and policies, targeted actions underpinned by strategic objectives lay out a framework for the national approach to biodiversity.

1.46 The Biodiversity Species List for County Donegal arose as an action/objective of the County Donegal Heritage Plan (2007-2011) – it lists those species in all groups of flora and fauna (excluding microbes) recorded in Co. Donegal and, as a principal objective, sets out lists of priority species for conservation action. There is no current Biodiversity Action Plan for Co. Donegal (the 2007 draft BAP seems to now be unavailable) and no local BAP covering Dunree Head.

1.47 Threat Response Plans have been prepared by NPWS for several taxa to address the requirement to establish a system of strict protection for species listed in Annex IV of the Habitats Directive. The plans provide detailed information on range, distribution and habitat, focus on the particular threats facing each species and identify the measures required to address these threats. Several All-Ireland Species Action Plans (AISAP) have been produced.

1.48 As a result of declining populations, Ireland's birds are prioritised in nature conservation. BirdWatch Ireland and the RSPB NI have agreed a list of species for conservation action. Birds of Conservation Concern in Ireland, BoCCI, are classified as red, amber and green, based on conservation status and priority, assessed on historical trends and the degree to which they are threatened in a global context.

1.49 The All-Ireland Pollinator Plan 2021-2025, published and co-ordinated by National Biodiversity Data Centre (NBDC), creates a framework to bring together pollinator initiatives across Ireland.

1.50 The National Biodiversity Data Centre (NBDC) provides national coordination and management of information on Ireland's non-native invasive species – Invasive Alien Species in Ireland (www.invasives.ie).

1.51 British Standard 42020:2013 is integral to the CIEEM guidelines for Ecological Impact Assessment (EcIA) and Preliminary Ecological Assessment (PEA) and, as such, is widely applied in Ireland. BS42020:2013 provides recommendations and guidance for those engaged in planning and development which might have implications for the conservation, or enhancement, of biodiversity.

2. Ecological Baseline

Introduction

2.1 This section sets out ecological baseline conditions at the site, as established by taxa-specific surveys, research and investigation undertaken by the author during 2022 and 2023.

Designated Sites

2.2 The site, for the most part, is not within or adjacent to any site designated under statute or convention or for the protection of habitats or wildlife (SAC, SPA, Ramsar, NHA, pNHA etc.). North Inishowen Coast SAC (pNHA) lies to the north and east, just beyond the eastern boundary, and overlapping a small section of the site in the northern corner that will be unaffected by development [Figure 2]. The site therefore shares direct physical and habitat connectivity with North Inishowen Coast SAC.

2.3 Screening for Appropriate Assessment (AA) focuses on North Inishowen Coast SAC but also considers other Natura 2000 sites associated with Lough Swilly – Ballyhoorisky Point to Fanad Head SAC (pNHA), Fanad Head SPA (pNHA), Horn Head to Fanad Head SPA (pNHA), Lough Swilly SAC (pNHA) & Lough Swilly SPA (pNHA). It is considered that the detailed screening for adverse impacts on the Natura 2000 sites, by extension, also covers the underlying pNHA designations.

2.4 Much of the terrestrial area of the extensive North Inishowen Coast SAC is dominated by dry heathland which is superficially similar to the heathland habitat found in the elevated northern and eastern sections of the Fort Dunree site. However, Dunree Head was excluded from North Inishowen Coast SAC (likely due to the historical military use) – the heathland is discontinuous, presents as a mosaic with dry acid grassland, and is significantly intruded by extensive stands of scrub and dense bracken in places; the complex suffers from considerable degradation in both structure and species

composition as a direct result of edge effects and other influences from long-standing, distributed development. However, the heathland/grassland mosaic that dominates the eastern and northern sections of is contiguous with the SAC heathlands and provides a valuable buffering function. As is set out in greater detail below, no new development is proposed in close proximity to any area designated within North Inishowen Coast SAC, the heathland/grassland mosaic within the site will be largely unaffected by new development and the buffering function will not be compromised. No drainage from the site will be directed towards the SAC.

2.5 Mobile feature (both qualifying and non-qualifying) associated with North Inishowen Coast SAC (pNHA) and other statutory designated sites in the area are present within and around the site from time but, as set out in further detail below, none will be significantly impacted by new development.

Conclusions

2.6 Screening has demonstrated that the construction/development and operation of the Fort Dunree Project will exert no appreciable influence on the site integrity of North Inishowen Coast SAC (pNHA) or any other designated site. No further assessments are required.

Habitats & Flora

2.7 The site was surveyed and assessed for habitat type, distribution, and extent, and botanical diversity, by the author in the springs and summers of 2022 and 2023.

Methodology

2.8 Field assessment followed the *JNCC Phase 1*[24] methodology; habitat types were then re-classified to Level 3 in the *Fossit*[25] system, with intra-type variations highlighted. This approach is consistent with the methods and requirements set out in the Heritage Council best practice guidance.[26]

Results

Species Records & Broad Habitat Assessment

2.9 NBDC database searches[27] at the 2km (C23Z) and townland (Dunree) scales returned species records characteristic of marine/intertidal, rocky coastal, and dry upland (heathland and acid grassland) habitat assemblages along with a few species more readily associated with wetter uplands and peatlands. The records included notable diversities of mosses and liverworts, including several protected and/or threatened species, but the majority of these records are pre-1980 and many are from the 19th and early 20th centuries. The database holds no records for protected or threatened flowering/vascular plants occurring at Dunree Head. Most of the species returned from the database were again recorded by the author in 2022 and 2023, along with several previously unreported species (no protected or threatened species). The NBDC database holds no records of non-native/ornamental or invasive plants, however, the author's recent surveys show that substantial sections of the site, particularly close to the previously developed areas, are dominated by overgrown non-native ornamentals, including a few low/medium-impact invasives, dense bracken, and scrub (a habitat type under-represented in the biological records).

[24] *'Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit'* (JNCC; 2007; Peterborough).

[25] *'A Guide to Habitats in Ireland'* (Fossit J. A., 2000 – Heritage Council). The *Fossit* system sets out a hierarchical framework with three levels – broad habitat groups (Level 1), habitat sub-groups (Level 2), and individual habitat types (Level 3).

[26] *'Best Practice Guidance for Habitat Survey and Mapping'* (Smith, G. F., O'Donoghue, P., O'Hora, K. & Delaney, E., 2011 – Heritage Council)

[27] National Biodiversity Data Centre (NBDC): www.biodiversityireland.ie

Habitat Classification

2.10 Due to the transitional nature of the site, its long history of development, and recent years/decades of disuse and neglect, the transitions between vegetation communities are gradual (certainly, not as sharp as is suggested by habitat mapping) and most areas present as mosaic of two or more distinct habitat types. The following were classified [Figure 3; Plates 1.1-1.6 & 2.1-2.22]:

- GS3 (HD1 WS1) Acid Grassland (with Dense Bracken & Scrub)
- HH1 & GS3 (HD1 WS1) Dry Heath (siliceous) & Acid Grassland (with Dense Bracken & Scrub)
- WS1 Scrub (native)
- BC2 & WS3 (HD1) Horticultural & Ornamental (with Dense Bracken)
- BL3 (ED2 GA2) Buildings & Artificial Surfaces (incl. Bare Ground & Amenity Grassland)
- ER1 Exposed Rock (siliceous)
- CS1 Rocky Sea Cliffs (vegetated & unvegetated)

2.11 The site is underlain by the Slieve Tooey Quartzite Formation – a whiteish quartzite bedrock with pebble beds – and is characterised by shallow peaty soils, poor subsoil percolation, and high groundwater vulnerability. However, the underlying shattered bedrock appears to provide good natural drainage.[28] Topography and edaphic/drainage conditions tend to preclude lowland (oceanic) blanket bog and favour *HH1 Dry Heath (siliceous).* Likely much more extensive at Dunree Head, the remaining patches of *HH1* display a fairly characteristic assemblage of dwarf shrubs (predominant *C. vulgaris* with some *E. cinerea* in places and occasional *V. myrtillus, E. tetralix, U. gallii*) with a significant grass/sedge component in patches (*A. canina, A. capillaris, F. rubra, F. ovina, N. stricta, D. flexuosa, C. nigra, C. binervis* and occasional atypical species such as *Poa spp., D. glomerata, D. decumbens, J. squarrosus* and, particularly at the edges, *H. mollis* & *L. perenne*). A wide range of typical and atypical herbs and wildflowers were recorded throughout (e.g. *L. corniculatus, N. ossifragum, P. coronopus, V. locusta, C. pratensis, Veronica spp., V. hirsuta, G. saxatile, J. montana, R. acetosella, P. erecta, S. album, A. millefolium*); some peat-forming mosses (*Sphagnum spp., H. selago, Racomitrium spp., R. squarrosus*) were recorded where edaphic conditions allow, and occasional lichens (not classified) are present on walls and exposed rocks etc.

2.12 Heathland cover is highly variable, ranging from patches of exposed and broken siliceous rock with sparse wildflowers (notably, *S. album, J. montana*), mapped as *ER1 Exposed Rock (siliceous),* to dense and in places leggy *C. vulgaris* with a limited herb layer. *HH1* areas are intruded in places with undesirable woody species (*U. europaeus, S. repens, S. aurita, R. fruticosus agg.*) and *P. aquilinum.*

2.13 The *GS3 Acid Grassland* swards are dominated by a range of characteristic grasses (*A. canina, A. capillaris, A. stolonifera, F. rubra, F. ovina, A. odoratum, N. stricta, D. flexuosa*) with variable amounts of other grasses (e.g. *C. cristatus, D. decumbens, D. glomerata, A. pratensis, Poa spp., Holcus spp., L. perenne, P. pratense*) depending on proximity to development and other habitat types. Several sedges, rushes, herbs and wildflowers typical of the grassland type (*J. squarrosus, J. effusus, Luzula sp., C. nigra, C. binervis, Veronica spp., G. saxatile, P. erecta, T. repens, R. acetosella, V. riviniana, A. millefolium*) were recorded frequently along with occasional orchids (*D. maculate, D. majalis*) and a variety of other species more commonly associated with neutral grasslands (e.g. *F. ulmaria, A. sylvestris, H. radicata, D. carota, R. acris, L. pratensis, H. sphondylium, T. scorodonia, S. virgaurea, L. corniculatus, P. coronopus, V. sepium, C. pratensis, Polygala sp., P. lanceolata and*) and occasional ruderals (*R. obtusifolius, C. capillaris, Leontodon sp., J. vulgaris, T. pratense, C. vulgare etc.*), particularly close the developed areas. Again, this habitat type is intruded in places by woody shrubs (*S. repens, U. gallii, R. fruticosus agg., U. europaeus* and, closer to the heathlands, *C. vulgaris, E. cinerea*) and *P. aquilinum*.

[28] '*Fort Dunree, Co. Donegal – Drainage and Water Supply Report'* (Design ID, August 2023). Tecsoil Site Assessment Ltd. memorandum re. Fort Dunree Tourism Project dated 16th August 2023.

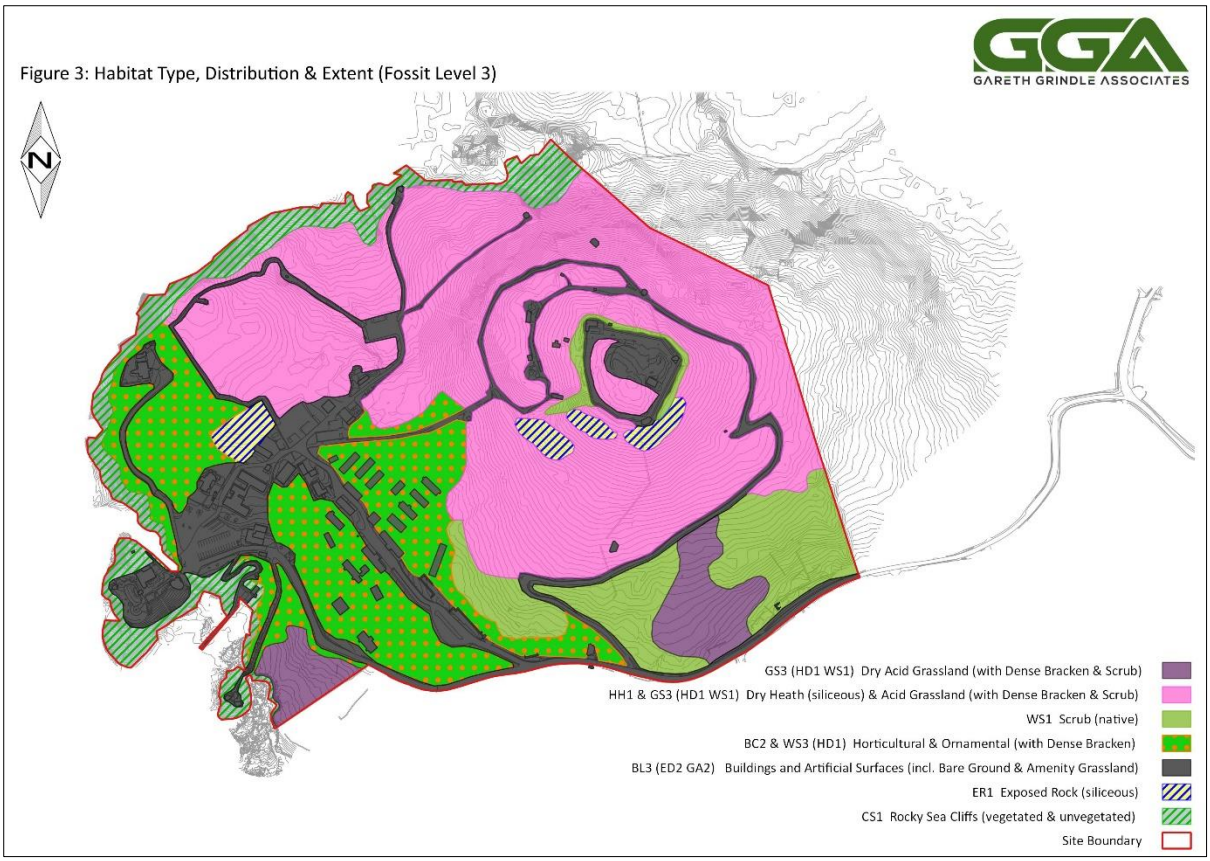


Plate 2.1: *HH1 Dry Heath (siliceous)* & *GS3 Acid Grassland* mosaic with some intrusion of *WS1 Scrub (native)* [August 2023]

Plate 2.3: *BL3 Artificial Surface* & discontinuous *HH1 Dry Heath (siliceous)* inside the High Fort [August 2023]

Plate 2.2: *HH1 Dry Heath (siliceous)*; note the edge intrusion of atypical and non-native flora [August 2023]

Plate 2.4: *BL3 Artificial Surface*; *HH1 Dry Heath (siliceous)* compromised by *WS1 Scrub* & *HD1 Dense Bracken* [August 2023]

Plate 2.5: *BL3 Artificial Surface* & *HH1/GS3 Dry Heath / Acid Grassland complex;* note edge intrusion of atypical flora [August 2023]

Plate 2.9: *HD1 Dense Bracken* & *WS1 Scrub (native)* – former heathland/grassland area now entirely overtaken [July 2022]

Plate 2.6: *HD1 Dense Bracken*, *HH1 Dry Heath (siliceous)* & *GS3 Acid Grassland*; *BL3 Buildings & Artificial Surfaces* [August 2023]

Plate 2.10: *GS3 Dry Acid Grassland* grading to *HH1 Dry Heath (siliceous)* at elevation; some atypical and non-native flora [June 2022]

Plate 2.7: *HH1 Dry Heath (siliceous)* sward; some intrusion from adjacent *GS3 Acid Grassland* & *HD1 Dense Bracken* [July 2022]

Plate 2.11: *WS1 Scrub (native)* – dense and extensive stand dominated by *Salix spp.* [July 2022]

Plate 2.8: *BL3 Artificial Surface* & *HH1 Dry Heath (siliceous)*; note the wide edge intrusion of *HD1 Dense Bracken* [July 2022]

Plate 2.12: *BL3 Buildings, GA2 Amenity Grassland,* overgrown *BC2 Horticultural* & *WS1 Scrub (native)* [June 2022]

Plate 2.13: Overgrown *BC2 Horticultural* & *WS3 Ornamental Shrub* with *HD1 Dense Bracken* [July 2022]

Plate 2.14: *BC2 Horticultural, WS3 Ornamental Shrub, GA2 Amenity Grassland* and *BL3 Buildings & Artificial Surfaces* [August 2023]

Plate 2.15: *BL3 Buildings & Artificial Surfaces* and *ED2 Bare Ground* at the car park beside the Lower Fort [August 2023]

Plate 2.16: *BL3 Buildings & Artificial Surfaces, ED2 Bare Ground, GA2 Amenity Grassland,* overgrown *BC2 Horticultural* [August 2023]

Plate 2.17: *BL3 Buildings & Artificial Surfaces, ED2 Bare Ground,* overgrown *BC2 Horticultural* & *HD1 Dense Bracken* [January 2023]

Plate 2.18: *ER1 Exposed Rock (siliceous)* – broken exposure at elevation; sparse *HH1 Dry Heath (siliceous)* vegetation [June 2022]

Plate 2.19: *ER1 Exposed Rock (siliceous)* – solid exposure at lower elevation, close to the car park [July 2022]

Plate 2.20: *CS1 Rocky Sea Cliffs* – exposed (unvegetated) & vegetated (semi-natural assemblage) [August 2023]

Plate 2.21: *CS1 Rocky Sea Cliffs* – exposed (unvegetated) & vegetated (semi-natural assemblage) below the Lower Fort [August 2023]

Plate 2.22: *CS1 Rocky Sea Cliffs* – vegetated (assemblage dominated by atypical and non-native flora) [August 2023]

2.14 The *HH1/GS3* complex dominates the elevated sections of the site to the north and east. *HH1* and *GS3* often form a mosaic in marginal upland areas such as this with transitions between dominant grassy sward and dominant dwarf shrub that are so gradual that mapping of the individual habitat types neither feasible nor instructive. As such the mosaic classifications are appropriate and the mapped boundaries between the habitat types/mosaics should be taken as indicative. In several places the *HH1/GS3* cover terminates abruptly at walls or walking paths (walls and fences are not mapped), usually with notable degradation from edge effects such as altered drainage and intrusion of undesirable species.

2.15 The *HH1/GS3* complex also grades variously into *WS1 Scrub (native)* (either *S. aurita, S. caprea, S. cinerea, S. atrocinerea* with *S. aucuparia;* or dominant *U. europaeus;* in both cases with small amounts of *R. fruticosus agg., C. monogyna, L. periclymenum, P. spinosa* and ruderals such as *F. convolvulus, G. aparine, U. dioica, H. sphondylium, E. angustifolium, C. vulgare*) or into stands of *HD1 Dense Bracken* (*P. aquilinum*). Indeed, several areas included within the *HH1/GS3* complex may have too much *Salix spp.* or *P. aquilinum* cover for a strict/exclusive *HH1* or *GS3* classification – again the mapped boundaries should be taken as indicative.

2.16 Although the intrusion of *WS1* and *HD1* into the *HH1/GS3* complex is undesirable, these bands of native and situationally-appropriate species do seem to have provided some protection from the encroachment of the non-native and ornamental species that dominate the overgrown areas around the developed sections of the site to the south and west, particularly around the derelict/abandoned billet buildings. The areas classified as *BC2 & WS3 Horticultural & Ornamental* are overgrown with native scrub and ruderals (*S. aurita, S. caprea, S. cinerea, S. atrocinerea, S. aucuparia, U. europaeus, R. fruticosus agg., C. monogyna, L. periclymenum, P. aquilinum, H. helix, F. convolvulus, G. aparine, U. dioica, H. sphondylium, E. angustifolium, C. vulgare, P. maculosa, C. vulgare, C. scoparius* etc.) with a significant component of non-natives and ornamentals (*C. crocosmiiflora, Fushia sp., Hebe spp., O. macrodonta and, in places, Cotoneaster sp., Hydrangea spp., R. rugosa, P. tenax, Austroderia sp.*).

2.17 The *BL3/ED2 Buildings, Artificial Surfaces & Bare Ground* classification is not devoid of vegetation. An assortment of typical native ruderals and ephemeral/perennials (*L. corniculatus, M. lupulin, Rumex spp., Plantago spp., V. sepium, H. radicata, Stellaria spp., T. farfara, C. fontanum, Sonchus spp., R. repens, B. perennis, T. officinale agg., A. prostrata, B. rapa, S. vulgaris, C. capillaris, Leontodon sp., G. robertianum, Trifolium spp., J. vulgaris, L. purpureum, P. maculosa, C. bursa-pastoris, A. anserina, J. effusus, C. vulgare, A. sylvestris, D. carota* etc.) have colonised neglected fringe/marginal areas and small areas and strips of maintained grassland have allowed occasional orchids (*O. mascula, D. maculate*) to persist where the mowing regime is favourable. A diverse fern-dominated (*A. adiantum-nigrum, Dryopteris spp., B. spicant, A. scolopendrium, A. filix-femina, A. trichomanes, D. filix-mas, P. vulgare* etc.) flora has developed in the humid and shady/dappled interiors of the abandoned billet buildings.

2.18 Away from existing development on the coast (the lighthouse, lower fort, the pier, coastal guardhouses etc.) the *CS1 Rocky Sea Cliffs* tend to retain natural vegetation patterns and assemblages – the more moderately sloped sections exhibit patches of *GS3* or occasionally *HH1* type vegetation, while the steeper and vertical sections tend to be exposed rock or sparsely-vegetated with typical salt-tolerant species (*C. officinalis, A. tripolium, P. maritima, Spergularia sp., E. paralias, A. maritima*). The cliffs between the pier/guardhouses and the existing carpark, and the cliff-tops close to the lighthouse etc., have been colonised by an atypical assemblage which includes several non-natives (particularly *P. aquilinum, C. crocosmiiflora, R. fruticosus agg., H. helix, R. rugosa* with some *F. convolvulus, Fushia sp., Hebe spp., Cotoneaster sp., Hydrangea spp.* etc.). Intertidal and littoral habitat is limited to a very small area of rock/boulder 'beach' beside the pier/jetty below the Lower Fort – elsewhere, rocky cliffs, albeit with much greater seaweed coverage, are exposed as the tide falls.

Botanical Diversity

2.19 The following species[29] were recorded within the site. The list is not exhaustive – it is likely that several species (particularly bryophytes) were missed and no attempt was made to record lichens. Indeed, a comprehensive inventory was not intended – sufficient numbers were recorded to identify vegetation communities, classify habitat types, highlight intra-type variation, and assess condition and value:

- Annual meadow grass *Poa annua*
- Bell heather *Erica cinerea*
- Bilberry *Vaccinium myrtillus*
- Bird's-foot-trefoil *Lotus corniculatus*
- Black bindweed *Fallopia convolvulus*
- Black medick *Medicago lupulin*
- Black spleenwort *Asplenium adiantum-nigrum*
- Blackthorn *Prunus spinosa*
- Bog asphodel *Narthecium ossifragum*
- Bog-moss *Sphagnum spp.*
- Bracken *Pteridium aquilinum*
- Bramble *Rubus fruticosus agg.*
- Broad-leaved dock *Rumex obtusifolius*
- Broadleaf plantain *Plantago major*
- Broom *Cytisus scoparius*
- Brown bent *Agrostis canina*
- Buck's-horn plantain *Plantago coronopus*
- Buckler-fern *Dryopteris spp.*
- Bush vetch *Vicia sepium*
- Cabbage palm *Cordyline australis*
- Cat's-ear *Hypochaeris radicata*
- Chickweed *Stellaria media*
- Cleavers *Galium aparine*
- Cock's-foot *Dactylis glomerata*
- Colt's foot *Tussilago farfara*
- Common bent *Agrostis capillaris*
- Common dog-violet *Viola riviniana*
- Common mouse-ear *Cerastium fontanum*
- Common nettle *Urtica dioica*
- Common scurvygrass *Cochlearia officinalis*
- Common sedge *Carex nigra*
- Common sow-thistle *Sonchus oleraceus*
- Cornsalad *Valerianella locusta*
- Cotoneaster *Cotoneaster sp.*
- Cow parsley *Anthriscus sylvestris*
- Creeping bent *Agrostis stolonifera*
- Creeping buttercup *Ranunculus repens*
- Creeping soft-grass *Holcus mollis*
- Creeping thyme *Thymus praecox*
- Creeping willow *Salix repens*
- Crested dog's-tail *Cynosurus cristatus*
- Cross-leaved heath *Erica tetralix*
- Cuckooflower *Cardamine pratensis*
- Curled dock *Rumex crispus*
- Daisy *Bellis perennis*
- Dandelion *Taraxacum officinale agg.*
- Eared sallow *Salix aurita*
- Early-purple orchid *Orchis mascula*
- Fat hen *Atriplex prostrata*
- Feather-moss *Brachythecium spp.*
- Field mustard *Brassica rapa*
- Fir clubmoss *Huperzia selago*
- Fringe-moss *Racomitrium spp.*
- Fushia *Fushia sp.*
- Germander speedwell *Veronica chamaedrys*
- Goat willow *Salix caprea*
- Goldenrod *Solidago virgaurea*
- Gorse *Ulex europaeus*
- Great willowherb *Epilobium hirsutum*
- Green-ribbed sedge *Carex binervis*
- Grey willow *Salix cinerea*
- Groundsel *Senecio vulgaris*
- Hairy tare *Vicia hirsuta*
- Hard-fern *Blechnum spicant*

[29] Species names (common and scientific nomenclature) are generally consistent with Webb, D. A. *'An Irish Flora'* (8th ed., 2012. Parnell, J. & Curtis, T. eds. Cork University Press).

- Hart's-tongue *Asplenium scolopendrium*
- Hawksbeard *Crepis capillaris*
- Hawkbit *Leontodon* sp.
- Hawthorn *Crataegus monogyna*
- Heath bedstraw *Galium saxatile*
- Hebe *Hebe spp.*
- Heath-grass *Danthonia decumbens*
- Heath rush *Juncus squarrosus*
- Heath spotted-orchid *Dactylorhiza maculata*
- Heather *Calluna vulgaris*
- Herb-Robert *Geranium robertianum*
- Hogweed *Heracleum sphondylium*
- Honeysuckle *Lonicera periclymenum*
- Hop trefoil *Trifolium campestre*
- Hydrangea *Hydrangea spp.*
- Ivy *Hedera helix*
- Japanese rose *Rosa rugosa*
- Knapweed *Centaurea nigra*
- Lady fern *Athyrium filix-femina*
- Lesser spearwort *Ranunculus flammula*
- Maidenhair spleenwort *Asplenium trichomanes*
- Male-fern *Dryopteris filix-mas*
- Marsh orchid *Dactylorhiza majalis*
- Mat-grass *Nardus stricta*
- Mayweed *Tripleurospermum sp.*
- Meadow buttercup *Ranunculus acris*
- Meadow foxtail *Alopecurus pratensis*
- Meadow-grass *Poa spp.*
- Meadow vetchling *Lathyrus pratensis*
- Meadowsweet *Filipendula ulmaria*
- Milkwort *Polygala sp.*
- Montbretia *Crocosmia × crocosmiiflora*
- New Zealand flax *Phormium tenax*
- New Zealand holly *Olearia macrodonta*
- Nipplewort *Lapsana communis*
- Polypody *Polypodium vulgare*
- Perennial ryegrass *Lolium perenne*
- Prickly sow-thistle *Sonchus asper*
- Purple-loosestrife *Lythrum salicaria*
- Ragwort *Jacobaea vulgaris*
- Red clover *Trifolium pratense*
- Red dead-nettle *Lamium purpureum*
- Red fescue *Festuca rubra agg.*
- Redshank *Persicaria maculosa*
- Ribwort plantain *Plantago lanceolata*
- Rosebay willowherb *Epilobium angustifolium*
- Rowan *Sorbus aucuparia*
- Rusty sallow *Salix atrocinerea*
- Sea aster *Aster tripolium*
- Sea plantain *Plantago maritima*
- Sea-spurrey *Spergularia sp.*
- Sea spurge *Euphorbia paralias*
- Sheep's-bit scabious *Jasione montana*
- Sheep's fescue *Festuca ovina*
- Sheep's sorrel *Rumex acetosella*
- Shepherd's purse *Capsella bursa-pastoris*
- Silverweed *Argentina anserina*
- Sorrel *Rumex acetosa*
- Soft rush *Juncus effusus*
- Spear thistle *Cirsium vulgare*
- Speedwell *Veronica sp.*
- Stitchwort *Stellaria sp.*
- Sweet vernal-grass *Anthoxanthum odoratum*
- Thrift *Armeria maritima*
- Timothy *Phleum pratense*
- Toetoe *Austroderia sp.*
- Tormentil *Potentilla erecta*
- Turf-moss *Rhytidiadelphus squarrosus*
- Wavy hair-grass *Deschampsia flexuosa*
- Western gorse *Ulex gallii*
- Wild angelica *Angelica sylvestris*
- White clover *Trifolium repens*
- White stonecrop *Sedum album*
- Wild carrot *Daucus carota*
- Wood-rush *Luzula sp.*
- Wood sage *Teucrium scorodonia*
- Yarrow *Achillea millefolium*
- Yorkshire fog *Holcus lanatus*

Protected & Priority Species

2.20 No species listed on Schedule IV of the Habitats Directive (EPS) and no vascular plants listed on Schedule A of the Flora (Protection) Order 2022 were recorded within the site during the author's 2022 and 2023 site surveys. While bryophytes are certainly underrepresented in the species list it is very unlikely that any protected mosses (Schedule B) or liverworts (Schedule C) are present in the areas that will be impacted by development. No plants identified as priority species for Co. Donegal[30] were found.

[30] *'Biodiversity Species List for County Donegal (with priorities)'* (Donegal County Council, 2009).

Invasive Alien Species (IAS)

2.21 No plants included on the Third Schedule to the Birds and Natural Habitats Regulations, or listed as *Invasive Species of Union concern* (EU IAS Regulation) were found within the site or on adjoining lands but a few species identified by *Invasive Alien Species in Ireland*[31] as low/medium-impact invasives – Cotoneaster *Cotoneaster sp.,* Hebe *Hebe spp.,* Japanese rose *Rosa rugosa,* Montbretia *Crocosmia* × *crocosmiiflora,* New Zealand flax *Phormium tenax,* New Zealand holly *Olearia macrodonta* – are present.

Plate 2.23: Montbretia *Crocosmia* × *crocosmiiflora* – dense stands surround the derelict/disused buildings [August 2023]

Plate 2.26: Japanese rose *Rosa rugosa* – planted in a hedge to the front of the existing car park [August 2023]

Plate 2.24: Montbretia *Crocosmia* × *crocosmiiflora* – dense stands on the clifftops close to the Lighthouse [August 2023]

Plate 2.27: New Zealand holly *Olearia macrodonta* – several mature bushes in the area proposed for the new car park [June 2022]

Plate 2.25: Montbretia *Crocosmia* × *crocosmiiflora* – intruding into semi-natural heathland habitat [August 2023]

Plate 2.28: New Zealand flax *Phormium tenax* – several mature plants in the curtilage of the Lighthouse [July 2022]

[31] Invasive Alien Species in Ireland (invasives.ie) & National Biodiversity Data Centre (NBDC): www.biodiversityireland.ie

2.22 *P. tenax* [Plate 2.28] is limited to a group of mature plants in the curtilage of the lighthouse and a few more in the grassy landscaped area at the top of the cliffs to the front of the cafeteria. Similarly, *Hebe spp.* and *O. macrodonta* [Plate 2.27] are limited to a few bushes in the same area and along the roadway in the area proposed for the new carpark. As extensive development works and/or new landscaping are proposed in these areas it is recommended that the existing plants (and other inappropriate neophytes such as Cabbage palm *Cordyline australis* & Toetoe *Austroderia sp.*) are removed during the works. *Cotoneaster sp.* has a very limited distribution at the site and is unlikely to become problematic.

2.23 *C. crocosmiiflora* is found growing throughout the site but much less so in the heathland and elevated sections [Plates 2.23-2.25]. *C. crocosmiiflora* is a tall grassy herb that forms into locally dense colonies, with a thick thatch of dead plant material beneath new growth each year. It outcompetes other ground flora, preventing the regeneration of native plants and displacing native biodiversity. The seeds are usually not viable (but given the extent of spread and distribution at Dunree Head this may not be the case locally) – spread more usually occurs vegetatively by rhizomes and corms. *C. crocosmiiflora* is not listed on the Third Schedule or as an *Invasive Species of Union concern* but is nevertheless identified (NBDC) as a problematic (low-risk) invasive species.

2.24 Dense stands of *C. crocosmiiflora* are present, often in conjunction with scrub and bracken, around the derelict/disused buildings and smaller stands and distributed plants are frequent elsewhere, particularly on the margins of roads and walking paths, and on the vegetated clifftops (the orange flowers are ubiquitous through the summer). The sea cliffs between the pier and the grassy landscaped area to the front of the cafeteria, and at the lighthouse, are particularly heavily invaded.

2.25 *R. rugosa* seems to have been planted as a hedge along the front (lower boundary) of the existing car park, from where it has spread to invade the sea cliffs between the pier and the grassy landscaped area to the front of the cafeteria [Plate 2.26]. *R. rugosa* is a woody, deciduous, perennial and spreading bushy shrub which can grow up to 1.5m in height. It has green or yellow leaves and attractive bright purplish-pink flowers in summer. It is particularly prevalent in coastal areas (particularly problematic in dues) where it forms into dense stands, excluding native flora and diminishing local invertebrate diversity. It spreads through seed dispersal and propagates from established plants. *R. rugosa* is not listed on the Third Schedule or as an *Invasive Species of Union concern* but is nevertheless identified (NBDC) as a problematic (medium-risk) invasive species.

2.26 Due to the extent and distribution of *C. crocosmiiflora* and *R. rugosa* it seems very unlikely that eradication can be achieved through the development of the site (i.e. prior to and during the construction phase), although local occurrences should be removed as opportunities present. It is recommended that the control of *C. crocosmiiflora* and *R. rugosa* is progressed during the on-going management of the completed site.

Landscaping

2.27 Landscaping and new planting are ultimately matters of design preference in line with the overall aims and objectives of the project and the desired visitor experience. This is particularly the case in areas around and close to the more heavily developed parts of the site such as the new car park and the new green area to the front of the Village. However, it is properly part of ecological assessment to ensure that planting proposals do not adversely impact any existing natural/semi-natural habitat resources or wildlife and local biodiversity more generally, and particularly to ensure that no new invasive, potentially invasive, or inappropriate species are introduced to the area. In this regard consideration must be given to the long term and the very-long term, i.e. to periods that encompass cycles of use, management/maintenance, and possible decline and neglect in the future, as has occurred a few times at Dunree Head during the last couple of centuries. Consideration must be given to the likely behaviour of introduced plants with management and maintenance, and in the absence of maintenance and management – *C. crocosmiiflora,* for example, is an attractive and harmless garden

plant while it remains under control but, as has occurred here, becomes invasive and problematic during periods of neglect when management and maintenance ceases. It is the author's consistent *recommendation* that existing invasives and inappropriate neophytes are removed as far as possible through development works and that the eradication of certain invasive species is pursued through development and the on-going management of the completed site.

2.28 The landscaping proposals have been reviewed with the primary aim of ensuring that invasive and potentially invasive species are not inadvertently introduced to the site, and to highlight any instances where new planting proposals may be inconsistent with other *recommendations* set out in this report. The following notes and recommendations are provided on the basis of the planting proposals[32] available to the author at the time this report was finalised – detailed reviews of earlier drafts were completed and the recommendations were largely incorporated into these finalised planting proposals (the remaining issue that can be reconsidered at the detailed design stage).

2.29 The landscaping and planting proposals are relatively 'light-touch' through most of the site and are focused on the areas that will be disturbed and redeveloped – as noted, the project proposals are concentrated in areas of the site that have previously been developed and are dominated by the lower-value vegetation assemblages (i.e. dense willow/gorse scrub, bracken/ruderals, and overgrown neophytes etc.) rather than the higher-value areas of heathland, acid grassland, and sea cliff habitats. The natural flora that likely would have been present in these long-developed areas, had there never been any development, would not easily regenerate and would no longer be entirely appropriate, given the history of the site and the aims/objectives of the project. As such, there is no habitat or vegetation that will be lost to development that must or should be replaced on a like for like basis and, pending a few recommendations set out below, the more valuable upland and coastal habitats will not be compromised by landscaping or inappropriate new planting.

2.30 The species mix proposed for new tree planting is dominated by appropriate natives – Alder *Alnus glutinosa*, Hawthorn *Crataegus monogyna*, Silver birch *Betula pendula,* Rowan *Sorbus aucuparia,* Blackthorn *Prunus spinosa* & Irish whitebeam *Aria Hibernica* (*Sorbus hibernica*). Field maple *Acer campestre* is non-native in Ireland and although reasonably benign is, in the author's opinion, unlikely to be beneficial at this site. Scots pine *Pinus sylvestris,* although a native species, tend to grow to be very tall and is probably inappropriate for this exposed coastal site which is notably devoid of tall trees. Similarly, the mix proposed (Mix 02) for native shrub planting is comprised of appropriate natives – Spindle *Euonymus europaeus,* Blackthorn *Prunus spinosa,* Burnet rose *Rosa spinosissima*, Elder *Sambucus nigra*, Hazel *Corylus avellana,* Guelder rose *Viburnum opulus,* Sea kale *Crambe maritima* & Briar-rose *Rosa rubiginosa*.

2.31 Ultimately, the long-term success of any planted trees, shrubs and hedgerows will be determined by the suitability of local edaphic conditions and the hardiness of the individual specimens to exposure at this coastal site – it is strongly recommended, particularly for the native-species planting, that plants of local progeny are sourced where possible.

2.32 It is strongly recommended that only native species of shrubs and trees are used for the areas of new planting proposed at the High Fort – both the main path entrance and the area around the new treatment plant.

2.33 It is appreciated that ornamental plants are often preferred for gardens and other formal landscaped settings. Certainly, the presence of several persistent ornamentals at Dunree Head confirms that non-

[32] Drawing Nos. 7543-PHL-SW-XX-DR-L-1001-01, 7543-PHL-SW-XX-DR-L-1002-01, 7543-PHL-SW-XX-DR-L-1003-01, 7543-PHL-SW-XX-DR-L-1004-01, 7543-PHL-SW-XX-DR-L-1005-01, 7543-PHL-SW-XX-DR-L-1006-01 & 7543-PHL-SW-XX-DR-L-1007-01 Landscape Softworks – Sheets 1-7 (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 Landscape Softworks – Overview (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 Landscape Softworks – Planting Schedule (Park Hood Chartered Landscape Architects, August 2023).

native garden ornamentals would have been a feature of this site while the military and lighthouse facilities were occupied and operational. It is noted that most of the species proposed for new ornamental shrub and defensive planting are both attractive to wildlife and of some utility to pollinators.[33]

2.34 Appropriate native are well represented in the species mixes proposed for new ornamental shrub and defensive planting (Mix 01, Mix 03 & Mix 04) – Spindle *Euonymus europaeus,* Blackthorn *Prunus spinosa,* Goat willow *Salix caprea*, Holly *Ilex aquifolium*, Elder *Sambucus nigra*, Guelder rose *Viburnum opulus,* Burnet rose *Rosa spinosissima,* Dog rose *Rosa canina,* Sea kale *Crambe maritima,* Briar-rose *Rosa rubiginosa* – along with several non-natives and ornamental cultivars which are largely acceptable for the previously developed, lower sections of the site, with the exception of: Oregon grape *Mahonia aquifolium* and Wilsons honeysuckle *Lonicera nitida,* which are considered invasive[34] to a greater or lesser extent and should be avoided.

2.35 A few of the ornamentals are potentially problematic in the absence of management and control, primarily due to the volume of seed production, and should probably be avoided unless sterile cultivars are available – Lady's mantle *Alchemilla mollis,* Red valerian *Centranthus ruber,* Japanese anemone *Anemone* × *hybrida,* Korean lilac *Syringa meyeri* & Mexican fleabane *Erigeron karvinskianus.* which may become invasive. Cranesbill *Geranium sp.* 'Rozanne', Wild cat *Nepeta grandiflora* and Kohuhu *Pittosporum tenuifolium* are clump-forming, spreading plants and should be restricted to containers or contained beds. In all cases, appropriate benign alternatives can be identified through reference to guidance[35] produced by the *Royal Horticultural Society* and *Plantlife* for gardening and landscaping without the use of harmful invasive plants. The proposed species mixes can be reconsidered at the detailed design stage in any case.

2.36 It is recommended that the planting of new Gorse *Ulex europaeus,* although a native and situationally appropriate species, is avoided. *U. europaeus* is present throughout Dunree Head and, in some areas of the site, is not entirely desirable. It will readily colonise suitable opportunities from the soil and wind-blown seed banks and needs no assistance. It is also recommended that Yarrow *Achillea millefolium* (including the 'red beauty' cultivar) is removed from the ornamental mixes as this species is present in the heathland and acid grassland assemblages as a native wild plant; similarly, Thrift *Armeria maritima* is present as a native wild plant on the sea cliffs locally – new plants should not be introduced through ornamental planting (in both cases, introduced plants may displace the local populations and/or corrupt local genetic distinctiveness). The proposed coastal amenity grassland and native wildflower mixes are largely unproblematic, but it is recommended that seed of local progeny is sourced (again, a matter for detailed design).

Fauna

2.37 The site was assessed for habitat suitability and surveyed for protected and notable wildlife by the author on several occasions between June 2022 and August 2023.

Species Records & Habitat Suitability Assessment

2.38 NBDC database searches[36] returned records for a surprisingly low-diversity assemblage of native/naturalised terrestrial wildlife (bats, otter, badger, hedgehog, hare, fox, rabbit) and some non-native/invasive/feral species (mink, feral goat) from the 10km reporting grid square (C23) in recent

[33] All-Ireland Pollinator Plan 2021-2025 (NBDC): www.pollinators.ie

[34] Invasive Alien Species in Ireland (invasives.ie) & National Biodiversity Data Centre (NBDC): www.biodiversityireland.ie

[35] *'Landscaping without harmful invasive plants – A guide to plants you can use in place of invasive non-natives'* (RHS & Plantlife, 2010) and *'Gardening without harmful invasive plants – A guide to plants you can use in place of invasive non-natives'* (RHS & Plantlife, 2010).

[36] National Biodiversity Data Centre (NBDC): www.biodiversityireland.ie

years/decades; otter, badger and hare have previously been recorded within the 2 km reporting grid square (C23Z) and/or the Dunree townland. A rich diversity of marine wildlife (including fish, sharks, rays, and marine mammals – whales, dolphins, porpoise, seals) was returned at 10km; dogfish, bottle-nosed dolphin, porpoise & minke whale have been reported within 2km. Rich and diverse assemblages of avifauna and both terrestrial and marine invertebrates have been recorded within the 2km reporting grid square and/or the Dunree townland but many of the records for protected and/or vulnerable species are dated (pre-1980, many late 19th or early 20th century).

2.39 The records and an assessment of habitat availability/suitability indicate that the site and surrounding lands are suitable and may provide opportunities for wintering and breeding birds, bats, terrestrial mammals (otters and possibly badgers, hares, hedgehogs etc.), and, due to the proximity of Lough Swilly, marine mammals. The site provides no realistic opportunities for protected herpetofauna and, as habitat loss will be minimal, it formal invertebrate surveys were considered unnecessary.

Birds

2.40 The site was assessed for habitat suitability and surveyed for birds during the breeding seasons of 2022 and 2023 and the 2022/23 wintering season.

Records & Habitat Suitability Assessment

2.41 Records of avifauna returned from the NBDC database at the 2km (C23Z) and townland (Dunree) scales suggest locally rich and diverse assemblages of seabirds, waterfowl, waders, raptors and passerines, including corvids and hirundines. The most recent records for most species are from 2011, but several notable species have not been recorded since the 1970s/80s/90s.

2.42 The numerous disused and derelict buildings provide good-optimal nesting opportunities for *hirundines* and other specialist *passerines* but otherwise structurally diverse nesting habitat is somewhat limited, as are wintering foraging resources. Nesting opportunities for *corvids* are sub-optimal, as are opportunities for and *raptors,* and the site is subject to relatively high levels of anthropogenic disturbance. The open heathlands and grassland provide reasonable opportunities for ground-nesting larks and pipits but no realistic nesting, recruitment and foraging resources for breeding waders.

2.43 The predominance of rocky cliffs and general lack of sheltered shoreline and/or intertidal sediments likely precludes the presence of waders and other predominantly estuarine or shore birds during the breeding and wintering periods. However, birds that tend to nest or loaf on rocky sea cliffs are likely to be present during the breeding season, as are birds that tend to forage and raft or loaf on open coastal waters, or roost on rocky sea cliffs, throughout the year (subject to residency and migration).

Methodology

2.44 As habitat loss will be minimal, the terrestrial sections of the site were not subject to formal surveys for birds during the breeding or wintering seasons. Incidental sightings were recorded during the numerous walkovers and surveys for other taxa; all sections of the site were scanned (*Opticron BGA Classic* 8x42) regularly.

2.45 Coastal sections were surveyed more formally during both the breeding and wintering seasons. Vantage points were identified from where visible sections of the sea cliffs and open water to the north and west of Dunree Head could be monitored for nesting and general activity. Breeding season observations were conducted in June and July 2022 and again in 2023, once per calendar month between April and June. Wintering season observations were conducted once per calendar month between October 2022 and March 2023. The cliffs and open water were scanned with binoculars (*Opticron BGA Classic 8x42*) and a spotting scope (*Opticron MM3 50 ED (HDF 40862 T Zoom)*) and all birds present within the fields of view were recorded (and photographed where possible).

Results – Terrestrial Sections

2.46 The breeding season assemblage was reasonably diverse and representative of site location/situation and habitat availability but overall numbers were low – Barn swallow *Hirundo rustica*, Blackbird *Turdus merula*, Blue tit *Cyanistes caeruleus*, Buzzard *Buteo buteo*, Chaffinch *Fringilla coelebs*, Coal tit *Periparus ater*, Collared dove *Streptopelia decaocto*, Goldfinch *Carduelis carduelis*, Great tit *Parus major*, Greenfinch *Carduelis chloris*, House sparrow *Passer domesticus*, Hooded crow *Corvus cornix*, Magpie *Pica pica*, Meadow pipit *Anthus pratensis*, Pied wagtail *Motacilla alba*, Pigeon *Columba livia*, Red-billed chough *Pyrrhocorax pyrrhocorax*, Robin *Erithacus rubecula*, Rock pipit *Anthus petrosus*, Rook *Corvus frugilegus*, Sky lark *Alauda arvensis*, Song thrush *Turdus philomelos*, Starling *Sturnus vulgaris*, Stonechat *Saxicola torquate*, Swift *Apus apus*, Willow warbler *Phylloscopus trochilus*, Wren *Troglodytes troglodytes*.

2.47 Of these, 2 no. – *A. pratensis* & *A. apus* – are BoCCI[37] red-listed (high conservation concern) and 7 no. – *H. rustica, C. chloris, P. domesticus, A. arvensis, P. pyrrhocorax, S. vulgaris, P. trochilus* – BoCCI amber-listed (medium conservation concern) during the breeding season; none are identified as priority species for Co. Donegal.[38]

2.48 It is assumed that all nested locally however, *A. pratensis* & *A. arvensis* were only observed engaged in nesting behaviour over heathlands to the north and east of the High Fort (i.e. not within the site) and no *corvid* or *raptor* nests were noted within the site boundaries. Several pairs of *H. rustica, A. apus* & *P. domesticus* were confirmed to be nesting in the numerous disused and derelict buildings (no nests were confirmed from occupied/in-use buildings). Of the remaining *passerines, T. merula, C. caeruleus, F. coelebs, P. ater, C. carduelis, P. major, M. alba, C. livia, E. rubecula, A. petrosus, T. philomelos, P. trochilus* & *T. troglodytes* were confirmed to be nesting in suitable habitat – either nest sites were confirmed, mostly within the extensive stands of scrub to the south of the site but also in smaller patches elsewhere and in the curtilage of the Lighthouse, or adult birds were observed engaged in nesting-related behaviour (defending nest sites, carrying food etc.). *P. pyrrhocorax* are known to nest at or close to Dunree Head but no nest sites were observed close to any areas proposed for new development.

2.49 The wintering assemblage closely resembled the nesting assemblage, but without the migratory species and several residents that seem to have moved elsewhere for winter (foraging resources and winter cover are generally scarce). Just two species that were not also present during the summer were recorded – Raven *Corvus corax* and Redwing *Turdus iliacus*, a BoCCI red-listed species during the winter. The wintering assemblage comprised: Blackbird *Turdus merula*, Blue tit *Cyanistes caeruleus*, Buzzard *Buteo buteo*, Chaffinch *Fringilla coelebs*, Coal tit *Periparus ater*, Collared dove *Streptopelia decaocto*, Goldfinch *Carduelis carduelis*, Great tit *Parus major*, Greenfinch *Carduelis chloris*, Hooded crow *Corvus cornix*, Magpie *Pica pica*, Pied wagtail *Motacilla alba*, Pigeon *Columba livia*, Raven *Corvus corax*, Red-billed chough *Pyrrhocorax pyrrhocorax*, Redwing *Turdus iliacus*, Robin *Erithacus rubecula*, Rook *Corvus frugilegus*, Wren *Troglodytes troglodytes*.

Results – Coastal Section

2.50 The following seabirds were recorded at Dunree Head and/or a short distance offshore during the breeding season surveys: Black guillemot *Cepphus grille*, Black-headed gull *Larus ridibundus*, Black-legged kittiwake *Rissa tridactyla*, Common guillemot *Uria aalge*, Gannet *Morus bassanus*, Grey heron *Ardea cinerea*, Herring gull *Larus argentatus*, Lesser black-backed gull *Larus fuscus*, Northern fulmar *Fulmarus glacialis*, Razorbill *Alca torda*, Sandwich tern *Sterna sandvicensis*, Shag *Phalacrocorax aristotelis.*

[37] Birds of Conservation Concern in Ireland (BirdWatch Ireland & RSPB NI; BoCCI 2020-2026)

[38] *'Biodiversity Species List for County Donegal (with priorities)'* (Donegal County Council, 2009).

2.51 Of these, 2 no. – *R. tridactyla* & *A. torda* – are BoCCI red-listed and 9 no. – *C. grille, L. ridibundus, U. aalge, L. canus, L. argentatus, L. fuscus, F. glacialis, S. sandvicensis* & *P. aristotelis* – BoCCI amber-listed during the breeding season; 2 no. – *L. ridibundus* & *L. argentatus* – are identified as priority species for Co. Donegal (SPA status is addressed in the AA Screening Report).

Plate 2.29: Northern fulmar *Fulmarus glacialis* – roosting at the Lower Fort in winter [January 2023]

Plate 2.32: Shag *Phalacrocorax aristotelis* – in flight over Lough Swilly but remaining close to the sea cliffs [July 2022]

Plate 2.30: Northern fulmar *Fulmarus glacialis* – nesting on cliffs below the Lower Fort [June 2022]

Plate 2.33: Black-throated diver *Gavia arctica* – foraging in near-coastal water below the Lower Fort [February 2023]

Plate 2.31: Northern fulmar *Fulmarus glacialis* – in flight over Lough Swilly [July 2022]

Plate 2.34: Gannet *Morus bassanus* – observed in flight over Lough Swilly and the site [January 2023]

2.52 Just 3 no. species were confirmed to be nesting in close proximity to areas proposed for development. *F. glacialis* were observed nesting on the sea cliffs, both at and close to the Lower Fort (Lough Swilly Walkway) and close to the location proposed for the Lighthouse Walkway, but in very low numbers. *R. tridactyla* and *C. grille* were regularly observed in flight close to the sea cliffs to the north and east of the Lighthouse and, while not confirmed through observation, are very likely nesting. Otherwise, *Larus spp.*, were regularly observed in flight and occasionally within the site (scavenging,

loafing/roosting etc.), *P. aristotelis* were regularly observed flying a foraging route over the water but remaining close to the sea cliffs, and *S. sandvicensis* were observed foraging over Lough Swilly; *U. aalge, M. bassanus, A. cinerea* & *A. torda* were spotted in flight over Lough Swilly, or on the water, but at some distance from Dunree Head.

2.53 The wintering assemblage was somewhat different: Black guillemot *Cepphus grille*, Black-headed gull *Larus ridibundus*, Black-throated diver *Gavia arctica*, Common gull *Larus canus*, Gannet *Morus bassanus*, Goldeneye *Bucephala clangula*, Herring gull *Larus argentatus*, Long-tailed duck *Clangula hyemalis*, Northern fulmar *Fulmarus glacialis*, Oystercatcher *Haematopus ostralegus*, Purple sandpiper *Calidris maritima*, Razorbill *Alca torda*, Red-breasted merganser *Mergus serrator*, Shag *Phalacrocorax aristotelis*, Shelduck *Tadorna tadorna*, Velvet Scoter *Melanitta fusca*.

2.54 Of these, 5 no. – *B. clangula, C. hyemalis, H. ostralegus, C. maritima* & *M. fusca* – are BoCCI red-listed and 6 no. – *L. ridibundus, G. arctica, L. canus, L. argentatus, M. serrator* & *T. tadorna* – BoCCI amber-listed during the wintering season; 2 no. – *L. ridibundus* & *L. argentatus* – are identified as priority species for Co. Donegal (SPA status is addressed in the AA Screening Report).

2.55 No birds were present in significant numbers, or in locations or behaviours that might present risks from construction works or other project-related activities. *Larus spp.* continued to be generally present around Dunree Head, in flight and occasionally within the site (scavenging, loafing/roosting etc.); *C. grille, M. bassanus, F. glacialis, A. torda* were spotted in flight over Lough Swilly from time to time; *P. aristotelis* were observed making similar foraging flights along the cliff faces; *H. ostralegus* were observed in groups but always in flight over Lough Swilly; *G. arctica* were observed foraging in low numbers (2 or 3 birds) below the sea cliffs close to the Lower Fort on several occasions; a single *C. maritima* was recorded on rocks at the water's edge, close to the pier, on one occasion; and *B. clangula, C. hyemalis, M. serrator, T. tadorna* & *M. fusca* were observed on the open water some distance off Dunree Head.

Bats

2.56 The site was assessed for habitat suitability and roosting potential, and surveyed for bat activity and roosting, during the 2022 active season. All surveys and assessments were undertaken with reference to specifications and best practice guidance produced by the Bat Conservation Trust (BCT).[39]

Preliminary Assessment – Methodology

Background Research

2.57 Background research was undertaken, using online geographical information systems, to provide information on the site in local landscape context. The NBDC database was interrogated to retrieve previous records and the derived landscape suitability index for the relevant reporting grid squares.

Habitat Suitability Assessment

2.58 The site was assessed for habitat suitability, with reference to BCT best practice guidance, initially in June 2022 with additional cursory inspections thereafter.

Preliminary Roosting Assessment (PRA)

2.59 All buildings and structures within the site were inspected to identify potential roost features (PRFs), locate evidence of roosting bats, identify actual bat roosts and/or roost access points (if possible), and inform the overall assessment of bat roosting potential. The buildings and other built structures were inspected for features and defects often exploited by bats to access or establish roosts, such as: gaps and cracks in stonework, brickwork or render; gaps and cracks in weatherboarding, facias and soffits;

[39] *'Bat Surveys for Professional Ecologists - Good Practice Guidelines'* (Bat Conservation Trust; 3rd Ed.; 2016; London).

slipped, cracked or missing roofing slates/tiles; gaps in end tiles, ridge tiles or flashing; missing or damaged guttering, drainage and overflow pipes; exposed ventilation ducts; and open or broken windows and doors etc. The condition of all potential roost features (e.g. presence/absence of debris and cobwebs etc.) and their suitability for roosting was assessed in conjunction with the habitat suitability assessment and frequent inspections for physical evidence of bats, such as: corpses, droppings, scratch marks, feeding/predation remains, staining etc. In all cases the inspections comprised visual examinations, from ground level, with emphasis on PRFs and direct evidence of the recent presence of bats. The site contains no mature trees capable of supporting roosting bats.

Preliminary Assessment - Results

Background Research

2.60 The NBDC landscape suitability index[40] – all bats: 15.56 (low), Soprano pipistrelle *Pipistrellus pygmaeus:* 51 (very high), Brown Long-eared bat *Plecotus auritus:* 26 (low), Common pipistrelle *Pipistrellus pipistrellus:* 20 (low), Lesser horseshoe bat *Rhinolophus hipposideros*: 1 (very low), Leisler's bat *Nyctalus leisleri:* 18 (very low), Whiskered Bat *Myotis mystacinus:* 1 (very low), Daubenton's Bat *Myotis daubentonii:* 22 (medium), Nathusius' pipistrelle *Pipistrellus nathusii:* 1 (very low), Natterer's bat *Myotis nattereri*: 0 (very low) – suggests that, with the likely exception of *P. pygmaeus,* the site and area more generally is of no significance or importance to bats. The NBDC database returned records for *M. daubentonii* (1 no., 09/2008), *Pipistrellus spp.* (1 no., 09/2008) & *P. pygmaeus* (3 no., 09/2008) from within 10 km of the site (C23); no records for bats of any species were returned from the site or the immediately surrounding area at ≤ 2 km.

Habitat Suitability Assessment

2.61 Generalist and light-tolerant bats (*Pipistrellus spp., Nyctalus sp.*) can do well in fragmented and peri-urban landscapes, but the sharp coastal transition at this site is likely to prove marginal for bats, particularly given the lack of woodland cover and linear habitat features (hedgerows and stream corridors etc.). The open heathlands/grasslands and stands of scrub provide a foraging resource which is likely to be exploited by local populations on calm evenings, but the site open and exposed, with limited structurally diverse vegetation, and poor linear habitat connectivity. The site is assessed, to BCT criteria, as being of *low* suitability for commuting and *moderate* suitability for foraging.

Preliminary Roosting Assessment (PRA)

2.62 On initial cursory appraisal many of the buildings within the site seem suitable for roosting bats. While the numerous former military billets and barracks, predominantly timber-framed with corrugated sheet cladding, and the various concrete bunkers and gun emplacements, now degraded and derelict, are generally unsuitable for bats the smaller number of stone or brick buildings with slate/tile roofs (both the derelict and renovated/in-use buildings) do display features which seem suitable for roost access and establishment. However, roosting opportunities must be assessed in context and given the exposed, coastal situation, the unfavourable habitat suitability assessment, the generally low landscape suitability index values, and the general lack of records for the site and area, it was considered that no buildings were particularly suitable for roosting bats and that none merited any roosting classification higher than *low,* with most assessed at *negligible.* Generally, the degraded timber/sheeting and solid concrete structures were assessed as being of *negligible* suitability, and the various stone/brick-built buildings with slate/tile roofs were assessed as being of *low* suitability, although the very exposed cliff-edge structures at the lower fort remained at *negligible* [Figure 4a; Plates 2.35-2.46]. Certainly, the same structures situated further inland and/or in closer proximity to woodlands or mature hedgerows would have merited higher classifications but, in the context of this site, higher classifications are unrealistic.

[40] Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N., (2011) '*Landscape conservation for Irish bats & species specific roosting characteristics'* (Bat Conservation Ireland).

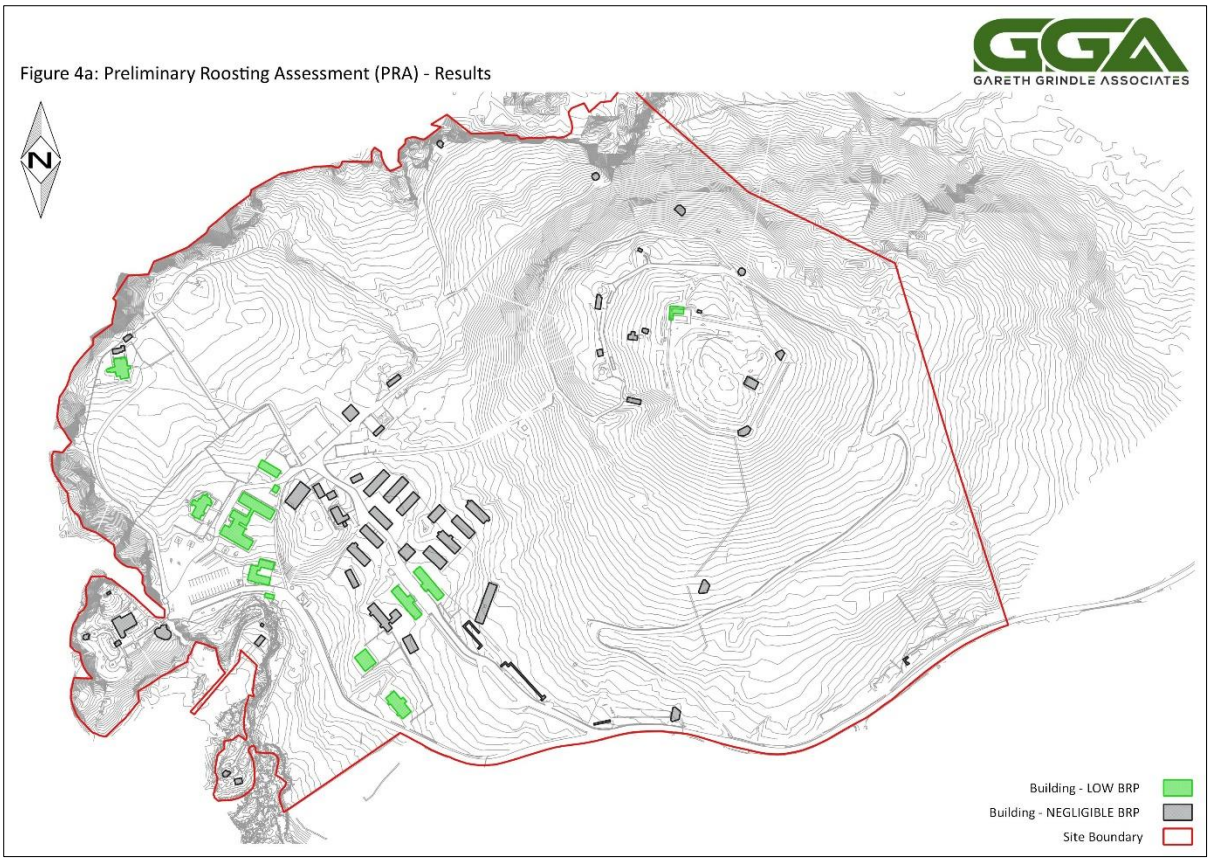


Plate 2.35: PRA – the cluster of derelict barracks/billets buildings; all assessed as being of *negligible* suitability for roosting [August 2023]

Plate 2.37: PRA – view of the interior of one of the more intact timber and metal sheeting barracks/billets buildings [July 2022]

Plate 2.36: PRA – the cluster of derelict barracks/billets buildings; all assessed as being of *negligible* suitability for roosting [August 2023]

Plate 2.38: PRA – typically small and low solid concrete structure; all assessed as being of *negligible* suitability for roosting [June 2022]

Plate 2.39: PRA – derelict stone/brick structures with slate/tile roofs were assessed as being of *low* suitability for roosting [August 2023]

Plate 2.40: PRA – derelict stone/brick structures with slate/tile roofs were assessed as being of *low* suitability for roosting [June 2022]

Plate 2.41: PRA – derelict stone/brick structures with slate/tile roofs were assessed as being of *low* suitability for roosting [August 2023]

Plate 2.42: PRA – derelict stone/brick structures with slate/tile roofs were assessed as being of *low* suitability for roosting [August 2022]

Plate 2.43: PRA – the brick structures at the high fort were assessed as being of *low* suitability for roosting [August 2023]

Plate 2.44: PRA – renovated and in-use stone/brick structures were assessed as being of *low* suitability for roosting [August 2023]

Plate 2.45: PRA – the lighthouse building, despite exposure, was assessed as being of *low* suitability for roosting [July 2022]

Plate 2.46: PRA – all other small structures and shelters were assessed as being of *negligible* suitability for roosting [August 2023]

2.63 The roosting classifications remained unchanged through several subsequent inspections and, as is set out below, the surveys and monitoring completed during the 2022 active season revealed nothing to warrant reconsideration. No physical evidence of bats (staining, cadavers, predation remains, droppings) was found within or around any structure despite several inspections during the 2022 and 2023 active seasons when it would be reasonable to expect that any such evidence would have accumulated and would have been found.

Crepuscular Surveys – Methodology

2.64 As per BCT Guidelines, roosting surveys are required for buildings with *low* suitability or higher. However, in this case, an initial suite of roosting/activity surveys and monitoring was designed to investigate species diversity and patterns of movement and behaviour, and assess overall levels of bat activity and roosting at the site (if any). It was anticipated that dedicated roosting surveys could then be undertaken subsequently, and targeted at specific buildings or parts of the site, if the results of the initial surveys indicated that any may be necessary. As is set out in detail below, it was concluded by mid-August 2022 that roosting opportunities at the site are not exploited by bats and that further targeted roost emergence/re-entry surveys were unnecessary.

2.65 The purpose of roosting surveys is to identify bat roosts through the direct observation of bats leaving or entering roost access points. As bats do not always echolocate immediately on emergence or during re-entry, visual observation is the primary method employed. Ultrasonic bat detectors and infra-red/thermal optical equipment is used to supplement and complement visual observations, and to capture audio and video recordings and still images for analysis. Species identification and behaviour is established in the field primarily through direct observation of bats in flight and the interpretation of echolocation calls in real time.

2.66 On each occasion the surveyor deployed a pair of *Dodotronic Ultramic (250 kHz)*, set to high gain (to maximise sensitivity), one powered by a *Samsung S2* tablet computer running *Bat Recorder* software on *Android,* the other powered by a *Panasonic CF-19 Toughbook* running *SeaPro* on *Windows 7.1 Pro*. This equipment allows continuous, full-spectrum recording and real-time audio/visual analysis of ultrasonic frequencies in the field. The *Bat Recorder* software can be switched between frequency division, heterodyne and low-pass filter modes in real-time while continuously recording to high quality, full-spectrum (8-125 kHz) *.wav files for export and analysis. The sensitive *Dodotronic* microphone detects low-intensity signals, such as the calls of *Plecotus sp.* and *Myotis spp.* bats at close range and the calls of other species at a distance, allows primary sources to be distinguished from reflections and allows even very faint echolocation calls to be differentiated from high levels of background noise. The microphones detect ultrasound emanating from all directions – relative signal strength can be used to determine the direction of the source and real-time spectrograph analysis aids species identification and behaviour differentiation in the field.

2.67 A *Sony FDR-AX700* video recorder, set in *low-lux* mode and with the *NightShot* feature enabled was also deployed. The *AX700* uses a large 1"- type CMOS sensor that maximises detail in low light conditions and, with *NightShot* enabled, records at up to 120 FPS. The camera was set on a tripod, focused on the surveyor's field of view. Additional infra-red illumination was not used at this site due to the wide fields of view under observation.

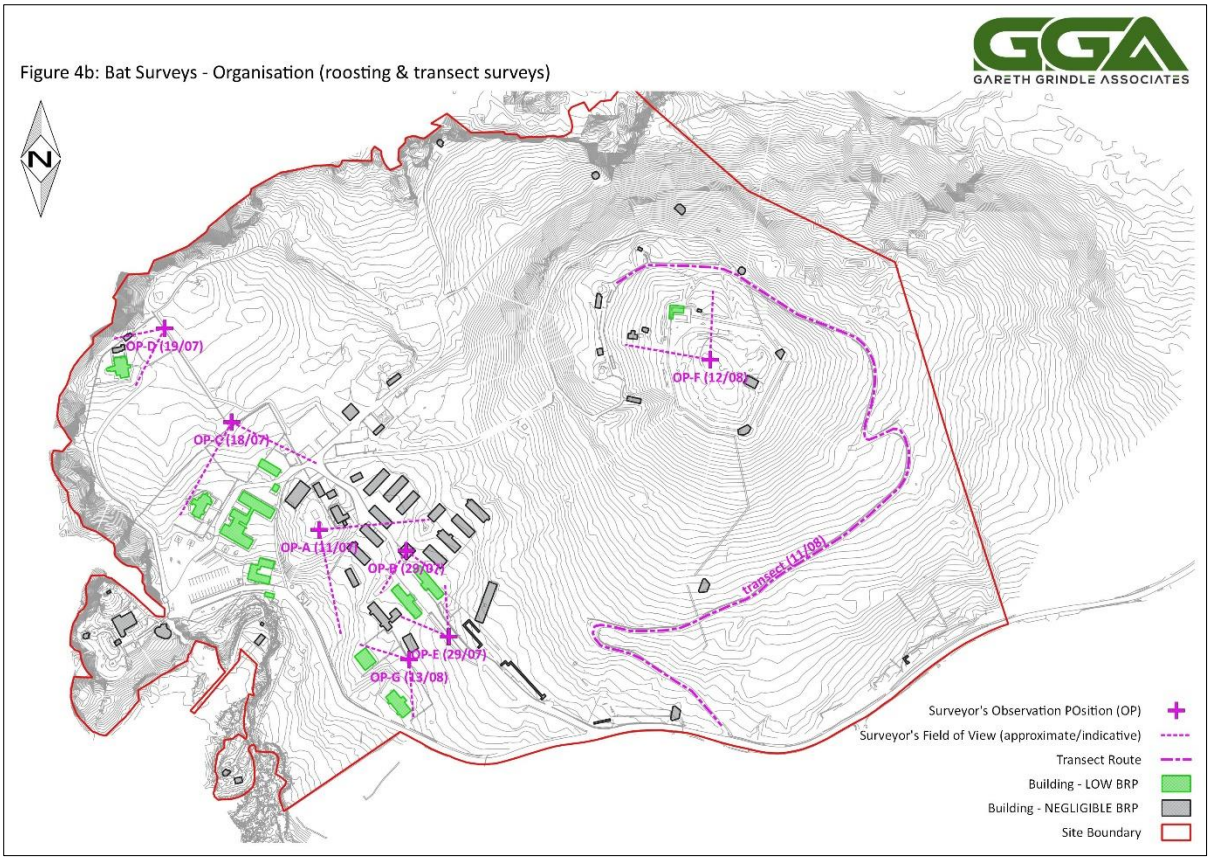
2.68 A *Wildlife Acoustics Song Meter SM4BAT ZC* (zero-crossing variant) automatic detector/recorder fitted with an SMM-U2 ultrasonic microphone was deployed to several locations within the site for periods of between 7 and 14 days in June, July & August 2022. The equipment was set to record (low filter at 8 kHz, high filter at 125 kHz) from 30 mins before sunset until 30 mins after sunrise.

2.69 The *Dodotronic* and *SM4BAT* recordings were analysed using *Kaleidoscope Pro (Wildlife Acoustics)* and the results were subject to expert review and verification by the author. To avoid under-reporting the

spectrograph generated from each of the 15-second samples generated from the continuous *Dodotronic* recordings, and each time the *SM4BAT* was triggered to record (including all those automatically classified as 'noise'), were examined to confirm or correct automatic species identifications and inspect echolocation call shapes for indications of behaviour.

Crepuscular Surveys – Results – Roosting & Activity Surveys

2.70 Observation positions were identified from where large sections of the site could be monitored for bat activity and the cluster of buildings, particularly the *low*-suitability buildings, could be monitored for emerging bats. 7 no. emergence/activity surveys were undertaken, using 7 no. different observation positions, OP-A-OP-G; a transect/activity survey was also completed [Figure 4b].



2.71 Table 2.1 provides details of the dates, times, and conditions.[41] Surveys commenced 15-20 mins before sunset and continued until c. 100-120 mins after sunset.

Table 2.1: Roosting & Activity Surveys – Dates, Times & Conditions

	Times		Sun	Position		Weather Conditions			
Date	start	end	rise	set		Temp.	Pptn.	Wind	Comments
12/07/2022	2140	2345	-	2203	OP-A	12-14°C	none	2.0-4.0 ms^{-1}	good – warm, dry, breezy
13/07/2022	2140	2345	-	2202	OP-B	13-17°C	none	c. 2.5 ms^{-1}	optimal – warm, dry, calm
18/07/2022	2130	2330	-	2156	OP-C	15-21°C	none	< 2.5 ms^{-1}	optimal – warm, dry, calm
19/07/2022	2130	2330	-	2155	OP-D	14-15°C	none	< 2.5 ms^{-1}	optimal – warm, dry, calm

[41] Conditions were recorded on site during the surveys and confirmed with almanac records retrieved from www.timeanddate.com/weather/; sunrise and sunset times were confirmed from www.timeanddate.com/sun/

	Times		Sun	Position		Weather Conditions			
Date	start	end	rise	set		Temp.	Pptn.	Wind	Comments
29/07/2022	2120	2330	-	2138	OP-E	15-17°C	light	2.0-4.0 ms^{-1}	acceptable – warm, calm, light rain
11/08/2022	2050	2330	-	2112	transect	15-20°C	none	< 2.5 ms^{-1}	optimal – warm, dry, calm
12/08/2022	2050	2300	-	2110	OP-F	16-18°C	none	< 2.5 ms^{-1}	optimal – warm, dry, calm
13/08/2022	2045	2300	-	2108	OP-G	17-19°C	none	< 2.5 ms^{-1}	optimal – warm, dry, calm

2.72 The results of the surveys are now presented as brief narrative accounts of the surveyor's observations with a summary of the data obtained from field observations and the analysis of the contemporaneous ultrasonic recordings. The results are illustrated [Figure 4c] and sample spectrographs are presented [Plates 2.47-2.52]. The detailed results obtained from the analysis, with surveyor's notes where relevant/significant, are provided [Annex A].

12th July 2022

2.73 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-A, at an elevated position within the cluster of buildings, from 2140 until 2345; sunset was 2203. Weather conditions were good (warm and dry but breezy); invertebrate prey was available but not abundant.

2.74 Just one species – *P. pipistrellus* – was observed, detected and recorded on site but numbers were very low (just 3 no. detections on site, 6 no. registrations in total) and just two bats were observed in flight. The earliest registration was 2222, c. 20 minutes after sunset. No bats emerged from any building within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

2.75 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and, as noted, a few registrations that were not discriminated by the surveyor on site were added to the aggregated results. No clustering of bat calls at or close to sunset was revealed. No bat activity was captured by the video equipment.

13th July 2022

2.76 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-B, at an elevated position within the cluster of buildings and with good visibility over two *low*-suitability structures, from 2140 until 2345; sunset was 2202. Weather conditions were optimal (warm, dry, calm); invertebrate prey was available but not abundant.

2.77 Two species – *P. pipistrellus* & *N. leisleri* – were observed, detected and recorded but again numbers were very low (5 no. detections on site, 6 no. registrations in total) and just three bats were observed in flight. The earliest *P. pipistrellus* registration was 2223, c. 20 minutes after sunset; the earliest *N. leisleri* registration c. 20 minutes later. No bats emerged from any building within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

2.78 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and just one registration that was not discriminated by the surveyor was added to the aggregated results. No clustering of bat calls at or close to sunset was revealed and no bat activity was captured by the video equipment.

18th July 2022

2.79 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-C, at an elevated position to the north of the cluster of buildings and with good visibility over renovated/in-use and derelict *low*-suitability structures, from 2130 until 2330; sunset was 2156. Weather conditions

were optimal (warm, dry, calm); invertebrate prey was available around the OP but less abundant around the cluster of buildings.

2.80 Two species – *P. pipistrellus* & *N. leisleri* – were again observed, detected and recorded on site. Levels of activity were notably much higher than on previous occasions but this was attributed to sustained periods of foraging by individual bats over the open heathland to the north of the surveyor – activity within and around the cluster of buildings was again very low. The earliest *P. pipistrellus* registration was 2222, c. 25 minutes after sunset, with just a single *N. leisleri* registration towards the end of the survey at 2250. No bats emerged from any building within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

2.81 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and registrations matched observations – no records were added to the aggregated results. No clustering of bat calls at or close to sunset was revealed and no bat activity was captured by the video equipment.

19th July 2022

2.82 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-D, close to the northern coast and with good visibility over the *low*-suitability lighthouse building and surrounding gardens, from 2130 until 2330; sunset was 2155. Weather conditions were optimal (warm, dry, calm) and invertebrate prey was available and abundant.

2.83 Just one species – *N. leisleri* – was detected and recorded and numbers were very low (just 2 no. detections/registrations) and no bats were observed in flight. The earliest registration was 2245, c. 50 minutes after sunset. No bats emerged from the buildings within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

2.84 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and registrations matched observations – no records were added to the aggregated results. No clustering of bat calls at or close to sunset was revealed and no bat activity was captured by the video equipment.

29th July 2022

2.85 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-E, at an open position within the cluster of buildings and with good visibility over two *low*-suitability structures, from 2120 until 2330; sunset was 2138. Weather conditions were acceptable (warm, calm and dry following some light rain at and just after sunset); invertebrate prey was available.

2.86 Just one species – *P. pipistrellus* – was observed, detected and recorded on site. Levels of activity were notably much higher than had been recorded from OPs within the cluster of buildings on previous occasions but again this was attributed to sustained periods of foraging by individual bats over the areas of scrub and grassland to the east of the surveyor – activity within and around the cluster of buildings was again very low and was limited to occasional commuting along the internal road corridor. The earliest registration was 2216, c. 38 minutes after sunset. No bats emerged from any building within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

2.87 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and registrations matched observations – just one record was added to the aggregated results. No clustering of bat calls at or close to sunset was revealed and no bat activity was captured by the video equipment.

11th August 2022

2.88 A transect/activity survey was completed. The surveyor patrolled the transect route along the rough

access road/part to the east and north of the site from 2050 until 2330; sunset was 2112. Two return circuits, with several lengthy listening stops, were completed. Weather conditions were optimal (particularly warm, dry, calm) and invertebrate prey was available and abundant.

2.89 Two species – *P. pipistrellus* & *P. pygmaeus* – were observed, detected and recorded. Levels of activity, mostly foraging, over the scrub and open heathland/grassland, were notably much higher than had been recorded for other parts of the site. The earliest *P. pipistrellus* registration was 2159, c. 47 minutes after sunset; the earliest *P. pygmaeus* registration was much later, at 2212, c. 60 minutes after sunset. No patterns of movement or behaviour that might suggest local roosting were noted.

2.90 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and several registrations that were not discriminated by the surveyor on site were added to the aggregated results. No clustering of bat calls at or close to sunset was revealed.

12th August 2022

2.91 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-F, at the high fort with good visibility over the *low*-suitability structures, from 2050 until 2330; sunset was 2110. Weather conditions were optimal (particularly warm, dry, calm) and invertebrate prey was abundant.

2.92 Three species – *P. pipistrellus, P. pygmaeus* & *N. leisleri* – were observed, detected and recorded. Levels of activity were relatively high, consistent with results from OPs close to areas of open heathland and other semi-natural habitat; indeed, all activity was attributed to sustained foraging over these areas and no activity was observed within and around the buildings at the high fort. The earliest *Pipistrellus spp.* registrations were 2156 and 2157, c. 45 minutes after sunset; a single *N. leisleri* was detected much later, at 2218. No bats emerged from any building within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

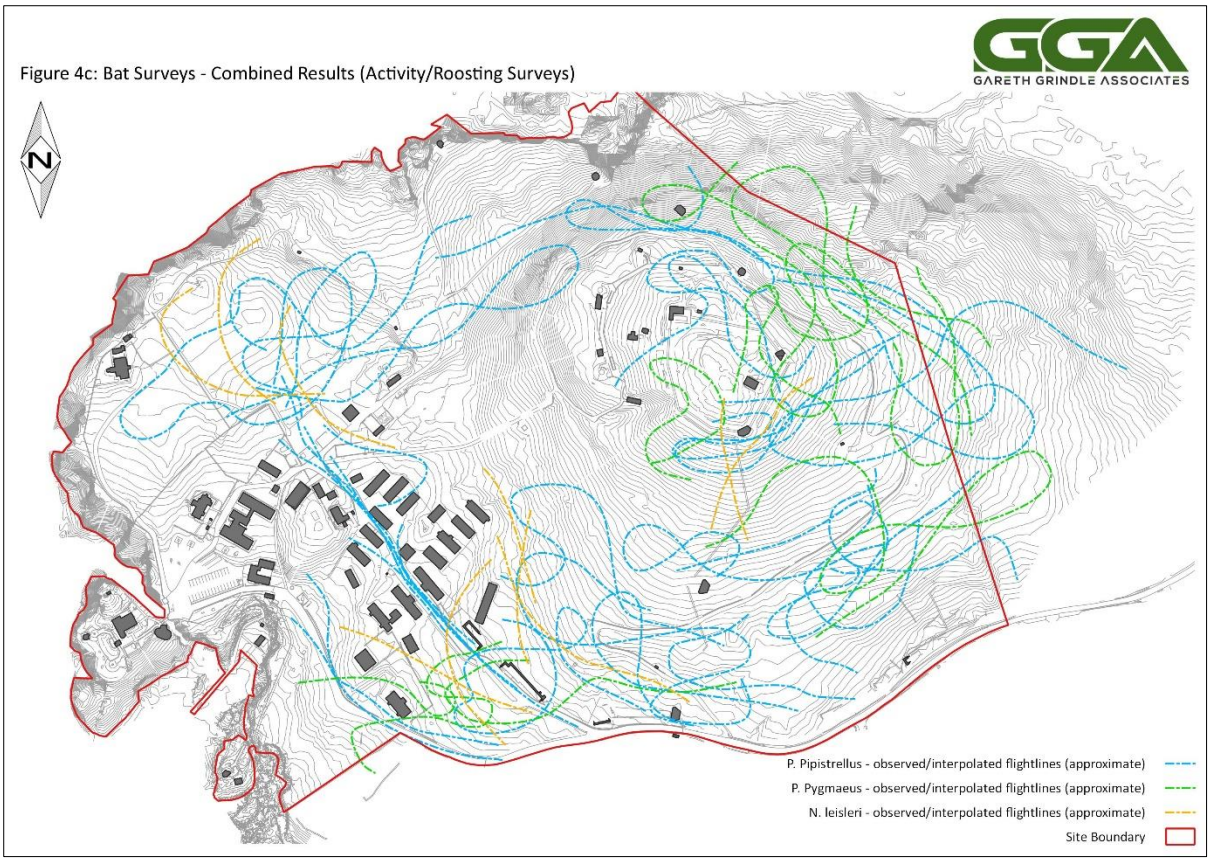
2.93 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings, with just a few registrations that were not discriminated by the surveyor on site added to the aggregated results. No clustering of bat calls at or close to sunset was revealed. No bat activity was captured by the video equipment.

13th August 2022

2.94 A dusk activity and roost emergence survey was completed. The surveyor remained at OP-F, within the cluster and with good visibility over two *low*-suitability structures, from 2045 until 2300; sunset was 2108. Weather conditions were optimal (warm, dry, calm); invertebrate prey was abundant.

2.95 Three species – *P. pipistrellus, P. pygmaeus* & *N. leisleri* – were observed, detected and recorded on site. Levels of activity were notably much higher than had had generally been recorded previously from OPs within the cluster of buildings, and again this was attributed to sustained periods of foraging by individual bats over the areas of scrub and grassland to the east of the surveyor – activity within and around the buildings was very low and limited to occasional commuting. The earliest *P. pipistrellus* and *P. pygmaeus* registrations were 2154 and 2155, c. 48 minutes after sunset; occasional *N. leisleri* were detected later on. No bats emerged from any building within the surveyor's field of view and no patterns of movement or behaviour that might suggest local roosting were noted.

2.96 Species diversity was confirmed through the analysis of contemporaneous ultrasound recordings and several registrations that were not discriminated by the surveyor on site were added to the aggregated results. No clustering of bat calls at or close to sunset was revealed and no bat activity was captured by the video equipment.



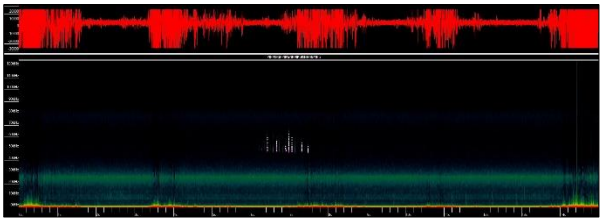


Plate 2.47: *P. pipistrellus* – typical strong but brief registration from a bat commuting in the area [July 2022]

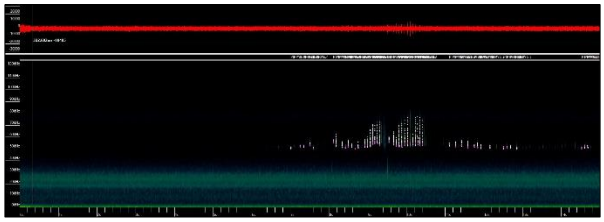


Plate 2.50: *P. pygmaeus* – typical strong registration from a bat foraging over open heathland [August 2022]

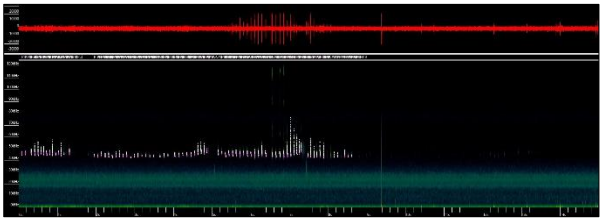


Plate 2.48: *P. pipistrellus* – typical strong registration from a bat foraging over open heathland [August 2022]

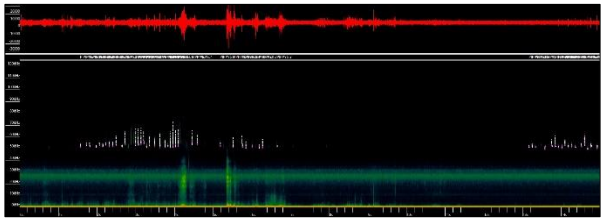


Plate 2.51: *P. pygmaeus* – typical strong registration from a bat foraging over open heathland [August 2022]

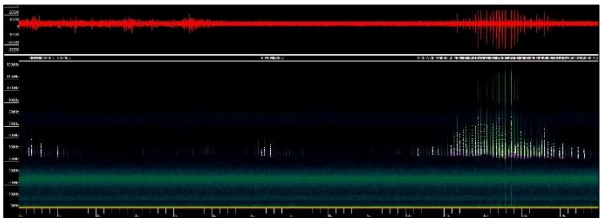


Plate 2.49: *P. pipistrellus* – typical strong registration from a bat foraging over open heathland [August 2022]

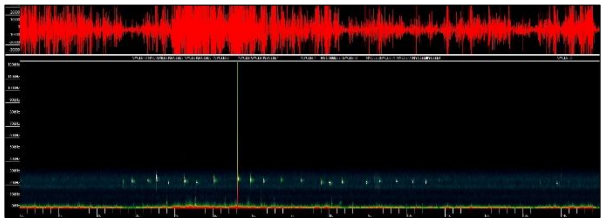


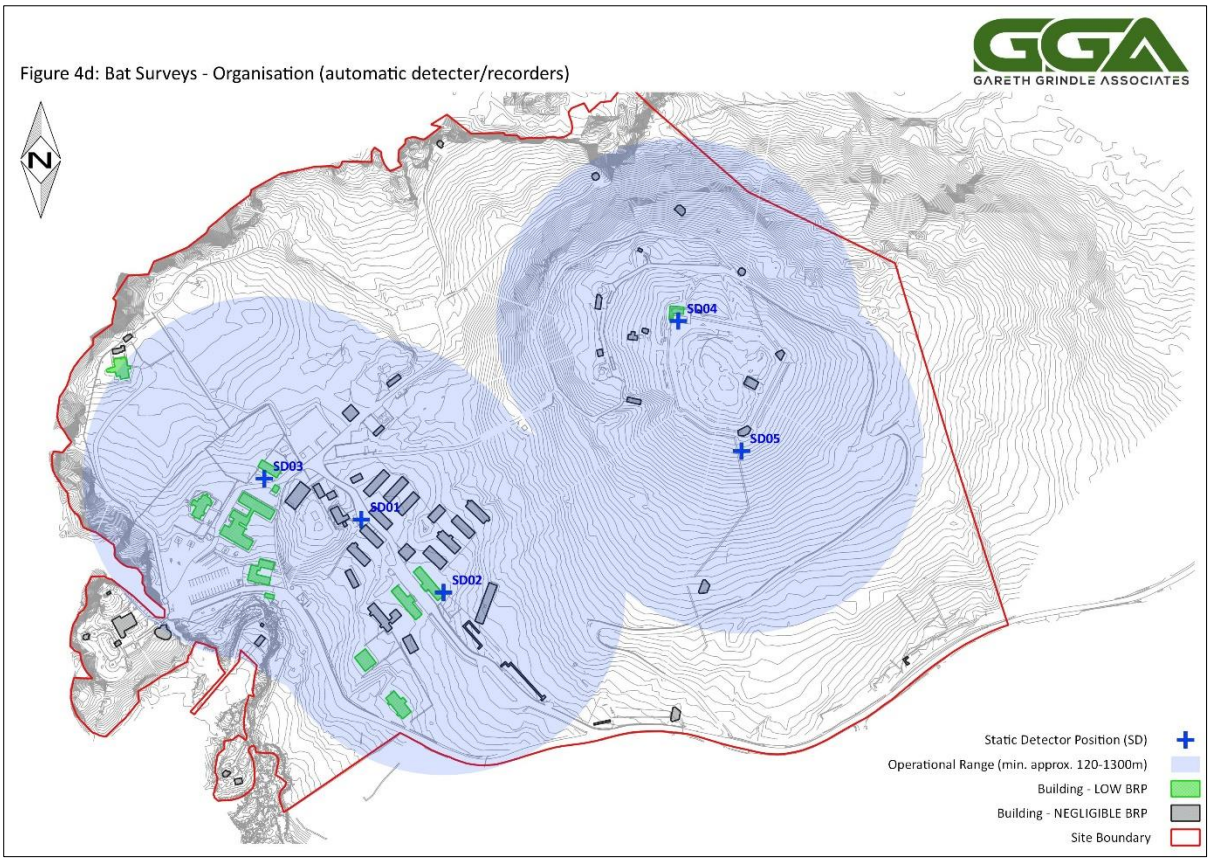
Plate 2.52: *N. leisleri* – typical registration from a bat commuting overhead [July 2022]

Mapping & Spectrographs

2.97 Sample spectrographs obtained during the analysis are presented [Plates 2.47-2.52]. All *Pipistrellus spp.* and *N. leisleri* flightlines that were observed and/or could be interpolated are illustrated [Figure 4c]. The results from all eight surveys are illustrated, perhaps giving the impression that the site is much busier with bat activity than is the case on any single evening; some areas are shown with no activity but this is due to the limitations of detector coverage and visual acuity rather than a lack of bat activity.

Crepuscular Surveys – Results – Automatic Monitoring

2.98 Locations were identified where the monitoring equipment (*SM4BAT ZC* detector/recorder & *SMM-U2* ultrasonic microphone) could be installed to record bat activity around the cluster of buildings and within large surrounding areas of the site for longer periods of time. The equipment was deployed to 5 no. locations, SD01-SD05 [Figure 4d], for periods of between 7 and 14 consecutive nights.



2.99 Table 2.2 provides details of the dates and conditions;[42] the equipment was set to record from 30-mins before sunset until 30-mins after sunrise.

Table 2.2: Automatic Monitoring – Dates & Conditions

Dates		Sun			
start	end	rise	set	Position	Conditions & Notes
24/06/2022	01/07/2022	0450-0454	2212-2214	SD01	variable – lows from 9°C, frequent rain, some strong winds
01/07/2022	12/07/2022	0454-0506	2203-2212	SD02	consistent, good – lows c. 12°C, little rain, lower winds
13/07/2022	20/07/2022	0507-0517	2153-2202	SD03	variable – lows from 9°C, frequent rain, general low winds

[42] Conditions were retrieved from almanac records available from www.timeanddate.com/weather/; sunrise and sunset times were retrieved from www.timeanddate.com/sun/

Dates		Sun			
start	end	rise	set	Position	Conditions & Notes
20/07/2022	30/07/2022	0517-0534	2136-2153	SD04	consistent, good – lows from 9°C, little rain, low winds
30/07/2022	11/08/2022	0534-0556	2112-2136	SD05	consistent, good – lows from 10°C, little rain, lower winds

2.100 The results are presented as summaries of the data with a scatter plot (time of night vs echolocation call frequency, classified by species) for each monitoring period [Figures 4e-4i].

24th June – 1st July 2022

2.101 The equipment was deployed to SD01, in the centre of the cluster of buildings, from 24th June until 1st July 2022 (7 no. consecutive nights) during a period of variable and unsettled weather (night-time temperatures generally in the 11-16°C range with some notable lows from 9°C, otherwise periods of warm, dry and calm weather interspersed with frequent rain showers and some higher winds).

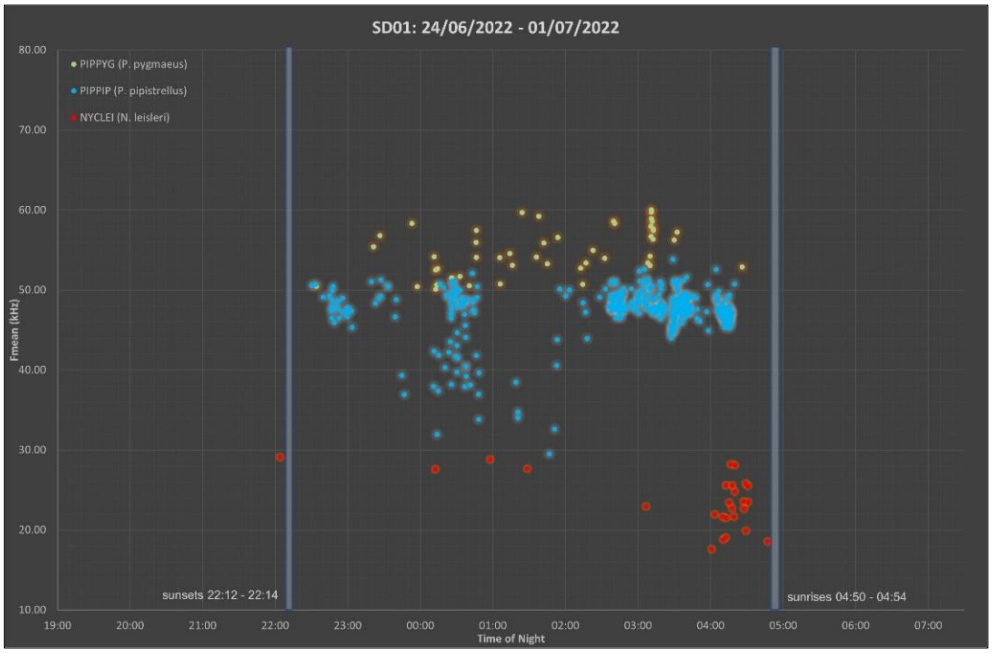


Figure 4e: Plot of registrations (kHz) vs time of night, with sunset and sunrise times indicated [SD01 24/06-01/072022]

2.102 A total of 2,953 no. discrete ultrasonic events were recorded. Following expert review of the spectrographs and recordings (all were examined individually) it was concluded that 463 no. were echolocation calls emitted by one or more bats – *N. leisleri* (26 no.), *P. pygmaeus* (49 no.), *P. pipistrellus* (389 no.) – with the remainder confirmed as 'noise'.[43] No bat activity was recorded during the nights of 25th/26th and 26th/27th but otherwise registrations were reasonably evenly distributed.

2.103 The scatter plot [Figure 4e] demonstrate that other than a couple of *N. leisleri* registrations, activity was largely confined to periods during the night, with some clustering but generally not at or around typical roost emergence or re-entry times or during the immediate post-sunset or pre-sunrise periods. *N. leisleri were* present in slightly greater numbers closer to dawn than during the evening and the clusters of *P. pipistrellus* registrations during the c. 30-90 minute periods after sunset and before sunrise

[43] The large number of noise files can be attributed to ultrasound generated by wind and rain, secondary noise from the movement of derelict buildings etc., vehicle movements, electricity and possibly birds and other animals. From the author's extensive experience of dealing with zero-crossing data sets from numerous deployments across dozens of varied sites over several years, high numbers of 'noise' or non-bat recordings is a common occurrence. It must be noted that the detection of bats is unaffected – echolocation calls and non-bat noise are reasonably well differentiated by the processing software and are clearly distinguishable from spectrographs, providing these are all subject to expert review.

suggest the presence of a local roost at an appreciable commuting distance from the site (i.e. not within or very close to the site).

1st July – 12th July 2022

2.104 The equipment was deployed to SD02, at the southern end of the cluster of buildings, from 1st July until 12th July 2022 (11 no. consecutive nights) during a period of consistently good weather (night-time temperatures generally no lower than 12°C with little rainfall and low winds).

2.105 A total of 3,669 no. discrete ultrasonic events were recorded. Following expert review of the spectrographs and recordings (all were examined individually) it was concluded that 993 no. were echolocation calls emitted by one or more bats – *N. leisleri* (59 no.), *P. pygmaeus* (202 no.), *P. pipistrellus* (732 no.) – with the remainder confirmed as 'noise'. No bat activity was recorded during the night of 1st/2nd and otherwise registrations were notably much more numerous towards the end of the period.

2.106 The scatter plot [Figure 4f] shows a very similar distribution and clustering for all species and largely confined to periods during the night. The similar clustering for *P. pipistrellus* again suggests a local roost some distance inland but the lack of clustering at or around typical roost emergence or re-entry times or during the immediate post-sunset or pre-sunrise periods tends to confirm that bats are not roosting at or very close to the site.

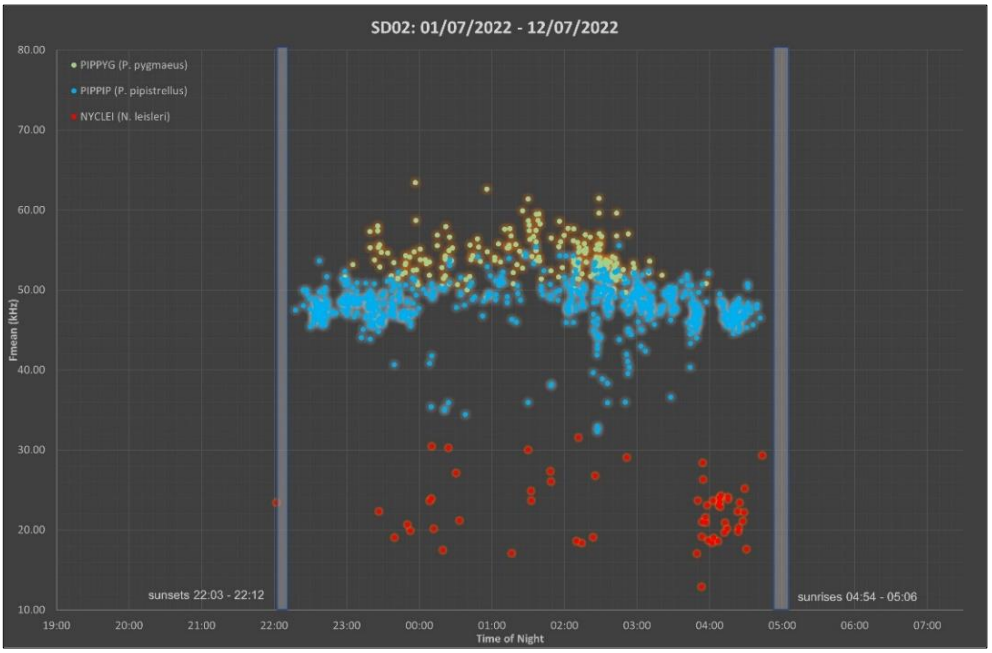


Figure 4f: Plot of registrations (kHz) vs time of night, with sunset and sunrise times indicated [SD02 01/07-12/072022]

13th July – 20th July 2022

2.107 The equipment was deployed to SD03, at the northern end of the cluster of buildings, from 13th July until 20th July 2022 (7 no. consecutive nights) during a period of variable and unsettled weather (night-time temperatures generally in the 12-14°C range with some notable lows from 8°C, otherwise periods of warmer, dry and calm weather interspersed with frequent rain and higher winds).

2.108 A total of 2,194 no. discrete ultrasonic events were recorded. Following expert review of the spectrographs and recordings (all were examined individually) it was concluded that 484 no. were echolocation calls emitted by one or more bats – *N. leisleri* (47 no.), *P. pygmaeus* (68 no.), *P. pipistrellus* (369 no.) – with the remainder confirmed as 'noise'. Bat activity was recorded on all nights, with more registrations during the nights with better (drier, calmer) weather conditions.

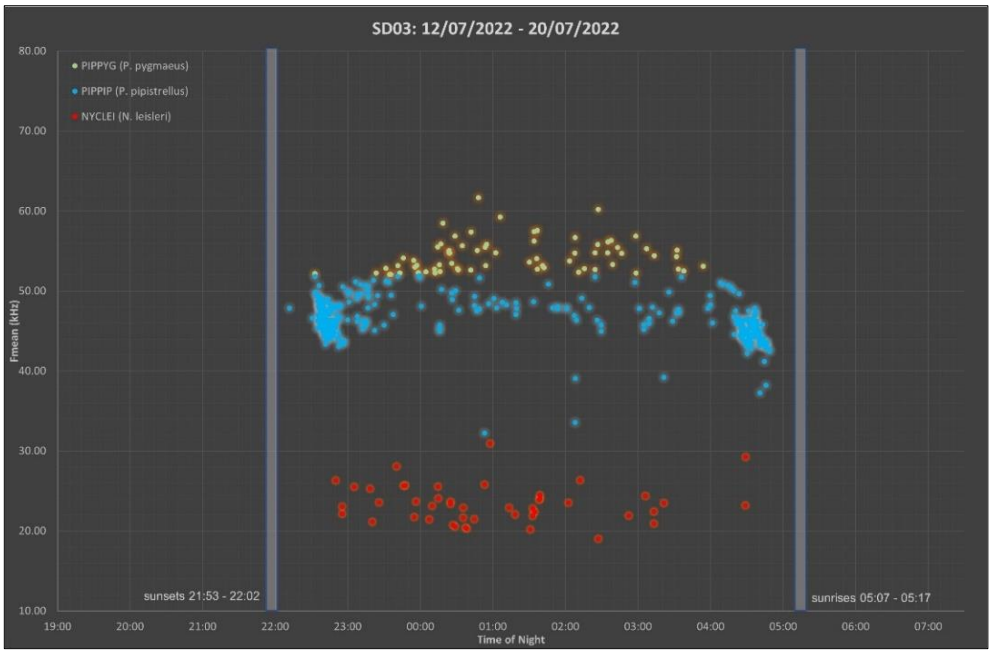


Figure 4g: Plot of registrations (kHz) vs time of night, with sunset and sunrise times indicated [SD03 12/07-20/072022]

2.109 The scatter plot [Figure 4g] again shows very similar distributions for all species but the pre-dawn clustering for *N. leisleri* is absent. Again, activity is confined to periods during the night and the clustering for *P. pipistrellus* during the post-sunset and pre-sunrise periods suggests local roosting some distance inland. The lack of registrations at or around typical emergence or re-entry times or during the immediate post-sunset or pre-sunrise periods confirms that bats are unlikely to be roosting in the immediate area.

20th July – 30th July 2022

2.110 The equipment was deployed to SD04, in the built structures at the high fort, from 20th July until 30th July 2022 (10 no. consecutive nights) during a period of consistently good weather (night-time temperatures generally no lower than 9°C with little rainfall and low winds).

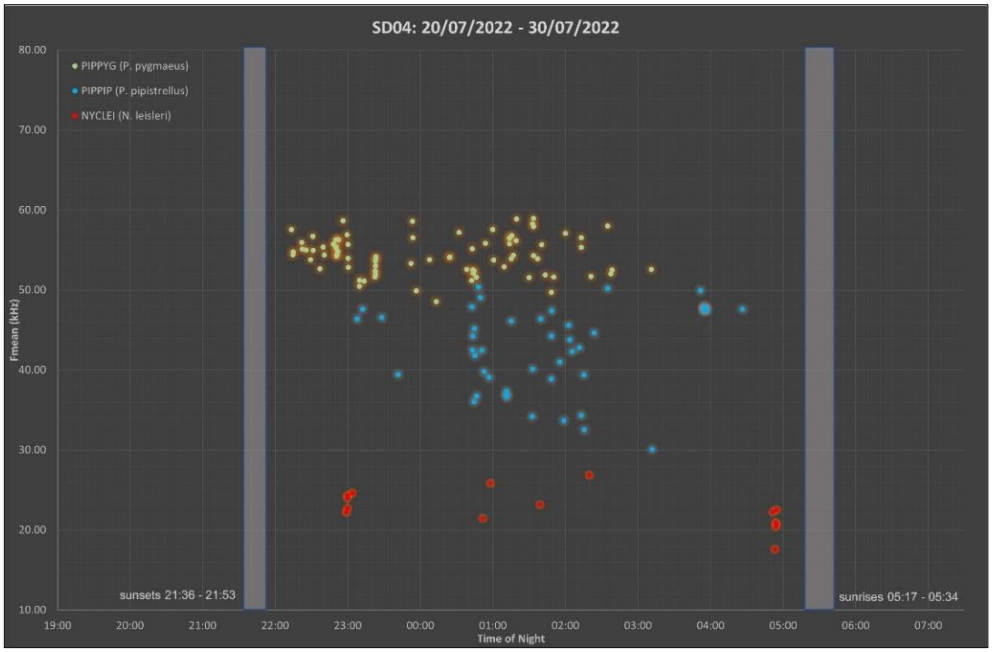


Figure 4h: Plot of registrations (kHz) vs time of night, with sunset and sunrise times indicated [SD04 20/07-30/072022]

2.111 A total of 2,075 no. discrete ultrasonic events were recorded. Following expert review of the spectrographs and recordings (all were examined individually) it was concluded that just 144 no. were echolocation calls emitted by one or more bats – *N. leisleri* (15 no.), *P. pygmaeus* (84 no.), *P. pipistrellus* (45 no.) – with the remainder confirmed as 'noise'. No bat activity was recorded during several nights – 20th/21st 23rd/24th 24th/25th & 25th/26th – but this cannot be explained by adverse weather conditions alone; otherwise, registrations were reasonably evenly distributed throughout the other nights.

2.112 The scatter plot [Figure 4h] shows no discernible patterns or clustering – bats seem to utilise this part of the site sporadically and infrequently which may be unsurprising for a locally elevated and exposed location. The lack of registrations at or around typical roost emergence and re-entry times, and during the immediate post-sunset and pre-sunrise periods, confirms that bats are not roosting at or close to this location.

30th July – 11th August 2022

2.113 The equipment was deployed to SD05, at an exposed location close to the summit at the high fort, from 30th July until 11th August 2022 (12 no. consecutive nights) during a period of consistently good weather (night-time temperatures generally no lower than 10°C with little rainfall and low winds).

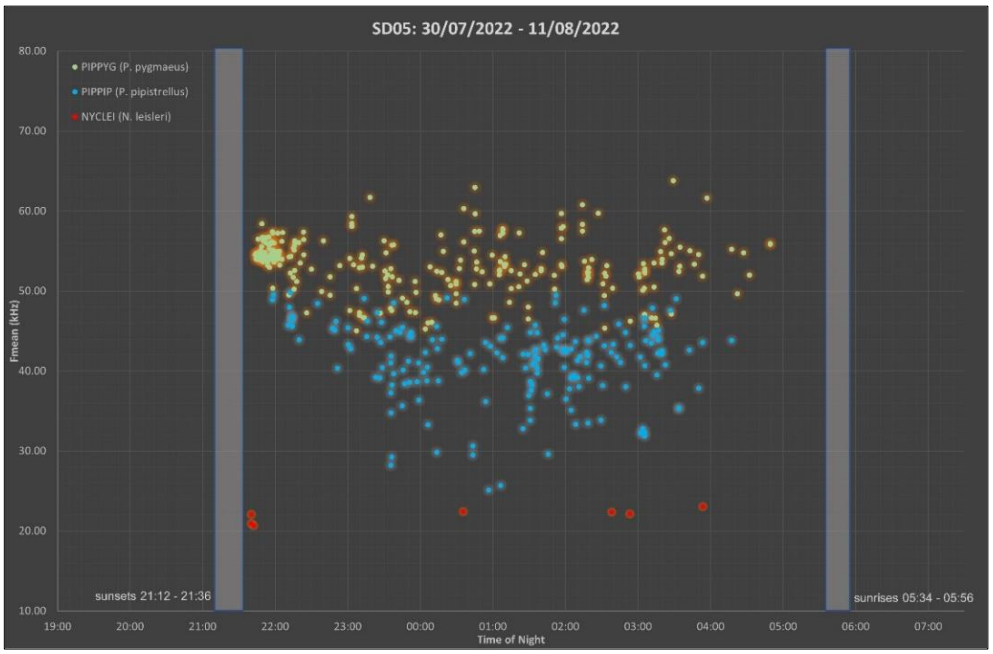


Figure 4i: Plot of registrations (kHz) vs time of night, with sunset and sunrise times indicated [SD05 30/07-11/08/2022]

2.114 A total of 3,893 no. discrete ultrasonic events were recorded. Following expert review of the spectrographs and recordings (all were examined individually) it was concluded that 464 no. were echolocation calls emitted by one or more bats – *N. leisleri* (7 no.), *P. pygmaeus* (272 no.), *P. pipistrellus* (185 no.) – with the remainder confirmed as 'noise'. No bat activity was recorded during the night of 3rd/4th and otherwise more registrations were recorded during the nights with better (drier, calmer) weather conditions.

2.115 The scatter plot [Figure 4i] shows no discernible patterns, other than a clustering of *P. pygmaeus* registrations during the 30-90 minute period after sunset, for which the cause is unknown but is unlikely to be related to local roosting (possibly increased numbers of juveniles on the wing). Again, bats seem to utilise this locally elevated and exposed part of the site sporadically and infrequently. Again, the lack of registrations at or around typical roost emergence and re-entry times, and during the immediate post-sunset and pre-sunrise periods, confirms that bats are not roosting in the immediate vicinity.

Appraisal

2.116 Three species – Leisler's bat *Nyctalus leisleri,* Common pipistrelle *Pipistrellus pipistrellus* & Soprano pipistrelle *Pipistrellus pygmaeus* – were regularly observed, detected and recorded within the site. *Pipistrellus spp.* were encountered/recorded regularly and frequently on warm and calm evenings, with *N. leisleri* activity infrequent and sporadic. Bats were absent, or activity was greatly reduced, when conditions at the site were unfavourable but conditions inland were likely more suitable. No roosting was observed, no patterns of movement or behaviour that might suggest roosting within the site were noted, and no clustering of echolocation calls at or close to sunset or sunrise was revealed through the analysis of contemporaneous ultrasound recordings. From the survey results it seems very likely the *Pipistrellus spp.* roost nearby, but further inland, and exploit the foraging resource over the open heathland, grassland and scrub at the site on dry and calm evenings.

2.117 The regime of strict protection established for bats (EPS) is engaged as local populations of several species are active in the area. The net effect of development will be the loss of some scrub and overgrown vegetation around the previously developed sections of the site and the loss or refurbishment of several derelict structures, but the open heathland and grasslands will be unaffected and no roosts will be damaged or destroyed. As no high-quality foraging or commuting resources will be lost or degraded, and as no roosts will be lost, it is concluded that the development proposals meet the legislative requirements and will not result in any significant adverse impacts on any local populations.

Otters

2.118 Otter *Lutra lutra* are well known from Lough Swilly and around the North Inishowen coast more generally, are a qualifying interest of North Inishowen Coast SAC, and are identified as priority species for Co. Donegal.[44] The NBDC database holds records for otters at the 10km, 2km and townland/site scales, however, the steep and exposed rocky sea cliffs to the north and west of the site are sub-optimal for transit and foraging and the previously developed sections of the site provide only marginal opportunities for the establishment of holts and other refuges.

Methodology

2.119 The site was surveyed for field evidence of otter presence and activity throughout several walkover completed in June, July and August 2022. As the project proposals became more developed and better defined, further detailed surveys for field evidence (October 2022, April-August 2023) were targeted on the specific areas proposed for new development, with less survey effort expended on areas that will be largely unaffected by the project. The site and safely accessible coastal areas were inspected for physical and field evidence of otter presence and activity such as: refuges (holts, hovers, couches etc.), slides, trails, paw prints, tracks, spraints, jelly, and feeding/predation remains etc.

Results

2.120 The parts of the site that are to be redeveloped are generally unsuitable for otters. No holts or other resting places and no physical or field evidence of otter activity was found within the site generally or within the areas subject to detailed, targeted surveys. Certainly, there are no holts within the areas of the site that will be directly impacted by the project. No evidence was found of any habitual or regular use of any accessible sections of the rocky shore. No spraints or predation remains were found on the concrete jetty or the small rocky beach at the boathouse below the lower fort despite several searches at high and low tides – this is unsurprising for a dynamic, coastal environment where transitory field evidence is unlikely to persist and shore/intertidal areas are largely absent.

[44] *'Biodiversity Species List for County Donegal (with priorities)'* (Donegal County Council, 2009).

Appraisal

2.121 Otters are undoubtedly present in Lough Swilly and are known to move around the coast of Dunree Head from time to time, foraging the near-shore waters at the foot of the sea cliffs. However, regular activity is likely confined to these areas and it is very unlikely that otters venture up into the terrestrial sections of the site with any regularity, if at all – there is, for example, no reliable source of fresh water that might attract otters up the cliffs – and it unsurprising that no evidence of regular, habitual activity was found.

2.122 The regime of strict protection established for otters (EPS) is engaged as individuals may be active along the coast from time to time but as no holts or other refuges will be lost to development, no foraging resources or regularly-used commuting corridors will be lost or degraded, and as individual otters are very unlikely to be harmed or disturbed during construction works it is concluded that the development proposals meet the legislative requirements.

2.123 It is recommended that the coastal sites are re-surveyed for otters activity prior to the commencement of development works.

Marine Mammals

2.124 All cetaceans (EPS) are subject to the regime of strict protection established by the Birds and Natural Habitats Regulations and pinnipeds are protected under the Wildlife Acts – this is in addition to protection afforded by designated sites, and applies to individual animals and populations wherever they are found.

2.125 Marine mammals are regularly present in Lough Swilly and in coastal waters off northern Co. Donegal. The four 10km reporting grid squares (NBDC C23, C24, C33, C34) that cover Lough Swilly to the south and north of Dunree Head returned recent records for: Atlantic white-sided dolphin *Lagenorhynchus acutus* (2015), Bottle-nosed dolphin *Tursiops truncates* (2020), Common dolphin *Delphinus delphis* (2019), Common porpoise *Phocoena phocoena* (2020), Common seal *Phoca vitulina* (2021), Cuvier's beaked whale *Ziphius cavirostris* (2018), Harbour porpoise *Phocoena phocoena* (2020), Humpback whale *Megaptera novaeangliae* (2020), Killer whale *Orcinus orca* (2012), Long-finned pilot whale *Globicephala melas* (2020), Minke whale *Balaenoptera acutorostrata* (2019), Risso's dolphin *Grampus griseus* (2006), Sperm whale *Physeter macrocephalus* (1972), Striped dolphin *Stenella coeruleoalba* (1989), several further general records for unidentified whales and dolphins, and Grey seal *Halichoerus grypus* (2021). *P. phocoena* and *T. truncates* are identified as priority species for Co. Donegal.[45]

Appraisal

2.126 Noise disturbance is widely accepted as one of the main threats to marine mammals. Construction, including works taking place onshore, can result in the generation of substantial levels of underwater noise as sound and vibration may be transmitted indirectly to the marine environment through substrates extending into the intertidal zone. In this case, it is considered that construction noise/vibration would only be an issue if piling operations, particularly driven piles, are required as part of the construction methodology – if this is the case, mitigation would be required to prevent injury or harm to marine mammals. However, it is very unlikely that piling will be required at this site, although this has yet to be confirmed.

2.127 Detailed engineering design and construction/working methodology to be developed (post-consent) at the detailed design stage. Should piling be needed, risks to marine mammals can be managed in a reasonably straightforward manner through the development and implementation of a Marine

[45] *'Biodiversity Species List for County Donegal (with priorities)'* (Donegal County Council, 2009).

Mammal Protocol (MMP), a standard scheme of mitigation developed in accordance with NPWS guidance,[46] where works are conducted under the supervision and direction of qualified and Marine Mammal Observers (MMOs). The MMOs are responsible for monitoring coastal waters and haul-out areas within the exclusion zone (typically 1 km but never less than 500 m) around the construction site for the presence of marine mammals, confirming when works may commence and then issuing stop or delay orders etc. as necessary. As it is more likely that piling will not be required, a detailed MMP has not been developed at this stage but can be provided, if necessary, once the details of construction methodology are confirmed.

2.128 The regime of strict protection established for cetaceans (EPS) is engaged, as are the protections afforded to seals. But it can be concluded that individual animals are very unlikely to be harmed or disturbed during construction works and that the development proposals meet the legislative requirements.

Badgers & Other Terrestrial Wildlife

2.129 The NBDC database holds records for Badger *Meles meles* at the 10km, 2km and townland scales; the interior of the site provides superficially good-optimal habitat and opportunities for transit, foraging and the establishment of setts.

2.130 A surprisingly low-diversity assemblage of other terrestrial wildlife, comprising Hedgehog Erinaceus europaeus, Irish hare *Lepus timidus hibernicus,* Fox *Vulpes vulpes* and Rabbit *Oryctolagus cuniculus*, have been recorded (NBDC) at ≤ 10km, with *L. timidus hibernicus* the only notable record for Dunree Head. A wide range of terrestrial invertebrates have been recorded at ≤ 2km but most of the records for protected and/or vulnerable species are dated (pre-1980, many late 19th or early 20th century).

Methodology

2.131 The site and adjoining (suitable, accessible) lands were surveyed for field evidence of Badger *Meles meles* presence and activity throughout several walkover surveys completed in June, July and August 2022. As the project proposals became more developed and better defined, further detailed surveys for field evidence (October 2022, April-August 2023) were targeted on the specific areas proposed for new development and appropriate buffers, with less effort expended on areas that will be largely unaffected by the project. The site was searched for setts and field evidence of badger presence/activity – trails, breach points, paw prints, guard hair, latrines, sign heaps, foraging scrapes & snuffle holes etc. Tracks and trails, where present, were followed to locate setts and evidence of territorial marking or dispute such as latrines. Searches for field evidence of other terrestrial notable wildlife were conducted in parallel but, as habitat loss is minimal, formal surveys for invertebrates were not undertaken.

Results

2.132 No badger setts and no conclusive field evidence of habitual or regular badger activity was found within the wider site at Dunree Head. Badgers are certainly present and active in the area – a cursory inspection of pasture fields to the south and east of the site confirmed trails and other corroborating field evidence, and badgers are likely to transit and forage parts of the site from time to time, but no evidence of any regular or habitual use of the site was found.

2.133 From observation and scat, Fox *Vulpes vulpes,* Hedgehog *Erinaceus europaeus* and Rabbit *Oryctolagus cuniculus* are present but no physical or field evidence of any other protected or notable terrestrial wildlife was found at or close to any area proposed for development. A reasonable density and

[46] *'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters'* (NPWS, 2014)

diversity of common terrestrial invertebrates (butterflies, moths, bumble bees, wasps, flies, spiders, beetles, shield bugs, ladybirds, hoverflies, midges etc.), characteristic of site, location, conditions and recent history, was noted but the site was not busy with invertebrate activity during the summer botanical surveys, or at night during the bat surveys, and no rare or notable species or populations were observed incidentally.

Appraisal

2.134 Badgers do seem to be present in the area generally and may be active around the terrestrial sections of Dunree Head from time to time but there are certainly no badger setts at or close to any area of the site that will be affected by development – this is unsurprising given the thin soils and the presence of bedrock close to the surface throughout – and as such, no setts will be lost to development and individual badgers are very unlikely to be harmed or disturbed during development works.

2.135 The legal and policy protections are engaged as individuals badgers may be active within the site from time to time but as no setts will be lost to development, no foraging resources or regularly-used commuting corridors will be lost or degraded, and as individual badgers are unlikely to be harmed or disturbed during works it is concluded that the development proposals meet the legislative and policy requirements.

2.136 It is recommended that the various terrestrial sites are re-surveyed for badgers and other terrestrial wildlife prior to the commencement of development works.

3. Ecological Impact Assessment (EcIA)

3.1 Impact assessment is based on the research and site surveys conducted to date, the development proposals presented at the time of submission and the site in current (August 2023) condition. The development proposals are assessed in terms of likely ecological impact and acceptability in the context of mitigation, where appropriate.

Introduction

3.2 The purpose of EcIA is to identify and classify the risk/probability of changes occurring to baseline ecological conditions, both adverse and beneficial, as a result of development proposals. This is achieved by assessing the likelihood of changes occurring, and their likely direction, magnitude and degree of permanence or reversibility, arriving ultimately at a robust and transparent assessment of the likely significant effects of the proposals, at appropriate geographical and temporal scales, with mitigation where necessary.

Methodology

3.3 EcIA follows the methodology set out by CIEEM.[47] The proposed development is assessed in terms of likely ecological impact (change with respect to baseline conditions) and acceptability (change with respect to standards and targets) in the context of ecological mitigation, where required.

Step 1 – Ecological Baseline

3.4 Detailed field surveys, site investigations and research are undertaken to establish the baseline condition of ecological resources within and ecologically/hydrologically connected to the site and surrounding area. This provides an accurate baseline for EcIA. Study areas vary according to the sensitivity of the receptor, the extent of influence of the project, and the requirements of prevailing legislation, guidance and best practice.

Step 2 – Ecological Evaluation

3.5 Levels of geographical value and importance (international, national, regional/county/vice-county, local/higher, local/lower) are established for each ecological receptor based on criteria set out in detail in the CIEEM Guidelines, the hierarchy outlined by the National Roads Authorities (NRA),[48] and professional judgment. Factors such as the level of legal protection, priority status or inclusion within a national or local biodiversity action plan are important factors in the overall consideration but do not automatically indicate any particular classification.

Step 3 – Characterisation of Likely Effects

3.6 Potential ecological effects are classified according to whether they are likely or unlikely to occur; whether they are likely to be positive or negative, direct or indirect, reversible or permanent; and, where relevant, whether an impact is likely to act in isolation only or also in an in-combination or cumulative context.

3.7 The magnitude of an ecological impact (negligible, low, medium, high, very high) relates to changes in the extent and integrity of a receptor and is determined on a quantitative basis, if possible. Impacts of higher magnitude will result in harmful effects to the conservation status of a receptor that are likely to threaten long-term integrity or survival; lower magnitude impacts may result in short-term harm

[47] '*Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine'* (Chartered Institute of Ecology and Environmental Management; September 2018).

[48] '*Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* (National Roads Authority; June 2009).

but generally do not threaten survival or integrity in the medium-long term, or may be of short duration and ultimately imperceptible. The extent of an impact is the area over which the effect is expected to occur; when assessing habitat changes, magnitude and extent are often synonymous. A permanent impact is one from which natural recovery is not possible within a reasonable timescale or for which there is no reasonable chance of successful intervention. Reversible or temporary effects are those for which recovery is expected either spontaneously or with intervention/mitigation – duration therefore applies only to reversible effects and refers to the period of time the effect is expected to last before recovery. Impacts are classified in the absence of mitigation.

Step 4 – Significance of Likely Effects

3.8 Table 3.1 shows how the various factors combine to establish overall levels of significance. In general terms, high magnitude effects will be of significance to all but locally important receptors, whereas low magnitude effects will only be of significance to nationally and internationally important receptors. Professional judgement is necessarily applied. Table 3.2 provides definitions of the various significance levels.

Table 3.1: Significance of Ecological Effects – Matrix

Magnitude	Geographical Value				
	local (lower)	local (higher)	regional / county	national	international
NEGLIGIBLE	*de minimis*	*de minimis*	minor	minor	minor
LOW	*de minimis*	minor	minor	moderate	moderate
MEDIUM	minor	minor	moderate	moderate	major
HIGH	minor	moderate	major	major	severe
VERY HIGH	moderate	moderate	major	severe	severe

Table 3.2: Significance of Ecological Effects – Definitions

Impact Assessment	Definition
Severe – negative/adverse	Fails to satisfy the environmental objective, results in severe, fundamental change in the environmental context at national and international levels of importance. Severe losses and/or alterations to baseline conditions resulting in fundamental, permanent changes. Highly significant. Warrants refusal of consent.
Major – negative/adverse	Fails to satisfy the environmental objective, results in major, fundamental change in the environmental context at national and international levels of importance. Major losses and/or alterations to baseline conditions resulting in significant changes. Highly significant. Warrants refusal of consent if not resolvable through careful design and/or mitigation.
Moderate – negative/adverse	Partly satisfies the environmental objective, fails to contribute to the environmental context at regional, national and international levels of importance. Loss or fundamental alterations of one or more features of baseline conditions, resulting in significant changes. Significant. May warrant refusal of consent if not resolvable through careful design and/or mitigation.
Minor – negative/adverse	Satisfies the environmental objective, fails to fully contribute to the environmental context at local, regional and national levels of importance. Minor shifts away from the baseline conditions but usually reversible and should not result in significant environmental change. May be significant in a cumulative context. Otherwise, not normally of concern providing standard impact minimisation and mitigation guidelines are followed.
de minimis	Satisfies the subject environmental objective, neither contributes to nor detracts from the

Impact Assessment	Definition
	environmental context. Remote probability that any changes will occur. Effects, if noticeable, will show a very slight change from the baseline ecological conditions. May be of concern to national and international levels of importance in a cumulative context. Otherwise, of no concern – difficult to distinguish from baseline conditions
Minor – positive/beneficial	Satisfies the subject environmental objective and partly contributes to the environmental context. Minor improvements to baseline conditions and should result in minor environmental gains which can easily be achieved through standard practices.
Moderate – positive/beneficial	Satisfies the subject environmental objective and contributes to the environmental context. Recognisable improvements to baseline conditions and will result in notable/significant improvements and environmental gains and require detailed design consideration. May be used to offset minor/moderate adverse impacts elsewhere.
Major – positive/beneficial	Satisfies the subject environmental objective and results in a major contribution to the environmental context. Quantifiable improvements to baseline conditions and will result in significant/substantial improvements and environmental gains at national and international levels of importance - benefits will result in the consolidation or expansion of areas of habitats or ensure the security or expansion of viable populations of species. Requires very detailed design consideration. May be used to offset moderate adverse impacts elsewhere.

Step 5 – Mitigation & Residual Effects

3.9 The residual ecological impacts of the project are assessed and determined by taking account of adverse impacts, expected beneficial effects, and mitigation. The mitigation hierarchy – *avoidance/elimination, protection, reduction/limitation, compensation, remediation, enhancement* – set out in Table 3.3, a familiar concept[49] in ecological and environmental assessment and management, is employed whereby adverse impacts on ecological receptors should first be *avoided* or *eliminated* from the project if possible, before looking at the *protection* of receptors or considering measures to *reduce* or *limit* significance or otherwise mitigate impacts that cannot be avoided, finally considering *compensation* or *remediation* for residual impacts and then any enhancement that can be achieved.

Table 3.3: Mitigation Hierarchy

	Definition
Avoidance	Where viable, the project is re-designed to avoid adverse ecological effects.
Elimination	Where possible and feasible, the project incorporates design features and measures which eliminate adverse ecological effects.
Protection	Where possible and feasible, the project incorporates design features and measures which protect ecological receptors from adverse effects.
Reduction/Limitation	Measures intended to reduce or limit the significance of adverse ecological effects are employed where options for avoidance, elimination and protection have been exhausted or are impractical.
Compensation	Where adverse ecological effects cannot be avoided, eliminated or reduced/limited in significance to an acceptable level, consideration is given to compensating for residual adverse effects.
Remediation	Where adverse ecological effects are unavoidable, consideration is given to remedial works.
Enhancement	Ecological improvement, enhancement and the realisation of ecological gains which can be achieved through standard techniques and practices.

3.10 In line with the scheme set out in Tables 3.1 & 3.2, the significance of expected residual (mitigated) ecological effects is associated with levels of acceptability where *de minimis* and minor adverse effects

[49] e.g. '*Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine'* (CIEEM, 2018) & '*BS 42020:2013 Biodiversity – Code of practice for planning and development'* (The British Standards Institution, 2013, London).

are not normally of concern, moderate adverse effects require careful consideration and major or severe effects are highly significant, usually warranting significant re-design.

Confidence & Uncertainty in EcIA

3.11 Uncertainty and levels of confidence are associated with the assessment of ecological impacts and mitigation. In general terms, tried-and-tested mitigation measures of known efficacy which attach higher probabilities of successful implementation are associated with higher levels of confidence and certainty than novel approaches to impact mitigation that may not work as intended. Confidence in predictions is necessarily based primarily on expert judgement but where confidence or uncertainty is expressed an objectively defined scale, as detailed in Table 3.4 (adapted from the CIEEM guidelines), is employed where possible:

Table 3.4: Confidence & Uncertainty in EcIA

Confidence Level	Definition
Certain	Probability estimated at 95% or higher.
Probable / Likely	Probability estimated at above 50% but below 95%.
Unlikely	Probability estimated at above 5% but below 50%.
Extremely Unlikely	Probability estimated at less than 5%.

3.12 The precautionary principle,[50] a central feature of environmental legislation, planning policy and professional guidance, provides a mechanism for managing uncertainty where scientific evidence is insufficient, inconclusive or uncertain – in such specific circumstances the protection of the environment is prioritised over the proposed project or activity.

Impact Assessment

EcIA (Step 1) – Ecological Baseline

3.13 The results of detailed field surveys, site investigations, research, and assessments are set out in the preceding sections, with analysis, and in the AA Screening Report.

EcIA (Step 2) – Ecological Evaluation

3.14 The ecological receptors and resources within and ecologically/hydrologically connected to the site are assigned value and importance in a geographical context (based on criteria set out in detail in the CIEEM Guidelines and professional judgment) as follows:

Table 3.5: Evaluation of Ecological Receptors

Receptor	Value	Rationale
North Inishowen Coast SAC	International	Designated Site – all internationally designated sites (SAC, SPA, Ramsar) and candidate/proposed sites are evaluated as being of international value and conservation importance – see AA Screening Report.
Horn Head to Fanad Head SPA	International	Designated Site – all internationally designated sites (SAC, SPA, Ramsar) and candidate/proposed sites are evaluated as being of international value and conservation importance – see AA Screening Report.
North Inishowen Coast pNHA	Regional	Designated Site – pNHA interest not covered by the higher SAC designation is evaluated as being of regional value and conservation importance.

[50] *'Communication from the Commission on the Precautionary Principle'* (European Commission, 2000)

Receptor	Value	Rationale
Lough Swilly	National	Natural Habitat – Lough Swilly is an extensive sea lough which retains a high level of naturalness and supports a wide range of coastal and marine wildlife, some of international and national conservation importance; its inner reaches are designated as SPA and SAC but local sections are undesignated. Evaluated at national value and conservation importance.
Heathland / Acid Grassland	Regional	Semi-Natural Habitat – discontinuous and degraded upland habitat that does not meet the criteria for classification as an Annex I type and is excluded from the SAC and pNHA designations. Provides a buffering function and has value beyond the site/local levels. Evaluated at regional value and importance.
Sea Cliffs	Regional	Semi-Natural Habitat – discontinuous and degraded coastal habitat that does not meet the criteria for classification as an Annex I type and is excluded from the SAC and pNHA designations. Provides a buffering function and has value beyond the site and local levels. Evaluated at regional value and importance.
Other Terrestrial Habitat	Local (site)	Semi-Natural Habitat – the remaining terrestrial habitat complex (scrub, bracken, overgrown horticultural, amenity grassland) supports no protected or priority flora, is heavily influenced by non-natives, and value is limited to the local (site) level; the impact of low/medium-impact invasives does not extend beyond the local (site) level.
Breeding Birds (terrestrial assemblage)	Regional	Protected Wildlife – all wild birds receive legal protection particularly during the nesting season. The terrestrial assemblage included 2 no. BoCCI red-listed and 7 no. BoCCI amber-listed species and is evaluated as being of local (higher) or regional value and conservation importance (classified at the higher level).
Wintering Birds (terrestrial assemblage)	Local (higher)	Protected Wildlife – all wild birds receive legal protection. The low-density and low-diversity assemblage of wintering *passerines* included just 1 no. BoCCI red-listed species (no amber-listed species) and is evaluated as being of local (higher) value and conservation importance.
Breeding Birds (seabird assemblage)	National	Protected Wildlife – all wild birds receive legal protection particularly during the nesting season. The seabird assemblage included 2 no. BoCCI red-listed & 9 no. BoCCI amber-listed species, two of which are in a group of three (*F. glacialis, R. tridactyla* & *C. grille*) confirmed to be nesting at the site. The assemblage included several SPA species and 2 no. Co. Donegal priority species and is evaluated as being of national value and conservation importance.
Wintering Birds (seabird assemblage)	National	Protected Wildlife – all wild birds receive legal protection. The wintering assemblage included 5 no. BoCCI red-listed & 6 no. BoCCI amber-listed species, 2 no. Co. Donegal priority species and several SPA species but not in significant numbers, or at any significant risk from the project. The wintering assemblage is evaluated as being of national value and conservation importance.
Soprano pipistrelle *Pipistrellus pygmaeus*	International	Protected Wildlife – commuting & foraging population – all bats are listed on Annex IV of the Habitats Directive as European Protected Species (EPS) and are of international value and conservation importance.
Common pipistrelle *Pipistrellus pipistrellus*	International	Protected Wildlife – commuting & foraging population – all bats are listed on Annex IV of the Habitats Directive as European Protected Species (EPS) and are of international value and conservation importance.
Leisler's bat *Nyctalus leisleri*	International	Protected Wildlife – commuting & foraging population – all bats are listed on Annex IV of the Habitats Directive as European Protected Species (EPS) and are of international value and conservation importance.
Marine Mammals	International	Protected Wildlife – individuals and populations of cetaceans and pinnipeds are regularly present in Lough Swilly – cetaceans are listed on Annex IV of the Habitats Directive as European Protected Species (EPS) and are of international value and conservation importance; pinnipeds are protected by the Wildlife Acts; *P. phocoena* & T. *truncates* are Co. Donegal priority species. Evaluated collectively at the higher, international, level.
Otter *Lutra lutra*	International	Protected Wildlife – likely occasional commuting (non-resident, non-territorial) population/individuals – otters are listed on Annex IV of the Habitats Directive as European Protected Species (EPS) and are of international value and conservation importance.
Other Terrestrial Wildlife	Local (higher)	Wild Fauna (native) – the remaining terrestrial faunal assemblage (including non-resident commuting/foraging badgers, foxes, hedgehogs etc. and invertebrates) has value beyond the site to the local (higher) level.

EcIA (Step 3) – Characterisation of Likely Effects

3.15 As the greater part of this extensive site will remain largely unaffected by new development, EcIA is considered in terms of each of the discrete project elements. Impacts on ecological receptors are identified and analysed on the basis of the detailed baseline information set out in Section 2, the evaluation set out above, and measures to protect the natural environment incorporated into the project proposals. Additional mitigation measures are identified where necessary, and additional recommendations provided, but these are not taken into account in the assessment at this stage.

High Fort / Redoubt

3.16 The redevelopment of the high fort[51] will result in the loss of a small amount of discontinuous and degraded heathland and acid grassland vegetation from within the redoubt walls, and the loss of narrow bands of gorse-dominated scrub from around the exterior perimeter and along the route of the connecting pathway. The derelict guard house buildings/structures at the northern corner are to be partially demolished and extensively refurbished [Figure 5a; Plates 3.1-3.4].

Plate 3.1: High Fort / Reboubt – discontinuous & degraded heathland/grassland will be lost from the interior [August 2023]

Plate 3.3: High Fort / Reboubt – gorse-dominated scrub and dense bracken will be lost from around the exterior [June 2022]

Plate 3.2: High Fort / Reboubt – discontinuous & degraded heathland/grassland will be lost from the interior [June 2022]

Plate 3.4: High Fort / Reboubt – discontinuous & degraded heathland/grassland will be lost from the interior [August 2023]

[51] Drawing No. 75006-03-ZZ-ZZZ-DR-TMA-AR-SL001 *High Fort – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-03-ZZ-ZZZ-DR-TMA-AR-PL001 *High Fort – Site Layout Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheet 4* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1006-01 & 7543-PHL-SW-XX-DR-L-1007-01 *Landscape Softworks – Sheets 6 & 7* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023).Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

3.17 The derelict buildings at the High Fort do not support roosting bats and, from the late-season monitoring at this location, and the current condition of the structures, and the level of exposure at this location, hibernation is very unlikely. At least 2 no. nesting pairs of Barn swallow *Hirundo rustica* were present in the derelict structures in both 2022 and 2023, and Swift *Apus apus* were observed foraging over the open heathlands in 2023 but nest locations were not confirmed. Several active *passerine* nests were noted in the dense scrub around the exterior (nesting Blackbird *Turdus merula*, Great tit *Parus major,* Pied wagtail *Motacilla alba*, Robin *Erithacus rubecula,* Song thrush *Turdus philomelos* & Wren *Troglodytes troglodytes* were confirmed in this area). Meadow pipit *Anthus pratensis* and Sky lark *Alauda arvensis* were observed in flight over heathlands to the north and east of the High Fort but no ground-nesting species were observed near-by. From scat, Fox *Vulpes vulpes* and Hedgehog *Erinaceus europaeus* are present in the area.

3.18 The losses of heathland, grassland and scrub to development are **direct, adverse** impacts which are **permanent,** of **low** magnitude, and **certain** to occur.

3.19 The destruction of active *hirundine* and other *passerine* nests with demolition/refurbishment and vegetation clearance are **direct, adverse** impacts which are **permanent,** of **high** magnitude and **likely** to occur. It is recommended that 2 no. *H. rustica* and 2 no. *A. apus* nesting boxes are installed at this location to compensate for lost nest sites and opportunities, and that demolition and vegetation clearance works are programmed and timed to avoid damaging active nests and disturbing nesting birds (across the site).

3.20 Landscaping and new planting at the High Fort is limited to new amenity grassland and wildflower planting along the flanks of the new pathways, two small areas of shrub/tree planting at the main path entrance, and to repair the ground required for the installation of the new treatment plant. It is strongly recommended that only native species of shrubs and trees are used for these areas.

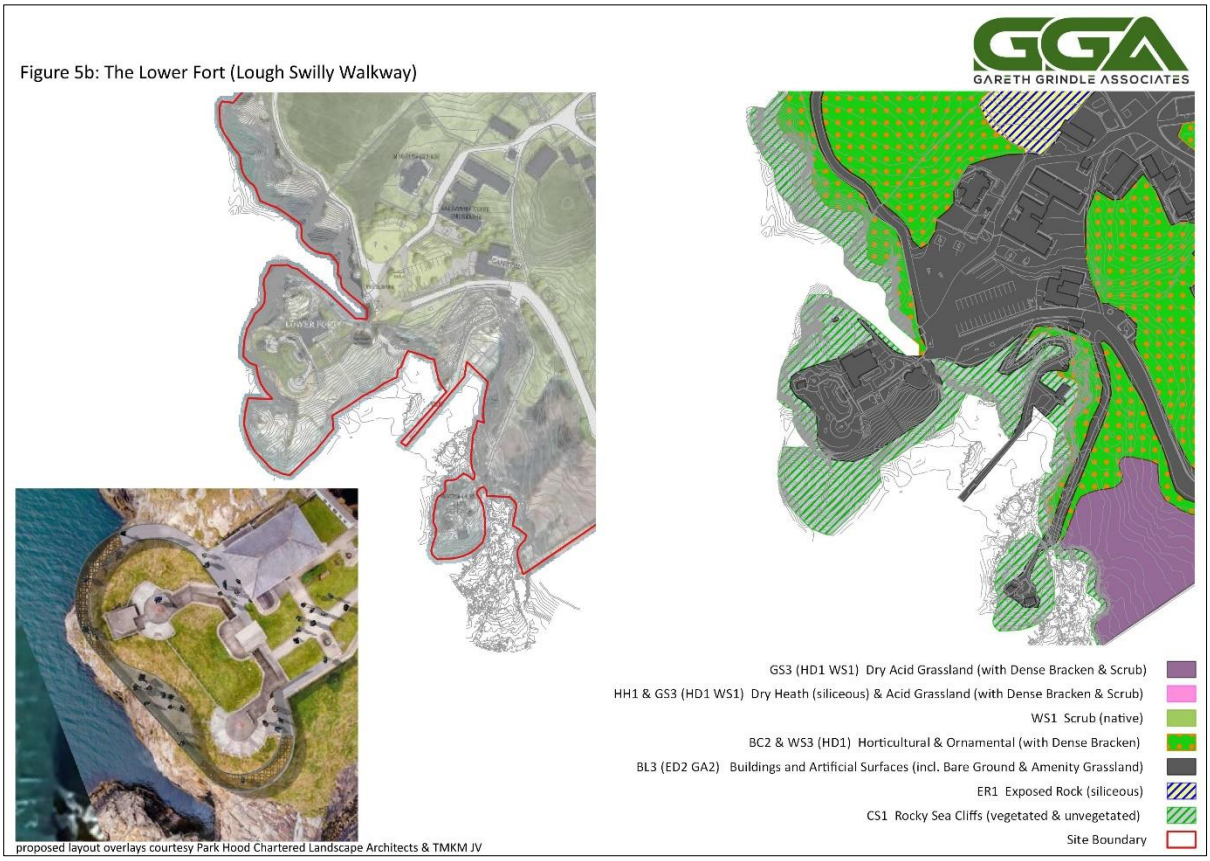
3.21 It is recommended that this site is re-surveyed for badgers and other terrestrial wildlife prior to the commencement of development works.

High Guns

3.22 The refurbishment proposals at the high guns[52] is very 'light-touch' and will result in only incidental losses of vegetation [Figure 5a]. No landscaping or new planting is proposed. The derelict structures do not support roosting or hibernating bats, no nesting birds were noted to be present, and there was no field evidence of any wild fauna. Noting that a generally cautious approach must be adopted to incidental vegetation clearance throughout the site, to avoid destroying, damaging or disturbing active nests, the proposed refurbishment of the high guns is expected to have **no adverse impact** on any ecological receptors. It is recommended that this site is re-surveyed for badgers and other terrestrial wildlife prior to the commencement of development works.

Lough Swilly Walkway (Lower Fort)

Figure 5b: The Lower Fort (Lough Swilly Walkway)



3.23 The development of the Lough Swilly Walkway[53] will result in the loss of a small area of cliff-top habitat (rough coastal grassland) and the partial overshading of the cliffs below the new walkway

[52] Drawing No. 75006- 03- ZZ- ZZZ- DR- TMA- AR- PL008 *High Guns* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheet 4* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

[53] *'Fort Dunree, Co. Donegal – Lower Fort – Lough Swilly Walkway – Planning'* (Design ID, August 2023). *'Fort Dunree, Co. Donegal – Lower Fort – Lough Swilly Walkway – Planning'* (Design ID, August 2023). Drawing No. 75006-31-ZZ-ZZZ-DR-TMA-AR-SL001 *Lower Fort – Lough Swilly Walkway – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-31-ZZ-ZZZ-DR-TMA-AR-PL001 *Lower Fort – Lough Swilly Walkway – Proposed Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

(which does not overhang the cliff edges or project beyond the high-water mark). The limited glass elements do not intrude into or interfere with any flightlines. All access is via the Lower Fort (the existing drawbridge is to be replaced to improve accessibility) [Figure 5b; Plates 3.5 & 3.6]. No new planting is proposed.

Plate 3.5: Lower Fort – Lough Swilly Walkway to be constructed on the seaward side of the fort [August 2023]

Plate 3.6: Lower Fort – Lough Swilly Walkway to be constructed on the seaward side of the fort [January 2023]

3.24 The loss of clifftop vegetation (rough coastal grassland) to development is a **direct, adverse** impact which is **permanent**, of **low** magnitude, and **certain** to occur.

3.25 Enabling and construction works will release loose material from the cliff tops and generate silts/sediments and other waste stream which may then enter and contaminate/pollute Lough Swilly. An outline construction methodology for the enabling and construction works is provided[54] – the detailed engineering design and construction/working methodology is to be developed (post-consent) at the detailed design stage. A Construction Environmental Management Plan (CEMP) will be required.

3.26 The pollution/contamination of Lough Swilly during enabling and construction works is a **direct, adverse** impact which is **temporary,** of **low** magnitude, and **likely** to occur.

3.27 The Lower Fort is constructed on a rocky promontory which is separated from the main headland by a narrow fissure (currently accessed by a narrow drawbridge) and, as such, is a reasonably secure location for nesting seabirds. Northern fulmar *Fulmarus glacialis* were confirmed to be present – birds were observed in low numbers on the sea cliffs to the north and east of the promontory during the nesting season (although many were likely to be younger, non-breeding birds), and loafing/roosting on the cliffs and the walls of the fort in winter. The walkway will not destroy any known nesting locations but nesting pairs could be subject to disturbances if enabling or construction works were to take place during the nesting season (works will be programmed and timed to avoid disturbing nesting birds across the site).

3.28 Disturbances to *F. glacialis* nests during enabling and construction works are **direct, adverse** impacts which are **permanent,** of **high** magnitude and **likely** to occur.

3.29 The construction and operation of the Lough Swilly Walkway is expected to have **no impact** on wintering seabirds, which were not present at this location in significant numbers.

3.30 The few pairs of *F. glacialis* that nest on the cliffs close to the Lower Fort seem to be well habituated to human proximity and activity and the viability of these cliffs as nesting a location is unlikely to

[54] *'Fort Dunree, Co. Donegal – Lower Fort – Lough Swilly Walkway – Planning'* (Design ID, August 2023).

change as visitor numbers increase over the years. However, it is possible that on-going and increased use of the Lough Swilly Walkway may displace nesting *F. glacialis* to other suitable opportunities around the coast.

3.31 Disturbances and/or displacement of nesting *F. glacialis* due to on-going and increased use of the walkway is an **indirect, adverse** impact which is **reversible** (with intervention), of **medium** magnitude and **unlikely** to occur.

3.32 It is recommended that this site is re-surveyed for otters prior to the commencement of work.

Lighthouse Walkway

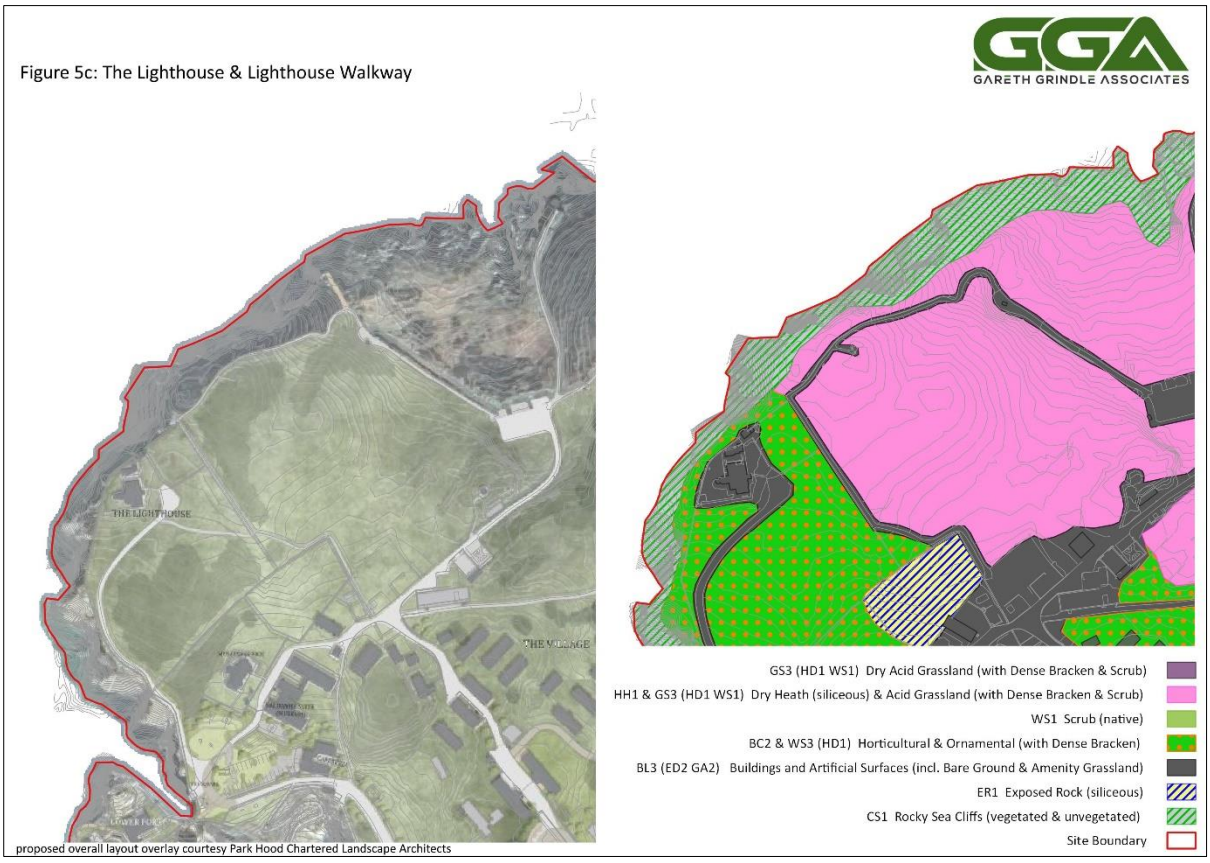


Plate 3.7: Lighthouse Walkway – to be constructed on the clifftop at a degraded location used informally as a viewpoint [August 2023]

Plate 3.8: Lighthouse Walkway – to be constructed on the clifftop at a degraded location used informally as a viewpoint [August 2023]

3.33 The location for the Lighthouse Walkway is well-chosen, on an existing clifftop walking path, close to a suitable location for a construction compound and vehicle/machinery access, and at a location on the clifftop that is already used informally as a viewpoint – clifftop habitat is already degraded and discontinuous [Figure 5c; Plates 3.7 & 3.8]. Development[55] will result in the loss of this small area of degraded cliff-top habitat (rough coastal heath) and the partial overshading of the cliffs below. The walkway does not project beyond the high-water mark and the cantilevered section does not intrude into or interfere with any flightline. No new planting is proposed.

3.34 The loss of clifftop vegetation (degraded coastal heathland) to development is a **direct, adverse** impact which is **permanent**, of **low** magnitude, and **certain** to occur.

3.35 Enabling and construction works will release loose material from the cliff tops and generate silts/sediments and other waste stream which may then enter and contaminate/pollute Lough Swilly. The detailed engineering design and construction/working methodology is to be developed (post-consent) at the detailed design stage (a CEMP will be required).

3.36 The pollution of Lough Swilly during enabling and construction works is a **direct, adverse** impact which is **temporary,** of **low** magnitude, and **likely** to occur.

3.37 Northern fulmar *Fulmarus glacialis,* Black-legged kittiwake *Rissa tridactyla* & Black guillemot *Cepphus grille*, were confirmed to be nesting in close proximity. *F. glacialis* were observed nesting on the sea cliffs close to the location proposed for the Lighthouse Walkway, in low numbers. *R. tridactyla* and *C. grille* were regularly observed in flight close to the sea cliffs to the north and east of the Lighthouse and, while not confirmed through observation, are very likely nesting in these areas. Rock pipit *Anthus petrosus* nest nearby. The walkway will not destroy any known nesting locations but nesting pairs could be subject to disturbances if enabling or construction works were to take place during the nesting season (works will be programmed and timed to avoid disturbing nesting birds across the site).

3.38 Disturbances to *F. glacialis, R. tridactyla* or *C. grille* nests during enabling and construction works are **direct, adverse** impacts which are **permanent,** of **high** magnitude and **likely** to occur.

3.39 The construction and operation of the Lighthouse Walkway is expected to have **no impact** on wintering seabirds, which were not present at this location in significant numbers.

3.40 The few pairs that nest on the cliffs close to the Lighthouse Walkway are unlikely to be habituated to human proximity and activity but these species do regularly nest in cliffside locations close to human activity which are otherwise secure. While unlikely, the viability of cliffs in the immediate vicinity of the walkway as nesting locations may change in the short-medium term as visitor numbers increase over the years, displacing nesting *F. glacialis, R. tridactyla* or *C. grille* to other suitable opportunities around the coast.

3.41 Disturbances and/or displacement of nesting *F. glacialis, R. tridactyla* or *C. grille* due to on-going and increased use of the walkway is an **indirect, adverse** impact which is **reversible** (with intervention), of **medium** magnitude and **unlikely** to occur.

3.42 It is recommended that this site is re-surveyed for otters prior to the commencement of work.

[55] Drawing No. 75006-AA-ZZ-ZZZ-DR-KXM-AR-PL001 *The Lighthouse Walkway – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-AA-ZZ-ZZZ-DR-KXM-AR-PL002 *The Lighthouse Walkway – Proposed Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

Lighthouse

3.43 The repairs and upgrades proposed at the lighthouse[56] represent minimum-intervention to preserve the facility for the future [Plates 3.9 & 3.10]. Other than a (possible) replacement roof, all works to the buildings are internal; some new soft landscaping is proposed within the curtilage of the lighthouse, currently an unkempt garden with a predominance of ornamental neophytes and including the low/medium impact invasives Montbretia *Crocosmia* × *crocosmiiflora* and New Zealand flax *Phormium tenax,* but no detail or planting proposals are shown on the draft landscaping drawings. No new surface drainage or infrastructure for foul disposal are proposed for the Lighthouse – it is likely that there is an existing septic tank which will be recommissioned to allow the occasional use of the toilet facilities, and it is likely that surface drainage is direct to Lough Swilly.

Plate 3.9: Lighthouse – current condition & presentation of the buildings and curtilage [July 2022]

Plate 3.10: Lighthouse – current condition & presentation of the buildings and curtilage [July 2022]

3.44 The lighthouse does not support roosting bats. The buildings are superficially suitable but the location is very exposed and the roofs have been treated with a sealing or waterproofing agent that is likely to have rendered the structure unsuitable. Very little bat activity was observed or recorded in the area. A couple of pairs of Barn swallow *Hirundo rustica* were observed foraging over the open gardens but the nest locations were not found, and a few active *passerine* nests were noted in bushes and trees (*T. merula*, *P. ater*, *C. carduelis*, *P. major*, *C. livia* & *E. rubecula* were confirmed from this area). There was no field evidence of any wild terrestrial mammals. Noting that a generally cautious approach will be adopted to demolition and incidental vegetation clearance throughout the site, to avoid destroying, damaging or disturbing active nests, and that a CEMP will be required to prevent incidental pollution of Lough Swilly, the refurbishment of the lighthouse is expected to have **no adverse impact** on ecological receptors.

3.45 For areas where extensive development and/or landscaping are proposed it is recommended that identified invasive plants (and other inappropriate neophytes) are removed during the works (noting that, due to the extent and distribution of *C. crocosmiiflora* and *R. rugosa,* it is unlikely that eradication can be achieved in this manner). It is recommended that firm proposals for landscaping and new planting are brought forward.

3.46 The removal of *P. tenax* (and other neophytes) and the control of *C. crocosmiiflora* in the curtilage of the lighthouse is a **direct, beneficial** impact which is **permanent** (with on-going management), of **medium** magnitude and **likely** to occur.

[56] Drawing No. 75006-36-ZZ-ZZZ-DR-TMA-AR-SL001 *Lighthouse – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-36-ZZ-ZZZ-DR-TMA-AR-PL001 *Lighthouse – Proposed Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

3.47 As the current arrangements for the Lighthouse are not known with any certainty it is recommended that existing arrangements are established and that firm operational proposals are brought forward.

3.48 It is recommended that 2 no. *H. rustica* nesting boxes are installed at this location.

3.49 It is recommended that this site is re-surveyed for otters and badgers prior to the commencement of construction/development work.

Car Park & Access Road

Figure 5d: The Car Park & Access Road

Plate 3.11: Car Park – the new location is previously developed but largely overgrown [June 2022]

Plate 3.12: Access Road – to be widened to accommodate the wheelchair-accessible mobility bus to the High Fort [June 2022]

3.50 Perhaps the most significant individual piece of construction work, the car park is to be relocated closer to the site entrance [Figure 5d; Plate 3.11]. A new access road (c. 160m) is to be constructed, to tie-in with the existing High Fort Access Road [Plate 3.12], which itself is to be widened (c. 400mm)

to accommodate the wheelchair-accessible mobility bus, along with patch repairs and upgrades as necessary and minor carriageway widening and vegetation clearance works at the site entrance to achieve sight lines etc.[57]

3.51 This is brownfield development – the new location for the car park and the new section of access road are predominantly hard-standing but largely overgrown with willow/gorse scrub, dense bracken/ruderals and ornamentals, including the low/medium impact invasives Montbretia *Crocosmia* × *crocosmiiflora,* Hebe *Hebe spp.* and New Zealand holly *Olearia macrodonta.* Some minor demolition (tarmacadam, old foundations etc.) and substantial vegetation clearance will be required, as will extensive earthworks and re-profiling. A new surface drainage network, landscaping, and new planting are proposed.

3.52 No buildings or other above-ground structures will be lost to the construction of the new car park – there is no potential for roosting bats or nesting *hirundines.* Several active *passerine* nests were noted in the overgrown vegetation bushes and trees (nesting Blackbird *Turdus merula*, Blue tit *Cyanistes caeruleus*, Pied wagtail *Motacilla alba*, Robin *Erithacus rubecula*, Willow warbler *Phylloscopus trochilus* & Wren *Troglodytes troglodytes* were confirmed in this area). Meadow pipit *Anthus pratensis* and Sky lark *Alauda arvensis,* ground-nesting species, were observed over grasslands and heathlands to the north and east of the access road but not close to the site; evidence of wild mammal activity was limited to fox scat on the access road.

3.53 The loss of overgrown willow/gorse scrub, dense bracken/ruderals and ornamentals to the development of the new car park area is a **direct, adverse** impact which is **permanent,** of **low** magnitude, and **certain** to occur.

3.54 The losses of narrow flanking strips of heathland/grassland and scrub/bracken to road widening are **direct, adverse** impacts which are **permanent,** of **low** magnitude, and **certain** to occur.

3.55 The destruction of active *passerine* nests with vegetation clearance are **direct, adverse** impacts which are **permanent,** of **high** magnitude and **likely** to occur. It is recommended that vegetation clearance works are programmed and timed to avoid damaging active nests and disturbing nesting birds.

3.56 Enabling works, earthworks and construction works will release silts/sediments and generate other waste stream which may be mobilised into the local receiving environment and/or enter and contaminate/pollute Lough Swilly. The detailed engineering design and construction/working methodology is to be developed (post-consent) at the detailed design stage (a CEMP will be required to prevent incidental pollution of the local receiving environment).

3.57 The pollution of the receiving environment and/or Lough Swilly during earthworks, reprofiling and construction is a **direct, adverse** impact which is **temporary,** of **low** magnitude, and **likely** to occur.

3.58 For areas where extensive development and/or landscaping are proposed it is recommended that identified invasive plants (and other inappropriate neophytes) are removed during the works (noting

[57] Drawing No. 75006-4-ZZ-ZZZ-DR-KXH-CE-PL001 *Car Park – Existing Site Plan* (KH Chartered Engineers, March 2023). Drawing No. 75006-4-ZZ-ZZZ-DR-KXH-CE-PL004 *Car Park – Proposed Site Plan 1* (KH Chartered Engineers, March 2023). Drawing No. 75006-4-ZZ-ZZZ-DR-KXH-CE-PL005 *Car Park – Proposed Site Plan 2* (KH Chartered Engineers, March 2023). Drawing No. 22130-DID-XX-XX-DR-C-5053-P03 *Drainage Layout Sheet 3* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1002-01, 7543-PHL-SW-XX-DR-L-1003-01, 7543-PHL-SW-XX-DR-L-1004-01 & 7543-PHL-SW-XX-DR-L-1005-01 *Landscape Softworks – Sheets 2, 3, 4 & 5* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-4-ZZ-ZZZ-DR-KXH-CE-PL002 *Proposed Access Road* (KH Chartered Engineers, March 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

that, due to the extent and distribution of *C. crocosmiiflora* and *R. rugosa,* it is unlikely that eradication can be achieved in this manner).

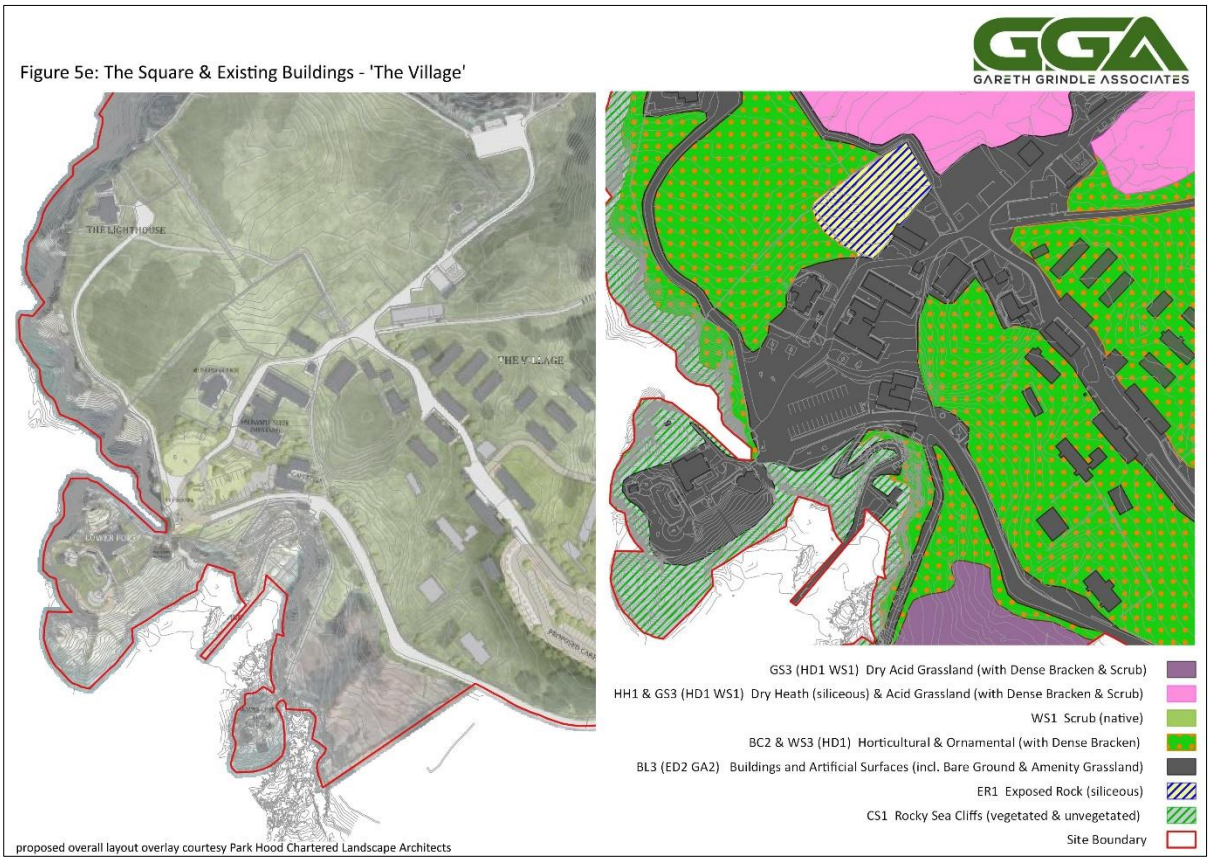
3.59 The removal of *Hebe spp.* and *O. macrodonta.* (and other neophytes) and the control of *C. crocosmiiflora* is a **direct, beneficial** impact which is **permanent** (with on-going management), of **medium** magnitude and **likely** to occur.

3.60 It is recommended that this site is re-surveyed for badgers prior to the commencement of construction/development work.

The Square

3.61 The area currently used as the car park is to be restored[58] and landscaped to a green area, with extensive soft landscaping and new planting [Figure 5e].

Figure 5e: The Square & Existing Buildings - 'The Village'



3.62 This is another individually significant construction project at a brownfield location which is currently all hard-standing; vegetation is limited to a hedge of the medium-impact invasive species Japanese rose *Rosa rugosa* to the front of the existing car park and a grassy area at the top of the cliffs to the front of the cafeteria with New Zealand flax *Phormium tenax,* scattered Montbretia *Crocosmia* ×

[58] Drawing No. 75006-28-ZZ-ZZZ-DR-KXM-AR-PL001 *The Square – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-28-ZZ-ZZZ-DR-KXM-AR-PL002 *The Square – Proposed Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 22130-DID-XX-XX-DR-C-5051-P03 *Drainage Layout Sheet 1* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1001-01 *Landscape Softworks – Sheet 1* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023).Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

crocosmiiflora, further *R. rugosa,* and other inappropriate neophytes such as Toetoe *Austroderia sp.*, Cabbage palm *Cordyline australis* & New Zealand holly *Olearia macrodonta.* Some minor demolition (tarmacadam, concrete surfaces, low walls etc.) and some vegetation clearance will be required, as will extensive earthworks and re-profiling (excess excavated and unused material from other aspects of development will be used as fill). A new surface drainage network and new landscaping and planting are proposed.

3.63 There are no buildings or other significant above-ground structures and no potential for roosting bats or nesting *hirundines.* No active *passerine* nests were noted in the sparse ornamental vegetation and there was no field evidence of any wild terrestrial mammals.

3.64 Earthworks, infilling, and reprofiling will release silts/sediments and generate other waste streams which may be mobilised into the local receiving environment and/or then enter and pollute/contaminate Lough Swilly. The detailed engineering design and construction/working methodology is to be developed (post-consent) at the detailed design stage (a CEMP will be required to prevent incidental pollution of the local receiving environment).

3.65 The pollution of the receiving environment and/or Lough Swilly during earthworks, reprofiling and construction is a **direct, adverse** impact which is **temporary,** of **low** magnitude, and **likely** to occur.

3.66 For areas where extensive development and/or landscaping are proposed it is recommended that identified invasive plants (and other inappropriate neophytes) are removed during the works (noting that, due to the extent and distribution of *C. crocosmiiflora* and *R. rugosa,* it is unlikely that eradication can be achieved in this manner).

3.67 The removal of *R. rugosa, P. tenax* (and other neophytes) and the control of *C. crocosmiiflora* is a **direct, beneficial** impact which is **permanent** (with management), of **medium** magnitude and **likely** to occur.

Existing Buildings – Billet Buildings

3.68 The restoration proposals[59] aim to protect the surviving corrugated-metal buildings, retaining as much of the existing fabric as possible.

Plate 3.13: Billet Buildings – the cluster of derelict billet buildings, viewed from above [August 2023]

Plate 3.14: Billet Buildings – typical view of the derelict billet buildings and surrounding vegetation & hard-standing [August 2023]

[59] Drawing No. 75006-07-ZZ-ZZZ-DR-KXM-AR-PL001 *Billet Buildings – Proposed Site Plan 1* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-07-ZZ-ZZZ-DR-KXM-AR-PL002 *Billet Buildings – Proposed Site Plan 2* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing Nos. 22130-DID-XX-XX-DR-C-5051-P03, 22130-DID-XX-XX-DR-C-5052-P03 & 22130-DID-XX-XX-DR-C-5053-P03 *Drainage Layout Sheets 1, 2 & 3* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

Plate 3.15: Billet Buildings – typical view of the derelict billet buildings and surrounding overgrown vegetation [August 2023]

Plate 3.16: Billet Buildings – typical view of the interior or the derelict billet buildings [July 2022]

3.69 The worst-affected buildings are to be restored, with many of the rest stabilised and preserved for potential future restoration [Figure 5e; Plates 3.13-3.16]. 4 no. are to be restored (Refs. 7.01, 7.05, 17.01 & 18.01); 9 no. are to be maintained to a suitable safety standard (Refs. 7.02, 7.03, 7.04, 7.06, 7.08, 7.09, 8, 10 & 19); 2 no. that have collapsed are to be removed (Refs. 7.07 & 24.02); the remainder (Refs. 3.16, 11, 12, 14 & 15) are not part of the project proposals.

3.70 The metal-clad billet buildings do not support roosting bats but several pairs of *hirundines* – both Barn swallow *Hirundo rustica* and Swift *Apus apus* – House sparrow *Passer domesticus* and Pigeon *Columba livia* were confirmed to be nesting in the various derelict structures in both 2022 and 2023, and several active *passerine* nests (Blackbird *Turdus merula*, Blue tit *Cyanistes caeruleus*, Chaffinch *Fringilla coelebs,* Great tit *Parus major,* Pied wagtail *Motacilla alba*, Robin *Erithacus rubecula*, Song thrush *Turdus philomelos* & Wren *Troglodytes troglodytes*) were confirmed from the surrounding scrub and bushes. The refurbishment proposals will result in only incidental losses of vegetation (very little local remediation of *C. crocosmiiflora* and other inappropriate neophytes can be achieved), and no significant new landscaping is proposed in the area.

3.71 The destruction/disturbance of active *passerine* nests with building refurbishment and vegetation clearance are **direct, adverse** impacts which are **permanent,** of **high** magnitude and **likely** to occur. It is recommended that works are programmed and timed to avoid damaging active nests and disturbing nesting birds.

3.72 No nesting boxes are proposed for this area as nesting opportunities for *hirundines* and specialist *passerines* will remain in the stabilised buildings and those that will be unaffected by the project. It is recommended that, where possible, access to the interiors of the billet buildings for *hirundines* is maintained post-development. It is recommended that works are programmed and timed to avoid damaging active nests and disturbing nesting birds (across the site).

3.73 It is recommended that this site is re-surveyed for badgers and other terrestrial wildlife prior to the commencement of development works.

Existing Buildings – Welcome Buildings & Cafeteria etc.

3.74 The redevelopment proposals include the restoration of at least 4 no. brick-built buildings for repurposing as Welcome Buildings (Refs. 5.01 & 6.01) to facilitate a ticket/pay station, souvenir shop, toilets, retail store, cleaning store & changing places facilities etc. [Figure 5e; Plates 3.17 & 3.18] and to extend and upgrade the existing Cafeteria (Ref. 29); the former gymnasium (Ref. 20) will be made structurally sound for continued use for storage by the Fort Dunree staff; a further building (Ref. 27.01) may also be refurbished for staff accommodation. Some new landscaping and additional

external hard-standing is proposed around the cafeteria.[60]

3.75 The brick-built buildings do not support roosting bats and no nesting *hirundines* or specialist *passerines* were noted in 2022 and 2023; as noted above, *passerine* nests (*T. merula*, *C. caeruleus*, *F. coelebs, P. major, M. alba*, *E. rubecula*, *T. philomelos, T. troglodytes*) were confirmed from the scrub and bushes around the clusters of derelict buildings. The refurbishment proposals will result in only incidental losses of vegetation (very little local remediation of *C. crocosmiiflora* and other inappropriate neophytes can be achieved), and no significant new landscaping is proposed in the area (local landscaping and planting is more accurately associated with the new car park).

Plate 3.17: Brick Buildings – 1 of 2 adjacent buildings to be restored and repurposed as Welcome Buildings [August 2023]

Plate 3.18: Brick Buildings – 1 of 2 adjacent buildings to be restored and repurposed as Welcome Buildings [August 2023]

3.76 The disturbance of active *passerine* nests with building refurbishment and vegetation clearance are **direct, adverse** impacts which are **permanent,** of **high** magnitude and **likely** to occur. It is recommended that works are programmed and timed to avoid damaging active nests and disturbing nesting birds. It is recommended that 2 no. *H. rustica* and 2 no. *A. apus* nesting boxes are installed on the refurbished buildings and that works are programmed and timed to avoid disturbing nests and nesting birds.

3.77 It is recommended that this site is re-surveyed for badgers and other terrestrial wildlife prior to the commencement of development works.

Existing Buildings – Blockhouses

3.78 Four of the numerous concrete blockhouses will be refurbished[61] in a very 'light-touch' manner that will result in only incidental losses of vegetation [Figure 5a; Plates 3.19 & 3.20].

[60] Drawing No. 75006-05-ZZ-ZZZ-DR-TMA-AR-SL001 *Welcome Buildings – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-05-ZZ-ZZZ-DR-TMA-AR-PL001 *Welcome Buildings – Proposed Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-29-ZZ-ZZZ-DR-TMA-AR-SL001 *Cafeteria – Existing Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 75006-29-ZZ-ZZZ-DR-TMA-AR-PL001 *Cafeteria – Proposed Site Plan* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing Nos. 22130-DID-XX-XX-DR-C-5051-P03, 22130-DID-XX-XX-DR-C-5052-P03 & 22130-DID-XX-XX-DR-C-5053-P03 *Drainage Layout Sheets 1, 2 & 3* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1001-01 & 7543-PHL-SW-XX-DR-L-1003-01 *Landscape Softworks – Sheets 1 & 3* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

[61] Drawing No. 75006-03-ZZ-ZZZ-DR-TMA-AR-PL008 *High Guns* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023). Drawing No. 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheet 4* (Design ID, July 2023). Drawing No. 7543-

3.79 The solid concrete structures do not support roosting or hibernating bats, no nesting birds were noted to be present, and there was no field evidence of any wild fauna. Noting that a generally cautious approach must be adopted to incidental vegetation clearance and the refurbishment of existing structures throughout the site, to avoid destroying, damaging or disturbing active nests, the proposed refurbishment of the high guns is expected to have **no adverse impact** on any ecological receptors.

Plate 3.19: Blockhouses – solid concrete structures with flat roofs [June 2022]

Plate 3.20: Blockhouses – solid concrete structures with flat roofs [June 2022]

Plate 3.21: Walkways & Trails – illustrating the typical condition of the current resource [June 2022]

Plate 3.22: Walkways & Trails – illustrating the typical condition of the current resource [August 2023]

Walkways/Trails & Accessibility

3.80 The existing network of walkways and trails is to be generally improved, upgraded and repaired throughout the site,[62] including some sections of new connecting pathways, including: a new pathway forming a looped walk from the lighthouse; a reinstated pathway to the High Fort (currently inaccessible to many due to topography); a new pathway connecting the Welcome Buildings to the

PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood ChartLandscape Architects, August 2023). Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

[62] Drawing No. 22130-DID-ZZ-XX-DR-C-5004-P02 *Walkways and Trails Area Plan – Existing* (Design ID, July 2023). Drawing No. 22130-DID-ZZ-XX-DR-C-5005-P05 *Walkways and Trails Area Plan – Proposed* (Design ID, July 2023). Drawing Nos. 22130-DID-XX-XX-DR-C-5051-P03, 22130-DID-XX-XX-DR-C-5052-P03, 22130-DID-XX-XX-DR-C-5053-P03 & 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheets 1-4* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1001-01, 7543-PHL-SW-XX-DR-L-1002-01, 7543-PHL-SW-XX-DR-L-1003-01, 7543-PHL-SW-XX-DR-L-1004-01, 7543-PHL-SW-XX-DR-L-1005-01, 7543-PHL-SW-XX-DR-L-1006-01 & 7543-PHL-SW-XX-DR-L-1007-01 *Landscape Softworks – Sheets 1-7* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023).Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

High Fort Access Road; new accessible routes to the Cafeteria, Lower Fort & Lough Swilly Walkway; an improved drop off zone outside the Saldanha Suite; a new path for visitors arriving on foot or by cycle; and general repairs and improvements to the existing pathways and steps, including the provision of handrails.

General Infrastructure – Drainage & Foul Disposal

3.81 The project includes new and upgraded infrastructure for surface drainage and foul disposal.[63]

3.82 SuDS surfacewater management and disposal seeks to emulate the natural drainage behaviour from this clifftop site by overland flows and discharge to Lough Swilly at pre-development rates and volumes. The existing underground gravity infrastructure and trenches will be refurbished and re-used where possible and outfalls will use the existing drains or follow the same route. A new attenuation system is proposed for the new car park, designed to cope with a 1–100–year rainfall event, with an appropriate uplift to account for climate change. Surface drainage is 'clean water' that is routinely discharged directly to coastal waters such as Lough Swilly, which already receives surface drainage from Fort Dunree and much of northern Co. Donegal. Discharges from the surface drainage systems to Lough Swilly will be controlled, and any existing sewers, drains or pipework that is superfluous and will not be incorporated into the new/refurbished infrastructure will be fully decommissioned to prevent the creation of preferential pathways. A couple of non-significant issues requiring clarification have been identified.

3.83 Surface drainage from the site is expected to have **no adverse impact** on Lough Swilly. The construction of the surface drainage system is largely accounted for within the construction of other elements considered above (primarily the new car park) and is expected to have **no additional adverse impacts** on ecological resources.

3.84 2 no. new package treatment plants will be installed to deal with foul effluents arising from the projected/expected increases in annual visitor numbers and ensure compliance with EPA and DCC emissions requirements. The new plants will be installed in the same locations as the existing infrastructure to minimise excavation and surface disturbance. As traditional drainage field soakaways are inappropriate, materials will be imported to form mono-grade raised sand polishing filters enclosed by impermeable panels – this meets EPA and DCC standards and in fact the quality of emissions to the local receiving environment may be somewhat improved by the new treatment plants despite increased capacity. Again, any existing sewers, drains or pipework that is superfluous and will not be incorporated into the new/refurbished infrastructure will be fully decommissioned to prevent the creation of preferential pathways. A couple of non-significant issues requiring clarification have been identified, including operational proposals for the Lighthouse.

3.85 Excavations and decommissioning of existing infrastructure will release silts/sediments and generate other waste streams which may be mobilised into the local receiving environment and/or then enter and pollute/contaminate Lough Swilly. The detailed engineering design and construction/working methodology is to be developed (post-consent) at the detailed design stage (a CEMP will be required to prevent incidental pollution of the local receiving environment).

[63] *'Fort Dunree, Co. Donegal – Drainage and Water Supply Report'* (Design ID, August 2023). Drawing Nos. 22130-DID-XX-XX-DR-C-5051-P03, 22130-DID-XX-XX-DR-C-5052-P03, 22130-DID-XX-XX-DR-C-5053-P03 & 22130-DID-XX-XX-DR-C-5054-P03 *Drainage Layout Sheets 1 – 4* (Design ID, July 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1000-01 *Landscape Masterplan* (Park Hood Chartered Landscape Architects, August 2023). Drawing Nos. 7543-PHL-SW-XX-DR-L-1002-01 & 7543-PHL-SW-XX-DR-L-1006-01 *Landscape Softworks – Sheets 2 & 6* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1008-01 *Landscape Softworks – Overview* (Park Hood Chartered Landscape Architects, August 2023). Drawing No. 7543-PHL-SW-XX-DR-L-1009-00 *Landscape Softworks – Planting Schedule* (Park Hood Chartered Landscape Architects, August 2023).Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

3.86 The pollution of the receiving environment and/or Lough Swilly during earthworks, reprofiling and construction is a **direct, adverse** impact which is **temporary,** of **low** magnitude, and **likely** to occur.

3.87 Losses of overlying heathland/grassland and scrub/bracken are **direct, adverse** impacts which are **temporary,** of **low** magnitude, and **certain** to occur. A generally cautious approach must be adopted to incidental vegetation clearance throughout the site, to avoid destroying, damaging or disturbing active nests.

3.88 The drainage layout drawings have notation labelled as *'existing foul water system to be re-purposed as a surface water system'* – it is recommended that this is clarified and a methodology for the safe disconnection, cleaning, and repurposing of any such sewers established.

3.89 It is recommended that existing arrangements for surface drainage and foul disposal at the Lighthouse are established and that firm operational proposals are brought forward.

3.90 As noted, it is strongly recommended that only native shrubs and trees are used for replanting at the high fort and that care is taken with species selection (per the recommendations provided) for new planting at the main treatment plant.

3.91 It is recommended that all sites where any excavation is required to install new infrastructure or repair existing infrastructure are re-surveyed for terrestrial fauna (otters, badgers as appropriate).

General Infrastructure – Lighting

3.92 New external lighting[64] is restricted to the lower part of the site and confined to the car park, the main access road, and the Village. New lighting follows responsible lighting practices and all installations are 'dark skies' approved – low-level illumination, less than 5lux, directed downwards to avoid spillage etc. The lighting will only be on when absolutely necessary and activated by motion sensors with an override for management control (lighting for the upper section of the car park will be on a separate circuit). The coastal and upland sections of the site will remain unilluminated and no important habitat or landscape features will be subject to any new illumination or indirect spillage - **no adverse impacts** on ecological receptors are expected.

General Infrastructure (anciliary)

3.93 The additional anciliary development, including mains water and electricity supplies, connections to services/utilities, toilet facilities, landscaping, fencing, signage & interpretation panels, general repairs to pathways and steps, provision of handrails, regrading of existing profiles, display of military artefacts etc. will be progressed in parallel with other aspects of the work and is expected to have **no adverse impact** on any ecological receptors.

EcIA (Step 4) – Significance of Likely Effects

3.94 The significance of the ecological impacts established [Table 3.6], per the criteria set out in Tables 3.1 & 3.2, without considering mitigation. In general terms, high magnitude effects are of significance to all but locally important receptors, whereas low magnitude effects are significance only to nationally and internationally important receptors; professional judgement is applied where necessary.

[64] *'Outdoor Lighting Report'* (Lighting Reality, July 2023).

Table 3.6: Significance of Likely Effects

Receptor	Value	Impacting Activity	Impact Classification	Significance
North Inishowen Coast SAC	International	none	n/a	**no adverse impact**
Horn Head to Fanad Head SPA	International	none	n/a	**no adverse impact**
North Inishowen Coast pNHA	Regional	none	n/a	**no adverse impact**
Lough Swilly	National	pollution/contamination (construction phase)	direct, adverse, low magnitude, temporary, likely to occur	**moderate adverse**
Heathland / Acid Grassland	Regional	minor distributed losses (construction phase)	direct, adverse, low magnitude, permanent, certain to occur	**minor adverse**
Sea Cliffs	Regional	minor losses of clifftop vegetation at walkways (construction phase)	direct, adverse, low magnitude, permanent, certain to occur	**minor adverse**
Other Terrestrial Habitat	Local (site)	minor distributed losses (construction phase)	direct, adverse, low magnitude, permanent, certain to occur	***de minimis***
		removal and/or control of invasives & neophytes (construction phase)	direct, beneficial, medium magnitude, permanent, likely to occur	**minor beneficial**
		ongoing control of invasives (operational phase)	direct, beneficial, medium magnitude, permanent, likely to occur	**minor beneficial**
Breeding Birds (terrestrial assemblage)	Regional	destruction or disturbance of *hirundine* & *passerine* nests (construction phase)	direct, adverse, high magnitude, permanent, likely to occur	**major adverse**
Wintering Birds (terrestrial assemblage)	Local (higher)	none	n/a	**no adverse impact**
Breeding Birds (seabird assemblage)	National	disturbances of seabird nests *(F. glacialis, R. tridactyla, C. grille*) (construction phase)	direct, adverse, high magnitude, permanent, likely to occur	**major adverse**
		displacement of nesting seabirds (*F. glacialis, R. tridactyla, C. grille*) (operational phase)	indirect, adverse, medium magnitude, reversible, unlikely to occur	**moderate adverse**
Wintering Birds (seabird assemblage)	National	none	n/a	**no adverse impact**
Soprano pipistrelle *Pipistrellus pygmaeus*	International	none	n/a	**no adverse impact**
Common pipistrelle *Pipistrellus pipistrellus*	International	none	n/a	**no adverse impact**
Leisler's bat *Nyctalus leisleri*	International	none	n/a	**no adverse impact**
Marine Mammals	International	none	n/a	**no adverse impact**
Otter *Lutra lutra*	International	none	n/a	**no adverse impact**
Other Terrestrial Wildlife	Local (higher)	none	n/a	**no adverse impact**

EcIA (Step 5) – Mitigation & Residual Effects

3.95 This section sets out the overall impact assessment, to CIEEM criteria. The likely significant impacts on ecological receptors identified above are re-analysed in the context of mitigation and recommendations to provide the overall characterisation and assessment of the residual impacts of the project [Table 3.7], per the characterisation and significance criteria; professional judgement is applied where necessary.

Designated Sites

3.96 No mitigation is necessary or proposed.

Lough Swilly and the Local Receiving Environment

3.97 The protection of the local receiving environment during the construction phase should be reasonably straightforward and can be achieved with standard measures for the orderly management and operation of a construction site and strict adherence to environmental best practice and all relevant pollution prevention guidance. In this case, due to the sensitivity of the site and the proximity of Lough Swilly, a Construction Environmental Management Plan (CEMP) will be required (*'construction'* is considered to include all site preparation and enabling works, all demolitions and vegetation clearances, all construction activities and engineering works, all plant and materials delivery and storage, all vehicle and plant maintenance, and all construction waste management etc.).

3.98 For all sub-projects the detailed engineering design and construction/working methodology will be developed (post-consent) at the detailed design stage. The CEMP will be developed in parallel and will identify all requirements for construction-phase environmental management and pollution control including the roles and responsibilities of relevant site personnel and all requirements for monitoring/inspection and reporting. The CEMP will set out the overall phasing and timing of the works; the construction methods, plant and equipment that will be used; and the measures that will be put in place to ensure the protection of the receiving environment. The main contractor, once appointed, will be responsible for detailing, maintaining, and updating the overall CEMP, and will be required to develop specific method statements for the various sub-projects. The locations of construction compounds have been identified.[65]

Habitats & Flora

3.99 Other than the recommendations provided following the review of the planting proposals, no mitigation is necessary or proposed.

Breeding Birds – Terrestrial Assemblage

3.100 All demolition and vegetation clearance works across the site are programmed and timed to avoid damaging active nests and disturbing nesting birds. Incidental vegetation removal can be progressed during the nesting season if under the supervision of the project ecologist who has confirmed that the vegetation is free from active nests.

3.101 Several *hirundine* nesting boxes are proposed to compensate for nesting sites and opportunities lost to development – 2 no. *H. rustica* & 2 no. *A. apus* nesting boxes at the High Fort, 2 no. *H. rustica* nesting boxes at the Lighthouse, and 2 no. *H. rustica* & 2 no. *A. apus* nesting boxes at the refurbished Welcome Buildings. The specific locations, heights and orientations etc. can be confirmed at the detailed design stage. No nesting boxes are proposed for *passerines* more generally as habitat loss is minimal and no

[65] Drawing No. 75006-ZZZ-ZZ-ZZZ-DR-KXM-AR-PL501 *Construction Phasing & Compounds* (Keys and Monaghan Architects & Taylor McCartney Architects, August 2023).

hirundine nesting boxes are proposed for the Billet Buildings as opportunities will remain post-development – it is recommended that access to the interiors for *hirundines* is maintained post-development.

Breeding Birds – Seabird Assemblage

3.102 Construction works at the two walkway sites are to be programmed and timed to avoid disturbing nesting seabirds.

3.103 No mitigation is proposed for the potential displacement of nesting seabirds (*F. glacialis, R. tridactyla, C. grille*) away from the sea cliffs close to the Lough Swilly Walkway and Lighthouse Walkway as a result of increased proximity to human activity, as this is considered unlikely to occur. Many seabirds successfully nest close to human activity in cliffside locations which are otherwise secure and, should nest sites be abandoned during and immediately following construction works, reoccupation is likely as birds become habituated to the walkways. As such, long-term abandonment and displacement is considered very unlikely. It is recommended that nesting activity in the vicinity of the new walkways is monitored during the initial years with a view to implementing remedial measures (information boards, temporary screens, or partial closures etc.) if necessary.

Wintering Birds – Terrestrial & Seabird Assemblages

3.104 No mitigation is necessary or proposed.

Bats

3.105 No mitigation is necessary or proposed. No artificial roosting boxes will be provided as current roosting opportunities at the site are not exploited and post-development opportunities will be sufficient given the local carrying capacity.

Marine Mammals

3.106 No mitigation is necessary or proposed at this stage. If, following detailed design, it is apparent that piling is required, risks to marine mammals can be managed in a reasonably straightforward manner through the development and implementation of a Marine Mammal Protocol (MMP).

Otters

3.107 No mitigation is necessary or proposed. It is recommended that coastal construction sites are re-surveyed for otters prior to the commencement of development works.

Badgers and Other Terrestrial Fauna

3.108 No mitigation is necessary or proposed. It is recommended that terrestrial construction sites are re-surveyed for badgers and other wild mammals prior to the commencement of development works.

Summary of Recommendations

3.109 The following recommendations are made:

i. it is recommended that the final planting proposals reconsidered at the detailed design stage in line with the recommendations provided (paras. 2.27-2.36).

ii. it is strongly recommended that only native shrubs and trees are used for the areas of new planting proposed at the High Fort – both the main path entrance and the area around the new treatment plant – and that plants of local progeny are sourced.

iii. it is recommended that the various construction sites are re-surveyed for terrestrial mammals (otters, badgers etc. as appropriate) prior to the commencement of development works.

iv. it is recommended that, where possible, access to the interiors of the billet buildings for *hirundines* is maintained post-development.

v. it is recommended that seabird nesting activity in the vicinity of the new walkways is monitored during the initial years of use.

vi. it is recommended that the notation on the drainage layout *'existing foul water system to be re-purposed as a surface water system'* is clarified and a methodology for the safe disconnection, cleaning, and repurposing of any such sewers is established.

vii. it is recommended that existing arrangements for surface drainage and foul disposal at the Lighthouse are established and that firm operational proposals are brought forward.

viii. it is recommended that the site-wide eradication of *C. crocosmiiflora, R. rugosa* and other inappropriate neophytes is continued post-development as part of the ongoing management of the site.

Table 3.7: Significance of Residual Effects

Receptor	Impact (no mitigation)	Mitigation	Residual Impact
North Inishowen Coast SAC	no adverse impact	no mitigation necessary	**no residual impact**
Horn Head to Fanad Head SPA	no adverse impact	no mitigation necessary	**no residual impact**
North Inishowen Coast pNHA	no adverse impact	no mitigation necessary	**no residual impact**
Lough Swilly	moderate adverse (construction phase)	CEMP	***de minimis***
Heathland / Acid Grassland	minor adverse (construction phase)	no mitigation proposed	**minor adverse**
Sea Cliffs	minor adverse (construction phase)	no mitigation proposed	**minor adverse**
Other Terrestrial Habitat	*de minimis* (construction phase)	no mitigation proposed	***de minimis***
	minor beneficial (construction phase)	n/a	**minor beneficial**
	minor beneficial (operational phase)	n/a	**minor beneficial**
Breeding Birds (terrestrial assemblage)	major adverse (construction phase)	timing of certain works to avoid destroying or disturbing active nests provision of *hirundine* nesting boxes	**no residual impact**
Wintering Birds (terrestrial assemblage)	no adverse impact	no mitigation necessary	**no residual impact**
Breeding Birds (seabird assemblage)	major adverse (construction phase)	timing of certain works to avoid disturbing active nests	**no residual impact**
	moderate adverse (operational phase)	no mitigation proposed monitoring during operational phase	**moderate adverse (but unlikely)**
Wintering Birds (seabird assemblage)	no adverse impact	no mitigation necessary	**no residual impact**
Soprano pipistrelle *Pipistrellus pygmaeus*	no adverse impact	no mitigation necessary	**no residual impact**
Common pipistrelle *Pipistrellus pipistrellus*	no adverse impact	no mitigation necessary	**no residual impact**
Leisler's bat *Nyctalus leisleri*	no adverse impact	no mitigation necessary	**no residual impact**

Receptor	Impact (no mitigation)	Mitigation	Residual Impact
Marine Mammals	no adverse impact	MMP if necessary	**no residual impact**
Otter *Lutra lutra*	no adverse impact	resurvey of sites prior to commencement (where necessary)	**no residual impact**
Other Terrestrial Wildlife	no adverse impact	resurvey of sites prior to commencement (where necessary)	**no residual impact**

Conclusions

3.110 Ecological Impact Assessment (EcIA) has demonstrated that the project is associated with:

- minor adverse impacts on heathland, acid grassland and sea cliff vegetation habitats due to minor, distributed losses to development construction-phase; losses are certain to occur but are not significant.
- minor beneficial effects due to the remediation and control of invasive flora and other inappropriate neophytes both during the construction phase and as part of the on-going management of the site; benefits are likely to occur and are significant at the site level.

3.111 The only aspect of the project that is of any significant concern is the potential displacement of nesting seabirds from the cliffs close to the Lough Swilly Walkway and the Lighthouse Walkway as a result of increased proximity to human activity; this would be considered a moderate adverse impact but is unlikely to occur.

Annex A: Bat Surveys – Detailed Results – *Kaleidoscope Pro* Analysis & Surveyor Notes

Table A1: Crepuscular Survey Results – 12th July 2022 (dusk, sunset 2203) – *Dodotronic* Analysis with Surveyor Notes (OP-A)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:22:36	PIPPIP	7	1.00	PIPPYG	2.66	57.41	49.86	PIPPIP	*P. pipistrellus*	commuting along the internal road corridor.
22:25:06	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:36:12	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:36:57	PIPPIP	2	1.00		3.07	50.69	46.86	PIPPIP	*P. pipistrellus*	brief echolocation detected; bat not observed.
22:37:57	NoID	4	0.00		3.40	51.97	47.31	PIPPIP	*P. pipistrellus*	observed briefly to the east of the OP.
22:41:57	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.

Table A2: Crepuscular Survey Results – 13th July 2022 (dusk, sunset 2202) – *Dodotronic* Analysis with Surveyor Notes (OP-B)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:23:51	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:35:36	PIPPIP	3	0.67		2.81	48.03	46.24	PIPPIP	*P. pipistrellus*	faint echolocation detected on site; bat not observed.
22:37:36	PIPPIP	8	1.00	PIPPYG	4.34	52.54	48.44	PIPPIP	*P. pipistrellus*	commuting along the internal road corridor.
22:41:21	NoID	4	0.00		3.00	25.21	24.97	NYCLEI	*N. leisleri*	echolocation detected on site; bat not observed (overhead).
22:56:51	NYCLEI	2	1.00		3.44	30.13	29.68	NYCLEI	*N. leisleri*	echolocation detected on site; bat not observed (overhead).
22:58:36	PIPPIP	13	0.85	MYODAU	3.27	51.52	46.37	PIPPIP	*P. pipistrellus*	commuting along the internal road corridor.

Table A3: Crepuscular Survey Results – 18th July 2022 (dusk, sunset 2156) – *Dodotronic* Analysis with Surveyor Notes (OP-C)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:22:28	PIPPIP	13	1.00		4.52	54.89	46.89	PIPPIP	*P. pipistrellus*	1 no. bat foraging over the open heathland to the north & east of the OP.
22:22:43	PIPPIP	66	0.97		4.46	60.41	47.42	PIPPIP	*P. pipistrellus*	
22:22:58	PIPPIP	31	1.00	MYODAU	3.53	55.92	46.96	PIPPIP	*P. pipistrellus*	
22:23:13	PIPPIP	42	1.00		4.74	63.50	47.54	PIPPIP	*P. pipistrellus*	
22:23:43	PIPPIP	14	1.00		2.83	56.24	47.78	PIPPIP	*P. pipistrellus*	
22:23:58	PIPPIP	4	1.00		2.88	52.16	46.93	PIPPIP	*P. pipistrellus*	
22:24:28	PIPPIP	19	1.00		3.46	55.21	46.94	PIPPIP	*P. pipistrellus*	

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:24:43	PIPPIP	22	1.00	MYODAU	3.46	52.63	46.56	PIPPIP	*P. pipistrellus*	
22:25:13	PIPPIP	11	0.91		2.64	51.35	46.46	PIPPIP	*P. pipistrellus*	
22:25:28	PIPPIP	17	1.00	MYODAU	2.76	51.54	46.38	PIPPIP	*P. pipistrellus*	
22:27:13	PIPPIP	37	0.97		2.97	59.46	48.38	PIPPIP	*P. pipistrellus*	1 no. bat foraging over the open heathland to the north & east of the OP.
22:27:58	PIPPIP	11	1.00		2.55	53.97	47.59	PIPPIP	*P. pipistrellus*	
22:28:13	PIPPIP	2	1.00		2.46	52.57	46.98	PIPPIP	*P. pipistrellus*	
22:28:28	PIPPIP	7	1.00	MYODAU	2.42	51.90	47.19	PIPPIP	*P. pipistrellus*	
22:28:43	PIPPIP	48	1.00	MYODAU	3.00	60.29	47.95	PIPPIP	*P. pipistrellus*	
22:29:28	PIPPIP	3	1.00		2.50	56.80	48.34	PIPPIP	*P. pipistrellus*	
22:31:43	NoID	2	0.00		2.24	51.81	46.56	PIPPIP	*P. pipistrellus*	1 no. bat foraging over the open heathland to the north & east of the OP.
22:32:13	PIPPIP	7	1.00		3.06	53.35	47.14	PIPPIP	*P. pipistrellus*	
22:32:43	PIPPIP	30	1.00		3.21	70.28	49.84	PIPPIP	*P. pipistrellus*	
22:33:13	PIPPIP	12	1.00	MYODAU	2.73	52.44	46.65	PIPPIP	*P. pipistrellus*	
22:33:28	PIPPIP	6	0.67	MYODAU	2.72	53.25	47.03	PIPPIP	*P. pipistrellus*	
22:38:17	PIPPIP	20	0.65		3.50	47.14	42.24	PIPPIP	*P. pipistrellus*	1 no. bat foraging over the open heathland to the north & east of the OP.
22:38:46	PIPPIP	14	1.00		3.27	53.86	46.65	PIPPIP	*P. pipistrellus*	
22:39:16	PIPPIP	13	0.92	MYODAU	2.84	52.43	46.69	PIPPIP	*P. pipistrellus*	
22:39:31	NoID	5	0.00		2.63	52.32	46.64	PIPPIP	*P. pipistrellus*	
22:41:16	PIPPIP	36	1.00		4.97	54.43	45.66	PIPPIP	*P. pipistrellus*	1 no. bat commuting south along the internal road corridor through the cluster of buildings.
22:42:16	PIPPIP	10	1.00		2.84	51.14	46.34	PIPPIP	*P. pipistrellus*	
22:50:31	NYCLEI	2	1.00		4.40	23.34	22.68	NYCLEI	*N. leisleri*	echolocation detected on site; bat not observed (overhead).

Table A4: Crepuscular Survey Results – 19th July 2022 (dusk, sunset 2155) – *Dodotronic* Analysis with Surveyor Notes (OP-D)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:45:52	NYCLEI	4	1.00		8.84	25.35	24.68	NYCLEI	*N. leisleri*	echolocation detected on site; bat not observed (overhead).
22:57:35	NYCLEI	22	1.00		6.81	24.13	23.30	NYCLEI	*N. leisleri*	1 no. bat to the rear of the OP; not observed.

Table A5: Crepuscular Survey Results – 29th July 2022 (dusk, sunset 2138) – *Dodotronic* Analysis with Surveyor Notes (OP-E)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:16:11	PIPPIP	4	1.00		2.72	52.90	46.63	PIPPIP	*P. pipistrellus*	1 no. bat foraging over scrub and grassland to the east and north of the OP.
22:16:41	PIPPIP	5	1.00		2.85	52.45	46.36	PIPPIP	*P. pipistrellus*	
22:16:56	PIPPIP	10	1.00	MYODAU	2.54	53.97	47.63	PIPPIP	*P. pipistrellus*	
22:16:56	PIPPIP	11	1.00		2.73	52.34	46.48	PIPPIP	*P. pipistrellus*	
22:17:11	NoID	2	0.00		2.62	53.74	47.29	PIPPIP	*P. pipistrellus*	
22:17:26	PIPPIP	7	1.00	MYODAU	2.71	53.38	47.03	PIPPIP	*P. pipistrellus*	
22:18:26	PIPPIP	47	0.96	MYODAU	2.87	60.53	48.31	PIPPIP	*P. pipistrellus*	
22:18:56	PIPPIP	14	1.00		3.14	54.99	47.50	PIPPIP	*P. pipistrellus*	
22:19:56	PIPPIP	16	1.00	MYODAU	3.17	52.24	46.69	PIPPIP	*P. pipistrellus*	commuting north along the internal road corridor.
22:20:41	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:22:44	PIPPIP	16	0.94		2.94	50.12	45.84	PIPPIP	*P. pipistrellus*	1 no. bat foraging over scrub and grassland to the east and south of the OP.
22:22:59	PIPPIP	25	1.00		3.00	57.51	47.51	PIPPIP	*P. pipistrellus*	
22:23:14	PIPPIP	17	0.94		3.11	51.78	45.89	PIPPIP	*P. pipistrellus*	
22:23:29	PIPPIP	15	0.93		3.33	51.11	45.83	PIPPIP	*P. pipistrellus*	
22:23:59	PIPPIP	2	0.50		2.10	54.81	47.53	PIPPIP	*P. pipistrellus*	
22:24:14	PIPPIP	10	1.00		3.47	55.87	46.33	PIPPIP	*P. pipistrellus*	
22:24:29	PIPPIP	13	0.85		2.86	48.99	44.33	PIPPIP	*P. pipistrellus*	
22:24:44	PIPPIP	5	1.00		2.92	52.60	46.68	PIPPIP	*P. pipistrellus*	
22:24:59	PIPPIP	13	0.92		3.05	51.60	46.11	PIPPIP	*P. pipistrellus*	
22:27:59	PIPPIP	20	0.95		2.86	51.34	46.29	PIPPIP	*P. pipistrellus*	commuting north along the internal road corridor.
22:28:29	PIPPIP	23	1.00		3.52	56.84	47.24	PIPPIP	*P. pipistrellus*	commuting south along the internal road corridor.
22:29:29	PIPPIP	93	0.94		5.10	57.23	45.38	PIPPIP	*P. pipistrellus*	1 no. bat foraging over scrub and grassland to the east and north of the OP.
22:29:44	PIPPIP	41	0.98	MYODAU	3.95	61.12	47.62	PIPPIP	*P. pipistrellus*	
22:43:29	PIPPIP	15	0.80	PIPPYG	3.22	52.80	49.75	PIPPIP	*P. pipistrellus*	commuting north along the internal road corridor.

Table A6: Crepuscular Survey Results – 11th August 2022 (dusk, sunset 2112) – *Dodotronic* Analysis with Surveyor Notes (transect)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
21:59:27	PIPPIP	2	1.00		2.84	48.21	46.79	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
21:59:42	PIPPIP	80	1.00		6.05	49.84	45.45	PIPPIP	*P. pipistrellus*	
22:06:12	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:06:27	PIPPIP	11	1.00	MYODAU	2.74	54.31	47.73	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:11:27	PIPPIP	3	0.67	PIPPYG	4.54	50.03	48.87	PIPPIP	*P. pipistrellus*	2 or 3 no. bats (at least one of each species) – sustained foraging over open heathland.
22:11:57	PIPPIP	5	1.00	MYODAU	2.64	53.52	47.52	PIPPIP	*P. pipistrellus*	
22:12:12	PIPPIP	8	1.00	MYODAU	2.62	54.64	47.68	PIPPIP	*P. pipistrellus*	
22:12:27	PIPPIP	22	1.00		3.79	47.51	46.04	PIPPIP	*P. pipistrellus*	
22:12:42	PIPPIP	4	1.00		4.15	45.98	45.52	PIPPIP	*P. pipistrellus*	
22:12:57	PIPPYG	21	1.00		4.88	53.12	51.99	PIPPYG	*P. pygmaeus*	
22:13:11	PIPPYG	7	1.00	PIPPIP	3.46	60.81	54.75	PIPPYG	*P. pygmaeus*	
22:13:26	PIPPYG	34	0.62	PIPPIP	4.71	54.20	50.63	PIPPYG	*P. pygmaeus*	
22:13:41	PIPPIP	8	1.00		2.61	51.70	46.84	PIPPIP	*P. pipistrellus*	
22:13:56	PIPPIP	16	1.00	MYODAU	2.71	54.54	47.30	PIPPIP	*P. pipistrellus*	
22:14:11	Noise							PIPPIP	*P. pipistrellus*	
22:14:26	PIPPYG	25	1.00		4.42	53.38	52.19	PIPPYG	*P. pygmaeus*	
22:14:41	PIPPYG	10	0.90	PIPPIP	5.98	55.42	51.15	PIPPYG	*P. pygmaeus*	
22:14:56	Noise							PIPPIP	*P. pipistrellus*	
22:15:11	PIPPIP	8	0.88		3.82	44.76	42.79	PIPPIP	*P. pipistrellus*	
22:15:56	PIPPIP	8	1.00	MYODAU	2.70	54.15	47.41	PIPPIP	*P. pipistrellus*	
22:16:41	PIPPIP	2	1.00		4.29	50.48	48.00	PIPPIP	*P. pipistrellus*	
22:16:56	PIPPIP	50	1.00		5.62	52.85	47.76	PIPPIP	*P. pipistrellus*	
22:17:11	Noise							PIPPIP	*P. pipistrellus*	bat(s) not detected or observed on site.
22:19:11	Noise							PIPPIP	*P. pipistrellus*	
22:19:26	Noise							PIPPIP	*P. pipistrellus*	

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:20:41	PIPPYG	36	0.58	PIPPIP	5.75	53.32	50.06	PIPPYG	*P. pygmaeus*	
22:23:11	Noise							PIPPIP	*P. pipistrellus*	
22:23:26	Noise							PIPPIP	*P. pipistrellus*	
22:23:41	Noise							PIPPIP	*P. pipistrellus*	
22:23:56	Noise							PIPPIP	*P. pipistrellus*	
22:24:26	PIPPYG	19	0.95	PIPPIP	4.59	53.01	51.10	PIPPYG	*P. pygmaeus*	2 or 3 no. bats (at least one of each species) – sustained foraging over open heathland.
22:24:41	PIPPYG	24	1.00	PIPPIP	4.66	52.35	50.85	PIPPYG	*P. pygmaeus*	
22:24:56	PIPPYG	7	0.71	PIPPIP	5.11	52.98	50.99	PIPPYG	*P. pygmaeus*	
22:25:26	PIPPYG	7	1.00		3.69	54.48	52.45	PIPPYG	*P. pygmaeus*	
22:25:41	PIPPYG	47	1.00	PIPPIP	4.01	60.54	53.62	PIPPYG	*P. pygmaeus*	
22:25:56	PIPPYG	7	0.86		4.42	48.06	47.06	PIPPYG	*P. pygmaeus*	
22:26:11	PIPPYG	13	0.85	PIPPIP	3.46	50.75	50.26	PIPPYG	*P. pygmaeus*	
22:27:26	Noise							PIPPIP	*P. pipistrellus*	
22:28:26	PIPPYG	16	1.00	PIPPIP	4.41	52.92	51.57	PIPPYG	*P. pygmaeus*	
22:29:41	PIPPYG	2	1.00		5.44	52.82	51.81	PIPPYG	*P. pygmaeus*	
22:29:56	PIPPYG	3	1.00		4.24	56.80	54.35	PIPPYG	*P. pygmaeus*	
22:32:26	PIPPYG	7	0.86	PIPPIP	3.57	56.59	51.86	PIPPYG	*P. pygmaeus*	1 no. bat – foraging.
22:32:41	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:32:56	PIPPYG	16	0.69	PIPPIP	4.27	61.13	52.04	PIPPYG	*P. pygmaeus*	1 no. bat – foraging.
22:33:11	PIPPYG	12	1.00	PIPPIP	4.27	53.09	51.68	PIPPYG	*P. pygmaeus*	
22:33:26	PIPPYG	30	0.93	PIPPIP	4.68	55.60	50.02	PIPPYG	*P. pygmaeus*	
22:33:41	PIPPIP	51	0.43	PIPPYG	4.73	54.87	50.56	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:34:41	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:34:56	Noise							PIPPIP	*P. pipistrellus*	
22:35:26	PIPPIP	10	1.00	MYODAU	2.75	55.08	47.41	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:42:42	PIPPIP	17	0.94	MYODAU	2.87	55.41	47.21	PIPPIP	*P. pipistrellus*	

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:42:57	NoID	6	0.00		2.52	51.07	46.60	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:53:41	PIPPIP	40	0.50		3.90	46.41	40.38	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
23:13:26	PIPPIP	7	1.00	MYODAU	2.64	52.90	47.11	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
23:13:41	PIPPIP	12	1.00	MYODAU	2.52	53.72	47.29	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
23:22:57	PIPPIP	30	1.00		3.74	59.07	47.50	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
23:23:56	PIPPIP	46	0.96		2.98	65.70	49.44	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.

Table A7: Crepuscular Survey Results – 12th August 2022 (dusk, sunset 2110) – *Dodotronic* Analysis with Surveyor Notes (OP-F)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
21:56:29	PIPPIP	2	1.00		2.13	58.64	51.57	PIPPIP	*P. pipistrellus*	faint echolocation detected on site; bat not observed.
21:57:44	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
21:59:44	PIPPIP	79	0.96		4.00	54.78	47.70	PIPPIP	*P. pipistrellus*	1 no. bat – foraging around hilltop.
22:00:29	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
22:03:44	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
22:03:59	PIPPIP	7	1.00	PIPPYG	2.32	59.52	50.76	PIPPIP	*P. pipistrellus*	faint echolocation detected on site; bat not observed.
22:04:29	PIPPIP	4	1.00		2.43	54.55	48.85	PIPPIP	*P. pipistrellus*	1 no. bat – foraging around over heathland to rear of surveyor.
22:04:44	PIPPIP	5	1.00	PIPPYG	2.25	55.97	50.25	PIPPIP	*P. pipistrellus*	
22:04:59	PIPPIP	2	1.00	PIPPYG	2.34	57.78	50.48	PIPPIP	*P. pipistrellus*	
22:07:14	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
22:11:29	PIPPIP	11	0.91	PIPPYG	2.65	60.20	51.15	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:12:29	PIPPIP	26	1.00		4.88	46.68	45.69	PIPPIP	*P. pipistrellus*	1 no. bat – foraging around over heathland to rear of surveyor.
22:13:14	PIPPIP	16	0.94		4.51	47.24	45.02	PIPPIP	*P. pipistrellus*	
22:13:29	PIPPIP	13	0.92		3.46	45.37	43.92	PIPPIP	*P. pipistrellus*	
22:13:44	PIPPIP	46	0.94		5.15	50.03	45.51	PIPPIP	*P. pipistrellus*	
22:16:44	PIPPIP	21	1.00		4.37	48.29	46.62	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:17:14	PIPPYG	3	1.00		3.68	52.88	51.46	PIPPYG	*P. pygmaeus*	1 no. bat – foraging; to the east of OP.

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:17:59	NYCLEI	7	0.86		7.68	25.43	24.80	NYCLEI	*N. leisleri*	1 no. bat – a couple of brief registrations from overhead and behind surveyor.
22:18:29	NYCLEI	2	0.50		4.16	31.05	30.55	NYCLEI	*N. leisleri*	
22:19:14	PIPPIP	36	1.00		5.95	49.50	46.93	PIPPIP	*P. pipistrellus*	1 no. bat – foraging around over heathland, mainly within surveyor's wider field of view.
22:19:44	PIPPIP	3	1.00		4.80	48.34	46.25	PIPPIP	*P. pipistrellus*	
22:19:59	PIPPIP	6	1.00	PIPPYG	2.36	60.18	51.30	PIPPIP	*P. pipistrellus*	
22:20:44	PIPPIP	21	0.86	PIPPYG	3.46	51.63	48.67	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:20:59	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:23:50	Noise							PIPPIP	*P. pipistrellus*	
22:24:04	PIPPYG	24	1.00		2.62	58.36	53.67	PIPPYG	*P. pygmaeus*	1 no. bat – foraging around hilltop.
22:24:49	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
22:25:04	PIPPIP	4	0.75		4.18	47.13	43.70	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:26:04	PIPPYG	3	1.00	PIPPIP	3.14	51.41	50.84	PIPPYG	*P. pygmaeus*	1 no. bat – foraging.
22:26:19	PIPPIP	54	0.52	PIPPYG	4.90	54.07	49.99	PIPPIP	*P. pipistrellus*	1 no. bat – foraging.
22:27:04	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
22:28:34	PIPPYG	6	0.83	PIPPIP	4.25	51.90	51.12	PIPPYG	*P. pygmaeus*	1 no. bat – foraging.

Table A8: Crepuscular Survey Results – 13th August 2022 (dusk, sunset 2108) – *Dodotronic* Analysis with Surveyor Notes (OP-G)

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
21:54:55	PIPPIP	2	1.00		2.30	62.55	52.26	PIPPIP	*P. pipistrellus*	faint echolocation detected on site; bat not observed.
21:55:10	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.
21:58:25	Noise							PIPPIP	*P. pipistrellus*	
21:58:40	PIPPIP	17	1.00	PIPPYG	2.67	59.10	50.05	PIPPIP	*P. pipistrellus*	2 no. bats – moving and foraging along the main access road corridor.
21:58:55	PIPPIP	30	1.00	PIPPYG	4.42	55.26	48.47	PIPPIP	*P. pipistrellus*	
22:00:10	PIPPIP	5	1.00	PIPPYG	2.53	56.84	49.82	PIPPIP	*P. pipistrellus*	
22:00:25	PIPPIP	5	1.00		2.57	50.55	47.91	PIPPIP	*P. pipistrellus*	
22:04:25	Noise							PIPPYG	*P. pygmaeus*	

Time	Auto ID	Pulses	Match Ratio	Alternates	Dur	F_{max}	F_{mean}	Manual ID	Species	Notes – significant observations
22:04:25	Noise							PIPPYG	*P. pygmaeus*	bat(s) not detected or observed on site.
22:08:10	Noise							PIPPYG	*P. pygmaeus*	
22:08:55	Noise							PIPPIP	*P. pipistrellus*	
22:12:10	PIPPYG	10	0.50		3.50	39.39	37.34	PIPPYG	*P. pygmaeus*	1 no. bat foraging over scrub and grassland to the east and north of the OP.
22:12:25	PIPPYG	32	0.97		4.97	52.82	51.36	PIPPYG	*P. pygmaeus*	
22:14:25	PIPPYG	2	1.00	PIPPIP	2.08	50.32	49.94	PIPPYG	*P. pygmaeus*	
22:14:55	Noise							PIPPIP	*P. pipistrellus*	not detected or observed on site.
22:16:10	NYCLEI	3	0.67		2.47	25.08	24.75	NYCLEI	*N. leisleri*	1 no. bat – brief registration from overhead.
22:16:25	PIPPYG	14	1.00		4.24	53.17	51.75	PIPPYG	*P. pygmaeus*	1 no. bat – foraging; to the front of OP.
22:16:40	NYCLEI	2	1.00		3.00	24.92	24.69	NYCLEI	*N. leisleri*	1 no. bat – brief registration from overhead.
22:18:25	PIPPIP	17	0.94		5.20	49.76	46.74	PIPPIP	*P. pipistrellus*	1 no. bat – foraging (not observed).
22:19:25	PIPPIP	8	1.00	PIPPYG	2.44	58.81	50.85	PIPPIP	*P. pipistrellus*	1 no. bat – foraging (not observed).
22:20:48	NYCLEI	3	0.33	MYODAU	2.29	19.89	19.58	NYCLEI	*N. leisleri*	1 no. bat – brief registration from overhead.
22:22:15	Noise							PIPPYG	*P. pygmaeus*	bat(s) not detected or observed on site.
22:23:30	Noise							PIPPYG	*P. pygmaeus*	
22:23:30	PIPPYG	53	1.00	PIPPIP	4.99	57.85	53.15	PIPPYG	*P. pygmaeus*	1 no. bat – foraging.
22:23:45	PIPPYG	24	1.00	PIPPIP	3.55	55.14	52.20	PIPPYG	*P. pygmaeus*	
22:26:00	Noise							PIPPYG	*P. pygmaeus*	not detected or observed on site.