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DUBLIN MOUNTAINS VISITOR CENTRE

Appropriate Assessment

Natura Impact Statement

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Dublin Mountains Visitor Centre

Natura Impact Statement

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1.0 INTRODUCTION

1.1 Background

Roughan & O'Donovan (ROD) was appointed by South Dublin County Council (SDCC) to provide environmental consultancy services in relation to the proposed Dublin Mountains Visitor Centre ("the proposed development"). The proposed development involves (a) changes to the landscape of the site including the trails; (b) conservation works to the architectural heritage features and interpretation of the heritage resources; (c) development of visitor facilities, parking, and services for the facilities, and (d) changes to the roads accessing the site, and provision of a shuttle service to the site. In addition to these physical developments, an operational management plan is proposed to facilitate the envisaged increase in visitor access/usage of the site.

In accordance with Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive"), as transposed into Irish law by Part 5 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended) ("the Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) ("the Planning and Development Act"), an Appropriate Assessment (AA) Screening Report was prepared to assess whether or not the proposed development, either individually or in combination with other plans or projects, was likely to have a significant effect on one or more sites of Community importance ("European sites") for nature conservation.

An Bord Pleanála ("the Board") wrote to SDCC on 6th February 2019 and stated:

"*Within the Bird Survey report, the applicant noted that it is widely accepted that Merlin is difficult to survey while the Board noted that the survey undertaken was limited and conducted in the summer months of 2018. The Board was not satisfied, having regard to the precautionary principle, that the survey was adequate and that the potential impact on Merlin which is a qualifying interest of the Wicklow Mountain Special Protection Area (Site Code: 004040) had been fully addressed. Therefore, the Board requests the applicant undertake additional bird surveys in optimal conditions to address these concerns.*

Furthermore, the Board is not satisfied, having regard to the precautionary principle, that the impact of increased visitor numbers using the proposed visitor centre as a new starting point for the Dublin Mountain Way, which leads into the nearby designated European sites, had been adequately assessed in terms of the potential impact on the qualifying interests within these sites. The Board could therefore not determine whether there was a requirement for mitigation measures, with respect to the potential issue of cumulative effects on the nearby European sites.

The applicant is therefore requested to consider and address the issues outlined above and to prepare a Natura Impact Statement inclusive of any mitigation proposals that are required to address any potential likely significant effects of the proposed development, either individually or in combination with other plans or projects, on European sites in view of the sites Conservation Objectives".

In accordance with Section 177AE of the Planning and Development Act and following the determination by the Board that AA was required in respect of the proposed development, the role of Competent Authority and responsibility for undertaking the AA was assumed by the Board. In order to assist the Board in carrying out its AA, a Natura Impact Statement (NIS) is required to be submitted.

This document comprises the NIS in respect of the proposed development and has been prepared by ROD on behalf of SDCC. It contains an examination, analysis and evaluation of the likely impacts from the proposed development, both individually and in combination with other plans and projects, in view of best scientific knowledge and the Conservation Objectives of the European sites concerned. It also prescribes appropriate mitigation to ensure that the proposed development will not adversely affect the integrity of those sites. Finally, it provides complete, precise and definitive findings which are capable of removing all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned.

This NIS was prepared by Patrick O'Shea. Patrick is an Ecologist with over seven years' experience in ecological assessment. He holds a degree in Botany from Trinity College Dublin and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. Patrick is an Associate member of the Chartered Institute of Ecological and Environmental Management and has a background in Ecological Impact Assessment and Appropriate Assessment including experience on recreation based projects.

This NIS was peer reviewed by Paul Murphy. Paul is a Chartered Environmentalist and holds an MSc in Environmental Science from Trinity College Dublin. He has been operating in the environmental field for over two and a half decades covering a broad range of projects in a variety of countries. He has expert knowledge of the various EU Environmental Directives (Habitats Directive, Birds Directive, Water Framework Directive, Environmental Liability Directive, etc.) and the Natura 2000 network and has been involved in the preparation of management plans for designated areas and Natura 2000 sites. He has extensive experience in Environmental Impact Assessment and ecological mitigation design for numerous major infrastructural schemes (roads, bridges, power plants, wind farms, etc) including habitat translocation and restoration. He has also been involved in the development and implementation of a variety of survey methodologies focusing on rapid assessment techniques, and has co-authored a variety of guidance documents for best practice in relation to road developments and for the film industry.

The NIS was also peer reviewed with regard to Merlin by Alan Lauder. Alan holds a BSc in Ecology from the University of Stirling and has over 30 years' experience as a professional ornithologist and nature conservation specialist. He has extensive raptor-specific experience including being the organiser of the 2001/2002 UK National Peregrine Survey, a steering group member on the 2017 Irish National Peregrine Survey, a steering group member and local organiser (Wicklow) for the Irish National Merlin Survey 2018.

1.2 Legislative Context

The Habitats Directive and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds ("the Birds Directive") list habitats and species which are, in a European context, important for conservation and in need of protection. This protection is afforded in part through the designation of sites which support significant examples of habitats or populations of species ("European sites"). Sites designated for birds are termed "Special Protection Areas" (SPAs) and sites designated for natural habitat types or other species are termed "Special Areas of Conservation" (SACs). The complete network of European sites is referred to as "Natura 2000".

In order to ensure the protection of European sites in the context of land use planning and development, Article 6(3) of the Habitats Directive provides for the assessment of the implications of plans and projects for European sites, as follows:

> "*Any plan or project not directly connected with or necessary to the management of the site* [or sites] *but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site* [...]*, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned* [...]*.*"

The requirements arising out of Article 6(3) are transposed into Irish law by Part 5 of the Habitats Regulations and Part XAB of the Planning and Development Act, and the assessment is referred to as "Appropriate Assessment" (AA).

The determination of whether or not a plan or project meets the two thresholds for requiring AA is referred to as "Stage 1" or "AA Screening". The first threshold is reached if the plan or project is not directly connected with or necessary to the management of one or more European sites. In its ruling in the Waddenzee case[1], the Court of Justice of the European Union (CJEU) interpreted the second threshold as being reached where "*it cannot be excluded, on the basis of objective information, that* [the plan or project] *will have a significant effect on that site*". Thus, in applying the Precautionary Principle, the CJEU interpreted the word "likely" to mean that, as long as it cannot be demonstrated that an effect will not occur, that effect is considered "likely". A likely effect is considered to be "significant" only if it interrupts or causes a delay in achieving the Conservation Objectives of the site concerned.[2]

Prior to approval of a plan or project which is the subject of AA (also referred to as "Stage 2"), it is necessary to "*ascertain*" that the plan or project will not "*adversely affect the integrity of the site*". In its guidance document (EC, 2001), the European Commission stated that "*the integrity of a site involves its ecological functions*" and that "*the decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives*". Regarding the word "ascertain", the CJEU, also in its ruling in the Waddenzee case, interpreted this as meaning "*where no reasonable scientific doubt remains as to the absence of such effects*". Therefore, the legal test at Stage 2 is satisfied (and the plan or project may be authorised) when it can be demonstrated beyond reasonable scientific doubt that the plan or project will not interrupt or cause delays in the achievement of the Conservation Objectives of the site or sites concerned. AA is informed by a "Natura Impact Report" (NIR) in the case of plans or a "Natura Impact Statement" (NIS) in the case of projects.

The CJEU has made a relevant judgment on what information should be contained within documents supporting AA[3] (in the NIR or NIS):

> "[The AA] *cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned.*"

[1] Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse vereniging tot Bescherming van Vogels *v*. Staatssecretaris van Landbouw, Naturbeheer en Visserij (Waddenzee) [2004] C-127/02 ECR I-7405.

[2] Conservation Objectives are referred to, but not defined, in the Habitats Directive. In Ireland, Conservation Objectives are set for Qualifying Interests (the birds, habitats or other species for which a given European site is selected) and represent the overall target that must be met for that Qualifying Interest to reach or maintain favourable conservation condition in that site and contribute to its favourable conservation status nationally.

[3] Sweetman *v*. An Bord Pleanála [2013] Case C-258/11.

The Irish High Court has also provided clarity on how competent authorities should undertake valid and lawful AA[4], directing that the AA:

> "*Must identify, in the light of the best scientific knowledge in the field, all aspects of the development project which can, by itself or in combination with other plans or projects, affect the European site in the light of its conservation objectives. This clearly requires both examination and analysis.*"
>
> "*Must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps. The requirement for precise and definitive findings and conclusions appears to require examination, analysis, evaluation and decisions. Further, the reference to findings and conclusions in a scientific context requires both findings following analysis and conclusions following an evaluation of each in the light of the best scientific knowledge in the field.*"
>
> "*May only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where, upon the basis of complete, precise and definitive findings and conclusions made, the consenting authority decides that no reasonable scientific doubt remains as to the absence of the identified potential effects.*"

In accordance with Article 6(3) of the Habitats Directive, the responsibility to screen for and carry out AA lies solely with the "competent national authorities", i.e. those with responsibility for granting or refusing consent for plans and projects. In that respect, an AA Screening Report, NIR or NIS (if not prepared by the competent authority) does not in itself constitute a valid AA Screening or AA; it merely provides the competent authority with the information that it needs in order to screen for and carry out its AA. In Ireland, the competent authority for a given plan or project is the relevant planning authority, e.g. the local authority or An Bord Pleanála.

1.3 Methodology

On the basis of the objective information provided and in view of the Conservation Objectives of the relevant European sites, the Board, as the Competent Authority, determined that the proposed development, either individually or in combination with other plans and projects, was likely to have a significant effect on one or more European site.

In accordance with the requirements for AA, this NIS assesses the likely effects of the proposed development on the integrity of the European sites "screened in" at Stage 1. This assessment is undertaken in six steps, as follows:

1. Step 1 involves gathering all of the information and data that will be necessary for a full and proper assessment. These include, but are not limited to, the details of all phases of the plan or project, environmental data pertaining to the area in which the plan or project is located, e.g. rare or protected habitats and species or invasive species present or likely to be present, and the details of the European sites within the likely zone of impact.
2. Step 2 involves examination of the information gathered in the first step and detailed scientific analysis of the effects of the plan or project on the ecological structure and function of the receiving environment, focussing on European sites.
3. Step 3 evaluates the effects analysed in Step 2 against the Conservation Objectives of the relevant European site or sites, thereby determining whether or not they constitute adverse effects on site integrity.

[4] Kelly *v*. An Bord Pleanála [2014] IEHC 422.

4. Having established that the plan or project will adversely affect the integrity of one or more European sites, Step 4 involves the development of appropriate mitigation, including, where appropriate, monitoring and enforcement measures, to eliminate or minimise those effects such that they no longer constitute adverse effects on the integrity of the site(s) concerned, as well as consideration of the significance of any residual (post-mitigation) effects.
5. Step 5 involved the assessment of the significance of any residual effects arising from the proposed development in combination with other plans or projects.
6. Step 6 involves the final determination of whether or not the plan or project will adversely affect the integrity of one or more European sites. Notwithstanding the final recommendation made in the NIS, the responsibility for completing this step lies solely with the competent authority.

The following guidance documents informed the assessment methodology:

- DEHLG (2010) *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2010) *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Circular Letter NPWS 1/10 & PSSP 2/10. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- EC (2001) *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Environment Directorate-General of the European Commission.
- EC (2018) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*. European Commission, Brussels.

1.4 Ecological Assessment

1.4.1 Desk Study

As part of the desk study, statutory and non-statutory consultees with an interest in biodiversity and conservation were contacted and invited to submit any observations that they had in relation to the proposed development.

During the preparation of this NIS, a thorough desk study was undertaken of all available baseline data relating to biodiversity within the likely zone of impact of the proposed development. This included reviews of the following resources:

- The statutory consultee, the National Parks & Wildlife Service (NPWS), provided information on designations of sites, habitats and species (including birds) of conservation interest. This included reports pursuant to Article 17 of the Habitats Directive[5] (NPWS, 2019a,b) and Article 12 of the Birds Directive[6] (Eionet, 2018), as well as Site Synopses, Natura 2000 Standard Data Forms and Conservation Objectives (including supporting documents) for the relevant European sites.
- The National Biodiversity Data Centre (NBDC) *Biodiversity Maps* (NBDC, 2018) provided records of protected, rare and invasive species.

[5] Under Article 17 of the Habitats Directive, Member States of the European Union are required to report to the Commission every six years on the status of Annex I habitats and Annex II species and on the implementation of the measures taken under the Directive.

[6] Every three years, Member States of the European Union are required by Article 12 of the Birds Directive to report on implementation of the Directive. The most recent reporting available is for the period 2008-2012.

- The Birds of Conservation Concern in Ireland 2014-2019 (Colhoun & Cummins, 2013) were also reviewed.
- The Environmental Protection Agency (EPA) online mapping system provided data in relation to water quality status of water bodies in the vicinity of the proposed development.
- Coillte provided data of walker numbers in the Dublin Mountains, taken from counters placed in their car parks.
- Submissions received from the Department of Arts, Heritage and the Gaeltacht, members of the public and interest groups during the consultation periods were also reviewed and considered in this assessment.

As with all desk studies, the data considered were only as good as the data supplied by the recorders and recording schemes. The recording schemes provide disclaimers in relation to the quality and quantity of the data that they provide and these were considered when examining outputs of the desk study.

1.4.2 Field Surveys

A range of ecological surveys were undertaken by suitably qualified ecologists to inform this NIS between 2016 and 2019.

The surveys adhered to the following guidelines:

- *Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA, 2008b).
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009).
- *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011).
- *BirdWatch Ireland & The Irish Raptor Study Group. 2018. Irish Merlin Survey 2018.*

The surveys with particular relevance to this NIS are described below.

Habitats

A habitat survey was conducted to define the habitats present within the site of the proposed development and along the trails leading into the European designated sites. Habitat surveys were undertaken to Level 3 in accordance Fossitt (2000) in a 20m band along the trail network for a distance of 5km from the location of the proposed visitor centre. Target notes on evidence of burning, existing erosion or areas that may require interventions to prevent erosion or braiding due to impeded drainage etc. were also taken.

Merlin

Merlin surveys were carried out during the breeding season in 2018 and 2019. In 2018, a Merlin survey was carried out from 6 vantage points on Montpellier Hill and the conifer plantations surrounding it. In 2019, the survey covered a wider area including Montpellier Hill, Annamount Spink, Glendoo Mountain, Kilakee Mountain and Tibradden Mountain. This survey, with a more localised focus than the national survey and many Irish studies, allowed for an approach which, within reason, maximised the likelihood of detection of Merlin while also collecting all information relating to Merlin activity observed in the area and which would inform the assessment of the likelihood of detection and the suitability of the area for breeding. The 2018 and 2019 Merlin Survey Reports are included in Appendix 3 to this NIS.

Otter

The otter survey was carried out in July 2019 and adhered to best practice guidance (NRA, 2008c). The surveys involved a systematic search of the Glendoo Brook and its tributaries up to 500 m upstream and downstream of the site of the proposed development. The site was searched for physical evidence of otters, e.g. spraints, prints, slides, trails, couches and holts. The survey methods also had regard to the *Otter Threat Response Plan 2009-2011* (NPWS, 2009), which highlights the importance of the riparian buffer, i.e. 10m from the water's edge). Two trail cameras were placed along the Glendoo Brook for a concurrent period of one week to detect otter.

Walker Surveys

In order to understand the current patterns of use (by walkers) within the site of the proposed development and the wider area, including the trails leading to European sites, walker surveys were undertaken. The surveys included an examination of car park data provided by the Dublin Mountains Partnership. Walker surveys using cameras were carried out in November 2017 in June, July and August 2019. The walker survey report is provided in Appendix 2 to this NIS.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Overview

2.1.1 Physical Elements of the Proposed Development

The proposed development includes:

(a) the conversion of 26ha of Coillte's Hell Fire Club property from productive conifer forest to mixed deciduous woodland for use primarily as amenity open space;

(b) modifications, including new sections of trail, and upgrade of the existing network of walking and equestrian trails throughout the Hell Fire Club and Massy's Estate forest properties;

(c) construction of a 'tree canopy walk'/pedestrian bridge over the R115 to link the trail networks of the two properties, with a 'bridge house' at the Hell Fire end of the bridge;

(d) conservation works to the Hell Fire Club building (South Dublin Record of Protected Structures - Ref. 388) and the architectural heritage of the Massy's Estate property including the walled garden (part of South Dublin Record of Protected Structures - Ref. 384);

(e) installation of heritage interpretation signage along the network of trails;

(f) construction of a new parking area for 275 No. cars (including 14 No. disabled spaces) and five coach spaces to replace the existing parking area on the Hell Fire Club property;

(g) construction of a visitor centre comprising two buildings (one single-storey and one two-storey) side-by-side at an elevation of c. 300m on the Hell Fire Club property, with a combined gross floor area of 980m^2, accommodating the following uses/spaces: audio-visual/exhibition facility (101m^2), education room (55m^2), café with seating area (175m^2), servery (36m^2) and kitchen (60m^2), 'Ramblers' Lounge' (43m^2), retail (45m^2), kiosk (27m^2), toilets (66m^2), facility management offices (55m^2), and associated reception, circulation, plant and storage spaces;

(h) construction of a stand-alone electricity substation (23m^2);

(i) installation of a new watermain line and sewage pipe under the R115 from the Hell Fire Club property to the existing watermain and public sewer network;

(j) construction of a network of swales and ponds for attenuation of surface run-off, and a culvert beneath the R115 to channel overflow of surface water into the Glendoo Brook;

(k) modifications to the existing entrance to the Hell Fire Club property;

(l) installation of new fences along sections of the Hell Fire Club property boundary;

(m) all ancillary works and landscaping on the Hell Fire Club and Massy's Estate properties. It is proposed to make modifications to the stretches of the R115 and R113 roads connecting the site to the urban area to the north, including the provision of a footpath (minimum 1.5m width) and an advisory cycle lane (1.5m width), and the retention of a carriageway of sufficient width for two-way traffic except at one location where a single lane traffic shuttle is proposed. The proposed modifications to the roads do not require encroachment into adjoining private lands, but do require localised widening of the R115 by 1.2m into the Massy's Estate property for a stretch of c.100 m.

2.1.2 Operational Elements of the Proposed Development

A critical part of the proposed development, not included in the description of the physical elements above, is the Operational Management Plan (Appendix 5). This document sets out the proposed management measures for the site which have been designed to (a) mitigate the impacts on key environmental receptors (e.g. archaeology and architectural heritage, and biodiversity), and (b) where possible go beyond mitigation of impacts to achieve enhancement of the condition and management of environmental aspects and features. The Operational Management Plan sets out the envisaged structure and responsibilities for management of the development during operation. The measures include the establishment of a permanent management steering group comprised of SDCC, Coillte and the Dublin Mountains Partnership (DMP) with responsibility for:

(a) management and maintenance of the development overall, and specifically the facilities outside of the direct responsibility of the private operator;

(b) management of the contract, lease or license of the private operator of the facilities;

(c) liaison with neighbouring landowners, residents and stakeholders, facilitated through the consultation forum of the DMP;

(d) coordination of forest operations ongoing in the western part of the Hell Fire Club property (the area largely unaffected by the proposed development); and,

(e) monitoring and management programmes for:

- the trails network;
- archaeological and architectural heritage features, and
- biodiversity (specifically the Key Ecological Receptors identified in the EIA process).

The Dublin Mountains Partnership or DMP was set up in May 2008 with the ultimate aim of improving the recreational experience for users of the Dublin Mountains. The Operational Management Plan also identifies access and parking management measures including:

(a) car park monitoring and variable message signs to prevent queuing and overspill parking;

(b) the proposed shuttle bus from Tallaght;

(c) the proposed park and ride facility at Tallaght Stadium.

2.2 Location

The proposed Dublin Mountains Visitor Centre will be located at the northern gateway into the Dublin and Wicklow Mountains from Dublin City. In broad terms, the site location is in the valley of the largest tributary of the River Dodder, the Owendoher River, to the south of Rathfarnham. There are several blocks of state-owned land (Coillte conifer plantations) in and around this valley and the proposal focuses on the development of the tourism facility in the area of Hell Fire Club and Massy's Estate, which already provide extensive public access and walking routes linking into the higher mountains above 300 m altitude.

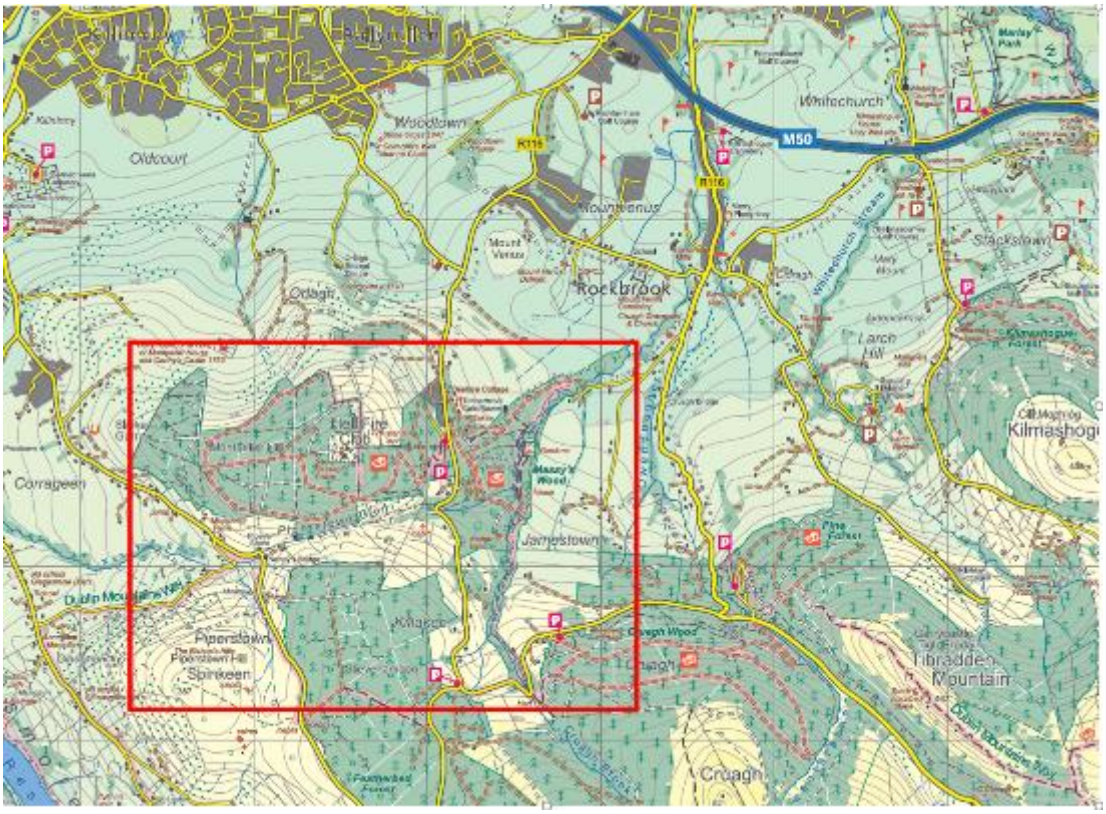

Plate 2.1 Location of the proposed development.

2.3 Visitor Centre

2.3.1 Siting and Design of Buildings

It is proposed to construct two buildings side-by-side (buildings 'A' to the front/east and 'B' to the rear/west, together comprising the visitor centre) on the Hell Fire Club site at a level of approximately 300m above sea level, adjacent and to the east of the existing forest road.

The buildings are partially set into the hill. The buildings are positioned one behind the other to limit their spread across the face of Montpelier Hill in views from the east. The buildings have linear, rectangular plan form and flat roofs to minimise their footprint and height. Building B is single volume. Building A is double-volume, the lower floor being set into the slope of the hill. There are gathering/entrance spaces, courtyards and terraces around the buildings. The buildings are clad in a combination of stone and timber, with green roofs. The natural materials are intended to reflect the site/development character and minimise the buildings' obtrusiveness. Building A has a broad window (36m × 2.3m) across its east façade on the upper level. The buildings are surrounded by new mixed woodland planting. The planting is thinned in front of Building A to allow views from the visitor centre across the surrounding landscape.

Plate 2.2 Photomontage showing the view of the Visitor Centre from forest road.

2.3.2 Building Uses and Floor Areas

The visitor centre facilities can be divided into three main components:

(a) Basic facilities for walkers and casual visitors. The facilities include shelter/resting place, toilets, food and beverage service, and access to information. They are located on the lower level of Building A, opening onto the terrace in front of the building. The facilities are intended to be available for quick, casual access, particularly for walkers;

(b) Seated café. The café has seating for 75 No. patrons, with counter service providing breakfast, brunch, lunch and tea options. It is located on the upper level of Building A, with a panoramic window affording a view across Massy's Estate towards Dublin Bay;

(c) Interpretation, exhibition and education facilities. The facilities include an audio-visual and exhibition room and an education room. The facilities are intended to cater for tourists (domestic and international), school groups, special interest groups and corporate groups. The buildings contain the following accommodation (described in three parts: Building A lower level, Table 2.1; Building A upper level, Table 2.2; Building B, Table 2.3):

Table 2.1 Building A Lower Level (Gross Floor Area 316m^2)

Room No.	Function / Name	Gross Floor Area	Description
001	Kiosk	27m^2	A kiosk with sheltered counter service, providing take-away hot and cold (non-alcoholic) drinks and basic food (sandwiches, snacks, fruit etc.). This is intended to cater for walkers and visitors using the (south) terrace and to take away on walks.
002	Circulation	14m^2	Stairs to upper level
003	Staff toilet	5m^2	-

Room No.	Function / Name	Gross Floor Area	Description
005-008	Public Toilets	22m^2	4 No. toilets (2 no. fully wheelchair accessible and with baby changing facilities) for use by the public.
009	Site Manager's Office	12m^2	Office space for site manager. This will include facilities such as CCTV monitors, etc.
010	Office (Coillte)	15m^2	Office space for Coillte personnel.
011	Dublin Mountains Partnership DMP Office	18m^2	Office room for the use of the DMP volunteer rangers. The room is located adjacent to the Ramblers' Lounge in order that the volunteers are accessible to visitors.
012	Retail space	45m^2	A small shop providing goods of relevance to walking and heritage focussed visitors, e.g. equipment (ponchos, umbrellas, walking sticks etc.), maps, books, souvenirs.
013	'Ramblers' Lounge'	43m^2	A rustic lounge-type room with stone flag flooring, bench seating around the walls, and a stove, opening onto the terrace to the front (east) and side (north) of the building. This room is intended to provide a resting and meeting place for walkers, and information on the site facilities, services and heritage, and the recreation facilities, services and heritage of the wider Dublin Mountains area.
015	Storage room	4m^2	Storage room for the shop and Ramblers' Lounge.
016	Plant room	57m^2	-
Building A Lower Level Gross Floor Area			**316m^2**

Table 2.2 Building A Upper Level (Gross Floor Area 394m^2)

Room No.	Function / Name	Gross Floor Area	Description
101	Café seating area	175m^2	A linear rectangular space aligned for maximum exposure to the panoramic window and the view east, with tables and seating for 80 patrons.
102	Servery	36m^2	A servery-equipped food display, cabinets, fridges, coffee machines, warming ovens etc. providing counter service to café patrons.
103	Kitchen	60m^2	A kitchen with storage space, all necessary equipment for food preparation and post-preparation storage, scullery, etc. for on-site preparation of food.
104	Dry Good Store	3m^2	Dry good store adjacent to kitchen.
105-107	Toilets	30m^2	Male, female and wheelchair accessible toilet facilities. Baby-changing to be provided within accessible toilet.

Room No.	Function / Name	Gross Floor Area	Description
108	Cleaner's Store	2m^2	Cleaner's store area.
109	Café Manager's Office	10m^2	Office space for café manager.
110	Bin Store	10m^2	A space for storage of bins for waste generated by the entire visitor centre.
111-113	Circulation	44m^2	Internal circulation and stairs to lower level.
Building A Upper Level Gross Floor Area			**392m^2**

Table 2.3 Building B (Gross Floor Area 265m^2)

Room No.	Function / Name	Gross Floor Area	Description
114	Entrance foyer	60m^2	Entrance foyer to audio-visual/exhibition facility, including reception desk for information and sale of tickets and a small selection of maps, books and souvenirs.
115	Exhibition room	101m^2	A large space sub-divided into an audio-visual theatre-style room and a separate exhibition space.
116	Education room	55m^2	A room equipped with tables and seating for groups of up to 54 persons, allowing for flexible use by various user groups.
117-118	Toilets	9m^2	One wheelchair accessible and one general toilet.
119	Circulation	40m^2	Circulation space including wide corridor with full length glazing intended as informal social/exhibition space
Building B Gross Floor Area			**265m^2**

Table 2.4 Total Gross Floor Area of Buildings A and B

Building A Lower Level Gross Floor Area	316m^2
Building A Upper Level Gross Floor Area	392m^2
Building B Gross Floor Area	272m^2
Total Gross Floor Area	**980m^2**

2.4 Expansion of the Hell Fire Club Parking Area

It is proposed to increase the capacity of the Hell Fire Club parking area from c. 80 No. car spaces to 275 No. car spaces (of which 14 No. are disabled spaces) and five coach spaces. The proposed parking area is comprised of three parallel tiers of parking, the lowest of which is approximately in the position (alignment and level) of the existing road and parking area, with the two upper tiers stepping up the hillside. The tiers are separated by retaining walls and strips of screening vegetation. The roads are proposed to be tarmac and top-dressed with a coloured aggregate. The parking spaces will be surfaced in 'Grasscrete' or similar permeable structured grass product. Footpaths from the parking area lead: (i) directly up the east face of Montpelier Hill; (ii)

towards the visitor centre, (iii) towards the pedestrian bridge over the R115 to Massy's Estate. It is proposed to provide low level lighting (bollard-type and directional) in the parking area. The lights will be turned off every night when the gates are locked. It is proposed to install a permanent electronic car park monitoring system to record the occupancy rate in the car park. This will link to Variable Message Signs (VMS) to the north on the two main approach routes from the city and M50 directions. At unusually busy periods the VMS signs will alert drivers to the lack of parking spaces at the Hell Fire Club and will instead direct them to the Park & Ride site.

2.5 Drainage

Measures have been proposed to minimise the increase in surface water run-off generated by new hard surfaces on the site, including green roofs on the visitor centre buildings and permeable paving in the parking area. A series of interconnected swales and ponds is proposed for surface run-off attenuation on the lower eastern slope of Montpelier Hill around the new built facilities. Any overflow from the ponds will be channelled into a proposed new culvert beneath the R115 and into an existing drainage channel on Massy's Estate feeding into the Glendoo Brook. A drawing showing drainage is provided in Appendix 1 to this NIS.

2.6 Services

2.6.1 Water Supply

A new water main line will be required to serve the development. The closest existing public water main is located at the intersection of the R115 (Old Military Road/Killakee Road) and the R113 (Gunny Hill). A new connection will be required into this 4-inch uPVC pipe and approximately 1260m of new water main pipe will be required along the R115 and up the eastern face of Montpelier Hill to bring the water main supply to the proposed visitor centre.

2.6.2 Foul Water Treatment

Site investigations determined that bedrock on the Hell Fire Club is too shallow to allow for on-site treatment of foul water. It is proposed that the site be connected to the public sewer by the installation of a new 150mm diameter sewage pipe from the site to the existing sewer network on the old Ballycullen Road, approximately 2km to the north.

2.6.3 Electricity Supply

It is proposed to supply the development's energy requirement by electricity; there is existing electricity infrastructure in close proximity to the site. No gas supply is proposed. An on-site electricity substation and LV switch room is proposed. This will be a stand-alone building of 7m × 4m and 3m high (28m^2), located off the main forest road c. 65m south of the visitor centre. It will be screened by earth mounds and planting. It is proposed to heat the visitor centre buildings with underfloor heating powered by air-to-water heat pumps located behind Building B. The buildings will be ventilated by a combination of natural and mechanical ventilation.

2.7 Modifications to the R115 and R113

It is proposed to modify the roads connecting the site to the South Dublin urban area. The proposals affect the following sections of road:

- the R115 Stocking Lane between its junction with Stocking Avenue and its junction with the R113 Mount Venus Road;
- the R113 Mount Venus Road between its junction with Stocking Avenue and the R115 Stocking Lane/Killakee Road;

- The R115 Killakee Road between its junction with the R113 Mount Venus Road and the Hell Fire Club site entrance.

These stretches of road in combination constitute the direct road connections between the site and the South Dublin urban area. The proposed modifications to the roads include:

a) the provision of a footpath on one side of the road, of 1.5m width or wider (depending on the distance between the adjacent property boundaries) separated from the carriageway by a kerb;

b) the provision of an advisory cycle lane on one side of the road (generally the opposite side to the footpath), of 1.5m width, indicated by road markings on the carriageway;

c) the provision of two-way carriageway of 5-6m width for the majority of the road, and the provision of single lane carriageway for one stretch of c. 90m where a single lane traffic shuttle would operate governed by yield signs at each end.

It is not proposed to widen the existing road into adjacent privately-owned properties. For one stretch of the road (c. 100m) it is proposed to widen the road by up to 1.2m in places, encroaching into the Massy's Estate property (Coillte-owned) east of the road.

2.8 R115 Road Frontage Modifications

The proposed widening of the R115 along the frontage of the Massy's Estate property would require the localised removal of the existing boundary wall along a 100m stretch. Where this occurs it is proposed to rebuild the wall, using the same materials, along the newly aligned boundary approximately 1m back from the original. It is proposed to modify the existing entrance to the Hell Fire Club to provide the required sightlines and turning radius for vehicles exiting the site, to achieve the required gradient on the internal road, and to provide dedicated pedestrian and equestrian entrance points.

2.9 Landscape Development

A 26ha area of the Hell Fire Club property is the subject of a Memorandum of Understanding between Coillte and SDCC, allowing – subject to the Board's approval of the proposed development - for the removal of this area from Coillte's commercial forest operation and its re-development for amenity use. This is the eastern face of Montpelier Hill between the property boundary along the R115 and the Hell Fire Club at the top of the hill and extending over the hilltop to include a conifer plantation behind (to the south and west of) the Hell Fire building. The remainder of the Hell Fire property would remain in commercial forest use, with some improvements to the trails in this area to facilitate continued recreational use. The Massy's Estate property is already managed by Coillte primarily as an amenity Woodland and minimal interventions in the landscape are proposed.

2.9.1 Hell Fire Club Property

Parts of the 26ha area have recently been felled as part of Coillte's ongoing management of the plantations. Some of the plantations are in mid-growth, and some of the area has mature plantations ready for felling. It is proposed to replace the felled and existing conifer plantations with permanent, mixed (predominantly deciduous) woodland managed for amenity and biodiversity purposes, incorporating the access and visitor facilities described below as well as pockets of green open space for amenity use. The existing conifer plantations would be converted to mixed woodland by means of continuous cover forestry, whereby the conifers are progressively thinned and inter-planted with deciduous species over time. In those areas within the Woodland identified for high usage amenity use, existing tree stumps will initially be

removed or ground down to ground level. It is proposed that the coniferous forest to the south and west of the Hell Fire Club building, as well as being replaced by mixed woodland over time, be cut back from the hilltop (with cleared areas replaced by meadow) so that the building will no longer be seen against a backdrop of vegetation and will return to its original prominence in views from Dublin. It is proposed to retain the hilltop surrounding the Hell Fire Club in grassland to allow for continued amenity use of the space. It is proposed to develop a number of additional amenity areas within the new permanent mixed woodland, including one on the hillside above and one below the visitor centre. In these areas the woodland would be thinned and meadow grassland maintained for uses such as picnicking and informal play (no formal playgrounds are proposed).

2.9.2 Massy's Estate Property

No significant interventions in the landscape of Massy's Estate are proposed other than (a) the restoration of the area disturbed by construction of the pedestrian bridge, (b) the conservation measures for the walled garden, (c) works associated with the improvement of the trails – particularly the Glendoo Brook trail, (d) the setting back off the boundary wall by 1m for approximately 100m to accommodate the proposed footpath and (d) installation of interpretation signage.

2.10 Landscaping and Associated Drainage Features

It is proposed to use a system of swales and ponds to capture surface water run-off on the Hell Fire Club (existing run-off and the increase in run-off volume from the proposed new facilities). These drainage features will be landscaped using naturalistic treatments so as not to appear excessively engineered and to allow for amenity usage when not inundated.

2.11 Boundary Treatments

It is proposed to install a 2m palisade security fence (or alternative design, e.g. timber fence or wall, subject to agreement with the neighbouring landowners) along the shared boundaries of the residential properties immediately to the north east and to the south east of the Hell Fire Club. Some neighbouring landowners expressed concern during consultation that their lands are illegally accessed by visitors to Coillte's Hell Fire Club and Massy's Estate properties, with people crossing boundaries to take short cuts. Consultees also reported litter on their properties near the shared boundaries. It is considered by the applicant that the wider Hell Fire Club and Massy's Estate property boundary is too long to erect a fence along its entire length and that a fence of sufficient specification to function as a barrier would detract from the landscape. It is intended that the proposed improvements to the walking trails and provision of improved directional signage and other information will contribute to reduced incidences of trespass and littering on neighbouring properties. The following measures are proposed:

- To install signage on the shared boundaries wherever trespass onto neighbouring property has historically taken place, and where the trail network approaches close to the site boundary, requesting visitors not to cross onto the neighbouring private lands;
- Engaging with the neighbouring landowners if problems of trespass or litter arise and taking measures to prevent them, if necessary.

2.12 Trails including Tree Canopy Bridge

The proposed development of the trails network on the site is described below in three sub-sections, addressing walking trails, the tree canopy walk/bridge, and equestrian

trails. It is not proposed to provide cycle trails on the site. However, cycle access to the site would be facilitated by the modifications to the public road accessing the site and the provision of cycle parking at the site.

2.12.1 Walking Trails

It is proposed to provide a suite of trails of various length, degree of accessibility and difficulty class (accessible, easy, moderate or strenuous) and character, by retaining and upgrading existing roads and paths and developing new sections in places. The trails will be designed in accordance with the standards of the Classification and Grading of Recreational Trails published by the National Trails Office. Notable elements of the trails proposals include:

- A 'feature stairway' to the Hell Fire Club. The existing direct route up Montpelier Hill, which is severely eroded in places, is proposed to be improved with the addition of stairs in places;
- A circular trail around the Hell Fire Club and the two adjacent passage tombs. This is the most significant intervention in the landscape around the Hell Fire Club building and the archaeological sites;
- Glendoo Brook Trail. Modifications are proposed to the alignment of the trails along the river corridor, to reduce the access of users to the riverbanks. Habitat enhancement measures are proposed in the river corridor in parallel with the trail modifications.

2.12.2 Tree Canopy Bridge

It is proposed to develop a pedestrian bridge – or 'tree canopy walk' - over the R115, to provide a pedestrian link between the Hell Fire Club and Massy's Estate properties and an attraction for visitors. The bridge is 330m long, following a winding route, and has a fall of 1:20 from ground level on Hell Fire Club at 273.0m to ground level on Massy's at 256.5m. It crosses the R115 with a clearance of 6.24m over the road level. The structure of the bridge is intended to be 'light' in profile and appearance to sit unobtrusively in the woodland setting. The width of the deck is 2.5m. The balustrades are 1.2m high with a hardwood handrail and balusters of Corten (rust-coloured steel). The bridge support columns have a diameter of 250mm and are of Corten steel. They are spaced clusters of two or three columns at approximately 10m centres, and variously angled (vertical and inclined) to look like groups of small tree trunks. The columns would be set in small concrete foundations below ground amongst the retained trees. The foundations will be located in consultation with an arborist so as to minimise damage to tree roots during construction.

2.12.3 Equestrian Trails

It is proposed to cater for the existing use of the site for horse riding by the development of dedicated equestrian trails. These are mostly located around (inside) the perimeter of the Hell Fire Club and Massy's Estate properties and are predominantly surfaced in grass.

2.13 Heritage and Interpretation

It is proposed to provide interpretation of the site's cultural and natural heritage resources and the external environment (Dublin City and Bay, other mountains visible from the site etc.). An interpretation and signage strategy and design will be commissioned in the event of development consent, complimentary to the audio-visual and exhibition materials in the visitor centre. It is envisaged that interpretation material will take the form of signage at points along the trails. The signage will be limited - in number and physical presence - so as not to intrude on the walker's experience of the landscape, but to be available at points of potential interest. The signage will be

discreet but robust and of fitting materials and character to the site/development. Additional functionality to signage, such as bar codes or similar to launch audio/audio-visual applications on smart phones will be considered.

2.14 Conservation Works on Protected Structures

A suite of conservation works are proposed to various architectural and archaeological heritage features on the site. These are intended to (a) improve the condition of the structures and ensure their physical integrity and (b) to facilitate improved access to and appreciation of the structures for visitors. It is proposed that a cultural heritage monitoring regime be implemented during operation, managed by the steering group, to identify any need for further measures to conserve the cultural heritage features on site.

2.14.1 Hell Fire Club Building

It is proposed to conserve the building as a ruin, with minimal interventions to protect the structure and replace certain recent insensitive works and improve visitor safety. The proposed interventions include:

- Replacement of iron handrails to the stairs and balconies (modern interventions by Coillte which are insensitive in design and have deteriorated, presenting a hazard). The handrails will be reversible interventions.
- The addition of one step to the existing large step down into the 'card room' on the half landing, to make the flight safer. The new step will be a reversible intervention.
- The sealing or blockage of the chimney flues to prevent people from climbing up the flues onto the roof. The sealing will be a reversible intervention.
- Removal of pigeon droppings from the interior.
- Removal of modern graffiti from the walls. It is proposed that any historic graffiti identified will be retained.
- Repairs to the roof to prevent water intrusion (some dampness and water were noted during survey, as well as lime leaching and some biological colonisation in the form of green mould and lichens). The roof repair will be informed by detailed survey of the roof structure.
- Investigation of the nature and condition of the earth flooring that exists currently on the interior of the Hell Fire Club is to be investigated, subject to the necessary ministerial and planning consents associated with national monuments and protected structures. Where stone floors survive, they are to be revealed and repairs carried out as necessary. Where earthen flooring is identified, it is to be overlaid with a more suitable durable material, such as stone flags, if deemed appropriate. It is intended that this will protect underlying archaeological features. A similar reversible approach was adopted in the crypt of Christ Church Cathedral in Dublin.
- The installation of discreet lighting inside the building where level changes or low lintels occur presenting hazards.
- A detailed survey by non-invasive techniques (LiDAR or laser scanners) to identify megalithic art, if this exists, on the Masonry within the building. The discovery of Neolithic art during the course of the recent excavation of the adjoining passage tomb, suggests that art may be present as it is suspected that stone from the adjacent passage tombs was used in the construction of the building. If such Neolithic artwork is discovered measures will be taken to ensure that it is not obscured by any recent or proposed interventions, and that it is suitably interpreted.

- Monitoring, repair and visitor access management of the Hell Fire Club building. Currently maintenance and conservation of the structure is piecemeal and visitor access is unchecked. It is proposed that as part of the management regime of the site the building will be formally inspected annually by a conservation architect to establish if repair works are required, to monitor the effects of increased visitor access and propose management measures if necessary.

It is not proposed to restrict access to the building. The building has proved resilient to visitor access in the past.

No other significant physical interventions are proposed for any architectural or archaeological features on the Hell Fire Club.

It is not proposed to return the fallen standing stone to an upright position.

The landscape development proposals for the Hell Fire Club have been prepared with consideration of the known and possible archaeological features of the site.

2.14.2 Massy's Walled Garden and other Protected Structures

It is proposed to conserve the walled garden as a ruin, with minimal interventions to protect the integrity of the structure and reveal the structure and spaces to visitors. The proposed interventions include:

- Removal of trees threatening the structure of the walled garden. A number of trees have taken root close to the external walls and the internal structural elements of the walled garden (notably the steps and the conservatory structure). These trees have caused, or have the potential to cause, the masonry to shift, and will continue to undermine the integrity of the structure if allowed to remain and grow. It is generally proposed that they be removed, under the guidance of a conservation architect to ensure that they do not further damage the structure, and that any damage already done is repaired;
- Retention of certain trees in the walled garden. It is considered that a certain number of the trees growing in the walled garden - notably one tree in the steps near the southern wall of the largest of the walled gardens, and several trees in the conservatory – (a) do not pose a threat to the integrity of the main structure, and (b) have significant amenity value. It is proposed that these trees (which have been individually identified) be retained and the masonry re-set where necessary, and that the effect of the trees on the structures be monitored annually as part of the architectural heritage monitoring and management programme;
- Clearance of scrub from the walled garden. It appears that the walled garden was used as a nursery in places (in the recent past) but abandoned; there are areas where numerous trees are growing close together. Elsewhere the garden has been colonised by scrub. As a result of the dense internal vegetation the interior of the walled garden is not legible. It is proposed to clear the vegetation (excluding trees with amenity value) to reveal the structure, spaces and level changes to visitors;
- Maintenance of a meadow grassland within the walled garden. It is proposed to establish and maintain meadow grassland in the walled garden;
- Access and interpretation. It is proposed as part of the trail network and interpretation plan that the trail through the walled garden will be improved where necessary to meet the required quality and safety standards, and that signage will be provided for interpretation.

- No other significant physical interventions are proposed affecting the architectural and archaeological features of the Massy's Estate. It is proposed to widen the R115 in places for a section of approximately 100m along the Massy's Estate boundary, requiring the realignment of the existing boundary wall. This includes works in the immediate vicinity of the gothic gate lodge near the Massy's Estate property entrance, but no physical changes are proposed to the building itself. With the exception of the Military Road the various structures within Massy's are protected under a single listing in both the Record of Protected Structures and the National Inventory of Architectural Heritage (RPS#: 384, NIAH#: 11221018). They are described in the RPS listing as follows: 'Buildings and features associated with the former Killakee House, including former gardens, bridges and walls'. Should the proposed development be consented it is proposed that a monitoring and management programme be implemented for the entire suite of structures comprising the Massy's Estate Protected Structure listing. This will comprise:
    - Detailed survey and repair of the Massy's Estate Protected Structures. Initially each structure will be surveyed and recorded and any necessary repairs will be carried out to ensure its structural integrity;
    - Annual inspection and repair. An annual inspection will be carried out by a conservation architect to establish the condition of each structure and specify and supervise any necessary repair work;
    - Management measures in the case of deterioration. It is likely (subject to an interpretation plan in the event of development consent) that each visible feature will be interpreted on site with signage. This will identify the feature and request visitors' assistance in conserving the structures. Should it be found that increased visitor access (or any other cause) is resulting in a deterioration of the structure, measures will be taken to further protect the structure. Such measures might include additional signage/information requesting visitors' cooperation, re-routing of trails away from the structure, and/or hiding the structure with vegetation to reduce its exposure.

2.15 Management and Maintenance of Facilities

2.15.1 South Dublin County Council, Coillte and Dublin Mountains Partnership Management Steering Group

It is proposed to establish a permanent management steering group comprised of SDCC, Coillte and the DMP. This steering group would have responsibility for:

a) managing the contract, lease or license of the private operator of the facilities;

b) management and maintenance of the Hell Fire Club and Massy's Estate properties, including:
    - maintenance of all areas outside of the responsibility of the private operator;
    - conducting or arranging to have carried out annual inspections of (a) the trails, (b) the archaeological and architectural heritage features, (c) identified Key Ecological Receptors, and implementing any repair, improvement or protection works required;
    - carrying out an annual programme of works for the conversion of existing conifer plantations to permanent native mixed woodland on the 26ha portion of the Hell Fire Club property the subject of the Memorandum of Understanding between Coillte and SDCC, until the conversion is completed;

- coordination of all forest operations to ensure minimal conflicts with recreational use of the site and vice versa;
- Liaison with the neighbouring landowners, residents and other stakeholders, facilitated through the consultation forum of the DMP; and,
- Responding to any issues raised by the operator to do with the area outside of the operator's area of responsibility (e.g. issues that might be brought to the operator's attention by users, such as issues with the trails).

2.15.2 Private Operator of the Parking Area, Visitor Centre and Pedestrian Bridge

It is envisioned that the core visitor facilities, i.e. the parking area, the visitor centre and the pedestrian bridge will be managed by a private operator with commercial experience in the leisure/tourism sector.

2.16 Staffing

The staffing of the facilities will ultimately be determined by the private operator. The Business Plan prepared by CHL Consulting Company Ltd. estimates a staff complement of 22 people, as follows:

Table 2.5 Estimated Staffing of Visitor Centre

Role	No. Staff	Weeks p.a.
Centre manager	1	52
Café chef	1	52
Sous chef	1	52
Commis chef	1	52
Kitchen porter	1	52
Counter/ Serving Staff	1	52
Administration	1	52
Marketing executive	1	52

2.17 Opening Hours

It is proposed that the facilities will operate approximately during daylight hours.

Parking Area

- April to September, inclusive: 7am to 10pm.
- October to March, inclusive: 8am to 6pm.

There will be an emergency phone number provided at the entrance for any walkers returning to their cars after closing time, and a call-out/opening charge will be payable.

Visitor Centre

- April to September, inclusive: 8am to 8pm.
- October to March, inclusive: 9am to 5pm.

Special Events

It is anticipated that there may be opportunities to host special events on the site occasionally, e.g. sporting or cultural events, which may require opening of the facilities outside of the normal opening hours. It is proposed that such occasional events usage would be facilitated by means of the normal outdoor events licensing procedures operated by SDCC, with input from the facility management steering group and the private operator.

2.18 Visitor Numbers

The Business Plan prepared by CHL estimates that, over a five year period after opening, the facility could achieve annual visitor numbers of 225,000 (made up of 'domestic amenity' i.e. local visitors, domestic tourists, international tourists, schools and corporate groups), with this number possibly growing further to 300,000 over the subsequent five year period.

It is estimated that weekend usage of the facilities would double (from existing usage). It is also anticipated that there would be a greater spread of usage across the week due to the growth of tourist visits, and that the duration of visits would increase with the expanded range of facilities.

2.19 Proposed Shuttle Bus from Tallaght

It is proposed to operate a shuttle bus service to the site from Tallaght LUAS stop and Public Transport Hub at Tallaght Town Centre, via a proposed Park & Ride facility at Tallaght Stadium. The proposed route is 7.5km long via Oldbawn and Ballycullen. At Woodstown Village the shuttle bus could interchange with the No.15/15B Dublin Bus route.

The proposed shuttle bus service will operate seven days a week year-round, with a frequency of 15 to 30 minutes according to varying seasonal and daily demand. The potential demand for the bus service has been determined as part of the overall transport demand assessment.

2.20 Construction Phase

2.20.1 Overview

An Outline Construction and Traffic Management Plan is included in Appendix 4. The following items from the Plan are notable:

- A construction programme of 15 months is estimated;
- The Plan identifies two possible locations for a Site Construction Compound;
- The existing public parking provision of c. 80 No. spaces will be maintained on the site throughout the construction phase and this capacity will not be available for use by Contractor staff and other personnel associated with the works;
- Construction works and deliveries on weekdays will be restricted to between 07:00 and 19:00 subject to planning approval. Construction works and deliveries on Saturdays will be restricted to between 08:00 and 13:00 subject to planning approval. No works or deliveries will take place on Sundays or Bank/Public Holidays without prior written approval from the Employers Representative;
- Two-way traffic on public roads (the R113 and R115) will be maintained throughout the construction phase through the use of shuttles, temporary lights and any other required temporary traffic management measures. The traffic management measures will comply with the Department of the Environment

Traffic Signs Manual – Chapter 8 Temporary Traffic Measures and Signs for Road Works, and the Department's Guidance for the Control and Management of Traffic at Road Works. The traffic management measures will be subject to a Traffic Management Road Safety Audit by an independent party.

2.20.2 Site Preparation

Preliminary site clearance will be carried out on the site. Scrub and vegetation removal will be required as part of site preparation. Vegetation cleared from the site to facilitate construction works will be collected and stored on site wherever possible. Any non-reusable vegetation will be disposed of at an appropriately licensed waste facility.

2.20.3 Site Construction Compound

A main site construction compound will be required during the construction phase to provide office, canteen, washroom and toilet facilities. The compound will also provide facilities for materials and plant storage and the maintenance of same. The principal site construction compound will be established at the commencement of the contract and remain in place throughout the construction period. It is envisaged that the site for the compound will be in the vicinity of the area marked as 'Location 1' in Plate 2.3 below. Another possible location of the site compound is marked as 'Location 2' on Plate 2.3. Potential impacts that need to be guarded against include:

- Accidental spillage of pollutants into the surface water drainage system and woodlands.
- Damage to existing trees, plants and the woodland habitat.

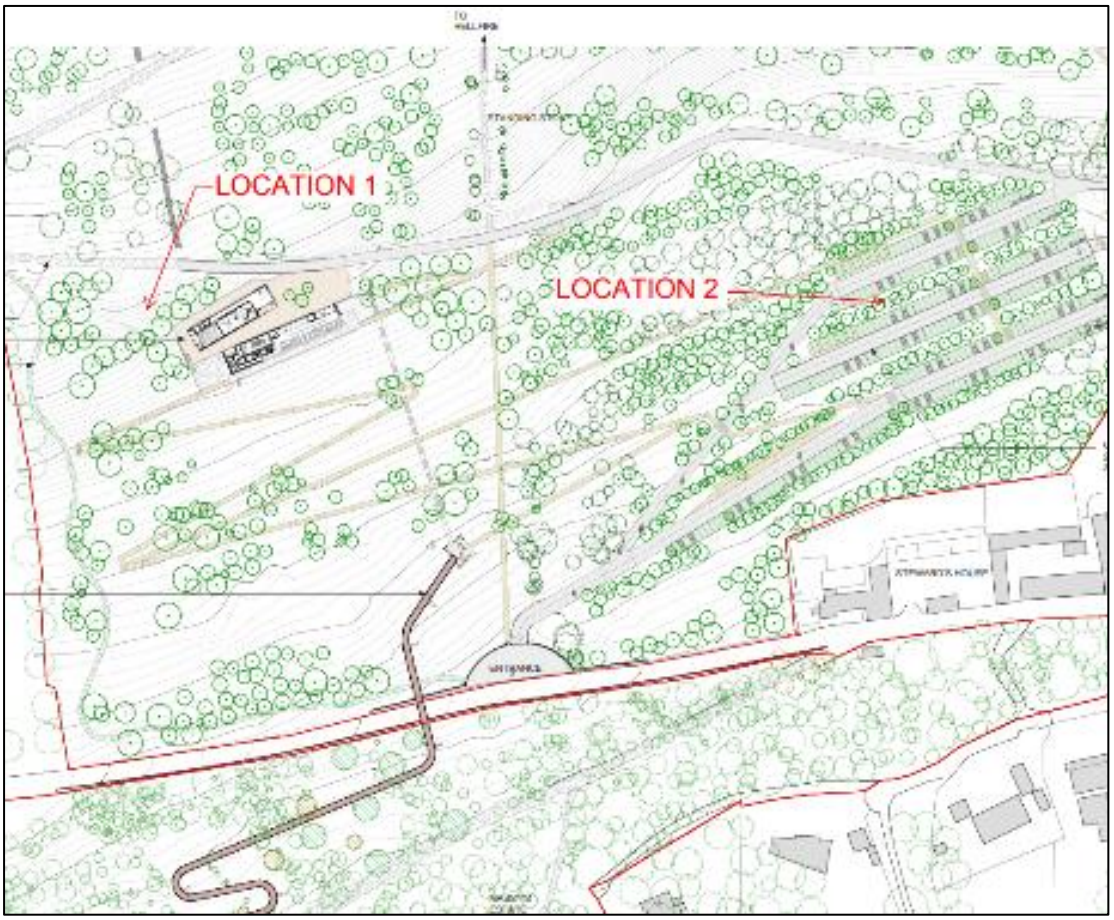

Plate 2.3 Construction site compound locations.

Bunded storage units for oil/fuel/hydrocarbons/chemical are to be provided on impermeable surfaces with a minimum 110% capacity.

There will be designated refuelling points selected which will be located on hard standing areas with no pathway to the surface water drainage system.

Oil interceptors will be provided in order to prevent runoff of pollutants to the river. The use of interceptors will be in compliance with Pollution Prevention Guidelines (PPG) 3. No detergents will be discharged to interceptors as this practice renders the interceptor useless.
A designated vehicle wash-down area will be identified with consideration to drainage arrangements and will be located away from surface water discharge point. Wash water will be collected and contained for disposal off site. Concrete washout will not be permitted to enter the surface water system.

The exact location and mode of operation of the site construction compound is selected by the contractor with regard to relevant guidelines of the Statutory Authority and the relevant agencies. There will be an early consideration of location of material stockpiles, which will be covered with geo-textile or similar to prevent mobilisation of suspended solids.

Embankment and cut slopes which are considered at risk from erosion are to be top soiled and seeded as soon as possible to prevent the deterioration due to weather events. Lining with hessian and maintenance will need to be considered if required.

Furthermore, the sites of the compounds will be cleared, reinstated and landscaped upon completion of the works to the satisfaction of the Statutory Authority.

2.20.4 Traffic Management

The Design Team has addressed the potential impacts of construction traffic to the local area of the R115 Stocking Lane/Killakee Road and existing carpark. There is no restriction on the Contractor in terms of the sequencing of construction activities. However, the current level of parking that is available to the public must be maintained throughout the works. Construction traffic may enter through the existing entrance; however, parking spaces that are made available for use by the public must not be occupied by construction traffic. Typical construction associated traffic would include operatives travelling to and from work and deliveries and removal of materials.

It is envisaged that advance traffic information on traffic proposals will be communicated to the public via local radio and newspapers. It is also envisaged that the Contractor will erect Variable Message Signs (VMS) at key locations in and around the R113 Mount Venus Road, R115 Stocking Lane/Killakee Road and Stocking Avenue.

All Construction Stage Traffic Management must comply with the following:

- Department of the Environment Traffic Signs Manual – Chapter 8 Temporary Traffic Measures and Signs for Road Works, and
- Department of the Environment Guidance for the Control and Management of Traffic at Road Works.

2.20.5 Constraints

Considering the relatively high volume of visitors to the Hell Fire Club at the weekends and on Bank/Public Holidays, constraints to the construction process may apply during these times.

Construction works and deliveries on weekdays will be restricted to between 07:00 and 19:00 subject to planning approval. Construction works and deliveries on Saturdays will be restricted to between 08:00 and 13:00 subject to planning approval. No works or deliveries will take place on Sundays or Bank/Public Holidays without prior written approval from the Employers Representative.

2.20.6 Temporary Traffic Management Road Safety Audit

The PSCS's/Contractor's Construction Stage Traffic Management Plan including all construction accesses, merges and diversions will be subject to a full Stage 2 (design) and Stage 3 (post-erection) Temporary Traffic Management Road Safety Audit by an independent Road Safety Audit Team.
The Construction Stage Traffic Management Plan must include:

- Construction vehicle accesses
- Location and details of all temporary roadworks signage including mobile VMS and road markings
- Location and details of all temporary safety barriers
- Details of works deliveries and storage of materials
- Risk Assessments for design and construction of temporary traffic management where relevant
- Details of any proposed construction phasing and associated temporary traffic management measures.

2.20.7 Vehicular Access to Site

Deliveries and general HGV traffic will access the DMVC site from the R115 Stocking Lane/Killakee Road. The location of the site compound is unlikely to change during the different construction phases. HGV's will be directed to an appropriate location and an appropriate member of staff from the contractor will be notified to meet the delivery and arrange offloading. Security of the site will be the responsibility of the Contractor and particular attention must be given to the continued use of the surrounding areas by the public. Pedestrian safety barriers will be erected at the entrance to the site to permit safe passage for pedestrians across the access to the development, segregating members of the public from HGV's and other vehicles entering the development.

The commencement of the main construction works will require significant additional construction plant. Regular deliveries of materials and ready mixed concrete will take place during these works. There will also be a minor increase in the construction workforce resulting in more cars and vans accessing the site. However, the Contractor will be required to provide a shuttle service for site operatives. All HGV's will access the site from the R115 Stocking Lane/Killakee Road. Safe access must be facilitated to construction traffic with additional specific measures employed to ensure safe access during darkness. It is assumed that the Contractor will have sufficient resources to facilitate safe access during hours that the car park is in use by the public. Sufficient space must be allocated to allow construction vehicles to turn around safely on-site to avoid vehicles reversing out of site access points.

2.20.8 Maintenance of Public Roads

There will be potential for delivery vehicles and other site traffic to carry mud and silt onto the public roads when exiting the site. In order to prevent this, a wheel-wash facility will be utilised on site. This will be used as required to wash down vehicles prior to leaving the site.

A road sweeper should also be deployed on the accesses to the site to keep this clean and prevent vehicles carrying mud onto the public roads and publicly used carparks. Roadside gullies and drainage channels will need to be maintained by the road sweeper contractor. Road line markings will require monitoring and markings that require replacement throughout the duration of the project will be replaced by a specialist contractor. Close supervision of haul vehicle loading must be carried out on a full-time basis by the Project Supervisor Construction Stage (PSCS)/Contractor personnel to ensure there is no over-loading of vehicles.

2.21 Environmental Operating Plans

Construction Environmental Management Plan

Prior to any demolition, excavation or construction a Construction and Traffic Management Plan (CTMP) will be produced by the contractor(s) for the proposed development. The CTMP will set out the Contractor's overall management and administration of a construction project. An Outline Construction and Traffic Management Plan has been prepared as part of this NIS, see Appendix 4. The CTMP will be developed by the Contractors during the pre-construction phase, to ensure commitments included in the statutory approvals are adhered to, and that it integrates the requirements of the EIAR. The Contractors will be required to include details under the following headings:

- Details of environmental management during construction (to be developed with the mitigation measures contained in the EIAR);
- Traffic management plan (to be developed in conjunction with the Local Authority – Roads Section) including details of routing of network traffic; temporary road closures; temporary signal strategy; routing of construction traffic; programme of vehicular arrivals; on-site parking for vehicles and workers; road cleaning; other traffic management requirements. The PSCS's/Contractor's Construction Stage Traffic Management Plan including all construction accesses, merges and diversions will be subject to a full Stage 2 (design) and Stage 3 (post erection) Temporary Traffic Management Road Safety Audit by an independent Road Safety Audit Team
- Details of emergency plan - in the event of fire, chemical spillage, cement spillage, collapse of structures or failure of equipment or road traffic incident within an area of traffic management. The plan must include contact names and telephone numbers for: Local Authority (all sections/departments); Ambulance; Gardaí and Fire Services;
- Details of temporary road surfaces, if required; and,
- Details of site clearance and set-up.

TII/NRA Environmental Construction Guidelines

The TII/NRA Environmental and Construction Guidelines provide guidance with regard to environmental best practice methods to be employed in construction on National Road Schemes for the following:

- Guidelines for the Treatment of Badgers prior to the Construction of a National Road Schemes;
- Guidelines for the Treatment of Bats during the Construction of National Road Schemes;
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes;

- Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes;
- Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post-Construction of National Road Schemes;
- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes;
- Guidelines on the Management of Noxious Weeds on National Roads;
- Guidelines for the Treatment of Noise and Vibration in National Road Schemes;
- Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes;
- Guidelines for the Management of Waste from National Road Construction Projects;
- Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan.

This is a non-exhaustive list and relevant guidance current at the time of construction will be followed. It is proposed to employ these guidelines, as and where relevant, on the Dublin Mountains Visitor Centre project.

2.22 Receiving Natural Environment

The site of the proposed development is located in the Montpellier Hill and Massy's Estate area of South County Dublin. The Hell Fire Club is located on Montpelier Hill which rises to 388m and is the most north westerly outlying hill of the Dublin Mountains. The slopes around the hill are comprised of agricultural grasslands on the north side and conifer plantation on the remaining sides. The Hell Fire Club is a working, commercial forest and will remain so into the future. With a new visitor facility and enhanced amenity function there would be a need for some localised changes in land use and management to ensure the commercial forest and the planned amenity can coexist. It is proposed to increase the area of car-parking in the northern section of the site through the provision of new terraces on the upper slopes. It is envisaged that the terrace arrangement could be laid out to suit site conditions and retain trees where necessary. At present some mature trees have been retained adjacent to the car park for aesthetic reasons and screening of the car park. However, their retention will not be feasible into the future due to the potential of the conifers to become over tall and prone to wind throw. The car-park spaces will be reinforced grass/Grass-crete and the routes/drives will be tarmac. A number of middle-aged broadleaved trees are found at Hell Fire Club as well as some mature trees which pre-date the forest and clearly grew in open ground in the past.

Massy's Estate, in contrast to Hell Fire Club, is predominantly a broadleaved woodland. There are some areas of coniferous plantation and specimen trees from the original Killakee demesne. Mature specimen trees are found throughout the woodland. Whilst predominantly a recreational forest with a high biodiversity function, woodland management works are ongoing with the thinning of areas of beech. It is expected that the management of the woodland can be adapted to accommodate the amenity value that may be required. Stone bridges and an area which consists of a walled garden which was originally part of the Killakee demesne are located to the eastern extremity of the site. The Glendoo Brook flows in a south-north direction along the eastern extremity of the Massy's Estate section of the site, with one tributary flowing east through Massy's Estateinto the Glendoo Brook. The river connects into the River Dodder approximately 6km downstream.

There are three European sites within the likely Zone of Impact of the proposed development, namely the Wicklow Mountains SAC, the Wicklow Mountains SPA, the Glenasmole Valley, the River Tolka and South Dublin Bay SPA and the North Bull Island SPA.

Plate 2.4 Location of proposed visitor centre.

2.23 Likely Effects on the Natural Environment

Significant potential risks to the natural environment arising from the proposed development are as follows:

- Construction works and the presence of new structures will result in habitat loss. The effect of these impacts would be a reduction in overall habitat area within and in the vicinity of the proposed development.
- Noise, vibration, lighting and visual disturbance will cause impacts during the construction phase and have the potential to impede the movement of species, including mammals and birds, in and around the area of the proposed development.
- Construction works have the potential to spread invasive species within and outside the site.
- Water quality impacts arising from both the construction and the operation of the proposed development have the potential to directly and indirectly affect a wide range of habitats and species. Surface water drains into Glendoo Brook and eventually the River Dodder which discharges into the River Liffey and eventually Dublin Bay. The potential effects of water quality impacts include habitat degradation and changes to population and community structure, as well as barriers to connectivity.

- The increase in visitors to the area of the proposed development and the wider area may cause disturbance and lead to habitat degradation or the permanent displacement of certain species.
- The increase in human presence may also lead to the spread of invasive species, particularly through people feeding grey squirrels.

3.0 IDENTIFICATION OF ADVERSE EFFECTS

3.1 Establishing the Likely Zone of Impact

Section 3.2.3 of DEHLG (2010) outlines the procedure for selecting the European sites to be considered in Appropriate Assessment. It states that European sites potentially affected should be identified and listed, bearing in mind the potential for direct, indirect and cumulative effects. It also states that the specific approach in each case is likely to differ depending on the scale and likely effects of the plan or project. However, it advises that the following sites should generally be included:

- All European sites within or immediately adjacent to the plan or project area;
- All European sites within the likely zone of impact of the plan or project; and,
- In accordance with the Precautionary Principle, all European sites for which there is doubt as to whether or not they might be significantly affected.

The "likely zone of impact" of a plan or project is the geographic extent over which significant ecological effects are likely to occur. In the case of plans, this zone should extend to a distance of 15km in all directions from the boundary of the plan area. In the case of projects, however, the guidance recognises that the likely zone of impact must be established on a case-by-case basis, with reference to the following key variables:

- The nature, size and location of the project;
- The sensitivities of the ecological receptors; and,
- The potential for cumulative effects.

For example, in the case of a project that could affect a watercourse, it may be necessary to include the entire upstream and/or downstream catchment in order to capture all European sites with water-dependent features of interest.

Having regard to the above key variables, the likely zone of impact was defined as the entire area within 5km of the proposed development, and, the Glendoo Brook downstream as far as The Liffey Estuary Lower transitional waterbody as far as the North Bull and Poolbeg Lighthouses.

The likely zone of impact covers the trails from the Hell Fire Club car park to a distance of over 5km i.e. a 10km round trip. This is in recognition of the potential for impacts associated with an increase in visitor numbers to the areas, which will include a proportion of walkers. The walker survey (Appendix 2) concluded that the proposed visitor centre has been forecast to attract up to 300,000 visitors per year (821 per day spread over the full 7 days of the week), which is approximately 3 times the current number of visitors (current daily average: 241). The average daily increase in visitors will therefore be 580 people.

The walker survey data shows that if the current visitor patterns are applied, then perhaps 3% of these additional visitors may venture through Massy's Estate to Cruagh Wood, which would amount to 20 people per day.

If the typical 11% proportion of walkers who go onto the open mountain from Cruagh Wood is applied (which seems quite unlikely given the cumulative distance of over 6km for the round trip from Hell Fire Club), then perhaps two of the additional visitors may reach the SAC and SPA area on Cruagh Mountain per day. Hypothetically therefore the number of people walking on the upper mountain could increase from just 23 per day to 25 per day on average.

A geographical representation of the likely zone of impact was produced in ArcGIS 10.5 using the proposed development boundary and publicly available Ordnance Survey Ireland maps. This was used in combination with NPWS shapefiles to identify the boundaries of European sites in relation to the likely zone of impact (Figures 3.1). It was determined that four European sites occur within or adjacent to the likely zone of impact. Table 3.1 assesses if and how these sites are connected to the proposed development. Detailed descriptions of these European sites are given in Section 3.2.

It was determined that four European sites, namely the Wicklow Mountains SPA, the Wicklow Mountains SAC, the Glenasmole Valley SAC and the South Dublin Bay and River Tolka Estuary SPA, occur within the likely zone of impact of the proposed development and that a further three sites, namely the North Bull Island SPA, the North Dublin Bay SAC and the South Dublin Bay SAC, occur adjacent to the likely zone of impact.

The North Bull Island SPA is considered to be connected to the proposed development as birds belonging to that site are likely to feed within the likely zone of impact. The North Dublin Bay SAC and the South Dublin Bay SAC are not considered to be in any way connected to the Project as the North Bull Wall and the Great South Wall form an effective barrier between any potential impacts from the proposed development and the Qualifying Interests of these sites, and these sites are not considered further.

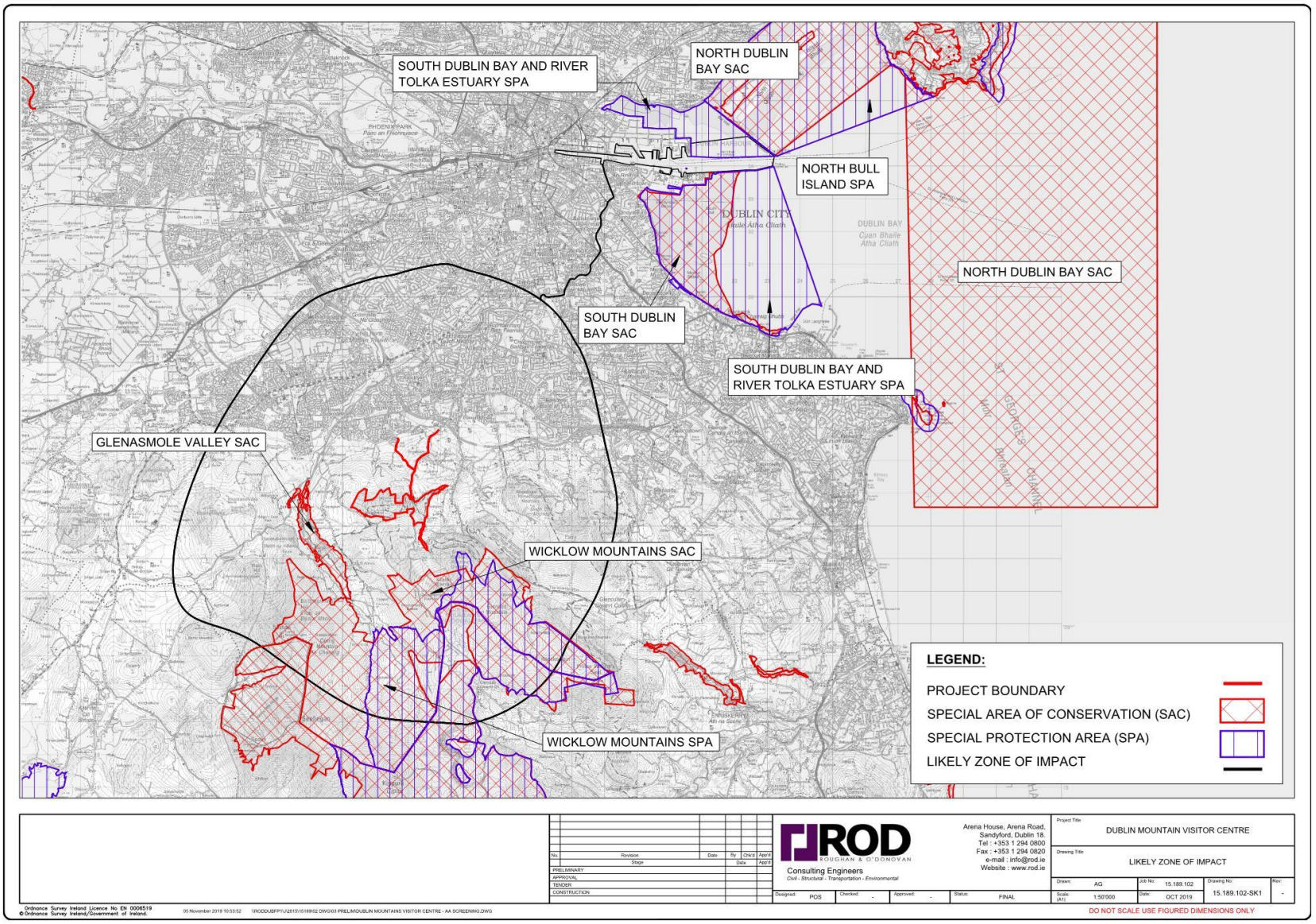

Figure 3.1 The boundaries of European sites relative to the likely zone of impact of the proposed development.

Table 3.1 European sites located within and adjacent to the likely zone of impact.

European site [site code]	How is the proposed development connected to this site?
Wicklow Mountains SAC [002122]	The shortest absolute distance from the proposed development (as the crow flies) to this site is 0.6km to the south. In terms of accessibility by visitors, the shortest walking distance between the proposed visitor centre car park and the site is 3.3km on existing trails through Massy's Estate, Cruagh Wood and the along the trail which traverses the western slope of Cruagh Mountain.
Wicklow Mountains SPA [004040]	The shortest absolute distance from the proposed development (as the crow flies) to this site is 0.9km to the south-east. In terms of accessibility by visitors, the shortest walking distance between the proposed visitor centre car park and the site is 2.8km on existing trails through Massy's Estate and Cruagh Wood.
Glenasmole Valley SAC [001209]	The shortest absolute distance from the proposed development (as the crow flies) to this site is 1.2km to the west. In terms of accessibility by visitors, the short shortest walking distance between the proposed visitor centre car park and the site is 7.9km on the Dublin Mountain Way. There is a shortcut through St. Anne's Burial Ground which is currently blocked by a farm gate and 'no entry' sign. If visitors were to leave the road and follow this route, the distance to the SAC would be 6.4km.
South Dublin Bay and River Tolka Estuary SPA [004024]	The shortest absolute distance from the proposed development (as the crow flies) to this site is 9.4km north-east. This distance is over land and the location is not within the likely zone of impact, i.e. there is no connection along these distances. The shortest distance from the proposed development to the site via a hydrological connection is 17 km north-east (down the Glendoo Brook, the Owendoher, the River Dodder and the River Liffey) at the ESB Dolphin, which is within the likely zone of impact. Therefore, the effective distance to the site is considered to be 17km.
North Bull Island SPA [004006]	The shortest absolute distance from the proposed development (as the crow flies) to this site is 14km north-east. This distance is over land, i.e. there is no connection along this distance. The shortest distance from the proposed development to the site via a hydrological connection is 20km north- east, through the Glendoo Brook, the Owendoher, the River Dodder, the River Liffey and across the Tolka Estuary to the Bull Wall, which is within the likely zone of impact. Therefore, the effective distance to the site is considered to be 20km.

3.2 Site Descriptions

3.2.1 Wicklow Mountains SAC

The description of the Wicklow Mountains SAC provided here is based on the Site Synopsis (NPWS, 2017a), Conservation Objectives (NPWS, 2017b) and Natura 2000 Standard Data Form (NPWS, 2017c) for the site, the Wicklow Mountains National Park Management Plan 2005-2009 (NPWS, 2005) and the Wicklow Mountains SAC Conservation Objectives Supporting Document- blanket bogs and associated habitats (NPWS, 2017d).

Site Overview

The Wicklow Mountains SAC is a complex of upland areas in Counties Wicklow and Dublin, flanked by the Poulaphouca Reservoir (Blessington Lake) to the west and Vartry Reservoir to the east, Cruagh Mountain in the north and Lybagh Mountain in the south. Most of the site is over 300m, with much ground over 600m. The dominant topographical features are the products of glaciation. High corrie lakes, deep valleys and moraines are common features of this area. The substrate over much of the area is peat, usually less than 2m deep. Poor mineral soil covers the slopes, and rock outcrops are frequent. The Wicklow Mountains are drained by several major rivers including the Dargle, Liffey, Dodder, Slaney and Avonmore.

Wicklow Mountains is important as a complex, extensive upland site. It shows great diversity from a geomorphological and a topographical point of view. The vegetation provides examples of the typical upland habitats with heath, blanket bog and upland grassland covering large, relatively undisturbed areas. In all, twelve habitats listed on Annex I to the Habitats Directive are found within the site. Several rare or protected plant and animal species occur, adding further to its value. Plate 3.1 below shows the path from Cruagh Wood looking South towards Killakee Mountain. Heath habitat typical of the Wicklow Mountains SAC is present.

Qualifying Interests of the Site

[1355] Otter (*Lutra lutra*)

[3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelleralia uniflorae*)

[3160] Natural dystrophic lakes and ponds

[4010] Northern Atlantic wet heaths with *Erica tetralix*

[4030] European dry heaths

[4060] Alpine and Boreal heaths

[6130] Calaminarian Grassland of the *Violetalia calaminariae*

[6230] *Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)

[7130] Blanket Bogs (* if active bog)

[8110] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)

[8210] Calcareous rocky slopes with chasmophytic vegetation

[8220] Siliceous rocky slopes with chasmophyic vegetation

[91A0] Old sessile oak wood with *Ilex* and *Blechnum* in the British Isles

Sensitivities of the Site and its Qualifying Interests

Large areas of the site are owned by the NPWS and are managed for nature conservation based on traditional land uses of upland areas. The most common land use is traditional sheep grazing, but others include turf cutting, mostly hand-cutting but some machine-cutting also occurs. These activities are largely confined to the Military Road, where there is easy access. Large areas which had been previously hand-cut and are now abandoned are regenerating. In the last 40 years, forestry has become an important land use in the uplands and has affected both the wildlife and the hydrology of the area. Amenity use is very high, with Dublin city close to the site. Peat erosion is frequent on the peaks. This may be a natural process but is likely to be accelerated by activities such as grazing.

Conservation Objectives for the Qualifying Interests

The conservation objective is to maintain the favourable conservation status for the qualifying interests that are currently of that status, including otter, Calaminarian grassland, dystrophic lakes and oligotrophic waters. The remaining qualifying interests are not of favourable conservation status, thus the conservation objective for these qualifying interests is to restore favourable conservation status. These Conservation Objectives focus on the Attributes of "*Habitat area*", "*Distribution", "Ecosystem function", "Diversity",* and *"Composition"* and *"Structure" of vegetation.*

Plate 3.1 Walking trail through the Wicklow Mountains SAC and SPA south of Cruagh Wood. Killakee Mountain is in the background.

3.2.2 Wicklow Mountains SPA

The description of the Wicklow Mountains SPA provided here is based on the Site Synopsis (NPWS, 2014a), Conservation Objectives (2014e), and Natura 2000 Standard Data Form (NPWS, 2017e) for the site, as well as the Wicklow Mountains National Park Management Plan 2005-2009 (NPWS, 2005).

Site Overview

This is an extensive upland site, comprising a substantial part of the Wicklow Mountains. Most of the site is in Co. Wicklow, but a small area lies in Co. Dublin. The underlying geology of the site is mainly of Leinster granites, flanked by Ordovician schists, mudstones and volcanics. The area was subject to glaciation and features fine examples of glacial lakes, deep valleys and moraines. Most of site is over 300m, with much ground being over 600m. The substrate over much of site is peat, with poor mineral soil occurring on the slopes and lower ground. Exposed rock and scree are features of the site. The predominant habitats present are blanket bog, heaths and upland grassland.

Up to 9 pairs of Merlin breed within the Wicklow Mountains SPA in any one year. The open peatlands provide excellent foraging habitat for Merlin with small birds such as Meadow Pipit being their main prey.

The cliffs and crags within the SPA also provide ideal breeding locations for Peregrine (20 pairs in 2002). Other birds of the open peatlands and scree slopes that have been recorded within the site include Ring Ouzel and Red Grouse. The Wicklow Mountains SPA is of high ornithological importance as it supports nationally important populations of Merlin and Peregrine, both species that are listed on Annex I of the Birds Directive. Part of Wicklow Mountains SPA is a Statutory Nature Reserve.

Qualifying Interests of the Site

[A098] Merlin (*Falco columbarius*)

[A103] Peregrine (*Falco peregrinus*)

Sensitivities of the Site and its Qualifying Interests

Large areas of the site are owned by the NPWS and are managed for nature conservation based on traditional land uses of upland areas. The most common land use is traditional sheep grazing, but others include turf cutting, mostly hand-cutting but some machine-cutting also occurs. In the last 40 years, forestry has become an important land use in the uplands and has affected both the wildlife and the hydrology of the area. Amenity use is very high, with Dublin city close to the site. Peat erosion is frequent on the peaks. This may be a natural process but is likely to be accelerated by activities such as grazing. The main threats which have been identified for this site include forestry, grazing, peat extraction, walking, horse-riding, unmotorized vehicles, paths, tracks and cycle tracks.

Conservation Objectives for the Qualifying Interests

No specific Conservation Objectives have been published for the Wicklow Mountains SPA, therefore, the Qualifying Interests have been assigned Conservation Objectives requiring the restoration or maintenance of favourable condition. As there are no Conservation Objectives for the Qualifying Interests, the Conservation Objectives have been taken from similar SPAs. The Conservation Objectives for these Qualifying Interests focus on population trend and distribution.

3.2.3 Glenasmole Valley SAC

The description of the Glenasmole Valley SAC provided here is based on the Site Synopsis (NPWS, 2013), Conservation Objectives (2018), and Natura 2000 Standard Data Form (NPWS, 2017f) for the site.

Site Overview

Glenasmole Valley in south Co. Dublin lies on the edge of the Wicklow uplands, approximately 5km from Tallaght. The River Dodder flows through the valley and has been impounded here to form two reservoirs which supply water to south Dublin. The non-calcareous bedrock of the Glenasmole Valley has been overlain by deep drift deposits which now line the valley sides. They are partly covered by scrub and woodland, and on the less precipitous parts, by a herb-rich grassland. There is much seepage through the deposits, which brings to the surface water rich in bases, which induces local patches of calcareous fen and, in places, petrifying springs.

The site provides excellent habitat for bats, with at least four species recorded: Pipistrelle, Leisler's, Daubenton's and Brown Long-eared. Otter occurs along the river and reservoirs. The site supports Kingfisher, an Annex I species under the Birds Directive. Glenasmole Valley contains a high diversity of habitats and plant communities, including three habitats listed on Annex I of the Habitats Directive.

The presence of four Red Data Book plant species further adds to the value of the site, as does the presence of populations of several mammal and bird species of conservation interest.

Qualifying Interests

[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)

[6410] *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

[7220] Petrifying springs with tufa formation (*Cratoneurion*)

Sensitivities of the Site and its Qualifying Interests

The main land use of the area within the site is agriculture and commercial forestry. The area supports pasture for grazing and commercial forest plantations. These activities alongside new developments are putting pressure on the sensitivities of the site. The Natura 2000 data form lists the main threats to the Glenasmole Valley SAC as non-intensive grazing, planting of non-native trees and clear-felling, untreated sewage, fertilisation, pollution from agriculture and forestry, discontinuous urbanisation and changes to hydrology.

Conservation Objectives for the Qualifying Interests

No specific Conservation Objectives have been published for the Glenasmole Valley SAC, therefore, the Qualifying Interests have been assigned Conservation Objectives requiring the restoration or maintenance of favourable condition. As there are no Conservation Objectives for the Qualifying Interests, the Conservation Objectives have been taken from similar SACs. The Conservation Objectives for these Qualifying Interests focus on habitat area, habitat distribution, vegetation structure and composition, hydrological regime and water quality.

Plate 3.2 below shows an example of the Glenasmole Reservoir service road.

Plate 3.2 Glenasmole Reservoir Service Road, part of the Dublin Mountain Way.

3.2.4 South Dublin Bay and River Tolka Estuary SPA

The description of the South Dublin Bay and River Tolka Estuary SPA provided here is based on the Site Synopsis (NPWS, 2015a), Conservation Objectives (NPWS, 2015b) and Natura 2000 Standard Data Form (NPWS, 2017g) for the site, as well as the South Dublin Bay and River Tolka Estuary SPA Conservation objectives supporting document (NPWS, 2014b).

Site Overview

This site comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dún Laoghaire and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included. In the south bay, the intertidal flats extend for almost 3km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist. A small sandy beach and bedrock shores occurs. The site includes an enclosed area of saltmarsh and muds that is cut off from the sea by a railway line, being linked by a channel to the east. Sea water incursions into the marsh occur along this stream at high tide. An area of grassland is also included in the site.

The site is of ornithological importance as it supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further nine wintering species. Furthermore, the site supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for three tern species. Notably, four of the species that regularly occur at this site are listed on Annex I of the Birds Directive, namely Bar-tailed Godwit, Common Tern, Arctic Tern and Roseate Tern. Parts of the site are also designated as the Ramsar Convention site "Sandymount Strand/Tolka Estuary".

Qualifying Interests of the Site

[A046] Light-bellied Brent Goose (*Branta bernicla hrota*)

[A130] Oystercatcher (*Haematopus ostralegus*)

[A137] Ringed Plover (*Charadrius hiaticula*)

[A141] Grey Plover (*Pluvialis squatarola*)

[A143] Knot (*Calidris canutus*)

[A144] Sanderling (*Calidris alba*)

[A149] Dunlin (*Calidris alpina*)

[A157] Bar-tailed Godwit (*Limosa lapponica*)

[A162] Redshank (*Tringa totanus*)

[A179] Black-headed Gull (*Chroicocephalus ridibundus*)

[A192] Roseate Tern (*Sterna dougallii*)

[A193] Common Tern (*Sterna hirundo*)

[A194] Arctic Tern (*Sterna paradisaea*)

[A999] Wetlands

Sensitivities of the Site and its Qualifying Interests

As this site is mostly comprised of coastal wetlands and is located directly adjacent to a major city and port, expansion of the city and port poses the greatest threat to its integrity. Reclamation of land from the sea, estuary or marsh represents a direct loss of key Qualifying Interests of the Site. Roads, urbanisation, human habitation, industrial and commercial activities and discharges present pressures on the site in terms of disturbance and pollution. Watersports, walkers, horse riding and non-motorised vehicles also cause persistent disturbance to the birds within the site. Angling, particularly bait collection, causes both disturbance to birds and reduces food availability. The site is also subject to some natural eutrophication pressures.

Conservation Objectives for the Qualifying Interests

All of the Qualifying Interests of the site are currently considered to be in a favourable conservation condition. Therefore, all Qualifying Interests, with the exception of Grey Plover, which is proposed for removal as a Qualifying Interest, have been assigned Conservation Objectives requiring the maintenance of this condition. These Conservation Objectives predominantly focus on the Attributes of "*Population trend*" and "*Distribution*", but those for the three tern species cover a broader range of Attributes, e.g. "*Breeding population abundance: apparently occupied nests (AONs)*" and "*Productivity rate: fledged young per breeding pair*", and that for Wetlands focuses exclusively on the Attribute of "*Habitat area*".

3.2.5 North Bull Island SPA

The description of the North Bull Island SPA provided here is based on the Site Synopsis (NPWS, 2014c), Conservation Objectives (NPWS, 2015c) and Natura 2000 Standard Data Form (NPWS, 2017g) for the site, as well as the North Bull Island SPA Conservation objectives supporting document (NPWS, 2014d).

Site Overview

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th Centuries.

It is c. 5km long and 1km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses.

The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also, of significance is the regular presence of several species that are listed on Annex I to the Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl. North Bull Island is a Ramsar Convention site, and part of the North Bull Island SPA is a Statutory Nature Reserve and a Wildfowl Sanctuary.

Qualifying Interests of the Site

[A046] Light-bellied Brent Goose (*Branta bernicla hrota*)
[A048] Shelduck (*Tadorna tadorna*)
[A052] Teal (*Anas crecca*)
[A054] Pintail (*Anas acuta*)
[A056] Shoveler (*Anas clypeata*)
[A130] Oystercatcher (*Haematopus ostralegus*)
[A140] Golden Plover (*Pluvialis apricaria*)
[A141] Grey Plover (*Pluvialis squatarola*)
[A143] Knot (*Calidris canutus*)
[A144] Sanderling (*Calidris alba*)
[A149] Dunlin (*Calidris alpina*)
[A156] Black-tailed Godwit (*Limosa limosa*)
[A157] Bar-tailed Godwit (*Limosa lapponica*)
[A160] Curlew (*Numenius arquata*)
[A162] Redshank (*Tringa totanus*)
[A169] Turnstone (*Arenaria interpres*)
[A179] Black-headed Gull (*Chroicocephalus ridibundus*)
[A999] Wetlands

Sensitivities of the Site and its Qualifying Interests

The greatest pressures/threats to the integrity of the North Bull SPA come from the bridge/viaduct located within the site (and the potential for other structures to be built within the site. Recreational pressures include bait digging/collection, nautical sports, walking, horse riding, non-motorised vehicles and the golf course (all inside the site). Roads, motorways, shipping lanes, continuous urbanisation and industrial or commercial areas (all outside the site) also represent significant pressures/threats to the integrity of this site. Other patterns of habitation within the site represent a lower-level pressure/threat. The pressures/threats listed also impact the species within the site, some of which are listed under Annex I to the Birds Directive disturbance, habitat loss, and a reduction in food availability.

Conservation Objectives for the Qualifying Interests

All of the Qualifying Interests of the site are currently considered to be in a favourable conservation condition. Therefore, all Qualifying Interests have been assigned Conservation Objectives requiring maintenance of this condition.

These Conservation Objectives focus on the Attributes of "*Population trend*" and "*Distribution*", but that for Wetlands focuses exclusively on the Attribute of "*Habitat area*".

3.3 Evaluation against Conservation Objectives

As highlighted in Section 1.2, guidance from the European Commission (EC, 2001) explains that "*the integrity of a site involves its ecological functions*" and that "*the decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives*". Following this guidance, the identification of adverse effects potentially arising from the proposed development on the integrity of the European sites identified in Section 3.1 and described in Section 3.2 focusses on and is limited to the Conservation Objectives of those sites.

Tables 3.2 to 3.6, inclusive, detail the identification of potential adverse effects on the sites concerned. In considering the potential for adverse effects on the Conservation Objectives for each Qualifying Interest in each European site, regard was had to the Attributes and Targets which define each site-specific Conservation Objective.

Table 3.2 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Wicklow Mountains SAC [002122].

Qualifying Interest	Conservation Objective as per NPWS (2017b)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Oligotrophic waters containing very few minerals of sandy plains (*Littorelleralia uniflorae*) [3110]	*"To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelleralia uniflorae) in the Wicklow Mountains SAC"*.	Lake habitat 3110 is likely to occur in Loughs Dan, Tay, Upper and Lower Lakes (Glendalough), and Upper and Lower Bray in the Wicklow Mountains SAC. The nearest example of this habitat to the proposed development is Lower Lough Bray, 5.8km from the southern end of Massy's Estate or 10.2km from the proposed visitor centre car park along the existing trails and the Military Road. Due to the distance between the proposed development and this Qualifying Interest and the lack of hydrological connectivity, the proposed development does not provide for any impacts to this habitat	No
Natural dystrophic lakes and ponds [3160]	*To maintain the favourable conservation condition of Natural dystrophic lakes and ponds in the Wicklow Mountains SAC*.	Owing to their altitude, all pools and lakes, with the exception of the Lower Lake (Glendalough) and Lough Dan, have been mapped as potential 3160. There are examples of this habitat in the Killakee and Glendoo Mountains. The nearest example of this habitat to the proposed development is near the summit of Killakee Mountain, 1.2km from the southern end of Massy's Estate or 4.8km from the proposed visitor centre car park along the existing trails. The pool is c. 230m from the path. Due to the distance between the proposed development and this Qualifying Interest and the lack of hydrological connectivity, the proposed development does not provide for any impacts to this habitat.	No
Northern Atlantic wet heaths with *Erica tetralix* [4010]	*To restore the favourable conservation condition of Northern Atlantic wet heaths with Erica tetralix in the Wicklow Mountains SAC.*	The habitat occurs throughout the SAC, often occurring in association with blanket bog, upland acid grassland and rocky habitats. It is typically present on shallow peaty soils on steep slopes and in sheltered conditions. From current available data the total area of the qualifying habitat is estimated to be approximately 8,248ha, covering 25% of the SAC. This habitat occurs locally on parts of Cruagh Mountain and Glendoo Mountain where it grades into blanket bog. It also occurs locally along some of the trails on Curagh, Glendoo and Kilakee Mountains where *Erica cinerea* and *Vaccinium myrtilus* are found. The nearest examples of this habitat in the SAC to the proposed development are 1.6km from the southern end of Massy's Estate or 3.4km from the proposed visitor centre car park along the existing trails. There is potential for a small increase in footfall to lead to braiding and erosion of the habitat along the existing trails, reducing the overall area in the SAC.	Yes

Qualifying Interest	Conservation Objective as per NPWS (2017b)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
European dry heaths [4030]	*To restore the favourable conservation condition of European dry heaths in the Wicklow Mountains SAC.*	The habitat occurs throughout the SAC, often occurring in association with blanket bog, upland acid grassland and rocky habitats. It is typically present on shallow peaty soils on steep slopes and in sheltered conditions. From current available data the total area of the qualifying habitat is estimated to be approximately 4,210ha, covering 13% of the SAC. This habitat is found on Cruagh Mountain, Kilakee Mountain and Glendoo Mountain. The nearest examples of this habitat in the SAC to the proposed development are 1.6km from the southern end of Massy's Estate or 3.4km from the proposed visitor centre car park along the existing trails. There is potential for a small increase in footfall to lead to braiding and erosion of the habitat along the existing trails, reducing the overall area in the SAC.	Yes
Alpine and Boreal heaths [4060]	*To restore the favourable conservation condition of Alpine and Boreal heaths in the Wicklow Mountains SAC.*	Alpine and Boreal heaths occur at high altitudes within the SAC. From current available data the total area of the qualifying habitat is estimated to be approximately 326ha, covering 1% of the SAC. Examples are present in the Kippure, Lugnaquilla and Mullaghcleevaun mountain areas. The nearest recorded example of this habitat to the proposed development is on Kippure Mountain, 5.8km from the southern end of Massy's Estate or 15.5km from the proposed visitor centre car park along the existing trails and the Military Road. Due to the distance between the proposed development and this Qualifying Interest and the lack of hydrological connectivity, the proposed development does not provide for any impacts to this habitat.	No
Calaminarian grasslands of the Violetalia calaminariae [6130]	*To maintain the favourable conservation condition of Calaminarian grasslands of the Violetalia calaminariae in Wicklow Mountains SAC.*	In Wicklow Mountains SAC, Calaminarian grassland is documented to occur at old lead mine workings at Glendasan (Old Hero Mine) on the north-facing slope of the Glendasan River valley side, at Foxrock Mine on the south-facing slope of the valley side and at East of Lough Nahanagan at the foot of the northeast-facing hillslope of Camaderry and on the base of a slope at the edge of the valley. The nearest example of this habitat to the proposed development is >25km south. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat.	No

Qualifying Interest	Conservation Objective as per NPWS (2017b)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
***Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]**	*To restore the favourable conservation condition of *Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) in the Wicklow Mountains SAC.*	This habitat is documented to occur on the north-eastern slopes of Carrigshouk Mountain and on the north-western slopes of Ballineddan Mountain. From current available data the total area of the qualifying habitat is estimated to be approximately 2ha, covering less than 1% of the SAC. The nearest recorded example of this habitat to the proposed development is 18km south on Carrigshouk Mountain. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat.	No
Blanket bogs (* if active bog) [7130]	*To restore the favourable conservation condition of Blanket bogs in the Wicklow Mountains SAC.*	Blanket bog is documented to occur throughout the SAC, often occurring in association with other habitats including heath and upland acid grasslands. Well-developed examples are present at Liffey Head Bog, Castlekelly Bog, Shankill Bog, Cloghoge Bog, Ballynultagh Bog and Brockagh Bog. The Liffey-head bog is found between Djouce, Kippure and Tonduff. The nearest example of this habitat to the proposed development is 5.8km from the southern end of Massy's Estate or 10.2km from the proposed visitor centre car park along the existing trails and the Military Road. The proposed development does not provide for any impacts to this habitat as defined by its conservation objectives. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat. Inactive blanket bog, which is not a Qualifying Interest of the SAC, is found on Glendoo Mountain in association with wet heath. It is flat and is dominated by Deergrass (*Trichophorum cespitosum*) and also contains Bog Asphodel, and, occasionally Bog Cotton and Sphagnum spp. in the lower areas.	No
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110]	*To restore the favourable conservation condition of Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) in the Wicklow Mountains SAC.*	The habitat is documented to occur at the Glen of Imaal, Ballineddan Mountain, Lough Nahanagan and Lugnaquilla including the North and South Prison. From current available data the total area of the qualifying habitat is estimated to be approximately 54ha, covering less than 1% of the SAC. The nearest example of this habitat to the proposed development is 25km south a Lough Nahanagan. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat.	No

Qualifying Interest	Conservation Objective as per NPWS (2017b)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Calcareous rocky slopes with chasmophytic vegetation [8210]	*To restore the favourable conservation condition of Calcareous rocky slopes with chasmophytic vegetation in the Wicklow Mountains SAC.*	The habitat is documented to occur within the corrie associated with Lough Ouler and close to the summit of Lugnaquilla. There is no data with which to estimate the approximate area of calcareous rocky slopes in the SAC. The nearest example of this habitat to the proposed development is 21km south at Lough Ouler. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat.	No
Siliceous rocky slopes with chasmophytic vegetation [8220]	*To restore the favourable conservation condition of Siliceous rocky slopes with chasmophytic vegetation in the Wicklow Mountains SAC.*	The habitat is documented to occur in locations with significant rock exposures such as Lugnaquilla, Glendalough Valley, Lough Ouler, cliffs to the northeast of Table Mountain, Lough Tay and the two Lough Brays. From current available data the total area of the qualifying habitat is estimated to be approximately 36ha, covering less than 1% of the SAC. The nearest example of this habitat to the proposed development is on the steep slopes around Lower Lough Bray, 5.8km from the southern end of Massy's Estate or 10.2km from the proposed visitor centre car park along the existing trails and the Military Road. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat.	No
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	*To restore the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the British Isles in the Wicklow Mountains SAC.*	The minimum area of old oak woodland within the SAC is estimated to be 215.4ha. The nearest example of this habitat to the proposed development and within the SAC is on the eastern shores of Lough Tay, 15km south-east of the proposed development. Due to the distance between the proposed development and this Qualifying Interest, the proposed development does not provide for any impacts to this habitat.	No
European *Otter Lutra lutra* [1355]	*To maintain the favourable conservation condition of European Otter in the Wicklow Mountains SAC.*	Several rivers rise in the likely zone of impact, namely the Glendoo Brook and Owendoher, tributaries of the River Dodder; and, the Glencullen and Glencree Rivers, tributaries of the River Dargle. At their headwaters on the heaths of Kilakee, Cruagh and Glendoo Mountain, which are within the SAC, these rivers are rushy areas of heath or at most small streams not big enough to hold an otter population. The Otter survey carried out of the Glendoo Brook and its tributary did not record any evidence of Otter. The proposed development does not provide for any impacts on this species as defined by its conservation objectives. Otter are considered in relation to the proposed development along the Glendoo Brook, however, given this species is largely nocturnal and the proposed will improve the riverine habitat, there is no impact on this species.	No

Table 3.3 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Wicklow Mountains SPA [004040].

Qualifying Interest	Conservation Objective as per NPWS (2014e)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Merlin (*Falco columbarius*) [A098]	*To maintain or restore the favourable conservation condition of Merlin (Falco columbarius) in the Wicklow Mountains SPA.* Attributes and Targets for this Qualifying Interest have been taken from those of the conservation condition of Merlin *Falco columbarius* in the British Isles in the Migneint-Arenig-Dduallt SPA [UK9013131] which is to maintain the favourable conservation condition of this Qualifying Interest (CCW, 2008).	The vast majority of Merlin nest in old crow nests at the edge of conifer plantations. The potential impacts on Merlin include loss of nesting site during the felling of conifer and disturbance of nest sites from the increase in visitors in the wider area. A Merlin survey was carried out during the breeding season in 2018 and 2019 which recorded a single Merlin Pass and a single 'possible' merlin plucking post. No evidence of breeding Merlin were recorded. A study on the current walker behaviour in the wider area of the proposed development and estimated change to this post development (Appendix 2) concluded that any increase in visitors accessing the SPA would be imperceptible when compared to the existing number of visitors accessing the SPA through the existing Coillte car parks such as Cruagh, Tibradden and Ticknock. However small (See Appendix 2), any increase in visitors accessing the SPA as a direct result of the proposed development could lead to habitat degradation, either directly through disturbance (visual, noise) or indirectly through a reduction in prey availability. Therefore, mitigation is required to reduce the potential for a reduction in habitat area and prey availability in the SPA.	Yes

Qualifying Interest	Conservation Objective as per NPWS (2014e)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Peregrine (*Falco peregrinus*) [A103]	*To maintain or restore the favourable conservation condition of Peregrine Falco peregrinus in the Wicklow Mountains SPA.* Attributes and Targets for this Qualifying Interest have been taken from those of the conservation condition of Peregrine *Falco peregrinus* in the British Isles in the Migneint-Arenig-Dduallt SPA. [UK9013131] which is to maintain the favourable conservation condition of this Qualifying Interest (CCW, 2008).	There are no potential nesting locations such as cliffs within the footprint of the proposed development or within 5km along the trails leading into the Wicklow Mountains SPA. Two Peregrine Falcon nesting sites are located within 5km of the proposed development (NPWS, pers comm). No Peregrine Falcon were recorded during the 2019 Merlin surveys, which indicates that the area is not important for this species. This is not surprising due to the low numbers of feral pigeons and stock doves, the favoured prey items of this species. Therefore, the proposed development will have no impact on the prey availability for this species. Owing to the nature and scale of the proposed development, the lack of Peregrine Falcon records in the area and low densities of prey species as well as the proximity of the project to the nearest nesting sites for Peregrine Falcon, the proposed development does not have the potential to adversely affect this Qualifying Interest. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for Peregrine Falcon.	No

Table 3.4 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Glenasmole Valley SAC [001209].

Qualifying Interest	Conservation Objective as per NPWS (2018)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]	*"To maintain or restore the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in the Glenasmole Valley SAC".* Attributes and Targets for this Qualifying Interest have been taken from those of the Conservation Objective for Seminatural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) in All Saints Bog and Esker SAC [000566] which is to maintain the favourable conservation condition of this Qualifying Interest (NPWS, 2016a).	In terms of accessibility by visitors, the short shortest walking distance between the proposed visitor centre car park and the site is 7.9km on the Dublin Mountain Way. There is a shortcut through St. Anne's Burial Ground which is currently blocked by a farm gate and 'no entry' sign. If this route was opened in the future, the shortest distance to the SAC on foot would be 6.4km. No Conservation Objectives have been developed for the site. However, the Site Synopsis describes this Qualifying Interest as occurring on the drier parts of the site. There are two access points into the site from the top of the upper reservoir. These are well developed access roads which are bound by fences or watercourses. The lands containing this Qualifying Interest are private farmland and therefore access by members of the public is unlikely. Therefore, owing to the nature and scale of the proposed development as well as the proximity of the proposed development to, and the location of the calcareous grasslands, the proposed development does not have the potential to adversely affect this Qualifying Interest. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for calcareous grasslands.	No

Qualifying Interest	Conservation Objective as per NPWS (2018)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
***Molinia* meadows on calcareous, peaty or clayey silt-laden soils (*Molinion caeruleae*) [6410]**	*"To maintain or restore the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in the Glenasmole Valley SAC".* Attributes and Targets for Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in Boleybrack Mountain SAC [002032], which is to maintain the favourable conservation condition of this Qualifying Interest (NPWS, 2016b)	In terms of accessibility by visitors, the short shortest walking distance between the proposed visitor centre car park and the site is 7.9km on the Dublin Mountain Way. There is a shortcut through St. Anne's Burial Ground which is currently blocked by a farm gate and 'no entry' sign. If this route was opened in the future, the shortest distance to the SAC on foot would be 6.4km. No Conservation Objectives have been developed for the site; however, the Site Synopsis describes the areas of Molinia meadows at the site occurring in association with the grasslands on the valley sides, and in particular in seepage and flushed areas. There are two access points into the site from the top of the upper reservoir. These are well developed access roads which are bound by fences or watercourses. The lands containing this Qualifying Interest are private farmland and therefore access by members of the public is unlikely. Therefore, owing to the nature and scale of the proposed development as well as the proximity of the project to, and the location of the *Molinia* meadows, the proposed development does not have the potential to adversely affect this Qualifying Interest. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for *Molinia* meadows.	No

Qualifying Interest	Conservation Objective as per NPWS (2018)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Petrifying springs with tufa formation (Cratoneurion) [7220]	*"To maintain or restore the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) in the Glenasmole Valley SAC"* Attributes and Targets for Petrifying springs with tufa formation (Cratoneurion) in Arroo Mountain SAC [001403] which is to maintain the favourable conservation condition of this Qualifying Interest (NPWS, 2016c).	In terms of accessibility by visitors, the short shortest walking distance between the proposed visitor centre car park and the site is 7.9 km on the Dublin Mountain Way. There is a shortcut through St. Anne's Burial Ground which is currently blocked by a farm gate and 'no entry' sign. If visitors were to leave the road and follow this route, the distance to the SAC would be 6.4km. No Conservation Objectives have been developed for the site; however, the Site Synopsis describes tufa springs as "*long-known from the site, along the valley sides, and some have substantial tufa mounds and banks. Tufa formation is also known from small streams within the woodland at the site. The tufa formations in Glenasmole are classified as in favourable conservation status. Tufa formation is also known from small streams within the woodland at the site*". There are two access points into the site from the top of the upper reservoir. These are well developed access roads which are bound by fences or watercourses. The lands containing this Qualifying Interest are within woodlands along the valley, particularly on the eastern side of the lower reservoir. Therefore, owing to the nature and scale of the proposed development as well as the proximity of the proposed development to, and the location of the tufa springs in relation to the areas normally accessed by visitors, the proposed development does not have the potential to adversely affect this Qualifying Interest. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for tufa springs.	No

Table 3.5 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the South Dublin Bay and River Tolka Estuary SPA [000710].

Qualifying Interest	Conservation Objective as per NPWS (2015b)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	*"To maintain the favourable conservation condition of Light-bellied Brent Goose in South Dublin Bay and River Tolka Estuary SPA"*	The Project is located 9.4km from the coast and 17km from the SPA hydrologically. Any accidental spillage of hydrocarbons, concrete or other pollutants which made their way into the Glendoo Brook would travel 17km through several urban rivers, the tidal sections of the Liffey and an industrial port before reaching the SPA. The significant downstream distance to the SPA, and the assimilative capacity of the River Liffey and Dublin Bay as a whole means that the risk of a contamination event occurring during construction or operation that would negatively affect water quality in the River Liffey and Dublin Bay is extremely low. Therefore, owing to the nature and scale of the proposed development as well as the proximity of the project to the Qualifying Interests, the proposed development does not have the potential to impact on significant numbers of any of these species. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for these Qualifying Interests.	No
Oystercatcher (*Haematopus ostralegus*) [A130]	*"To maintain the favourable conservation condition of Oystercatcher in South Dublin Bay and River Tolka Estuary SPA"*		No
Ringed Plover (*Charadrius hiaticula*) [A137]	*"To maintain the favourable conservation condition of Ringed Plover in South Dublin Bay and River Tolka Estuary SPA"*		No
Grey Plover (*Pluvialis squatarola*) [A141]	*"Grey Plover is proposed for removal from the list of Special Conservation Interests for South Dublin Bay and River Tolka Estuary SPA. As a result, a site-specific conservation objective has not been set for this species."*		No
Knot (*Calidris canutus*) [A143]	*"To maintain the favourable conservation condition of Knot in South Dublin Bay and River Tolka Estuary SPA"*		No

Qualifying Interest	Conservation Objective as per NPWS (2015b)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Sanderling (*Calidris alba*) [A144]	*"To maintain the favourable conservation condition of Sanderling in South Dublin Bay and River Tolka Estuary SPA"*	[as above]	No
Dunlin (*Calidris alpina alpina*) [A149]	*"To maintain the favourable conservation condition of Dunlin in South Dublin Bay and River Tolka Estuary SPA"*		No
Bar-tailed Godwit (*Limosa lapponica*) [A157]	*"To maintain the favourable conservation condition of Bar-tailed Godwit in South Dublin Bay and River Tolka Estuary SPA"*		No
Redshank (*Tringa totanus*) [A162]	*"To maintain the favourable conservation condition of Redshank in South Dublin Bay and River Tolka Estuary SPA"*		No
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	*"To maintain the favourable conservation condition of Black-headed Gull in South Dublin Bay and River Tolka Estuary SPA"*		No
Roseate Tern (*Sterna dougallii*) [A192]	*"To maintain the favourable conservation condition of Roseate Tern in South Dublin Bay and River Tolka Estuary SPA"*		No

Qualifying Interest	Conservation Objective as per NPWS (2015b)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Common Tern (*Sterna hirundo*) [A193]	*"To maintain the favourable conservation condition of Common Tern in South Dublin Bay and River Tolka Estuary SPA"*	[as above]	No
Arctic Tern (*Sterna paradisaea*) [A194]	*"To maintain the favourable conservation condition of Arctic Tern in South Dublin Bay and River Tolka Estuary SPA"*		No
Wetlands [A999]	*"To maintain the favourable conservation condition of the wetland habitat in South Dublin Bay and River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it"*	Owing to the nature and scale of the proposed development as well as the proximity of the proposed development to the Qualifying Interests, the proposed development does not have the potential to reduce the habitat area of wetlands. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for this Qualifying Interest.	No

Table 3.6 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the North Bull Island SPA [004006].

Qualifying Interest	Conservation Objective as per NPWS (2015c)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	*"To maintain the favourable conservation condition of Light-bellied Brent Goose in South Dublin Bay and River Tolka Estuary SPA"*	The proposed development is located 14km from the SPA directly and 20km from the SPA hydrologically. Any accidental spillage of hydrocarbons or other pollutants which made their way to the Glendoo Brook would travel 20km through several urban rivers, the tidal sections of the River Liffey and an industrial port before reaching the SPA, or areas used for feeding by the Qualifying Interests of the SPA. The significant downstream distance to the SPA, and the assimilative capacity of the River Liffey and Dublin Bay as a whole means that the risk of a contamination event occurring during construction or operation that would negatively affect water quality in the River Liffey and Dublin Bay is extremely low. Therefore, owing to the nature and scale of the proposed development as well as the proximity of the proposed development to the Qualifying Interests, the proposed development does not have the potential to impact on significant numbers of any of these species. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for these Qualifying Interests.	No
Oystercatcher (*Haematopus ostralegus*) [A130]	*"To maintain the favourable conservation condition of Oystercatcher in South Dublin Bay and River Tolka Estuary SPA"*		No
Golden Plover (*Pluvialis apricaria*) [A140]	*"To maintain the favourable conservation condition of Ringed Plover in South Dublin Bay and River Tolka Estuary SPA"*		No
Grey Plover (*Pluvialis squatarola*) [A141]	*"Grey Plover is proposed for removal from the list of Special Conservation Interests for South Dublin Bay and River Tolka Estuary SPA. As a result, a site-specific conservation objective has not been set for this species."*		No
Knot (*Calidris canutus*) [A143]	*"To maintain the favourable conservation condition of Knot in South Dublin Bay and River Tolka Estuary SPA"*		No

Qualifying Interest	Conservation Objective as per NPWS (2015c)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Sanderling (*Calidris alba*) [A144]	*"To maintain the favourable conservation condition of Sanderling in South Dublin Bay and River Tolka Estuary SPA"*	[as above]	No
Dunlin (*Calidris alpina alpina*) [A149]	*"To maintain the favourable conservation condition of Dunlin in South Dublin Bay and River Tolka Estuary SPA"*		No
Black-tailed Godwit (Limosa limosa) [A156]	*"To maintain the favourable conservation condition of Black-tailed Godwit in South Dublin Bay and River Tolka Estuary SPA"*		No
Bar-tailed Godwit (*Limosa lapponica*) [A157]	*"To maintain the favourable conservation condition of Bar-tailed Godwit in South Dublin Bay and River Tolka Estuary SPA"*		No
Curlew (*Numenius arquata*) [A160]	*"To maintain the favourable conservation condition of Curlew in South Dublin Bay and River Tolka Estuary SPA"*		No
Redshank (*Tringa totanus*) [A162]	*"To maintain the favourable conservation condition of Redshank in South Dublin Bay and River Tolka Estuary SPA"*		No

Qualifying Interest	Conservation Objective as per NPWS (2015c)	Does the Project provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Turnstone (*Arenaria interpres*) [A169]	*"To maintain the favourable conservation condition of Turnstone in South Dublin Bay and River Tolka Estuary SPA"*	[as above]	No
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	*"To maintain the favourable conservation condition of Black-headed Gull in South Dublin Bay and River Tolka Estuary SPA"*		No
Wetlands [A999]	*"To maintain the favourable conservation condition of the wetland habitat in South Dublin Bay and River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it"*	Owing to the nature and scale of the proposed development as well as the proximity of the proposed development to the Qualifying Interests, the proposed development does not have the potential to reduce the habitat area of wetlands. As such, it can be concluded beyond reasonable scientific doubt that the proposed development will not adversely affect the Conservation Objectives for this Qualifying Interest.	No

3.4 Summary of Adverse Effects

In Section 3.1, it was established that five European sites, namely the Wicklow Mountains SPA, the Wicklow Mountains SAC, the Glenasmole Valley SAC, the South Dublin Bay and River Tolka Estuary SPA and the North Bull Island SPA occur within or are connected to the likely zone of impact of the proposed development and that there are no pathways for effects between the proposed development and any other European sites.

In Section 3.3, it was established that, as a result of the implementation of the proposed development in the absence of appropriate mitigation, interruptions or delays in achieving certain Conservation Objectives for two of those sites, namely the Wicklow Mountains SAC and the Wicklow Mountains SPA, cannot be ruled out. A summary of the effects identified is given in Table 3.7 below.

Table 3.7 Summary of the European sites potentially affected by the proposed development and the Qualifying Interests potentially affected in each site.

European site	Qualifying Interest
Wicklow Mountains SAC	Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030]
Wicklow Mountains SPA	Merlin (*Falco columbarius*) [A098]

4.0 ASSESSMENT OF ADVERSE EFFECTS

4.1 Approach to Assessment

In Section 3.0 of this NIS, potential adverse effects on the integrity of the Wicklow Mountains SAC and the Wicklow Mountains SPA were identified. In accordance with European Commission guidance (EC, 2001), the identification of these effects was focussed on and limited to the Conservation Objectives of the sites concerned.

Section 4.0 provides a detailed analysis and evaluation of the adverse effects identified in Section 3.0 (as summarised in Section 3.4). In order to fully assess the implications of the proposed development for the European sites concerned, each of the potential adverse effects is evaluated with reference to the Attributes and Targets which define the Conservation Objectives of those sites.

4.2 Wicklow Mountains SAC

4.2.1 Annex I Habitats

The two Annex I habitats for which the Wicklow Mountains SAC is selected, and which are likely to be affected by the proposed development, are "Northern Atlantic wet heaths with *Erica tetralix*" and "European dry heaths". The Conservation Objectives for these two Qualifying Interests are shown in Table 3.2 above and the Attributes of the same are summarised as follows:

- Habitat area;
- Habitat distribution;
- Ecosystem function: soil nutrients;
- Community diversity;
- Vegetation composition;
- Vegetation structure;
- Physical structure; and,
- Indicators of local distinctiveness.

Habitat Area

The area of these Annex I habitats in the Wicklow Mountains SAC have not been mapped in detail. The Wicklow Mountains National Park Management Plan 2005-2009 mapped the area of the SAC within 5km of proposed development as 'Bog/ Heath/ Grassland mosaic'. These individual habitats have not been mapped, however following field studies and the precautionary principle, they are treated as such for the purpose of this assessment.

The proposed development does not provide for any loss of these habitats within its footprint. The proposed development may lead to an increase in visitors accessing the SAC and this has the potential to lead to braiding of paths and consequently erosion of the habitats along the existing trails within the SAC, particularly on Cruagh Mountain, Kilakee Mountain and Glendoo Mountain.

A survey of visitor usage was carried out in 2017 and again in 2019 for the proposed development. Data was also provided by the Dublin Mountains Partnership on car park use. The walker survey report (Appendix 2 to this NIS) concluded that based on the existing usage patterns, the proposed development would lead to an average increase in two people per day who enter the Wicklow Mountains SAC.

There is one link trail between the Hell Fire Club car park and Cruagh Wood that could enable visitors at the proposed visitor centre to extend their activity as far as Cruagh Mountain to the south, within the Wicklow Mountains SAC. The number of visitors using this path is insignificant relative to the numbers of visitors entering at the Cruagh Wood car park. Furthermore, dwell times at the Hell Fire Club car park mean that very few visitors stay more than two hours, which is roughly the time required to reach the boundary of the SAC and return.

The trails leading to the summit of Cruagh Mountain and further afield towards the Glendoo and Kilakee Mountains are informal, narrow with some localised erosion from rainfall. There was no evidence of significant erosion or excessive widening as a result of footfall. Recent fire damage was evident on the northern slope of Glendoo Mountain and the southern slope of Killakee Mountain close to the Old Military Road.

The total estimated area of "Northern Atlantic wet heaths with *Erica tetralix*" and "European dry heaths" is 12,458 hectares. The total length of trails within 5km of the proposed development which occur in the SAC and are considered one of these Annex I habitats is 4.95 km. If 1m of habitat was eroded from either side of the tracks, this would amount to 1 hectare in total, or 0.008% of the total area in the SAC. Therefore, the proposed development could lead to a slight decrease in habitat area and mitigation is required to avoid potential adverse effects.

Habitat Distribution

The distribution of these Annex I habitats in the Wicklow Mountains SAC have not been mapped in detail. The Wicklow Mountains National Park Management Plan 2005-2009 (which is the latest publication of the document) mapped the area of the SAC within 5km of proposed development as 'Bog/ Heath/ Grassland mosaic'. These habitats have not been mapped, however following field studies and the precautionary principle, they are treated as Annex I habitats for the purpose of this assessment.

The proposed development will not result in any loss of these habitats within its footprint. The proposed development may lead to an increase in visitors accessing the SAC and this has the potential to lead to braiding and erosion of the habitats along the existing trails within the SAC, particularly on Cruagh Mountain, Kilakee Mountain and Glendoo Mountain.

The distribution of these habitats is illustrated in the Wicklow Mountains National Park Management Plan 2005-2009 and in the Conservation Objective for the SAC. These habitats are widespread within 5km of the proposed development. Owing to the nature of the potential impacts i.e. localised path widening, it is considered that the proposed development does not have potential to lead to any significant change in the distribution of these Annex I habitats, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Ecosystem Function: Soil Nutrients

The target for this attribute is to '*Maintain soil nutrient status within natural range*'. The proposed development will not involve any physical works within the SAC or upstream of the SAC. The potential although unlikely increase in footfall in the SAC does not have the potential to alter the soil nutrient levels in these habitats because these impacts will be localised to the path edges and will not involve any drainage or additions of nutrients. Therefore, it is considered that the proposed development does not have potential to lead to any change in the soil nutrient status in these Annex I habitats in the SAC, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Community Diversity

The target for this attribute is to '*Maintain variety of vegetation communities, subject to natural processes*'. The proposed development will not involve any physical works within the SAC or upstream of the SAC. The slight increase in footfall in the SAC does not have the potential to alter habitats other than potentially those immediately adjacent to the existing paths. These impacts will be localised along the path edges and will not involve any drainage, disturbance outside a very small area or the addition of nutrients. Therefore, it is considered that the proposed development does not have potential to lead to any change in the abundance or variety of vegetation communities in these Annex I habitats, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Vegetation Composition

This attribute relates to the cover of certain species which define these types of habitats. Given the large area that these habitats cover within 5km of the proposed development, and the fact that the proposed development will not involve any physical works within the SAC or upstream of the SAC, the proposed visitor centre will not lead to any changes in the vegetation composition of these habitats within the SAC. The slight increase in footfall in the SAC does not have the potential to alter the vegetation composition other than potentially immediately adjacent to the existing paths. These potential impacts would be localised along the path edges and will not involve any drainage, disturbance outside a very small area, or, the addition of nutrients. Therefore, it is considered that the proposed development does not have potential to lead to any changes in the vegetation composition of these Annex I habitats, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Vegetation Structure

This attribute relates to the physical features of these habitats such as browsing and burning. Given the large area that these habitats cover within 5km of the proposed development, and the fact that the proposed development will not involve any physical works within the SAC or upstream of the SAC, the proposed visitor centre will not lead to any changes in the vegetation structure of these habitats within the SAC. The slight increase in footfall in the SAC does not have the potential to alter the vegetation structure other than potentially immediately adjacent to the existing paths. These impacts will be localised along the path edges and will not involve any drainage, disturbance outside a very small area or the addition of nutrients. Therefore, it is considered that the proposed development does not have potential to lead to any changes in the vegetation structure of these Annex I habitats, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Physical Structure

This attribute relates to the physical features of these habitats such as the amount of bare ground and drainage. Given the large area that these habitats cover within 5km of the proposed development, and the fact that the proposed development will not involve any physical works within the SAC or upstream of the SAC, the proposed visitor centre will not lead to any changes in the physical structure of these habitats within the SAC. The slight increase in footfall in the SAC does not have the potential to alter the physical structure other than potentially immediately adjacent to the existing paths. These impacts will be localised along the path edges and will not involve any drainage, disturbance outside a very small area or the addition of nutrients.

Therefore, it is considered that the proposed development does not have potential to lead to any changes in the physical structure of these Annex I habitats, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Indicators of Local Distinctiveness

This attribute relates to rare, scarce and protected species which occur in these Annex I habitats. Given the extensive areas that these habitats cover in the SAC and within 5km of the proposed development and the fact that the proposed development will not involve any physical works within the SAC or upstream of the SAC, the slight increase in footfall in the SAC does not have the potential to lead to a decline in the distribution or population sizes of rare, scarce and protected species. The impacts of footfall, if noticeable, will be localised along the path edges and will not involve any disturbance outside a very small area, the addition of nutrients or drainage. Therefore, it is considered that the proposed development does not have potential to lead to any changes in the physical structure of these Annex I habitats, therefore the proposed development will have no adverse effect on this attribute and no mitigation is required.

Conclusion

In the absence of mitigation, the proposed development provides for adverse effects on the integrity of the Wicklow Mountains SAC, in view of its Conservation Objectives for "Northern Atlantic wet heaths with *Erica tetralix*" and "European dry heaths". These effects include potentially some habitat loss along the trails in the SAC. Mitigation is, therefore, required in order to prevent such effects.

4.3 Wicklow Mountains SPA

The Qualifying Interest for which the Wicklow Mountains SPA is selected, and which is likely to be adversely affected by the proposed development is "Merlin". Conservation Objectives for the Wicklow Mountains SPA have not been prepared, and so, for the purpose of this assessment, the Conservation Objectives for Merlin have been taken from the Migneint-Arenig-Dduallt SPA [UK9013131] (CCW, 2008). The Conservation Objectives for this Qualifying Interests is shown in Table 3.3 above and the Attributes of the same are summarised as follows:

- Breeding population size;
- Breeding Merlin distribution;
- Breeding success;
- Extent of available nesting habitat; and,
- Extent of available hunting habitat and prey items.

Breeding Population Size

The Merlin studies carried out in 2018 and 2019 (Appendix 3) established that Merlin did not breed in the vicinity of the proposed development. There are known historical breeding sites to the southern fringes of the Dublin mountains at Glencree and Prince William Seat (McElheron, 2008). It is not known whether these have been occupied in recent years, but they are within relevant "hunting" distance of the sighting. There were also at least two active territories recorded in two 5km squares to the south west of the study area, at Kippure and the Coronation Plantation areas during the 2018 National Merlin Survey (unpublished data, Irish Raptor Study Group) and these are within 8 - 10 km of the location of the sighting noted in the 2019 survey, which is also within a feasible foraging range for Merlin.

Owing to the nature and scale of the development, it is considered that the proposed development does not provide for any sources of impacts which could lead to a decrease in the Merlin breeding population size. No adverse effects are anticipated on breeding population size of Merlin and no mitigation is required.

Breeding Merlin Distribution

The merlin studies carried out in 2018 and 2019 (Appendix 3) established that Merlin did not breed in the vicinity of the proposed development. Therefore, it is considered that the proposed development does not provide for any decrease in the breeding distribution of Merlin. No adverse effects are anticipated on breeding distribution of Merlin and no mitigation is required.

Breeding Success

The Merlin studies carried out in 2018 and 2019 (Appendix 3) established that Merlin did not breed in the vicinity of the proposed development in 2019, and that the area is not heavily used by hunting Merlin. Therefore, the proposed development does not provide for any decrease in the breeding success. No adverse effects are anticipated on the breeding success of Merlin and no mitigation is required.

Extent of Available Nesting Habitat

The merlin studies carried out in 2018 and 2019 (Appendix 3) established that Merlin did not breed in the vicinity of the proposed development in 2019. Merlin nesting habitat is generally along the edges of mature conifer plantations. Potential nesting habitat i.e. conifer plantations is found in areas on Montpellier Hill, Cruagh and Tibradden. These are outside the SPA but provide important nesting opportunities for the Wicklow and Dublin Mountains breeding population. The small areas of conifers which are being removed on Montpellier Hill are not considered under 'available nesting habitat' because they are highly disturbed, exposed and the adjacent habitat is not the preferred habitat for nesting Merlin. Merlin show a preference for nesting adjacent to moorland (Lusby et al., 2017) The proposed development will lead to a slight increase in visitors to areas of suitable habitat and this increase in disturbance may in turn lead to a decrease in available nesting habitat, although not in the context of conifer plantation forestry in the Dublin and Wicklow Mountains which is constantly in cycles of planting and felling. No adverse effects are anticipated on the extent of available nesting habitat for Merlin and no mitigation is required.

Extent of Available Hunting Habitat and Prey Items

The Merlin studies carried out in 2018 and 2019 (Appendix 3) established that Merlin did not breed in the vicinity of the proposed development in 2019. The open moorlands and woodland edges inside and outside the SPA, including the hills in the Dublin Mountains in the vicinity of the proposed development provide suitable hunting habitat for Merlin. Species such as Chaffinch, Skylark and Meadow Pipit were recorded regularly on the Merlin Survey in 2019. The walker survey report (Appendix 2 to this NIS) concluded that based on the existing usage patterns, two additional people would enter the Wicklow Mountains SPA per day as a result of the proposed development. The proposed development will lead to a slight increase in visitors to areas of suitable hunting habitat and this increase in disturbance may lead to a decrease in overall available hunting habitat and prey availability. The proposed development could lead to a decrease in available hunting habitat and prey items; therefore, mitigation is required to avoid potential adverse effects.

Conclusion

In the absence of mitigation, the proposed development provides for adverse effects on the integrity of the Wicklow Mountains SPA, in view of its Conservation Objectives for "Merlin". These effects include a decrease in the extent of available hunting habitat and prey items in the SPA. Mitigation is, therefore, required in order to prevent such effects.

5.0 MITIGATION

5.1 Principles and Approach

Section 4.0 of this NIS identified adverse effects likely to arise from the proposed development on the specific Attributes and Targets which define the Conservation Objectives for a number of Qualifying Interests of the Wicklow Mountains SAC and the Wicklow Mountains SPA. This section (Section 5.0) prescribes measures and a protocol to ensure their full and proper implementation aimed at mitigating these adverse effects, thereby protecting the integrity of these European sites during the construction and operation of the proposed development.

The mitigation measures prescribed in this NIS have been designed according to the principle of a mitigation hierarchy, as outlined in the European Commission's guidance document *Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2001). According to this hierarchy, the following mitigation approaches were adopted, in order of decreasing preference:

1. Avoiding impacts at their source;
2. Reducing impacts at their source;
3. Abating impacts on site; and,
4. Abating impacts at their receptor.

As mitigation measures are related directly to impacts and only indirectly to receptors and as, in this case, all of the affected receptors have been identified as being affected by the same set of impacts, to describe mitigation measures under the headings of the relevant receptors would lead to undue repetition. Therefore, the measures prescribed in this NIS are described under the headings of the types of impacts which they are intended to mitigate.

The mitigation measures are prescribed in Section 5.2 and a protocol to ensure their full and proper implementation is prescribed in Section 5.3. The significance of any residual effects following the inclusion of mitigation measures is evaluated in Section 5.4. As per the assessment of adverse effects in Section 4.0, this evaluation is made in view of the relevant Conservation Objectives.

5.2 Mitigation Measures

5.2.1 Visitor Management

Operational Phase

As explained in Section 4, the only element of the operation of the proposed development with the potential to give rise to adverse effects is the increase in visitor numbers entering the European sites which may lead to habitat loss and habitat degradation in relation to "Northern Atlantic wet heaths with *Erica tetralix*" and "European dry heaths", and a decrease in the availability of hunting habitat and prey items for Merlin.

In order to minimise the potential for 1) the loss of Annex I heath habitats along the existing trails and 2) the reduction in the availability of hunting habitat and prey items for Merlin as a result of increased visitor numbers accessing the SAC and SPA, the following mitigation measures shall be implemented:

- Information boards will be provided at the proposed visitor centre, in the car park, at the entrances to Massy's Estate and at the southern end of Massy's Estate. The boards shall be aesthetically engaging to encourage buy-in from visitors.

The information boards will communicate the following to visitors:

- The presence of Natura 2000 sites.
- The presence of ground nesting birds and other sensitive wildlife.
- The presence of sensitive heath habitats.
- A request to remain on the paths and to keep dogs on the lead.
- A map showing the waymarked trails in Massy's Estate, Montpellier Hill and the Dublin Mountain Way but not the trails leading into the SAC or SPA.

A number of looped, waymarked walking routes will be established in Massy's Estate and Montpellier Hill. These will be on the existing trails, with some sections improved and a small section of new trail forming a new link path. The establishment of these walks shall involve:

- The placement of suitably spaced colour-coded way marker posts at appropriate locations along the trails; and,
- The erection of a sign at the outset of the routes displaying a map of the routes with approximate length (km), duration (hours/minutes) and a conservative estimate of difficulty level (i.e. easy/moderate/strenuous).

5.3 Implementation and Compliance

In order to ensure the full and proper implementation of the mitigation and monitoring prescribed in Section 5.2 of this NIS, it is proposed as a condition of any consent granted in respect of the proposed development.

Ecological Clerk of Works

In order to ensure the successful development and implementation of the mitigation measure outlined in this NIS, SDCC will appoint an independent Ecological Clerk of Works (ECoW). The principal functions of the ECoW are:

- To approve the content and placement of the information boards.
- To carry out regular inspections of the construction works and report on the implementation of the mitigation measures prescribed in this NIS and in Chapter 7 Biodiversity of the EIAR.

The ECoW shall possess training, experience and knowledge appropriate to the role, including an NFQ Level 8 qualification or equivalent or other acceptable qualification in ecology or environmental biology.

5.4 Residual Effects

5.4.1 Annex I Habitats

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Annex I habitats to imperceptible levels. Any residual habitat loss will not significantly affect the overall structure and function of these habitats within the SAC.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Wicklow Mountains SAC in view of the Conservation Objectives for "Northern Atlantic wet heaths with *Erica tetralix*" and "European dry heaths"

5.4.2 Merlin

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Merlin to imperceptible levels. Any residual disturbance will not significantly affect the overall available hunting habitat and prey availability within the SPA.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Wicklow Mountains SPA in view of the Conservation Objective for "Merlin".

6.0 IN-COMBINATION EFFECTS

6.1 Introduction

Article 6(3) of the Habitats Directive requires that AA be carried out in respect of plans and projects that are likely to have significant effects on European sites, "*either individually or in combination with other plans or projects*". Therefore, the combined effects of the plan or project under assessment and other past, present or foreseeable future plans or projects must also be examined, analysed and evaluated.

6.2 Methodology

The geographical scope for the identification of plans and projects to be included in the assessment of in-combination effects included the entire area within 15 km of the proposed development.

The following were the principal sources consulted in the identification of other plans and projects with potential in-combination effects:

- An Bord Pleanála website;
- SDCC Planning Department; and
- The Department of Housing, Planning and Local Government's EIA Portal.

Table 6.1 below details the assessment of the implications for the relevant European sites of the following:

- The residual effects likely to arise from the proposed development (see Section 5.4 above); in combination with,
- Effects likely to arise from other plans and projects identified as having potential in-combination effects.

This assessment has been undertaken in view of the Conservation Objectives of the relevant European sites.

6.3 Outcome

As shown in Table 6.1 below, the proposed development does not have the potential to adversely affect any European site in combination with other plans or projects.

Table 6.1 Assessment of adverse effects arising from the proposed development in combination with plans or projects.

Name of plan or project	Description of plan or project	Likely in-combination effects
River Dodder Greenway	A 17km Greenway connecting Grand Canal Dock in Dublin City with Fort Bridge in Bohernabreena. Planning permission was granted for the South Dublin County Council section between Bohernabreena and Orwell Park in 2017 and this is currently in detailed design.	No likely significant effect – The River Dodder Greenway will lead to an increased number of recreational visits to the Glenasmole Valley SAC. The increase in visitors accessing the Glenasmole Valley in combination with the additional visitors accessing it from the Dublin Mountains Visitor Centre has been examined, and based on the current level of recreational use originating at the Hell Fire Club and the sensitivities and locations of the qualifying interests of the SAC, there will be no in-combination adverse effects.

No other projects or plans have been identified which would result in significant negative cumulative impacts. Other initiatives to improve access to and appreciation of the Dublin Mountains landscape, natural and cultural heritage resources (e.g. those of the DMP, Coillte and SDCC) could increase use of the site by visitors, but this is intended, and no significant negative impacts are predicted to arise as a result.

7.0 CONCLUSION

This NIS has been prepared in accordance with the relevant provisions of the Habitats Directive, the Habitats Regulations and the Planning and Development Act, as well as the relevant case law and current guidance. It has demonstrated that, in the absence of appropriate mitigation, the proposed Dublin Mountains Visitor Centre, individually or in combination with other plans or projects, would adversely affect the integrity of two European sites, namely the Wicklow Mountains SAC and the Wicklow Mountains SPA. In light of this finding, this Natura Impact Statement has prescribed appropriate mitigation to eliminate and minimise all negative impacts such that they no longer constitute adverse effects on the integrity of the sites concerned. This assessment has been undertaken on the basis of the best scientific knowledge in the field and the Precautionary Principle and no reasonable scientific doubt remains as to the absence of such effects.

It is the considered opinion of ROD, as the author of this NIS, that, in making its AA in respect of the proposed Dublin Mountains Visitor Centre, An Bord Pleanála, as the Competent Authority in this case, can determine that, given the full and proper implementation of the mitigation prescribed in this NIS, the proposed development, either individually or in combination with other plans or projects, will not adversely affect the integrity of the Wicklow Mountains SAC, the Wicklow Mountains SPA or any other European site.

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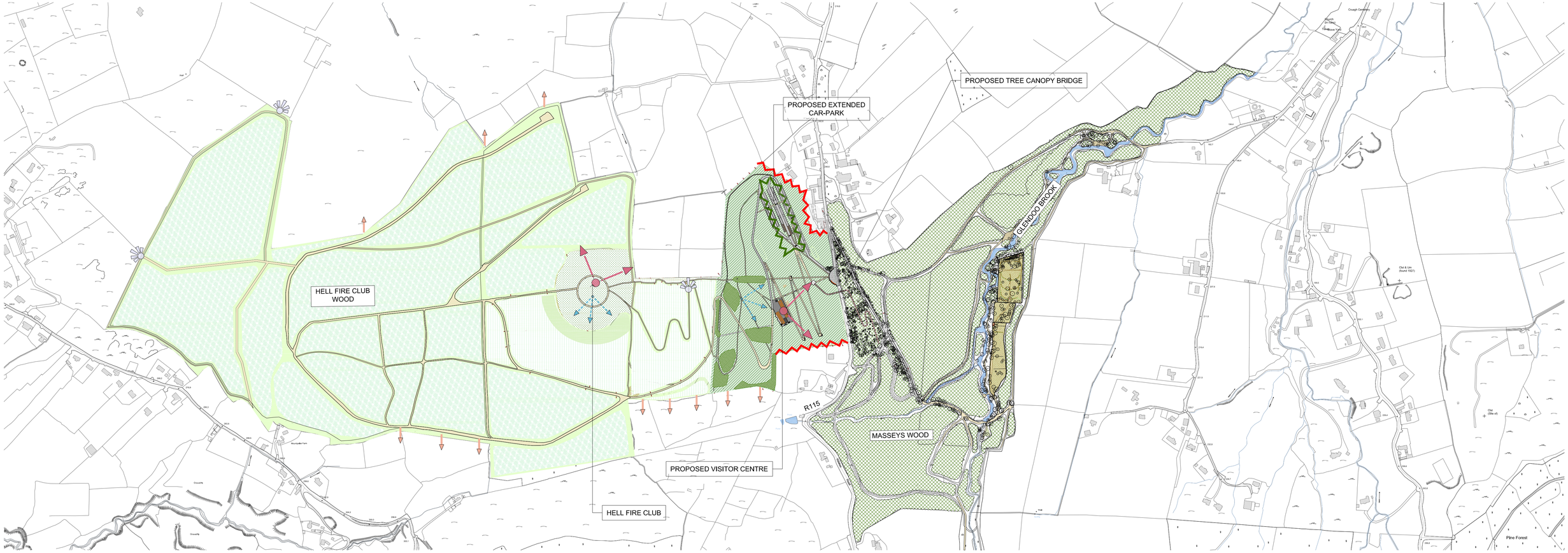
APPENDIX 1
Drawings of the Proposed Development



KEY:

LANDSCAPE OBJECTIVES

Retained Commercial Forest managed to compliment enhanced amenity role.
E.g:
- Diversification of species
- Continuous cover forestry
- Enhanced ecological functions
- Exemplar forest practices

Phased removal of coniferous woodland and conversion to predominately broad-leaved woodland.

Broad-leaved woodland restoration project. Recreating historic landscape pattern. Restoring old walls, maintaining open views north and east, and integrating new site infrastructure (robust screening and fencing to adjacent residential property)

Protect Residential amenity, retained and enhanced planting to screen development, secure boundary treatment to be provided.

Integrate/screen extended car parking.
- Retain existing mature trees whilst progressing broad-leaved woodland restoration program.
- Introduce new woodland tree and shrub planting between car-park terraces.

Restore / Enhance Remnant Historic Beechwoods

Masseys Wood
- Ongoing and enhanced management of Masseys Wood for amenity and natural conservation purposes.

Walled Garden
- Repair structures and clear overgrowth as required to enhance legibility of garden form in accordance with Conservation Architects Report.

CIRCULATION

(for further details see Trails Strategy)

Pedestrian Trails, where designated Equestrian use

Shared Use Trails - Pedestrian, accommodating vehicles (Coillte and/or Shuttle Bus), where designated Equestrian use

Grassed or Earthern Equestrian Trails

MANAGEMENT OF VIEWS

Panoramas to be maintained/enhanced through the long term management of tree height & spread

Intermittent/framed vistas to be opened up or managed

Localised views to surrounding landscape to be opened up through selective thinning of trees

Developed viewpoint with seating/picnic facilities

NOTE: Restore prominence of Hell Fire Club as landmark feature/silhouette on summit of Montpellier Hill when viewed from city/suburbs and environs.
- Cut back surrounding plantations from intruding on summit profile around Hell Fire Club.

NOTES:
DRAWINGS ISSUED FOR PLANNING PURPOSES ONLY.
LANDSCAPE IS SUBJECT TO APPROVAL OF THE PLANNING AUTHORITY.

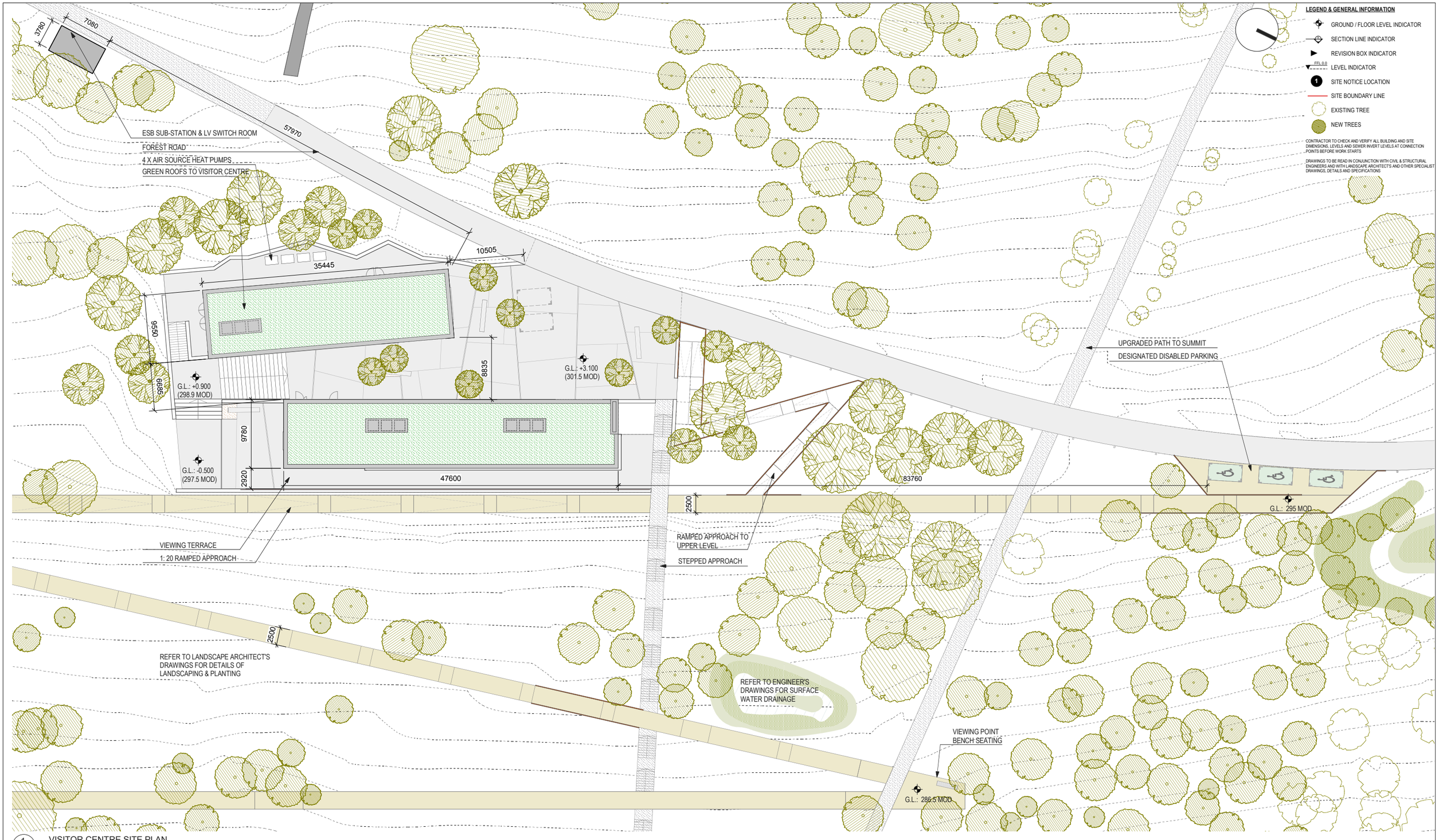
REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN

DUBLIN OFFICE
3 MOLESWORTH PLACE DUBLIN 2
TEL 01 661 0419 FAX 01 661 0431
EMAIL info@csrlandplan.ie

N

PROJECT: **DUBLIN MOUNTAINS VISITOR CENTRE**	DATE: JUNE 2017
	SCALE: 1:5000 @ A1
DRAWING: **LANDSCAPE STRATEGY**	DRAWN: DM CHECKED: DOL
	DRAWING NO: **16508-2-100**



1 PA-906 VISITOR CENTRE SITE PLAN

OUTLINE SPECIFICATION

FOUNDATIONS
REINFORCED PILES/STRIP CONCRETE FOUNDATIONS TO ENGINEER'S SPECIFICATION AND DETAILS

FLOORS
CONCRETE SCREED ON PRECAST HOLLOW-CORE FLOORS TO ENGINEER'S SPECIFICATION AND DETAILS: INSULATION TO GROUND FLOOR SLABS.

EXTERNAL WALLS
SELECTED STONE / CONCRETE /TIMBER FINISHES TO ARCHITECT'S SPECIFICATION. REFER TO ELEVATIONS FOR LOCATIONS.

340/455MM CAVITY WALL WITH A PAINTED 15MM SAND AND CEMENT RENDER FINISH ON 100MM BLOCK OUTER LEAF.

WINDOWS & DOORS
WINDOWS: TRIPLE-GLAZED TIMBER / ALUMINIUM COMPOSITE WINDOWS TO MANUFACTURER'S SPECIFICATION AND DETAIL.

DOORS
ALUMINIUM / HARDWOOD DOORS TO ARCHITECT'S LATER SPECIFICATION AND DETAIL.

GREEN ROOF
BAUDER OR EQUIVALENT GREEN ROOF SYSTEM TO ARCHITECT'S LATER SPECIFICATION

RAINWATER GOODS
ALUMINIUM GUTTERS AND DOWNPIPES TO ARCHITECT'S LATER SPECIFICATION.

LANDSCAPING
REFER TO LANDSCAPE DRAWINGS.

FINISHES
WALLS: 100/215MM PLASTER BLOCK/STUD WALLS THROUGHOUT.

CEILINGS: SKIM PLASTER CEILINGS TO ARCHITECT'S DETAILS.

DRAINAGE
INTERNAL STACKS TO FOUL AND ALL DRAINAGE TO ENGINEER'S SPECIFICATION AND DETAIL.

REVISIONS		STATUS		DRAWN	CHECKED
A	31/07/17	FA	ISSUED FOR PART 10 PLANNING APPROVAL	BNM	PK

STATUS : PR - PRELIMINARY ISSUE; FI - FOR INFORMATION; FA - FOR APPROVAL; FP - FOR PRICING; FC - FOR CONSTRUCTION

PROJECT: DUBLIN MOUNTAINS VISITOR CENTRE
DRAWING: VISITOR CENTRE SITE PLAN
JOB NO: 1639 | CLIENT: SDCC
DATE: JULY 2017 | SCALE: 1: 500 (A3). 1: 250 (A1)

PAUL KEOGH ARCHITECTS, CATHEDRAL COURT, NEW ST., DUBLIN 8.
TEL NO: 01 6791551 FAX NO: 01 6793476 E-MAIL: info@pka.ie

DRAWING NO.: 1639 / PA / 906 / A

PKA PAUL KEOGH ARCHITECTS

LEGEND & GENERAL INFORMATION

- GROUND / FLOOR LEVEL INDICATOR
- SECTION LINE INDICATOR
- REVISION BOX INDICATOR
- FFL 0.0 LEVEL INDICATOR
- 1 SITE NOTICE LOCATION
- SITE BOUNDARY LINE
- EXISTING TREE
- NEW TREES

CONTRACTOR TO CHECK AND VERIFY ALL BUILDING AND SITE DIMENSIONS, LEVELS AND SEWER INVERT LEVELS AT CONNECTION POINTS BEFORE WORK STARTS

DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL & STRUCTURAL ENGINEERS AND WITH LANDSCAPE ARCHITECTS AND OTHER SPECIALIST DRAWINGS, DETAILS AND SPECIFICATIONS

UPGRADED PATH TO HELLFIRE CLUB
HISTORIC STONE WALLS RETAINED
DESIGNATED PARKING

39 M

2 PA-905

FOREST ROAD
ESB SUB-STATION & LV SWITCH ROOM
VISITOR CENTRE
REFER TO DRG.1639-PA-001-008
EQUESTRIAN TRAIL
NEW RAMPED PATHS & RESTING PLACES WITH BENCH SEATING / INFORMATION PANELS

GL.: 301.5 MOD
GL.: 298 MOD
68 M
31 M
47.6 M

HELL FIRE WOODS

STEPPED APPROACH TO VISITOR CENTRE
BRIDGE HOUSE & TREETOP BRIDGE TO MASSY'S. REFER TO DRG. 1639-PA-010-014
REVISED, ENLARGED ENTRANCE FROM R115 REFER TO DRG. 1639-PA-020
REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR DETAILS OF PLANTING & LANDSCAPING

137 M

GL.: 273 MOD
GL.: 262 MOD
GL.: 256.5 MOD

MASSY'S ESTATE

KILLAKEE ROAD(R115)

1 PA-009
2 PA-009

GL.: 277 MOD
GL.: 278 MOD
GL.: 273 MOD
GL.: 269 MOD
28 M

CAR & BUS PARKING
275 CAR SPACES (14 DESIGNATED)
5 BUS SPACES
WETLAND AREAS FOR ATTENUATION (REFER TO ENGINEER'S DRAWINGS)
PROPOSED ROAD IMPROVEMENTS TO R115 (REFER TO ENGINEER'S DRAWINGS)

STEWARD'S HOUSE

LOCALISED WIDENING OF R115 INTO MASSY'S WOODS, ADJACENT TO EXISTING ENTRANCE
PROPOSED NEW FOOTPATH TO R115 (REFER TO ENGINEER'S DRGS.)

1 PA-905

TIMBERTROVE

1 PA-904 PROPOSED SITE LAYOUT PLAN

OS Sheet Nos: 3453-B, 3453-D, 3454-A, 3454-C, 3514-B, 3515-A, 3390-23, 3390-24, 3391-21, 3391-22, 3391-23, 3453-03

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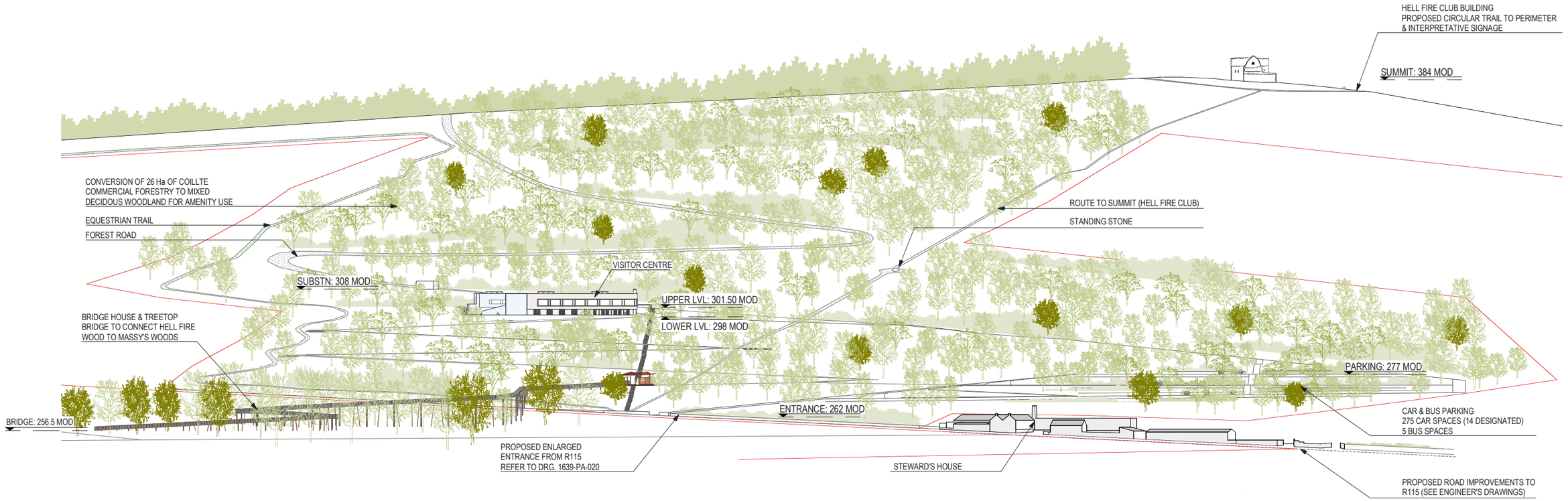
DRAWING: PROPOSED SITE LAYOUT PLAN
JOB NO: 1639 | CLIENT: SDCC
DATE: JULY 2017 | SCALE: 1: 1500 (A3), 1: 750 (A1)

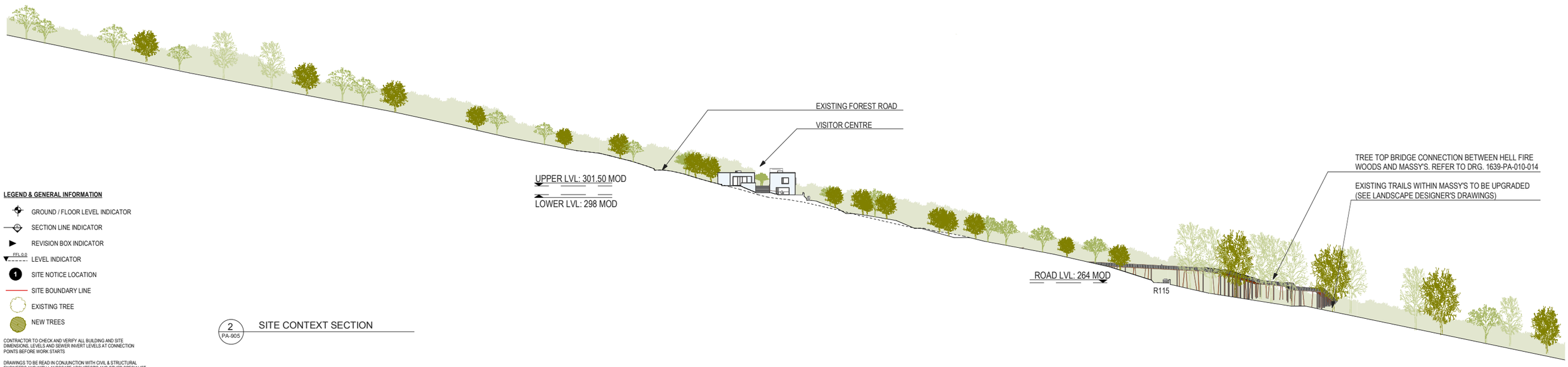
PAUL KEOGH ARCHITECTS, CATHEDRAL COURT, NEW ST., DUBLIN 8.
TEL NO: 01 6791551 FAX NO: 01 6793476 E-MAIL: info@pka.ie

DRAWING NO.: 1639 / PA / 904 / A

PKA PAUL KEOGH ARCHITECTS



1 PA-905 SITE CONTEXT ELEVATION



2 PA-905 SITE CONTEXT SECTION

LEGEND & GENERAL INFORMATION

- GROUND / FLOOR LEVEL INDICATOR
- SECTION LINE INDICATOR
- REVISION BOX INDICATOR
- FFL 0.0 LEVEL INDICATOR
- 1 SITE NOTICE LOCATION
- SITE BOUNDARY LINE
- EXISTING TREE
- NEW TREES

CONTRACTOR TO CHECK AND VERIFY ALL BUILDING AND SITE DIMENSIONS, LEVELS AND SEWER INVERT LEVELS AT CONNECTION POINTS BEFORE WORK STARTS

DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL & STRUCTURAL ENGINEERS AND WITH LANDSCAPE ARCHITECTS AND OTHER SPECIALIST DRAWINGS, DETAILS AND SPECIFICATIONS

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DRAWING: SITE CONTEXT SECTIONS & ELEVATIONS
JOB NO: 1639 | CLIENT: SDCC
DATE: JULY 2017 | SCALE: 1: 1500 (A3)

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HISTORIC STONE WALLS RETAINED
DESIGNATED PARKING

39 M

2 PA-905

FOREST ROAD
ESB SUB-STATION & LV SWITCH ROOM
VISITOR CENTRE
REFER TO DRG.1639-PA-001-008
EQUESTRIAN TRAIL
NEW RAMPED PATHS & RESTING PLACES WITH BENCH SEATING / INFORMATION PANELS

GL.: 301.5 MOD
GL.: 298 MOD
68 M
31 M
47.6 M

HELL FIRE WOODS

STEPPED APPROACH TO VISITOR CENTRE
BRIDGE HOUSE & TREETOP BRIDGE TO MASSY'S. REFER TO DRG. 1639-PA-010-014
REVISED, ENLARGED ENTRANCE FROM R115 REFER TO DRG. 1639-PA-020
REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR DETAILS OF PLANTING & LANDSCAPING

137 M

GL.: 273 MOD
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MASSY'S ESTATE

KILLAKEE ROAD(R115)

1 PA-009
2 PA-009

GL.: 277 MOD
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28 M

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275 CAR SPACES (14 DESIGNATED)
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68 M
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KILLAKEE ROAD(R115)

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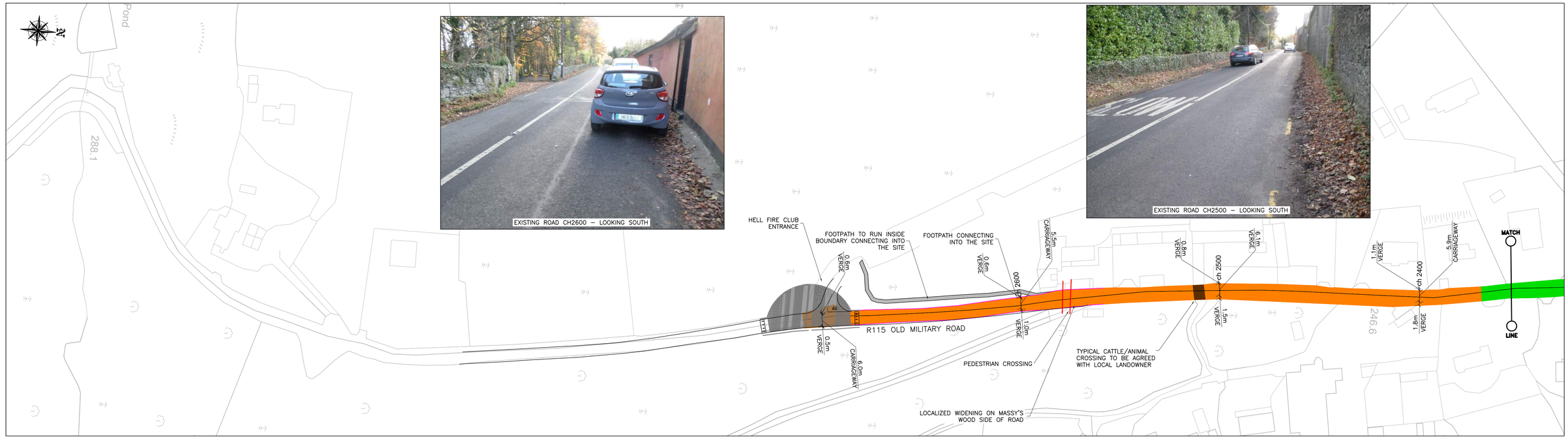
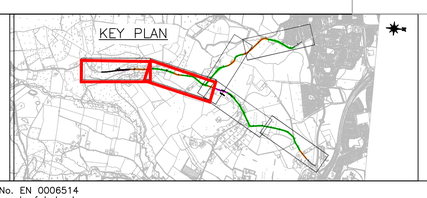


LEGEND:

- TYPE 1 – 5.5–6m TWO–WAY ROAD WITH 1.5m FOOTPATH
- TYPE 2 – 5–5.5m TWO–WAY ROAD WITH 1.5m FOOTPATH
- TYPE 3 – 3.5m SINGLE LANE ROAD WITH TRAFFIC CALMING

KEY PLAN



No.	Revision	Date	By	Chk'd	App'd
P1	ISSUED FOR PLANNING	24/07/17	LW	KOR	AWT

Stage	Date	App'd
PRELIMINARY		
APPROVAL		
TENDER		
CONSTRUCTION		

ROD ROUGHAN & O'DONOVAN
Consulting Engineers
Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford, Dublin 18.
Tel : +353 1 294 0800
Fax : +353 1 294 0820
e-mail : info@rod.ie
Website : www.rod.ie

Designed: RE | Checked: AWT | Approved: AWT | Status: PLANNING

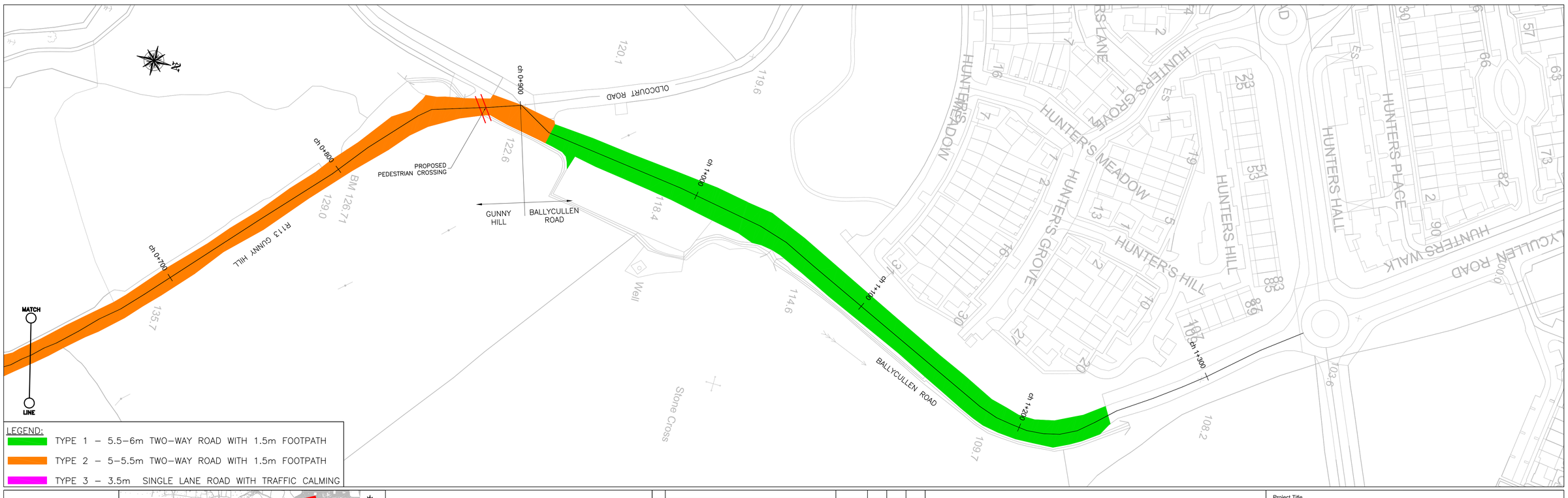
Project Title: DUBLIN MOUNTAINS VISITOR CENTRE

Drawing Title: PROPOSED ROAD LAYOUT
SHEET 1 OF 5

Drawn: RE | Job No: 15189 | Drawing No: DMVC-ROD-ZO-00-DR-C-0020 | Rev: P1

Scale: (A1) 1:25 @ A1 | Date: JULY '17

DO NOT SCALE USE FIGURED DIMENSIONS ONLY



LEGEND:

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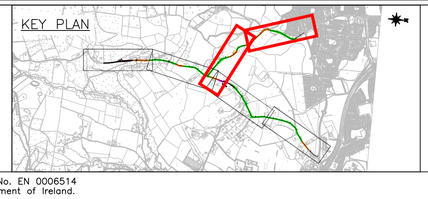
KEY PLAN



No.	Stage	Revision	Date	By	Chk'd	App'd
P1	PRELIMINARY	ISSUED FOR PLANNING	24/07/17	LW	KOR	AWT
	APPROVAL			Date		App'd
	TENDER					
	CONSTRUCTION					

ROD ROUGHAN & O'DONOVAN
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Civil - Structural - Transportation - Environmental

Arena House, Arena Road,
Sandyford, Dublin 18.
Tel : +353 1 294 0800
Fax : +353 1 294 0820
e-mail : info@rod.ie
Website : www.rod.ie

Designed:	Checked:	Approved:	Status:
RE	AWT	AWT	PLANNING

Project Title: DUBLIN MOUNTAINS VISITOR CENTRE

Drawing Title: PROPOSED ROAD LAYOUT SHEET 2 OF 5

Drawn:	Job No:	Drawing No:	Rev:
RE	15189	DMVC-ROD-ZO-00-DR-C-0021	P1
Scale: (A1) 1:25 @ A1	Date: JULY '17		

PROPOSED OPTION 3 LAYOUT PLAN
SEE DMVC-ROD-ZO-00-DR-C-0024
FOR DETAILS

R115 KILLAKEE ROAD

MATCH LINE

0.5m VERGE
5.2m CARRIAGEWAY
ch 1+500
0.9m VERGE
1.0m VERGE
5.7m CARRIAGEWAY
ch 1+400
1.2m BANK
8.6m CARRIAGEWAY
1.0m VERGE
ch 1+300
2.2m VERGE
6.1m CARRIAGEWAY
ch 1+200
1.5m VERGE
7.4m CARRIAGEWAY
1.4m BANK
ch 1+100
3.5m VERGE
1.1m BANK
ch 1+000
0.5m VERGE
0.4m VERGE
5.9m CARRIAGEWAY
0.7m VERGE
1.2m VERGE
6.1m CARRIAGEWAY
ch 0+900
0.8m BANK
0.7m VERGE
0.8m VERGE
5.8m CARRIAGEWAY
ch 0+800

193.6 191.3 185.9 180.6 BM 180.63 173.8 167.1 161.0 153.2 BM 139.22

KILLAKEE ROAD
STOCKING LANE
MOUNT VENUS ROAD
ROCKBROOK
R115 STOCKING LANE

Area under construction

EXISTING ROAD CH1500 – LOOKING NORTH

PROPOSED AREA FOR FOOTPATH

PROPOSED AREA FOR FOOTPATH

MATCH LINE

R115 STOCKING LANE

0.9m VERGE
1.0m BANK
ch 0+500
0.8m VERGE
ch 0+600
1.3m VERGE
6.4m CARRIAGEWAY
1.6m VERGE
ch 0+700
1.2m VERGE
6.4m CARRIAGEWAY
1.7m VERGE
5.7m CARRIAGEWAY
5.9m CARRIAGEWAY

139.2 135.8 132.0 131.0 131.0 146.7 141.5 144.42

ch 0+400
1.2m VERGE
5.9m CARRIAGEWAY
ch 0+300
1.4m VERGE
5.6m CARRIAGEWAY
1.2m VERGE
ch 0+200
1.8m VERGE
5.1m CARRIAGEWAY
0.5m VERGE
ch 0+100
2.0m VERGE
6.0m CARRIAGEWAY
ch 0+000

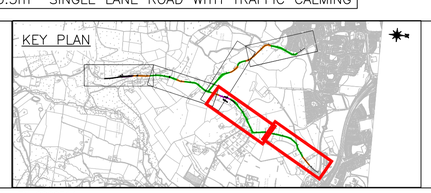
132.3 134.2 133.3

STOCKING AVENUE

LEGEND:

- TYPE 1 – 5.5–6m TWO–WAY ROAD WITH 1.5m FOOTPATH
- TYPE 2 – 5–5.5m TWO–WAY ROAD WITH 1.5m FOOTPATH
- TYPE 3 – 3.5m SINGLE LANE ROAD WITH TRAFFIC CALMING

KEY PLAN



No.	Revision	Date	By	Chk'd	App'd
	Stage		Date		App'd
P1	ISSUED FOR PLANNING	24/07/17	LW	KOR	AWT
	PRELIMINARY				
	APPROVAL				
	TENDER				
	CONSTRUCTION				

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Website : www.rod.ie

Designed: RE | Checked: AWT | Approved: AWT | Status: PLANNING

Project Title: DUBLIN MOUNTAINS VISITOR CENTRE

Drawing Title: PROPOSED ROAD LAYOUT
SHEET 3 OF 5

Drawn: RE | Job No: 15189 | Drawing No: DMVC-ROD-ZO-00-DR-C-0022 | Rev: P1

Scale: (A1) 1:25 @ A1 | Date: JULY '17

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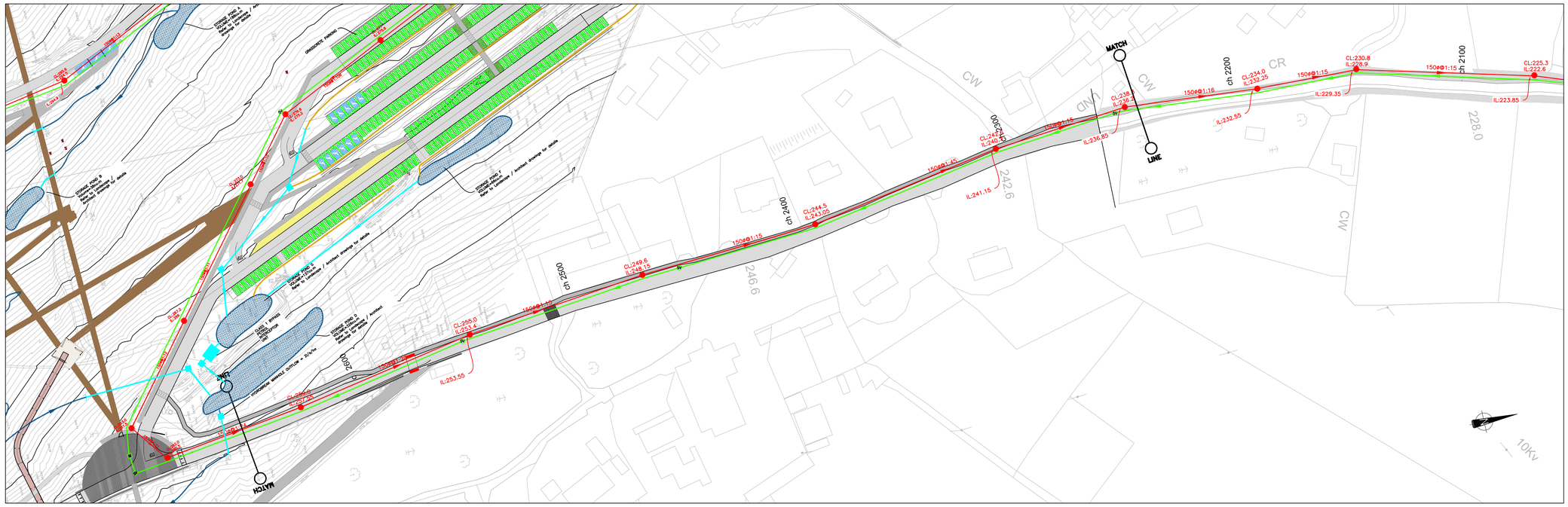

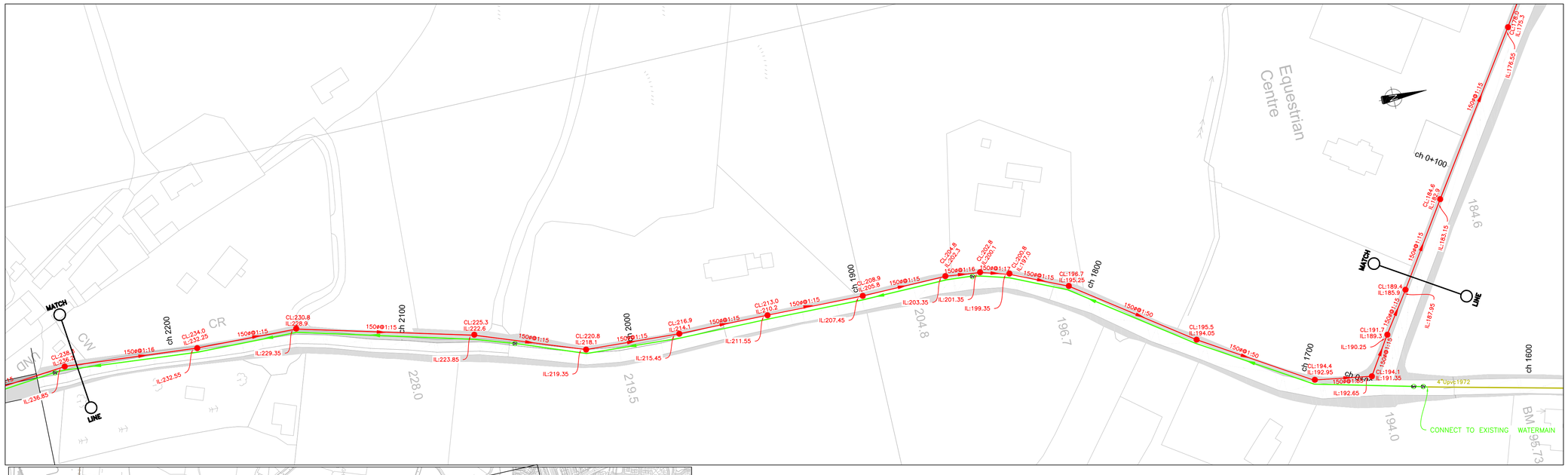

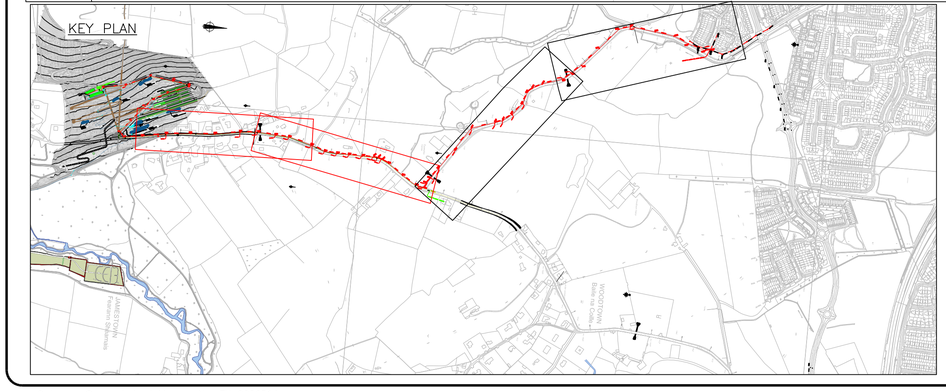

NOTES:

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2. HYDRANT QUANTITY AND LOCATION TO BE AGREED AS PART OF FIRE SAFETY CERTIFICATION
3. DOMESTIC CONNECTIONS TO NEW FOUL SEWER TO BE PROVIDED ONLY WITH RESIDENTS CONSENT

LEGEND:

- EXISTING SURFACE WATER SEWER/DRAIN WITH MANHOLE
- PROPOSED SURFACE WATER SEWER/DRAIN WITH MANHOLE
- IL:XXX.XX CL:XXX.XX BACK DROP MANHOLE
- PROPOSED SURFACE WATER SEWER/DRAIN WITH AJ
- PROPOSED GREEN ROOF
- GRASSCRETE PARKING
- PROPOSED STREAMS
- PROPOSED SWALES
- PROPOSED PONDS
- EXISTING FOUL WATER SEWER/DRAIN WITH MANHOLE
- PROPOSED FOUL WATER SEWER/DRAIN WITH MANHOLE
- PROPOSED WATEWRMAIN
- SV PROPOSED SLUICE VALVE ON LINE
- H PROPOSED HYDRANT ON LINE
- M PROPOSED METER ON LINE
- AV PROPOSED AIR VALVE ON LINE
- SCV PROPOSED SCOUR VALVE ON LINE
- EXISTING WATERMAIN

No.	Revision	Date	By	Chk'd	App'd
P1	ISSUED FOR PLANNING	24/07/17	LW	KOR	AWT

Drawing Status: **PLANNING**

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Client: **SOUTH DUBLIN COUNTY COUNCIL**

Project Title: **DUBLIN MOUNTAINS VISITOR CENTRE**

Drawing Title: **PROPOSED DRAINAGE AND WATERMAIN LAYOUT SHEET 2 OF 3**

Drawing Number: **DMVC-ROD-Z0-00-DR-C-0031** Rev: **P2**

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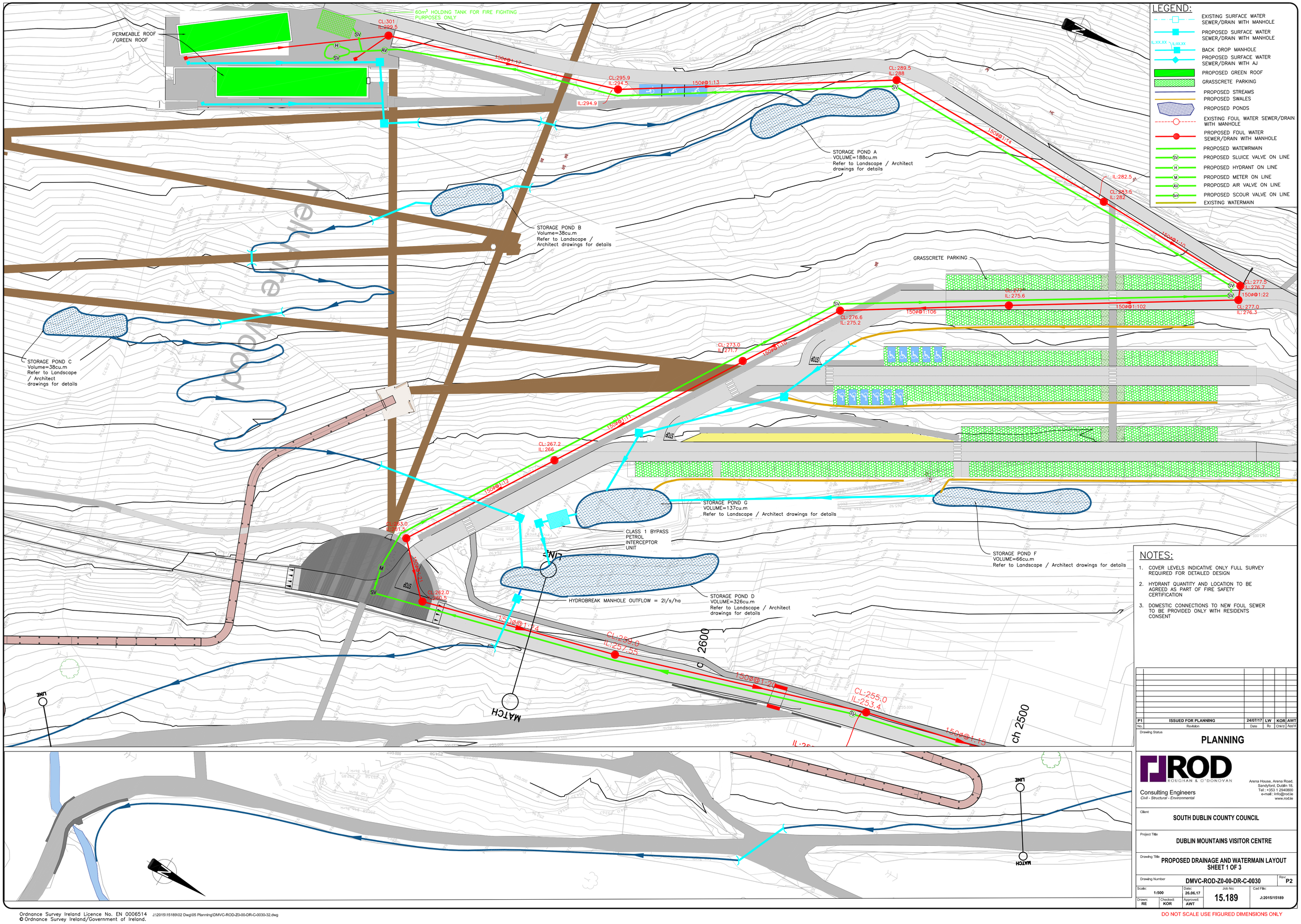

NOTES:

1. COVER LEVELS INDICATIVE ONLY FULL SURVEY REQUIRED FOR DETAILED DESIGN
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No.	Revision	Date	By	Chk'd	Appr'd
P1	ISSUED FOR PLANNING	24/07/17	LW	KOR	AWT

Drawing Status: **PLANNING**

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Client: **SOUTH DUBLIN COUNTY COUNCIL**

Project Title: **DUBLIN MOUNTAINS VISITOR CENTRE**

Drawing Title: **PROPOSED DRAINAGE AND WATERMAIN LAYOUT SHEET 1 OF 3**

Drawing Number	Rev.
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LEGEND:

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- IL:XX.XX / IL:XXXX BACK DROP MANHOLE
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- AV PROPOSED AIR VALVE ON LINE
- SCV PROPOSED SCOUR VALVE ON LINE
- EXISTING WATERMAIN

CONNECT TO EXISTING WATERMAIN

CONNECT TO EXISTING FOUL SEWER NETWORK

KEY PLAN

No.	Revision	Date	By	Chkd	Appd
P1	ISSUED FOR PLANNING	24/07/17	LW	KOR	AWT

Drawing Status: **PLANNING**

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Client: **SOUTH DUBLIN COUNTY COUNCIL**

Project Title: **DUBLIN MOUNTAINS VISITOR CENTRE**

Drawing Title: **PROPOSED DRAINAGE AND WATERMAIN LAYOUT SHEET 3 OF 3**

Drawing Number	Rev.
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APPENDIX 2
Walker Survey Report

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Dublin Mountains Visitor Centre

Walker Survey Report

December 2019

ROD
ROUGHAN & O'DONOVAN

DUBLIN MOUNTAINS VISITOR CENTRE

Walker Survey Report

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Appendix A Dublin Mountain Partnership Visitor Monitoring

Appendix B 2017 Walker Survey Map

Appendix C 2019 Walker Survey Map

1. INTRODUCTION

Roughan & O'Donovan was appointed by South Dublin County Council to provide environmental and engineering services for the proposed Dublin Mountains Visitor Centre.

The planning application for the development included an Environmental Impact Assessment Report (EIAR) and Screening for Appropriate Assessment Report which were submitted to An Bord Pleanála in July 2017.

In the letter dated the 6th February 2019 (Ref 06S.JA0040), An Bord Pleanála requested further information in relation to the impacts of the development, particularly in relation to the impact of increased visitor numbers using the proposed visitor centre as a new starting point for the Dublin Mountains Way, which leads into the nearby European sites, and the impacts that the increased number of users might have on the European sites.

In order to assess the impact of increased visitor access on the surrounding environment, including the Wicklow Mountains SPA, the Wicklow Mountains SAC and the Glenasmole Valley SAC, ROD commissioned walker surveys in 2017 and 2019. The Dublin Mountains Partnership provided data on car park usage in the Dublin Mountains. All available data has been compiled in this report for ease of reference by An Bord Pleanála.

The visitor data is presented and discussed in this report, particularly in relation to the existing patterns of usage and the potential changes in the patterns of usage that may occur as a result of increased visitor numbers using the proposed visitor centre.

To avoid repetition, the project and site descriptions, which are detailed in the EIAR and Natura Impact Statement, are not reiterated in this report.

2. SOURCES OF INFORMATION

2.1 Dublin Mountains Partnership Visitor Monitoring (Nomad)

Visitor Monitoring was carried out by Nomad Traffic Counting Systems (Nomad, hereafter) on behalf of the Dublin Mountains Partnership at eight car parks in the Dublin Mountains. As set out in Table 1, below, monitoring commenced at half of the sites in July 2015 and at the remainder of sites in July 2017 and used a mix of vehicle and pedestrian counters. Using data collected between the date of the installation of the respective counters and the 30th of June 2019, Nomad Traffic Counting Systems produced a summary report. The full report is presented in Appendix A to this report.

Table 1. Visitor Monitoring Sites (Nomad)

Monitoring site	Counter type	Date of installation of counter
Barnaslingan	Pedestrian	08/07/2015
Cruagh Wood	Pedestrian	08/07/2015
Hell Fire Wood	Vehicle	08/07/2015
Ticknock	Vehicle	08/07/2015
Kilmashogue Forest	Pedestrian	01/07/2017
Glenasmole	Pedestrian	01/07/2017
Rathmichael Woods	Pedestrian	01/07/2017
Kiltipper Park	Pedestrian	01/07/2017

2.2 2017 Walker Survey (Abacus)

A previous survey of walker numbers was conducted by Abacus from the 3rd to the 6th of November 2017. The survey sites were selected to establish how well used the trails are which link the Hell Fire Club car park, Cruagh Wood and the Dublin Mountains Way towards the Glenasmole Valley. Counters were placed at the following locations:

- The south end of Massy's Estate, 100m north of the Cruagh Road. This is the trail that links the proposed development to the Dublin Mountains Way.
- The Cruagh Wood Car Park - Counters were placed at the two pedestrian exits leading into Cruagh Wood from the car park.
- Killakee Wood (also known as 'the Featherbeds Forest') - 550m west of the Old Military Road, where the Dublin Mountains Way passes through felled conifer plantation.
- Piperstown Local Road - West of Killakee Wood along the Dublin Mountains Way towards the Glenasmole Valley SAC.

A map showing the survey locations is presented in Appendix B to this report.

2.3 2019 Walker Survey (Traffinomics)

Following the request for further information from An Bord Pleanala in February 2019 fresh walker surveys were carried out by Traffinomics at 12 sites over 3 months in Summer 2019 coincident with other ecological surveys at selected sites across the recreational forests in the Dublin Mountains at the northern edge of the Wicklow Mountains Special Protection Area for birds. The surveys were carried out over four days per month in June (7^{th} - 10^{th}), July (5^{th} - 8^{th}) and August (9^{th} - 12^{th}) 2019. The surveys involved visitor counts using cameras and a car park traffic survey to record the dwell times of vehicles as an indicator for the typical duration of visits. The aim of the surveys was to collect data on the durations of visits and the level of visitor use at the Hell Fire Club, Massy's Estate, Cruagh Wood and on the interconnecting paths leading from the proposed development towards the Natura 2000 Sites. The 12 locations were as follows:

- Three cameras were placed at the Hell Fire Club at the footpath 2 exits from the car park and close to the summit on the eastern side where several approach paths intersect;
- Three cameras were placed in Massy's Estate near the entrance from Killakee Road, at the upper bridge over the Glendoher Brook, and on the Dublin Mountains Way Link trail that leaves the southern end of the wood at Cruagh Road;
- Four cameras were placed in Cruagh Wood, one at the Dublin Mountains Way trail exit onto Cruagh Road, one at the forest road exit from the car park, and two along the paths at the southern edge of the forest leading into the Wicklow Mountains SAC and SPA at Cruagh Mountain; and
- Two cameras were placed along the Military Road, where walking trails leave the road heading northeast towards Cruagh and Glendoo Mountains.

A map showing the survey locations is provided in Appendix C to this report.

3. RESULTS

3.1 Dublin Mountains Partnership Visitor Monitoring (Nomad)

A summary of the results obtained for the car parks nearest to the proposed development is shown in Table 2, below. The full report for these data is provided in Appendix A to this document.

Table 2. Average visitor numbers at car parks surveyed 2015/2017 - 2019

Car Park	Survey Period	Counter type	Distance (km)*	Average Visitor Numbers		
				Monthly	Weekly	Daily
Hell Fire Club	07/2015 – 06/2019	Vehicle	0.2	7,355	1,688	241
Cruagh	07/2015 – 06/2019	Pedestrian	1.1	2,723	625	89
Glenasmole	07/2017 – 06/2019	Pedestrian	2.4	2,313	531	76
Kilmashogue	07/2017 – 06/2019	Pedestrian	3.2	1,816	417	60
Ticknock	07/2015 – 06/2019	Vehicle	4.8	16,768	3,848	550
*Approx. linear distance from proposed Visitor Centre						

3.2 2017 Walker Survey (Abacus)

The 2017 walker surveys were undertaken at 4 locations on, or adjacent to, the Dublin Mountains Way where it traverses across the mountains in close proximity to the Natura 2000 sites. These surveys sought to quantify the scale of walker activity in relation to the proximity to the main access point at Cruagh Wood car park which is the closest of the recreational forests to the SPA on Cruagh Mountain. The survey at Massy's Estate was located at the southern extremity of the forest where a trail links to the Dublin Mountains Way on Cruagh Road. This provided an indication of the number of walkers that make linked trips between the lower forest at Massy's Estate and the higher forest at Cruagh.

A summary of the results is presented in Table 3, below. The figures refer to 'movements' recorded, where a movement is a single person; horse or mountain bike passing a counter.

Table 3. Total daily movements at sites surveyed in November 2017

Site	Daily Total Movements				Total	%
	Friday 03/11/2017	Saturday 04/11/2017	Sunday 05/11/2017	Monday 06/11/2017		
Massy's Estate	34	50	54	11	149	7%
Cruagh	178	540	1,057	82	1,857	88%
Killakee	11	21	44	13	89	4%
Piperstown	0	10	9	0	19	1%
Total	223	621	1,164	106	2,114	100%
%	11%	29%	55%	5%	100%	

In total, 2,114 movements were recorded at the survey sites between the 3rd and the 6th of November 2017. Cruagh Wood car park was the busiest location, accounting for 88% of the total number of movements recorded across all days. Sunday was the busiest day overall, accounting for 55% of the movements during the four-day survey period. The data obtained

indicate that weekend days (Saturday and Sunday) are notably busier than weekdays at the sites in question.

The maximum daily number of movements recorded west of Massy's Estate on the Dublin Mountains Way were 44 at Killakee Wood / Featherbeds Forest and 10 at the Local Road in Piperstown. (Where a person does a looped walked, two movements will be triggered).

The 2017 walker surveys show that very few walkers stray beyond the limits of the recreational forest along the Dublin Mountains Way. Those surveys did not however cover the trails leading from Cruagh Wood out onto the open mountain and into the SPA south of the forest. The later surveys in 2019 were more extensive and fill that information gap.

3.3 2019 Walker Survey (Traffinomics)

At each site between two and twelve movements were recorded as indicated on the site maps. A movement is a single person; horse or mountain bike passing a camera. It can be assumed that the vast majority of visitors will trigger a camera at a car park twice; once on the beginning of a walk, and once again when returning to their vehicle. Furthermore, once in the woodlands, a visitor may trigger multiple cameras. As such, the overall number movements is not representative of the total number of visitors, but rather of relative intensity of use at each survey location. Plate 1 below illustrates how movements are recorded. The site locations and movements are presented in a drawing in Appendix C to this report. The summary of the results is presented in Table 4, below, and should be read in conjunction with Appendix C.

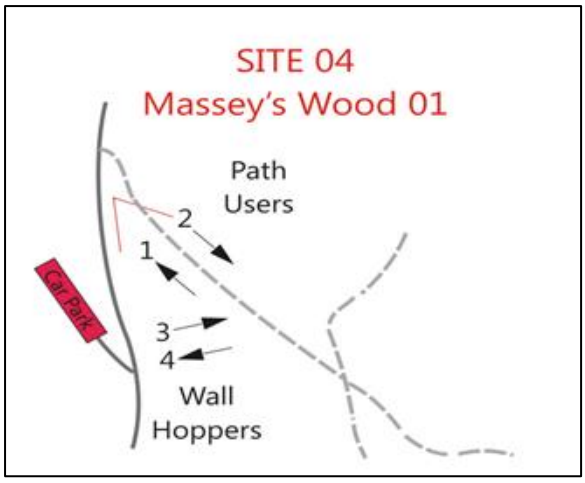


Plate 1. Movements at Site 04 Massy's Wood 01.

Table 4. Total movements at sites surveyed in 2019

Site No.	Site Name	Total Movements (over 4 days)			Total over 12 Days	Average per Day
		7th – 10th June	5th – 8th July	9th – 12th August		
1	Hellfire 01 Car Park	1,887	2,143	1,490	5,520	460
2	Hellfire 02 Car Park	2,445	2,639	1,860	6,944	579
3	Hellfire 03 Summit	1,338	1,497	1,029	3,864	322
4	Massy's 01 NW Entrance	741	1,051	856	2,648	220
5	Massy's 02 Glendoo Brook Bridge	512	577	468	1,557	130
6	Massy's 03 South	194	235	113	542	45
7	Cruagh Wood 01 DMW West	110	143	75	328	27
8	Cruagh Wood 02 Car Park	1,559	1,578	1,393	4,530	378
9	Cruagh Wood 03 NW Mountain	84	66	53	203	17
10	Cruagh Wood 04 NE Mountain	410	500	258	1,168	97
11	Military Road 01	25	26	7	58	5
12	Military Road 02	141	102	17	260	22
Overall Total		**9,446**	**10,557**	**7,619**	**27,622**	**2,300**
Totals at Main Entrances (Sites 1, 2, 4 & 8)					***19,642***	***1,636***

Review and Assessment of 2019 Walker Surveys

A. Hell Fire Wood

Hell Fire Wood is by far the busiest location for visitors with 1,039 average daily movements recorded at the two footpaths leading from the car park into the forest. This is 2.75 times higher than the number of movements recorded at Cruagh Wood car park.

B. Massy's Estate

The results show that 220 average daily movements occurred at the entrance to Massy's Estate (Site No. 4) compared to 45 average daily movements recorded at Site No. 6 at the southern end of Massy's Estate leading to Cruagh Wood. This indicates that 80% of visitors to Massy's Estate do not venture through to the southern exit at Cruagh Road.

C. Cruagh Wood

The average daily movement of 27 at Site No. 7 where the Dublin Mountains Way exits from Cruagh Wood onto Cruagh Road at the western edge was 7% of the total number of movements (378) recorded at Site No. 8 at Cruagh Wood car park. This shows that people linking between Cruagh Wood and Massy's Estate are a small minority of the overall number who visit Cruagh.

D. Interactions between Hell Fire Club, Massy's Estate and Cruagh Wood

The survey figures indicate low interactions between Massy's Estate and Cruagh Wood along the Glendoo Brook trail that links the two forests.

The combined number of average daily movements recorded at Hell Fire Club and Massy's Estate at the Killakee Road (Sites 1,2 & 4) accesses was 1,259 of which 17.5% was at Massy's Estate. This figure indicates the degree of interaction between the two adjoining recreational forests, with 1 in 6 of the combined visitors entering Massy's Estate from the Killakee Road side.

With 80% of visitors remaining in Massy's Estate it may be postulated that 1 in 35 (<3%) of visitors to the Hell Fire Club car park (or who park on Killakee Road) may venture further through Massy's Estate to Cruagh Wood, and perhaps all the way to Cruagh Mountain, over a walking distance of 3.2km.

E. Visitors to Cruagh Mountain and the SPA

The results from Site No. 9 and Site No. 10 show that on average 114 people per day visited Cruagh Mountain from the two access points at the southern edge of Cruagh Wood. This represents 30% of the number of visitors recorded at the car park. Therefore, 70% of visitors to Cruagh Wood remain within the forest and presumably circulate along the forest roads.

Detailed movements at the two access points are presented in Tables 5 and 6, below. There are informal paths at these locations that link Cruagh Wood to the uplands, including the Wicklow Mountains SAC and SPA. Along the most direct path leading to the Natura 2000 Sites (Site No. 9) 203 movements were recorded. The main path walked by most people follows the edge of the forest linking the two survey locations, and forming a loop walk that travels adjacent to the boundary of the SPA but does not enter any Natura 2000 site. The movements are broken down in Table 5, below.

At Site 9 over the 12 days survey period, a daily average of 3 people walked into Cruagh Wood from the direction of Cruagh Mountain (Movement 1), and 3 people walked out of Cruagh Wood towards the uplands (Movement 2). In the same period, 3 people followed the forest perimeter path south-east towards Cruagh Mountain (Movement 3), and 8 people walked in the opposite direction (Movement 4).

Table 5. Site No. 9 (Cruagh Wood Northwest) total movements over 12 days

Movement	1	2	3	4	Total
June	14	21	8	41	84
July	13	5	9	39	66
August	12	8	15	18	53
Total	**39**	**34**	**32**	**98**	**203**
Daily Average	**3**	**3**	**3**	**8**	**17**

Significantly more traffic was recorded at Site No. 10, 1,168 no. over 12 days, with an average of 97 people per day. This site is at a junction where the main mountain access track from the

east meets the forest perimeter path from the north, a trail from Cruagh Mountain to the west, and another the trail heading southeast towards Glendoo Mountain.

Plate 2. Site 10: Cruagh Wood Southeast Access Point onto Cruagh Mountain

Plate 3. Site 10: View west onto Cruagh Mountain – Forest Perimeter Trail on right

Table 6. Site No. 10 (Cruagh Wood Southeast) total movements

Movement	1	2	3	4	5	6	7	8	9	10	11	12	Total
June	90	15	12	15	25	4	2	9	20	14	58	146	410
July	130	20	7	31	28	4	10	10	30	24	85	120	499
August	69	1	3	6	15	0	1	2	4	4	29	125	259
Total	**289**	**36**	**22**	**52**	**68**	**8**	**13**	**21**	**54**	**42**	**172**	**391**	**1,168**
Daily Average	**24**	**1.5**	**2**	**4**	**6**	**<1**	**1**	**2**	**4**	**4**	**14**	**33**	**97**

680 of the 1,169 movements recorded at Site No. 10 refer to two movements - movement 1 and 12 - which indicate a looped walk from Cruagh Wood along the conifer plantation edge, turning into the forest at the junction. Movements 3, 4, 5, 6, 7 and 11 travel from the junction into or out from Cruagh Mountain (and the Natura 2000 Sites). These movements can be translated as 207 people (17 per day on average) walking towards Cruagh Mountain (movements 3, 7, 11) and 128 people (11 per day on average) walking down from Cruagh Mountain (movement 4, 5, 6) during the survey period.

The total number of people entering and exiting the trails leading into upland habitats, including the Wicklow Mountains SAC and SPA, from Cruagh Wood are presented in Table 7, below. In summary, the data from Sites No. 9 and 10 show that the number of movements entering the uplands and the Wicklow Mountains SAC and SPA is 273 over the full survey period (23 per day on average). For comparison, there are 2,475 movements entering Cruagh Wood from Sites 7 and 8 during the same period. These figures show that 11% of visitors to Cruagh Wood go beyond the forest boundary onto the open mountain within the SAC and SPA.

Table 7. Total walkers entering and exiting the Wicklow Mountain SAC/SPA.

	Site 9 (Cruagh Wood 03)	Site 10 (Cruagh Wood 04)	12 Days Total	Daily Average
Into SAC/SPA	66	207	**273**	**23**
Out of SAC/SPA	137	128	**265**	**22**

Interpretation of the Walker Surveys

The survey data has shown that only a very small number of people who visit the 3 recreational forests in the Glendoher Valley of the Dublin Mountains (Hell Fire, Massy's and Cruagh Woods) venture further and onto the open mountain areas within the SAC and SPA. The daily average number of visitors to the 3 forests was 1,636 people, of which 23 people per day visited the upper mountain area, which is 1.4% of the total. It was not possible to record how many of these people, if any at all, started their trip from Hell Fire Club car park, but it is unlikely that any walkers came from that far away.

The proposed visitor centre at Hell Fire Club has been forecast to attract up to 300,000 visitors per year (821 per day spread over the full 7 days of the week), which is approximately 3 times the current number of visitors (current daily average: 241). The average daily increase in visitors will therefore be 580 people. The walker survey data shows that if the current visitor

patterns are applied, then perhaps 3% of these additional visitors may venture through Massy's Estate to Cruagh Wood, which would amount to 20 people per day.
Furthermore, if the typical 11% proportion of walkers who go onto the open mountain from Cruagh Wood is applied (which seems quite unlikely given the cumulative distance of over 6km for the round trip from Hell Fire Club), then perhaps two of the additional visitors may reach the SAC and SPA area on Cruagh Mountain per day. Hypothetically therefore the number of people walking on the upper mountain could increase from just 23 per day to 25 per day on average.

Car Parking Surveys

The car park survey was carried out at the Hell Fire Club car park and at the Cruagh Wood car park on Saturday the 10th August 2019. The survey recorded the numbers of vehicles entering and exiting the site and used number plates to determine the dwell time. The vehicle types and dwell times for vehicles are presented in Tables 8 and 9, below.

Table 8. Summary of vehicle types – Hell Fire Club and Cruagh Car Parks.

Location	Total Entries/ Exits	Car	LGV	Bus
Hell Fire Club Car Park	161	154	6	1
Cruagh Car Park	97	96	1	0

Table 9. Vehicle dwell times – Hell Fire Club and Cruagh Car Parks.

Dwell Time	Hell Fire Club Car Park	Cumulative %	Cruagh Car Park	Cumulative %
0 - 15 Mins	19	12%	12	12%
15 - 30 Mins	7	16%	5	17%
30 - 45 Mins	23	30%	7	25%
45 - 60 Mins	34	51%	27	52%
1 - $1^{1/4}$ hr	28	69%	26	79%
$1^{1/4}$ hr - $1^{1/2}$ hr	20	81%	8	88%
$1^{1/2}$ hr - $1^{3/4}$ hr	10	88%	4	92%
$1^{3/4}$ hr - 2hr	3	89%	6	98%
2hr - 3hr	11	96%	2	100%
3hr - 4hr	6	100%	0	-
Total	**161**		**97**	

The dwell times of vehicles at the car parks show that visits are generally short, with approximately 50% of visits lasting under 1 hour in both car parks. This number increases at a similar rate, with 89% and 98% of visits being less than 2 hours in Massy's Estate and Cruagh Wood, respectively. This information tallies with the recorded small number of walker movements at the southern boundary of the forest and indicates that most walkers travel the relatively short circuit along the forest trails which can be completed in less than 2 hours rather than venturing into the uplands including the European designated sites.

4. EXISTING WAYMARKED TRAILS

Coillte lists a number of waymarked trails at the Hell Fire Club, Massy's Estate and Cruagh Wood. The trails at the Hell Fire Club and in Massy's Estate begin at the Hell Fire Club car park and the entrance to Massy's Estate from the R115. The trails in Cruagh Wood begin in the Cruagh Wood Car Park. The trails are described in Table 10, below.

Table 10. Waymarked Trails at the Hell Fire Club, Massy's Estate and Cruagh Wood.

Site	Trail Name	Distance; Time
Hell Fire Club	Forest Loop	5.5km; 1.5 hours
Hell Fire Club	Montpellier Loop	4km; 1 hour
Massy's Estate	Riverside Walk	6km; 2 hours
Massy's Estate	Nature Trail	1.5km; 45 mins
Massy's Estate	Mountain Access Trail	2.5km; 45 mins (one way)
Massy's Estate	Cruagh Slí na Sláinte	5km; 1 hour

The Dublin Mountains Way is a 42km long trail from Shankill to Tallaght through the Dublin Mountains. From the east, the Dublin Mountains Way travels from Tibradden Mountain through Cruagh Wood and along Cruagh Road and the Military Road briefly before entering Killakee Wood / Featherbeds Forest and continuing on local roads to Bohernabreena. There is a link between the Dublin Mountains Way and the proposed development through Massy's Estate.

5. EXISTING TRAIL CONDITIONS

Th walking trails in the Dublin Mountains as shown in the following photographs are a mix of forest roads, maintained walking trails and informal paths. The trails which border Cruagh Wood are maintained and in good condition. The trails leading to the summit of Cruagh Mountain and further afield towards the Glendoo and Killakee Mountains are informal and narrow, with some localised erosion from rainfall. There was no evidence of significant erosion or excessive widening as a result of footfall. Recent fire damage was evident on the northern slope of Glendoo Mountain and the southern slope of Killakee Mountain close to the Old Military Road. The photographs below show a selection of the trails.

Plate 4. The western path leading from Cruagh Wood to the Cruagh Mountain, close to Site No. 9 in the 2019 walker surveys.

Plate 5. The path leading north-west along the southern boundary of Cruagh Wood, close to Site No. 10 in the 2019 walker surveys.

Plate 6. The path descending Cruagh Mountain northward. The Hell Fire Club can be seen in the background.

Plate 7. The western trail from Cruagh Wood looking towards Killakee Mountain to the south. Which skirts to the west of the summit of Cruagh Mountain (to the left).

Plate 8. The trail leading eastward from Killakee Mountain beside the Military Road to Glendoo Mountain in the background.

Plate 9. The reservoir service road alongside the upper Glenasmole Reservoir, Bohernabreena, which forms part of the Dublin Mountains Way.

6. ASSESSMENT

Access to the Dublin Mountains in Glendoher by walkers is almost entirely from the car parks at Hell Fire Club and Cruagh Wood. The survey data show that the typical visits are short in duration (<2 hours) and do not allow enough time for the vast majority of the visitors to travel beyond the waymarked trails at the Hell Fire Club, Massy's Estate and Cruagh Wood and into the European designated sites.

The number of people observed walking on Cruagh Mountain within the SAC and SPA was very low at weekends, and almost nil during weekdays. As noted separately in the ecological surveys, there appears to be no evidence of disturbance to wildlife being caused by the very low level of human presence on the mountain.

The link between Massy's Estate and Cruagh Wood is not well used, and people accessing Cruagh Wood from Massy's Estate make up a very small proportion of the overall number of visitors. It is evident that walkers currently park at the Cruagh Wood Car Park rather than the Hell Fire Club car park to access Cruagh Woods and Cruagh Mountain. This is a small car park with approximately 35 parking spaces.

The low usage of the trail leading south from Massy's Estate and the 2017 survey figures for the Dublin Mountains Way at Killakee indicates that there is virtually no link by walkers between Massy's Estate and the Glenasmole Valley (SAC) at 8km walking distance to the southwest.

The EIAR for the proposed development states that the proposed visitor centre will lead to a three-fold increase in visitors to the Hell Fire Club and Massy's Estate. The visitor profile will change from the existing, largely local visitors to include a higher proportion of international and domestic tourists. It is likely that the additional visitor activity will focus entirely on the Hell Fire Club and Massy's Estate. It is very unlikely that these new visitors will extend their walk very significantly to access the wider higher Dublin Mountains area further south via the single linking trail through Massy's Estate.

Based on the current visitor patterns as observed in the walker surveys, it may be postulated that the large increase in visitor numbers expected at the proposed visitor centre at Hell Fire Club could lead to a very small increase in walkers at Cruagh Mountain of just 2 additional visitors per day. The impact of such a very small increase in terms of adverse effects on the qualifying interests of the SAC and SPA will be nil.

7. CONCLUSION

Based on the data obtained during several surveys, including the detailed visitor surveys in 2019, a number of conclusions can be drawn:

a) There is one link trail, although not well used, between the Hell Fire Club car park and Cruagh Wood that could enable visitors at the proposed visitor centre to extend their activity as far as Cruagh Mountain to the south within the Wicklow Mountains SAC and SPA.
b) At both the Hell Fire Club and Cruagh Wood, visitors tended to stay for a short period of time, with half of the visitors staying less than one hour, and almost all staying less than two hours.
c) Based on the dwell times at both car parks, there are very few visitors that stay for enough time to venture far into the uplands.
d) In Cruagh Wood, the majority of visitors do not enter the heath habitats on the open mountain, and it appears that the walks alongside and through Cruagh Wood are the most popular.
e) A three-fold increase in visitor numbers at the Hell Fire Club is highly unlikely to result in a significant increase in visitor numbers accessing Cruagh Wood or the Natura 2000 Sites through the existing trail network.

APPENDIX A
DMP Visitor Monitoring

Visitor Monitoring Report

Dublin Mountains Partnership

01/07/2015 to 30/06/2019

Dublin Mountains Partnership

NOMAD

Site Id	Site	Type	Calibration Factor
1007A	Barnaslingan	pedestrian	1
1013A	Cruagh	pedestrian	0.5
1024A	Hellfire	vehicle	1.25
1051A	Ticknock	vehicle	2.5
0023A	Kilmashogue Forest TOTAL	pedestrian	0.5
0024C	Glenasmole TOTAL	pedestrian	0.5
0025A	Rathmichael Woods TOTAL	pedestrian	0.5
0026A	Kiltipper Park TOTAL	pedestrian	0.5

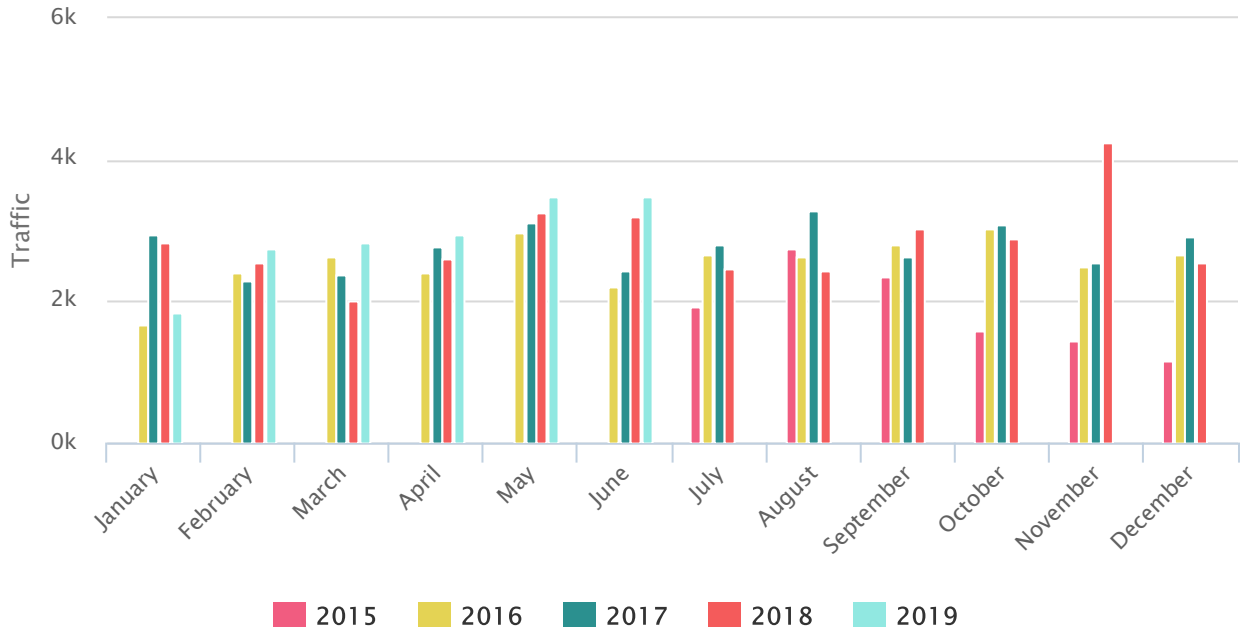
Barnaslingan 1007A

Data Summary

	Barnaslingan
Total Traffic for Period	126,367
Monthly Average	2,651
Weekly Average	608
Daily Average	87
Busiest day of the year	2018-11-26
Busiest day of the week	Sunday
Busiest hour of the day	14
Device Type	pedestrian
Installation Date	2015-07-08
Site ID	1007
Calibration Factor	1
GPS Co-ordinates	,

Totals for each month of the year

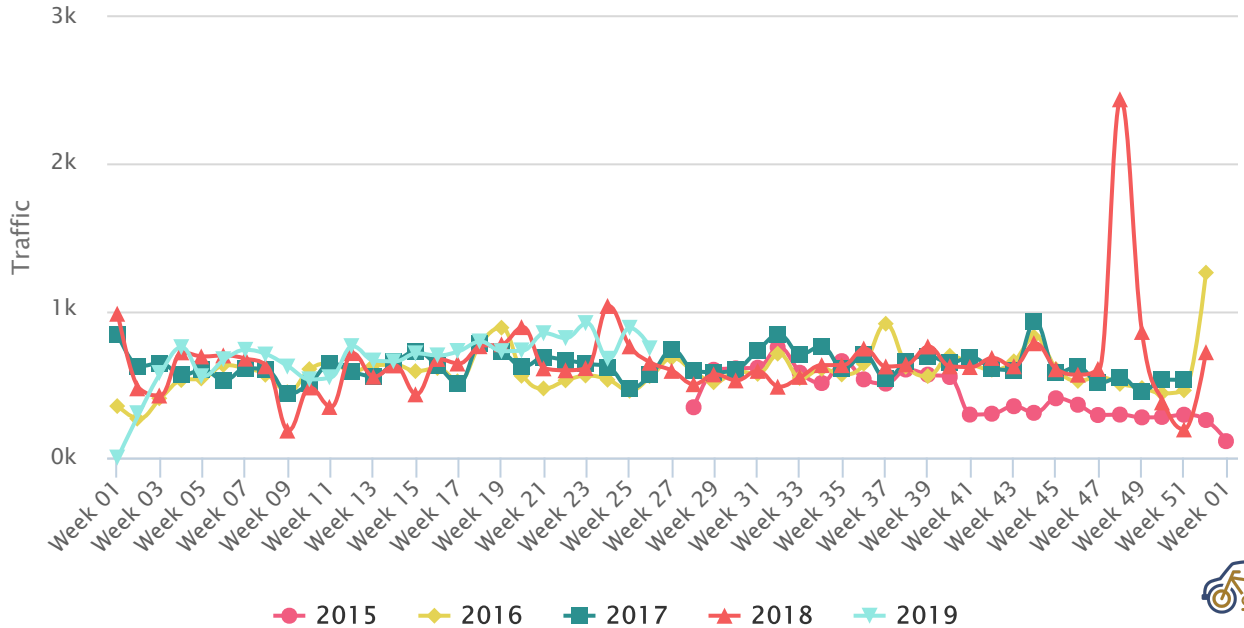
1st July 2015 to 30th June 2019



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015							1,932	2,753	2,335	1,587	1,452	1,150
2016	1,660	2,401	2,641	2,405	2,967	2,216	2,651	2,632	2,811	3,026	2,484	2,651
2017	2,941	2,287	2,390	2,764	3,118	2,430	2,812	3,281	2,641	3,076	2,547	2,922
2018	2,837	2,557	2,007	2,610	3,265	3,199	2,458	2,446	3,030	2,889	4,246	2,538
2019	1,835	2,755	2,820	2,933	3,484	3,495						

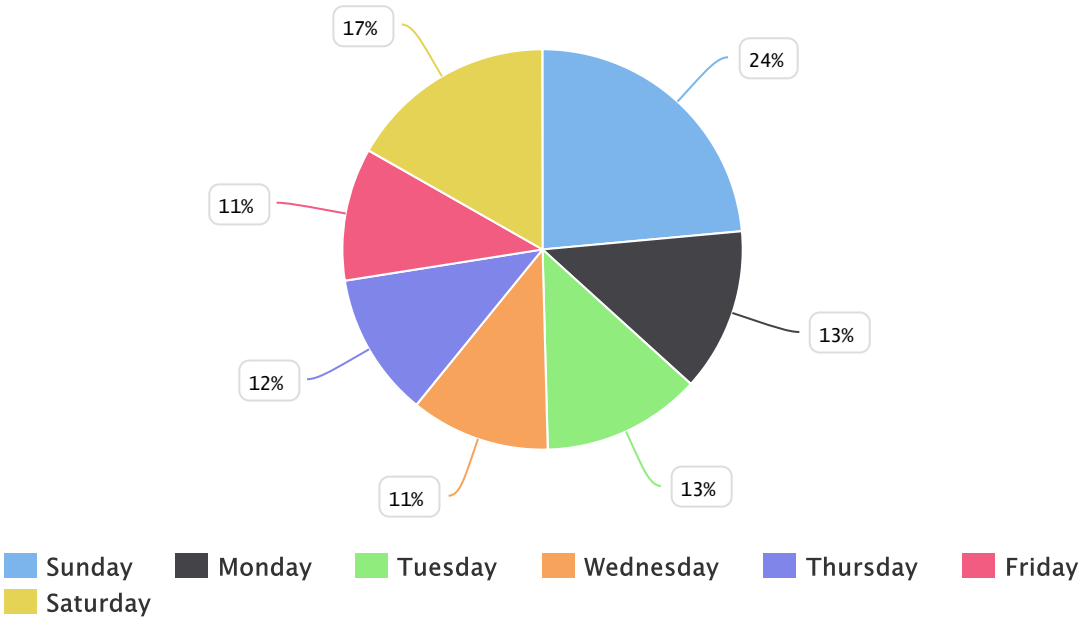
Weekly Totals

1st July 2015 to 30th June 2019



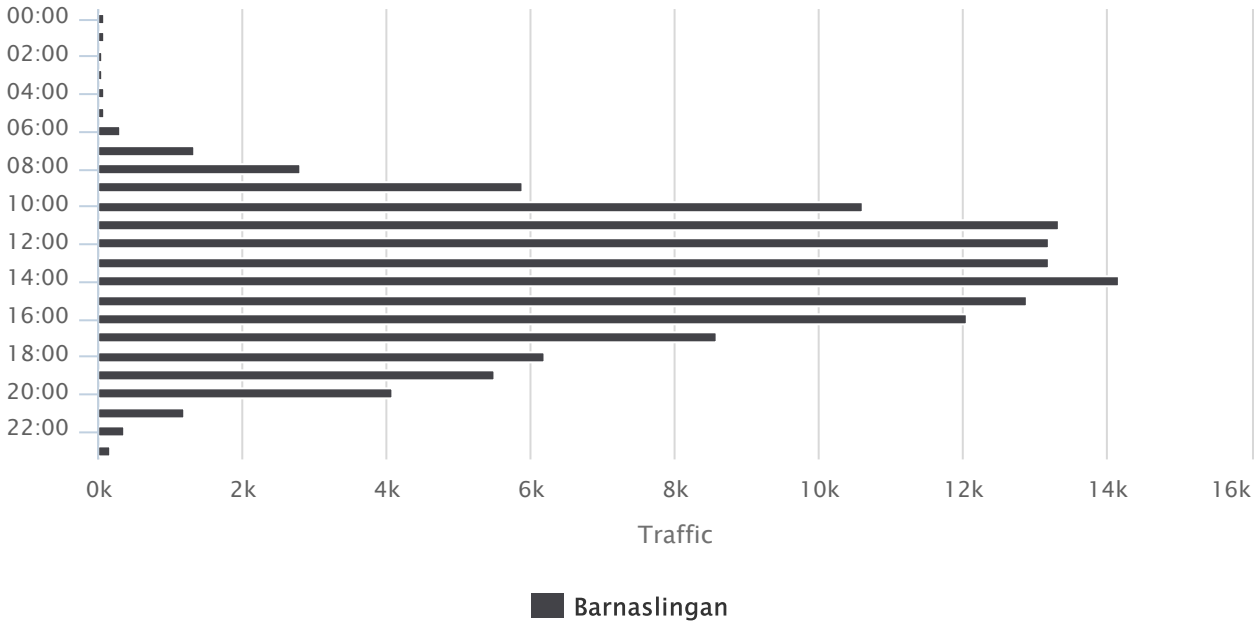
Totals for each day of the week

1st July 2015 to 30th June 2019



Totals for each hour of the day

1st July 2015 to 30th June 2019



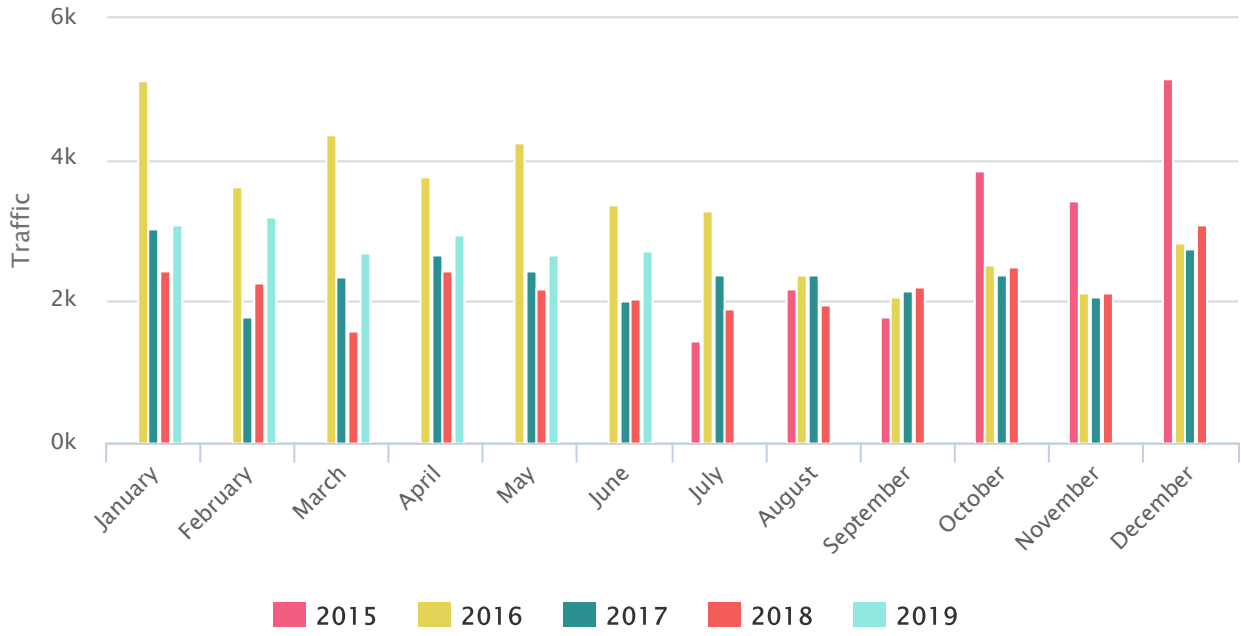
Cruagh 1013A

Data Summary

	Cruagh
Total Traffic for Period	129,804
Monthly Average	2,723
Weekly Average	625
Daily Average	89
Busiest day of the year	2015-12-27
Busiest day of the week	Sunday
Busiest hour of the day	12
Device Type	pedestrian
Installation Date	2015-07-08
Site ID	1013
Calibration Factor	0.5
GPS Co-ordinates	,

Totals for each month of the year

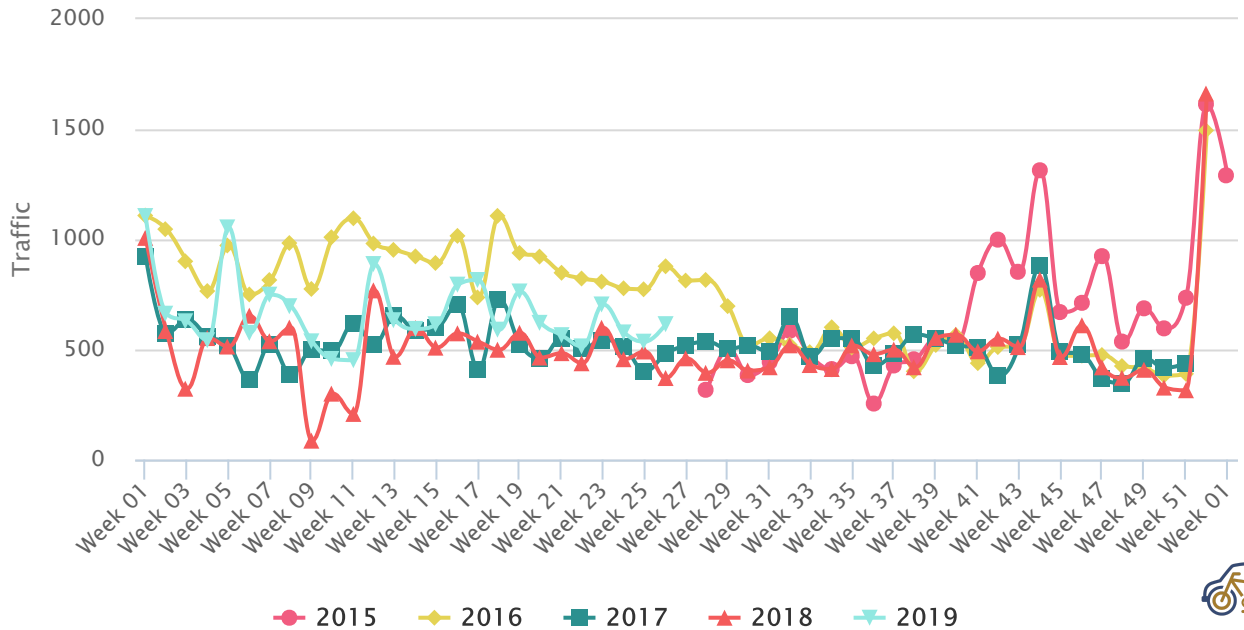
1st July 2015 to 30th June 2019



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015							1,441	2,177	1,795	3,840	3,423	5,153
2016	5,112	3,611	4,348	3,753	4,245	3,380	3,292	2,390	2,054	2,510	2,109	2,832
2017	3,024	1,779	2,359	2,665	2,445	2,005	2,385	2,385	2,145	2,390	2,076	2,741
2018	2,432	2,257	1,592	2,438	2,172	2,041	1,903	1,942	2,210	2,477	2,109	3,091
2019	3,074	3,205	2,703	2,933	2,662	2,710						

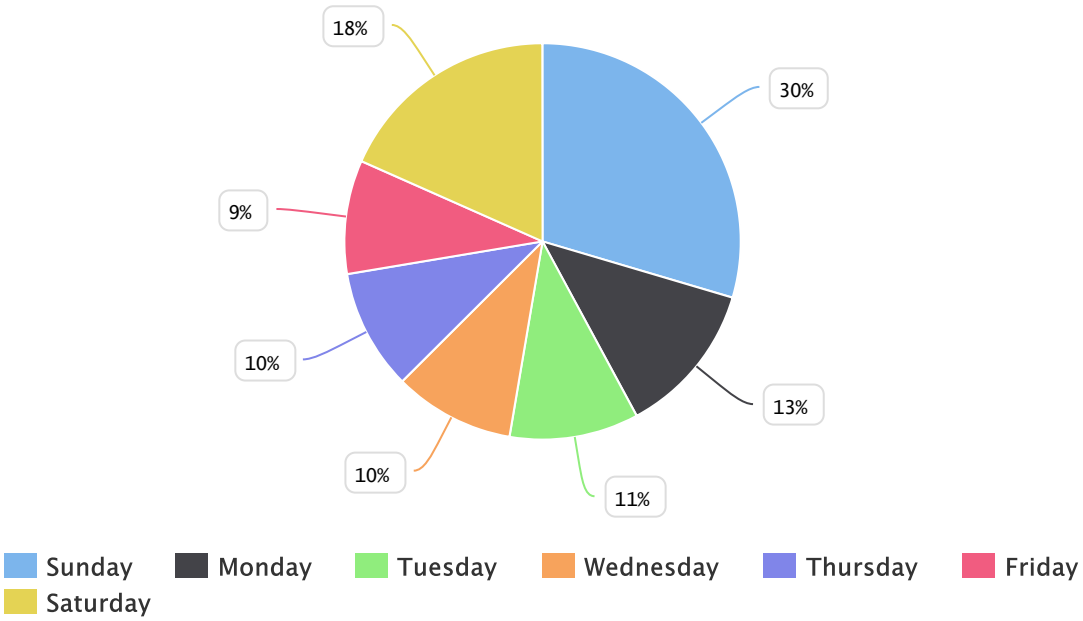
Weekly Totals

1st July 2015 to 30th June 2019



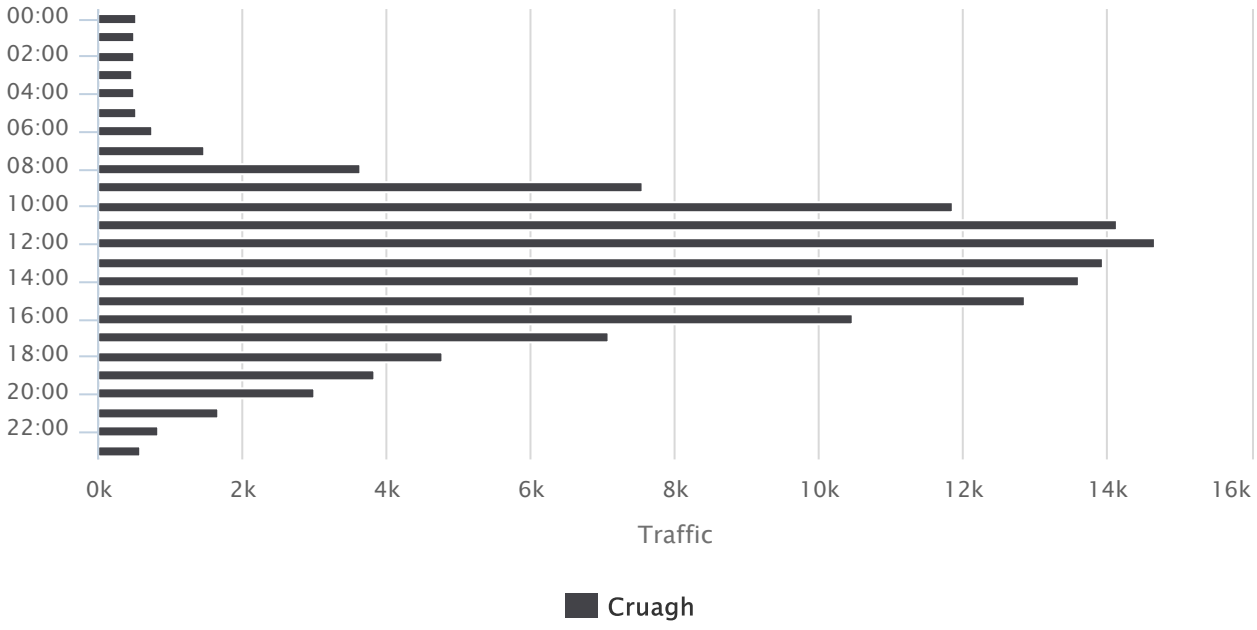
Totals for each day of the week

1st July 2015 to 30th June 2019



Totals for each hour of the day

1st July 2015 to 30th June 2019



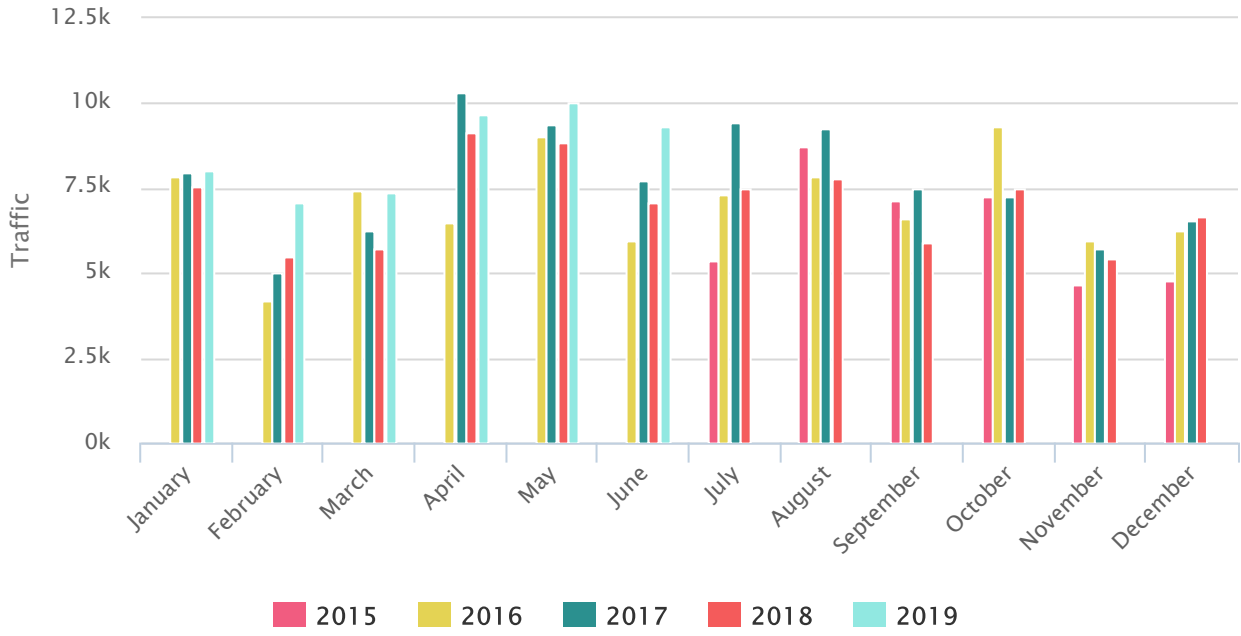
Hellfire 1024A

Data Summary

	Hellfire
Total Traffic for Period	350,629
Monthly Average	7,355
Weekly Average	1,688
Daily Average	241
Busiest day of the year	2019-04-22
Busiest day of the week	Sunday
Busiest hour of the day	14
Device Type	vehicle
Installation Date	2015-07-08
Site ID	1024
Calibration Factor	1.25
GPS Co-ordinates	,

Totals for each month of the year

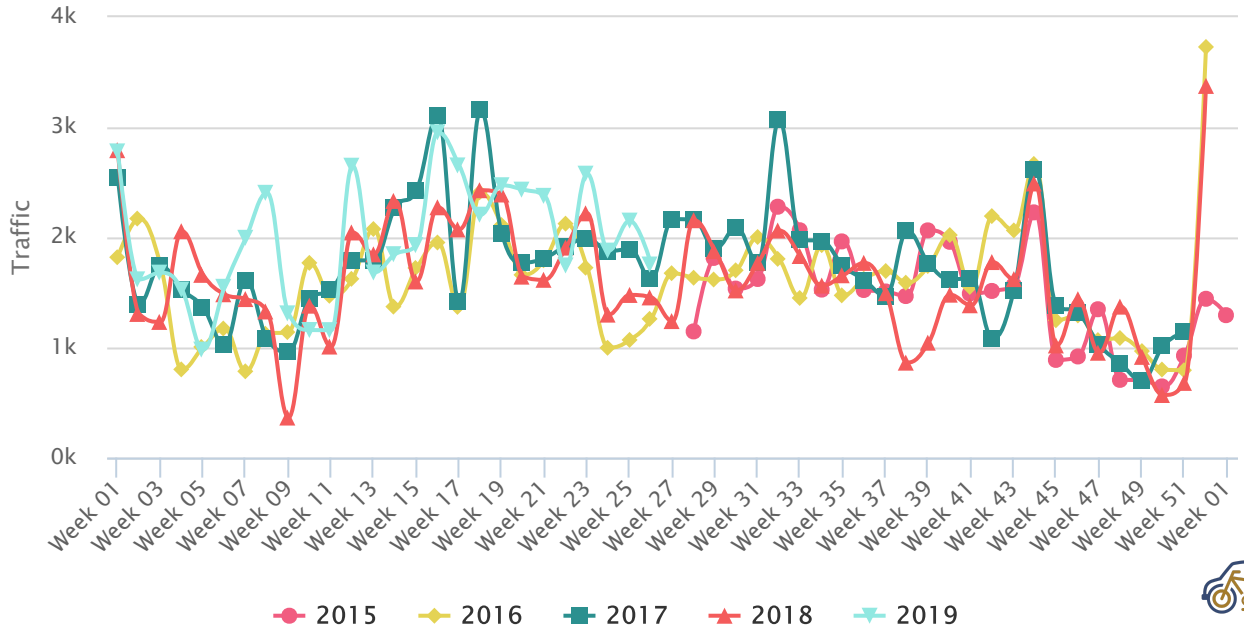
1st July 2015 to 30th June 2019



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015							5,376	8,708	7,135	7,279	4,684	4,748
2016	7,838	4,158	7,443	6,489	9,031	5,934	7,305	7,865	6,583	9,323	5,960	6,253
2017	7,969	5,036	6,261	10,328	9,390	7,709	9,461	9,278	7,511	7,234	5,740	6,554
2018	7,570	5,460	5,740	9,145	8,821	7,064	7,488	7,800	5,881	7,513	5,428	6,656
2019	8,031	7,080	7,388	9,671	10,028	9,289						

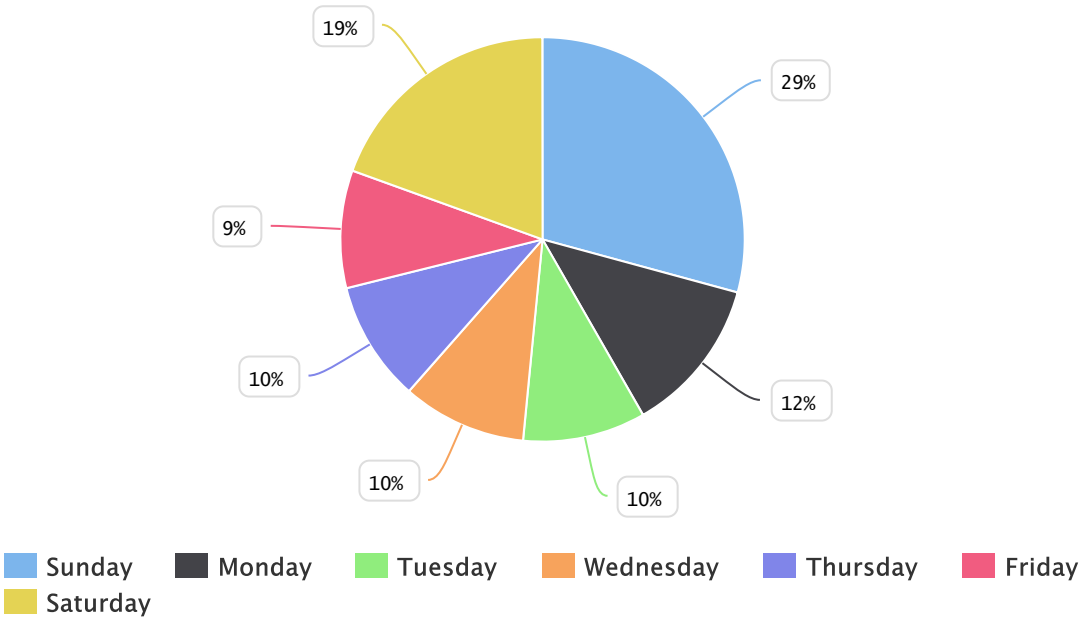
Weekly Totals

1st July 2015 to 30th June 2019



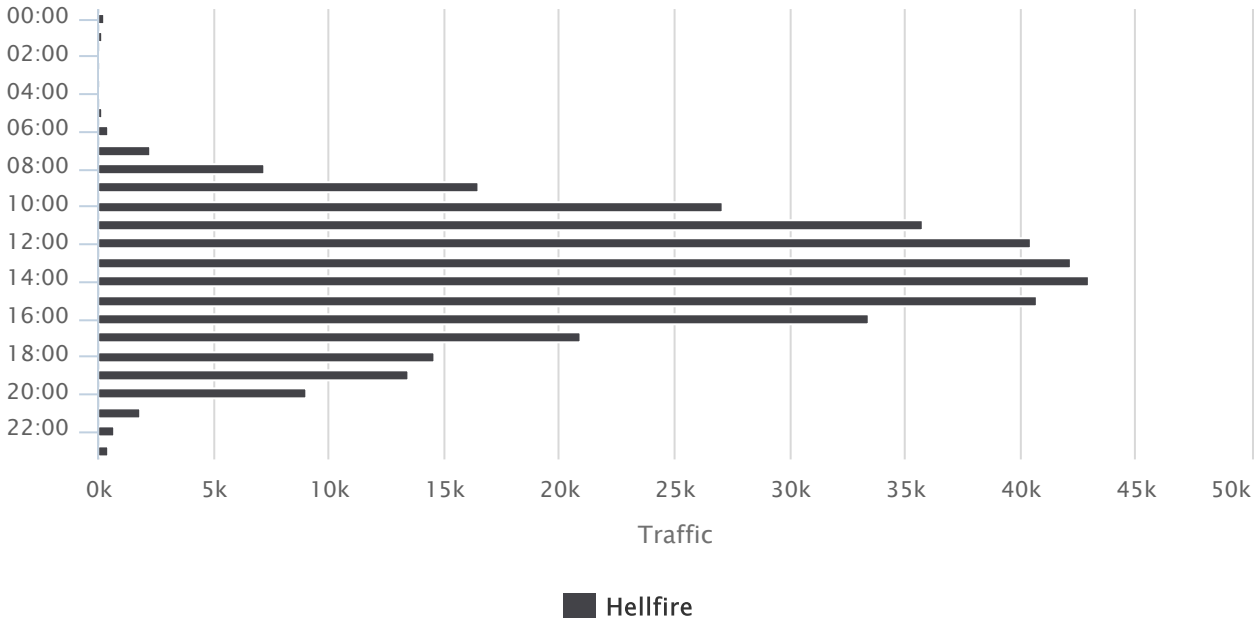
Totals for each day of the week

1st July 2015 to 30th June 2019



Totals for each hour of the day

1st July 2015 to 30th June 2019



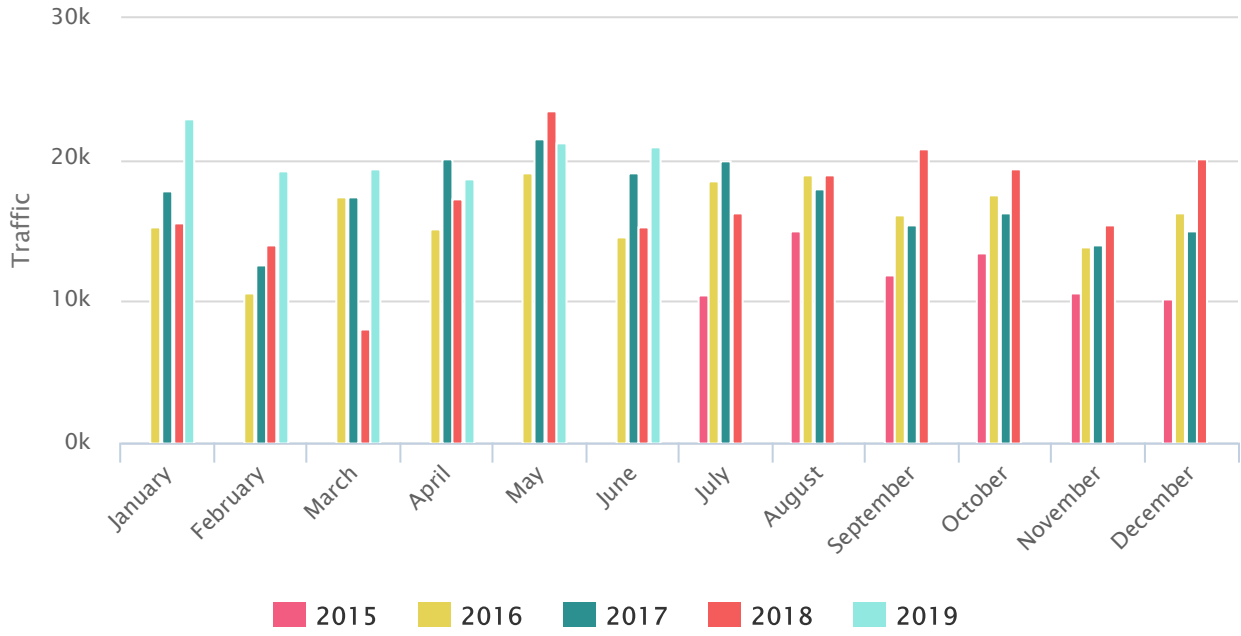
Ticknock 1051A

Data Summary

	Ticknock
Total Traffic for Period	799,373
Monthly Average	16,768
Weekly Average	3,848
Daily Average	550
Busiest day of the year	2019-03-24
Busiest day of the week	Sunday
Busiest hour of the day	11
Device Type	vehicle
Installation Date	2015-07-08
Site ID	1051
Calibration Factor	2.5
GPS Co-ordinates	,

Totals for each month of the year

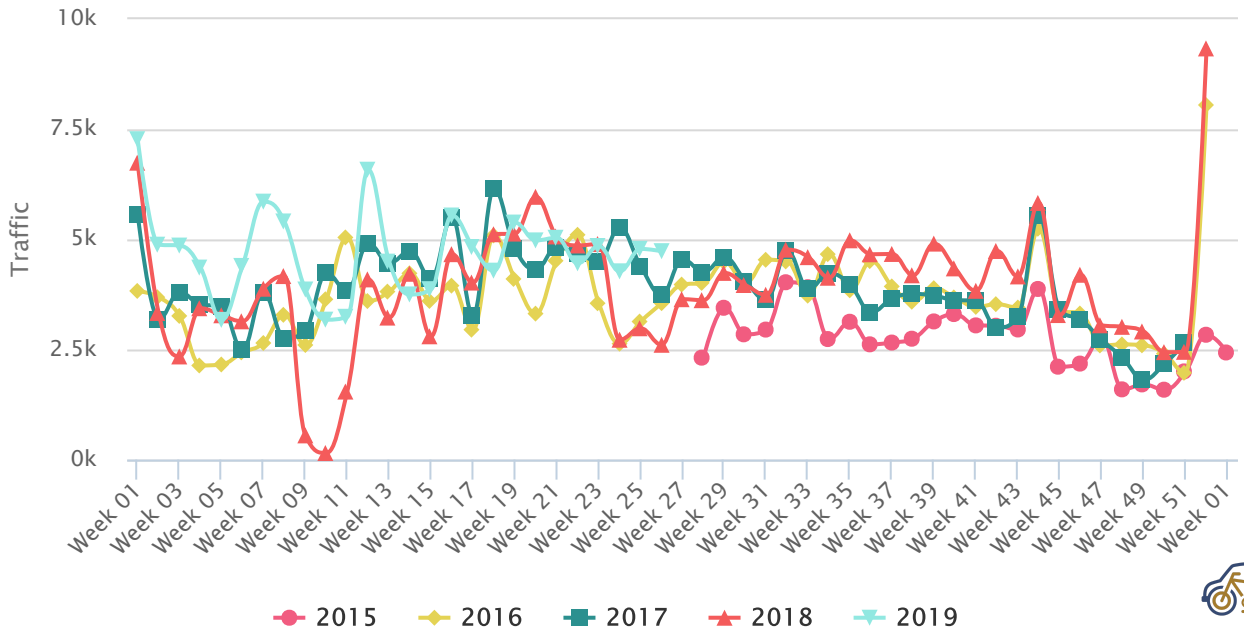
1st July 2015 to 30th June 2019



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015							10,523	15,063	11,940	13,413	10,558	10,200
2016	15,350	10,645	17,468	15,150	19,135	14,530	18,518	18,998	16,203	17,555	13,923	16,238
2017	17,770	12,600	17,370	20,050	21,570	19,128	19,895	17,960	15,430	16,278	14,005	14,938
2018	15,505	14,025	8,120	17,203	23,550	15,265	16,328	19,008	20,773	19,343	15,455	20,055
2019	22,870	19,280	19,420	18,668	21,180	20,930						

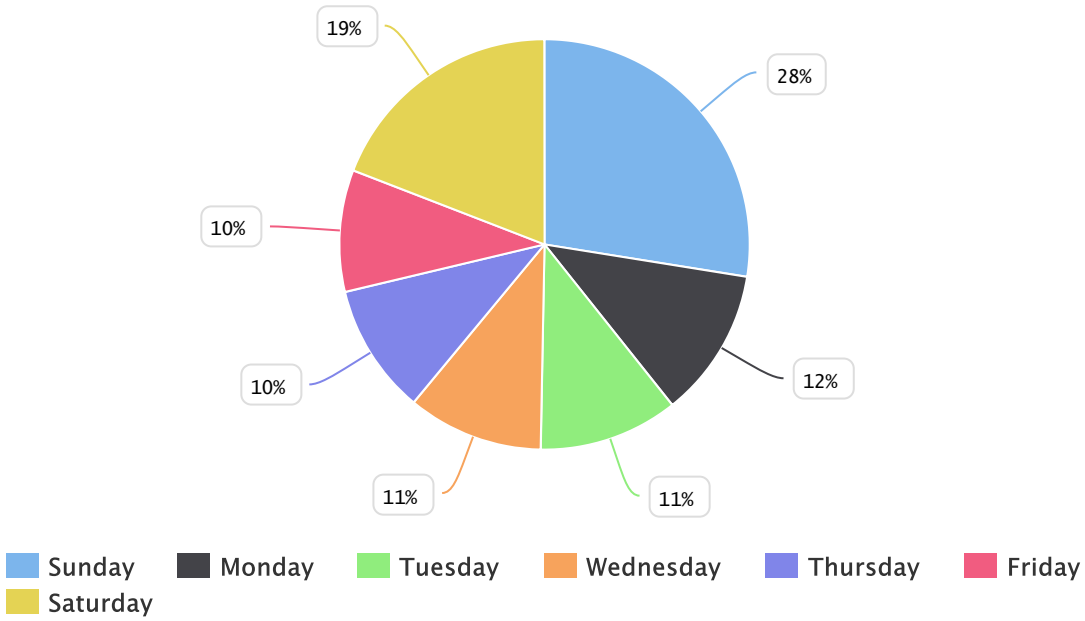
Weekly Totals

1st July 2015 to 30th June 2019



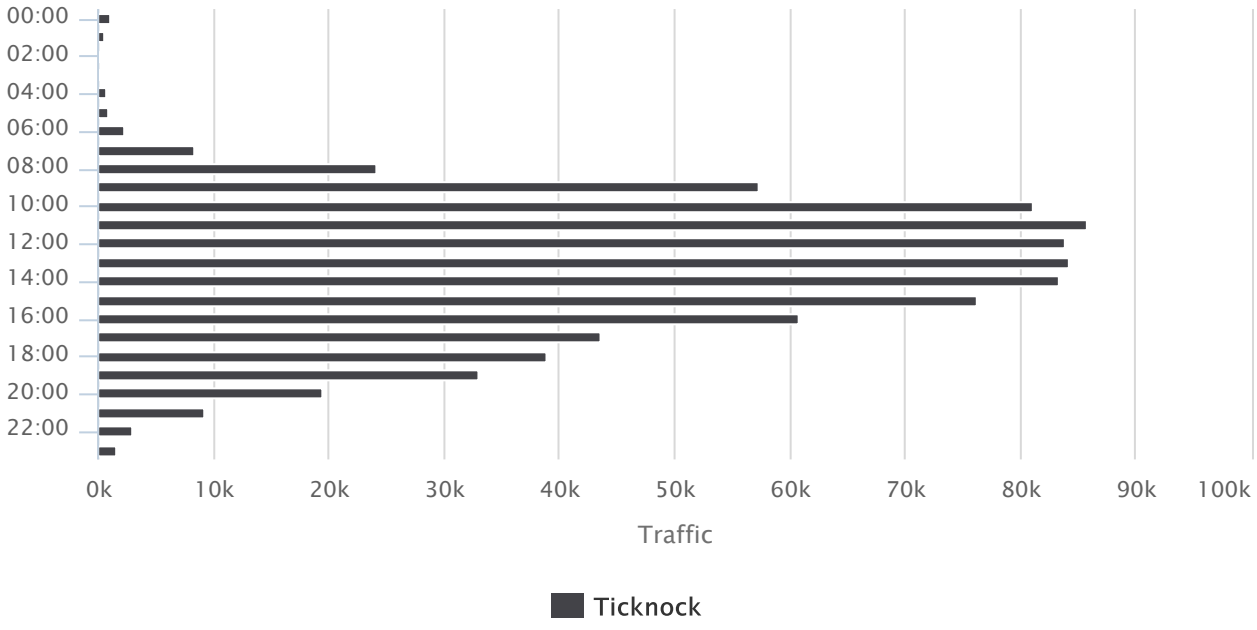
Totals for each day of the week

1st July 2015 to 30th June 2019



Totals for each hour of the day

1st July 2015 to 30th June 2019



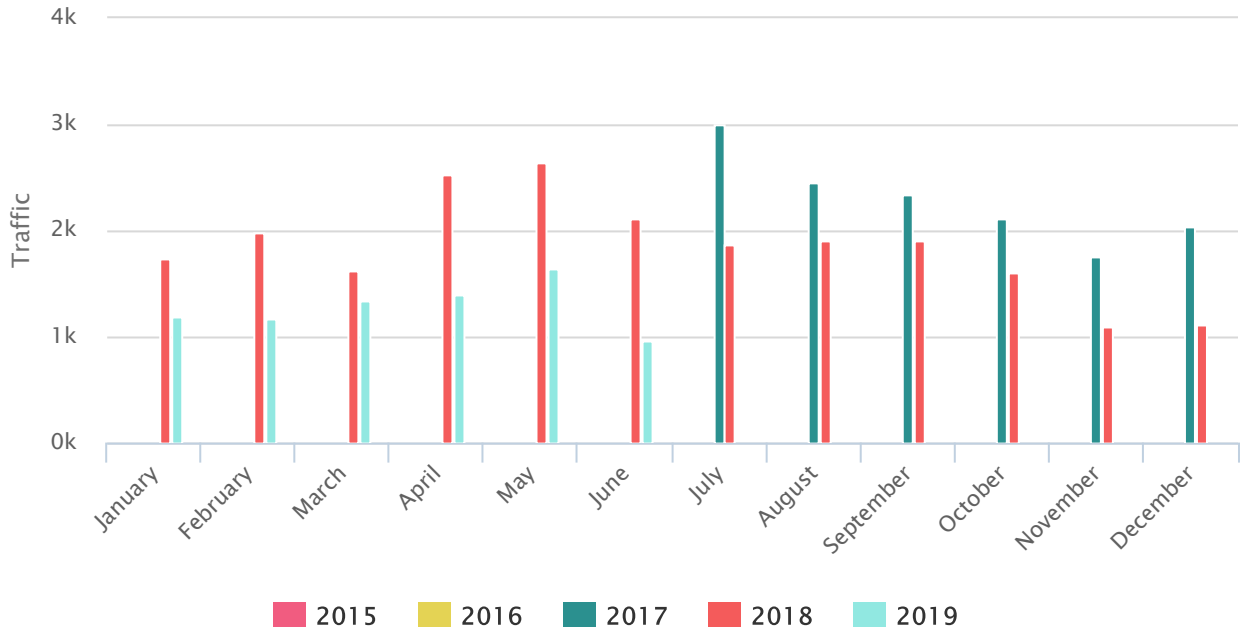
Kilmashogue Forest TOTAL 0023A

Data Summary

	Kilmashogue Forest TOTAL
Total Traffic for Period	43,472
Monthly Average	1,816
Weekly Average	417
Daily Average	60
Busiest day of the year	2017-12-26
Busiest day of the week	Sunday
Busiest hour of the day	11
Device Type	pedestrian
Installation Date	2017-07-01
Site ID	0023
Calibration Factor	0.5
GPS Co-ordinates	,

Totals for each month of the year

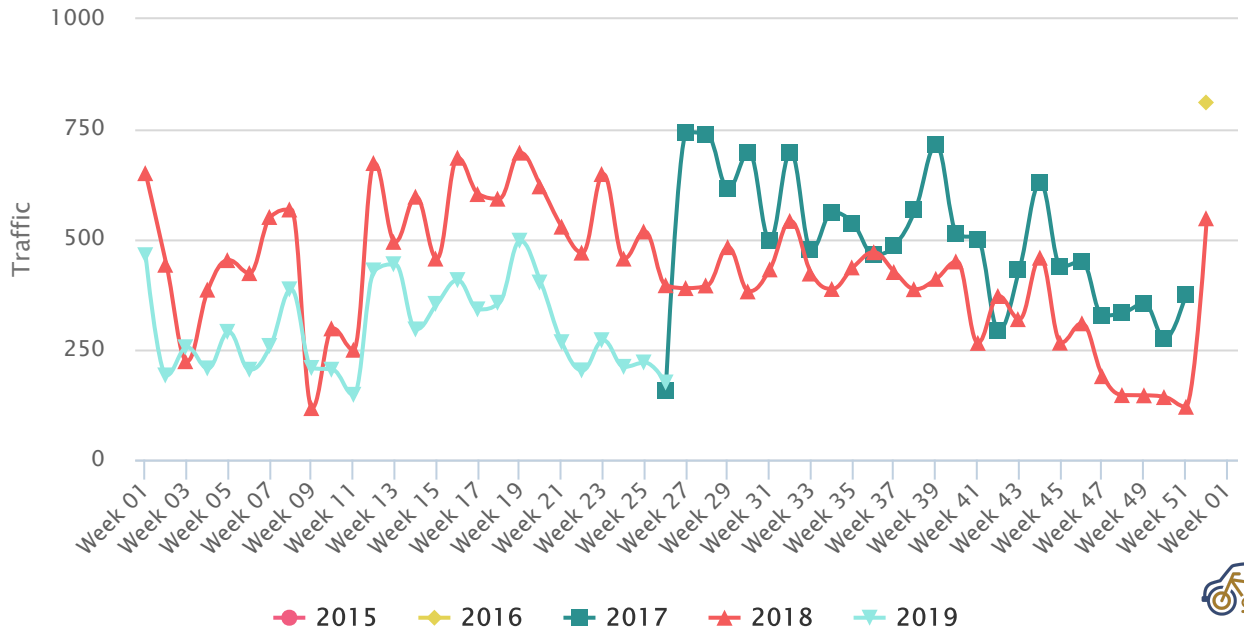
1st July 2015 to 30th June 2019



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015												
2016												
2017							3,003	2,447	2,339	2,110	1,755	2,038
2018	1,742	1,975	1,621	2,523	2,636	2,118	1,869	1,901	1,907	1,598	1,101	1,107
2019	1,182	1,173	1,333	1,401	1,634	964						

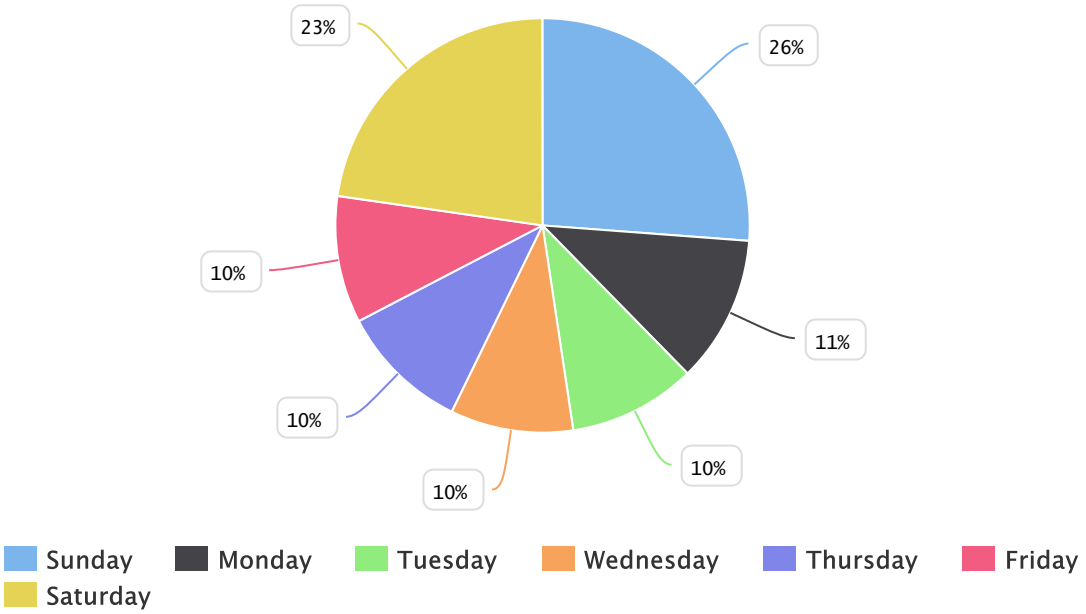
Weekly Totals

1st July 2015 to 30th June 2019



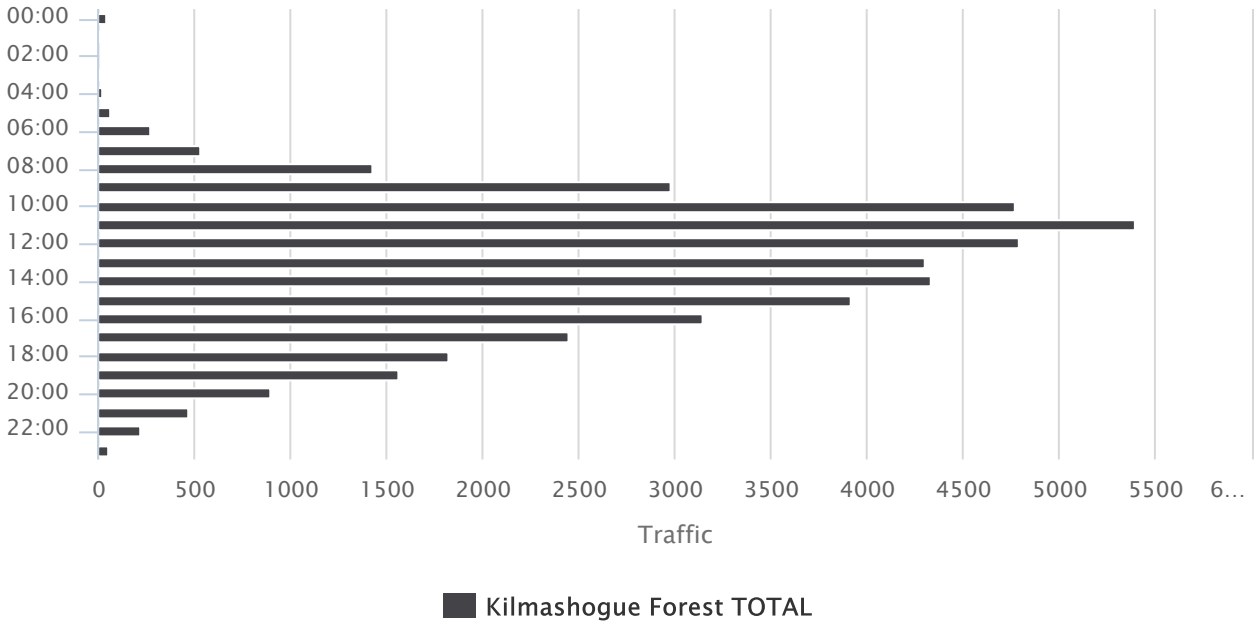
Totals for each day of the week

1st July 2015 to 30th June 2019



Totals for each hour of the day

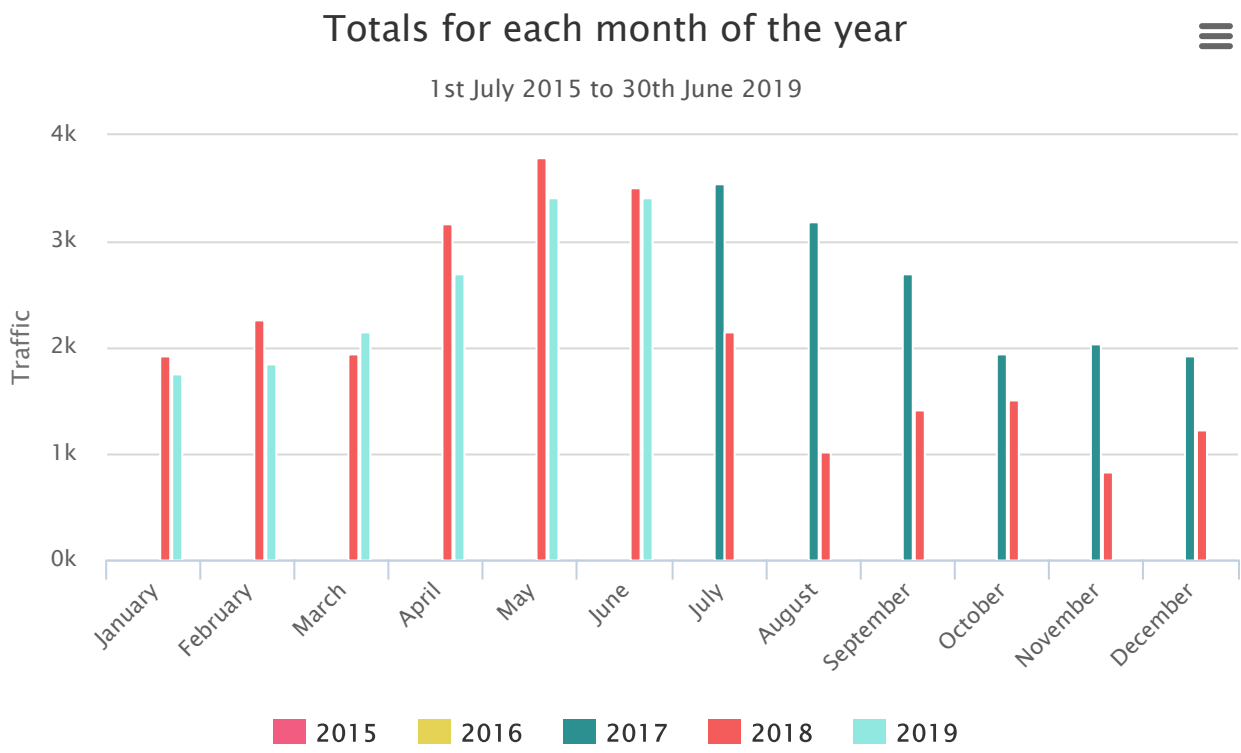
1st July 2015 to 30th June 2019



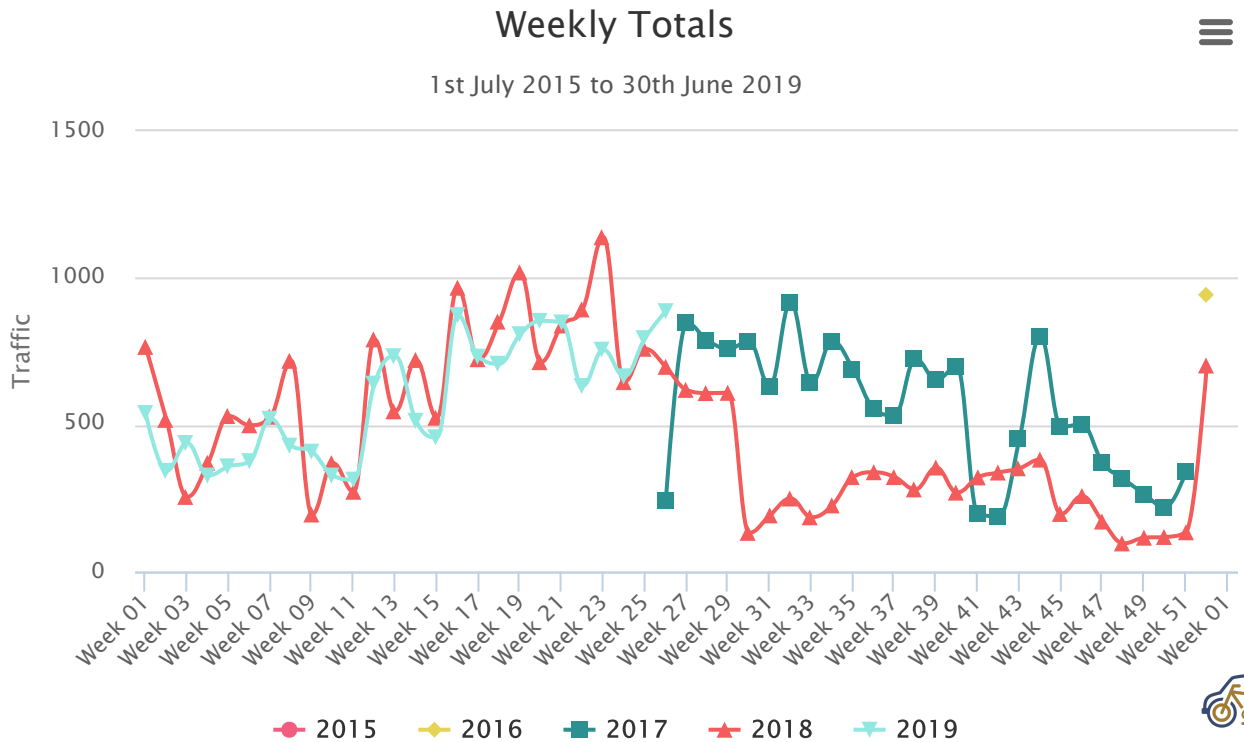
Glenasmole TOTAL 0024C

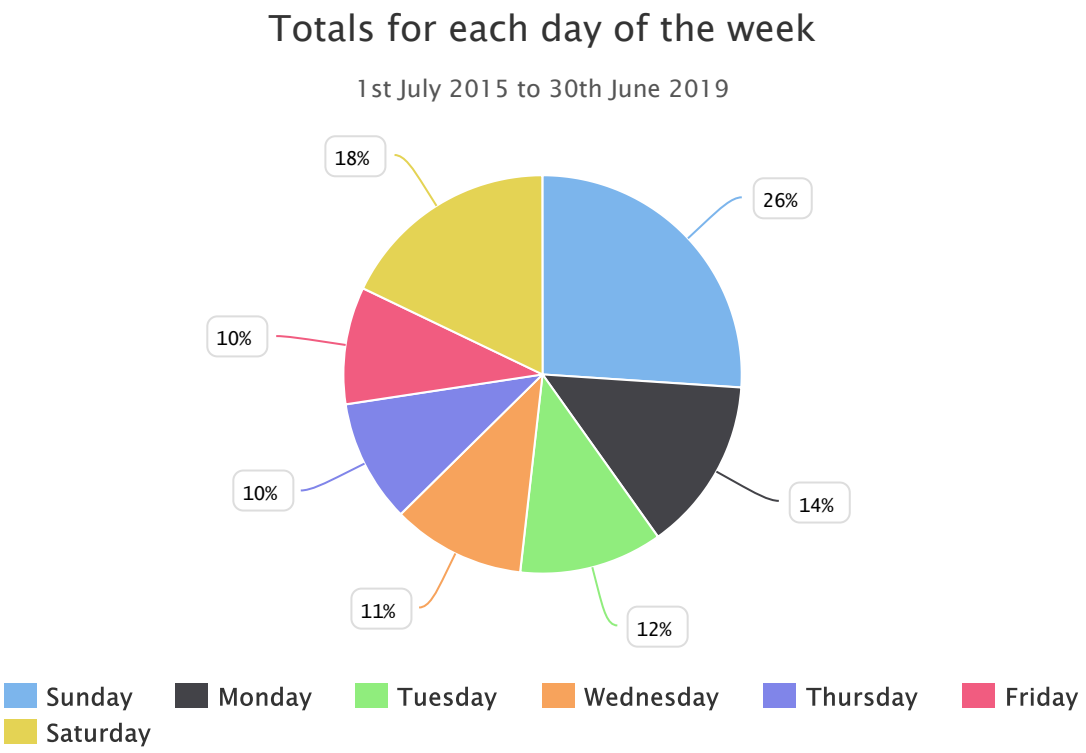
Data Summary

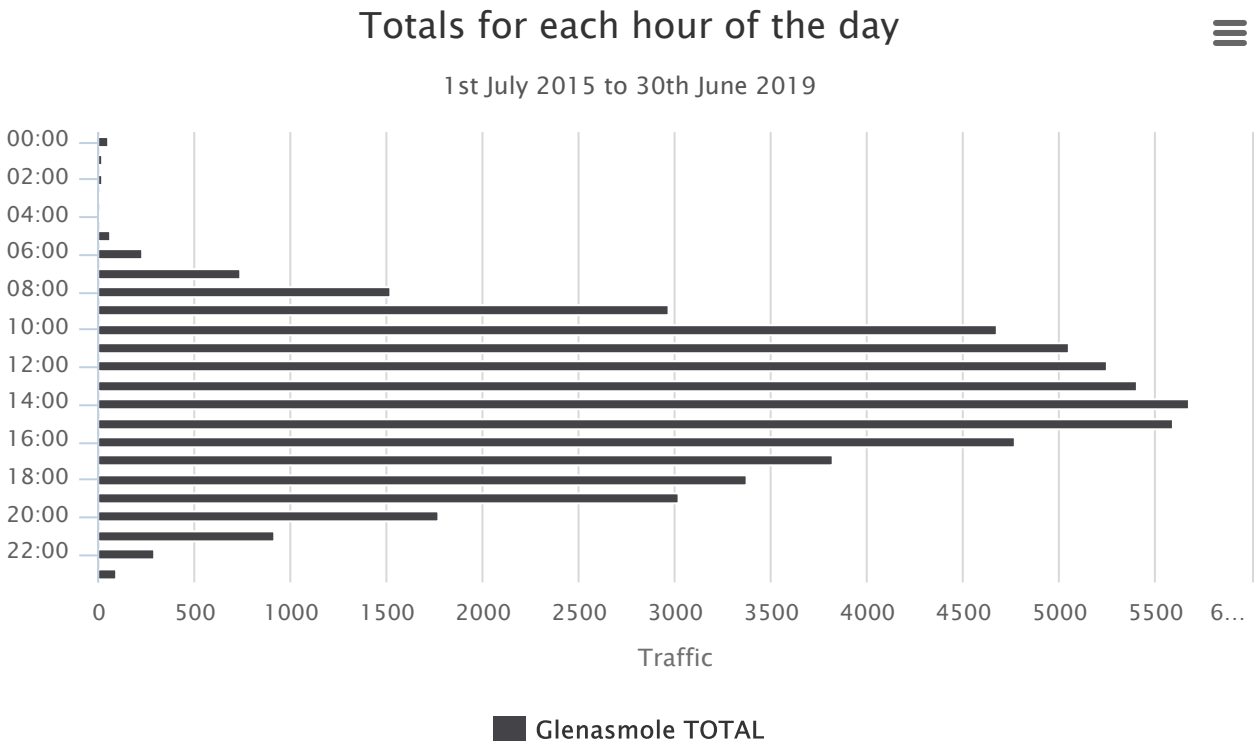
	Glenasmole TOTAL
Total Traffic for Period	55,352
Monthly Average	2,313
Weekly Average	531
Daily Average	76
Busiest day of the year	2018-05-27
Busiest day of the week	Sunday
Busiest hour of the day	14
Device Type	pedestrian
Installation Date	2017-07-01
Site ID	0024
Calibration Factor	0.5
GPS Co-ordinates	,



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015												
2016												
2017							3,539	3,184	2,704	1,938	2,043	1,928
2018	1,928	2,264	1,941	3,167	3,798	3,501	2,150	1,010	1,412	1,504	833	1,229
2019	1,759	1,853	2,143	2,701	3,409	3,421						



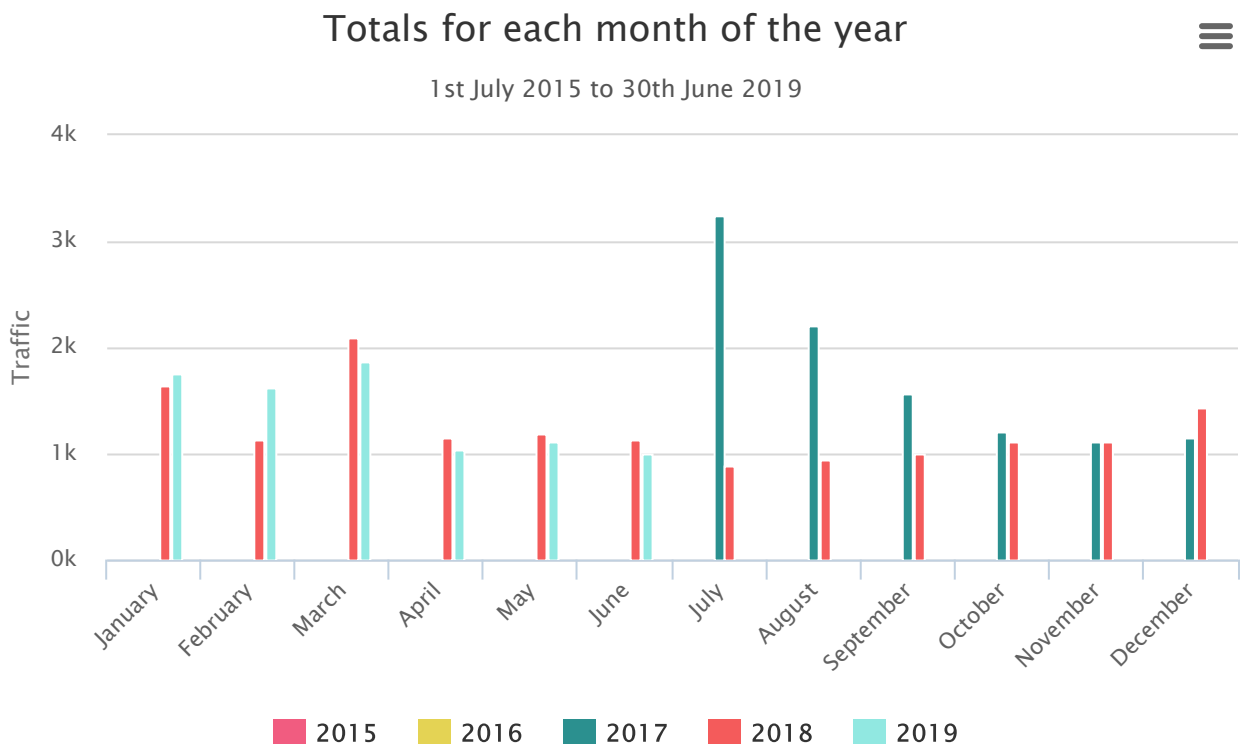

Totals for each day of the week
1st July 2015 to 30th June 2019
18%
26%
10%
14%
10%
11%
12%
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday


Totals for each hour of the day
1st July 2015 to 30th June 2019
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6...
Traffic
Glenasmole TOTAL

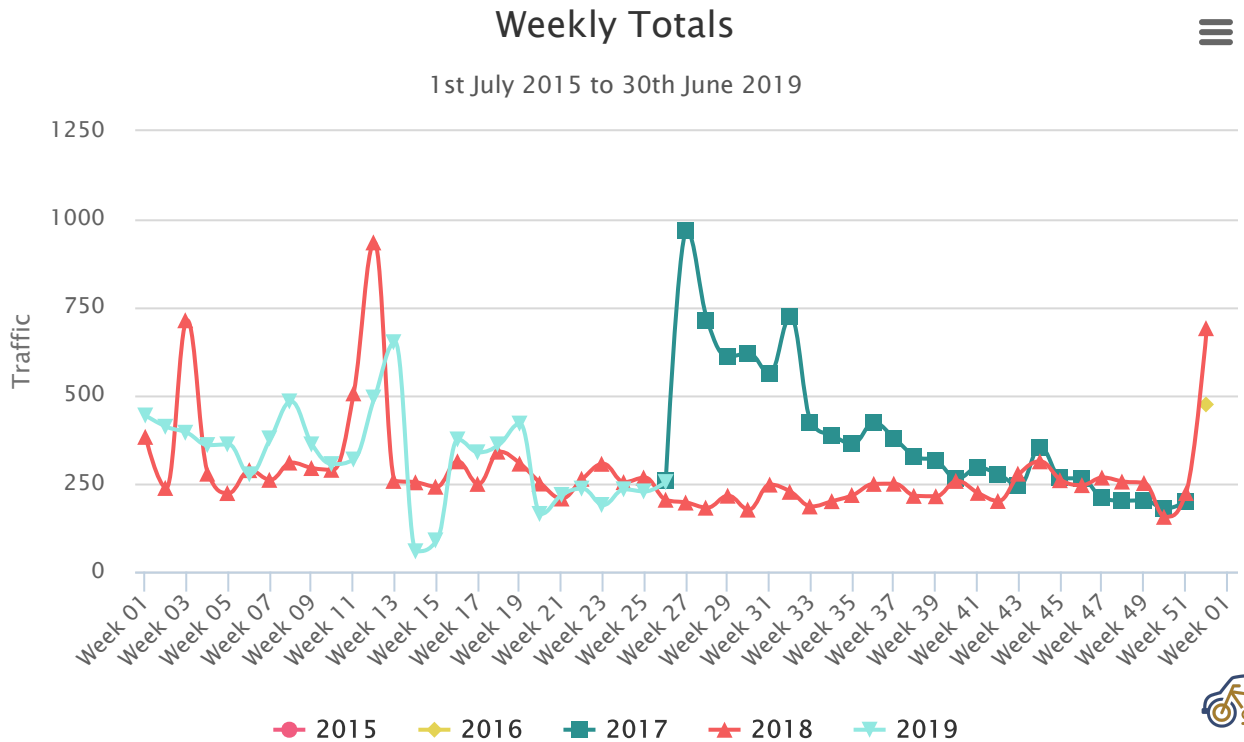
Rathmichael Woods TOTAL 0025A

Data Summary

	Rathmichael Woods TOTAL
Total Traffic for Period	33,709
Monthly Average	1,408
Weekly Average	323
Daily Average	46
Busiest day of the year	2018-03-21
Busiest day of the week	Sunday
Busiest hour of the day	15
Device Type	pedestrian
Installation Date	2017-07-01
Site ID	0025
Calibration Factor	0.5
GPS Co-ordinates	,

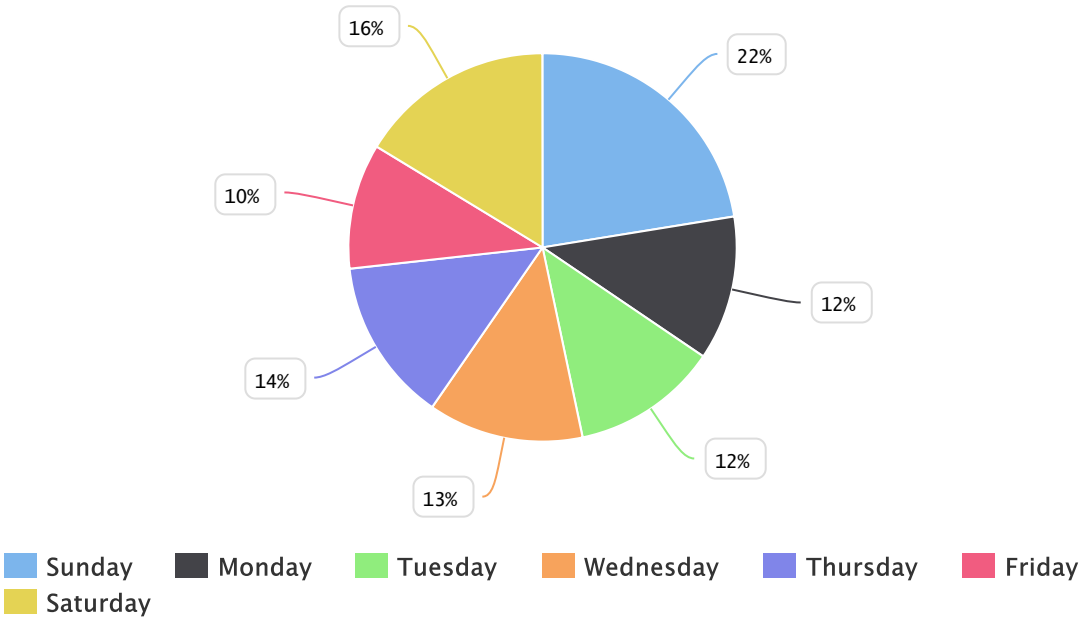


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015												
2016												
2017							3,236	2,214	1,574	1,204	1,116	1,148
2018	1,638	1,131	2,102	1,149	1,194	1,123	888	939	998	1,120	1,108	1,436
2019	1,747	1,625	1,862	1,044	1,111	1,006						



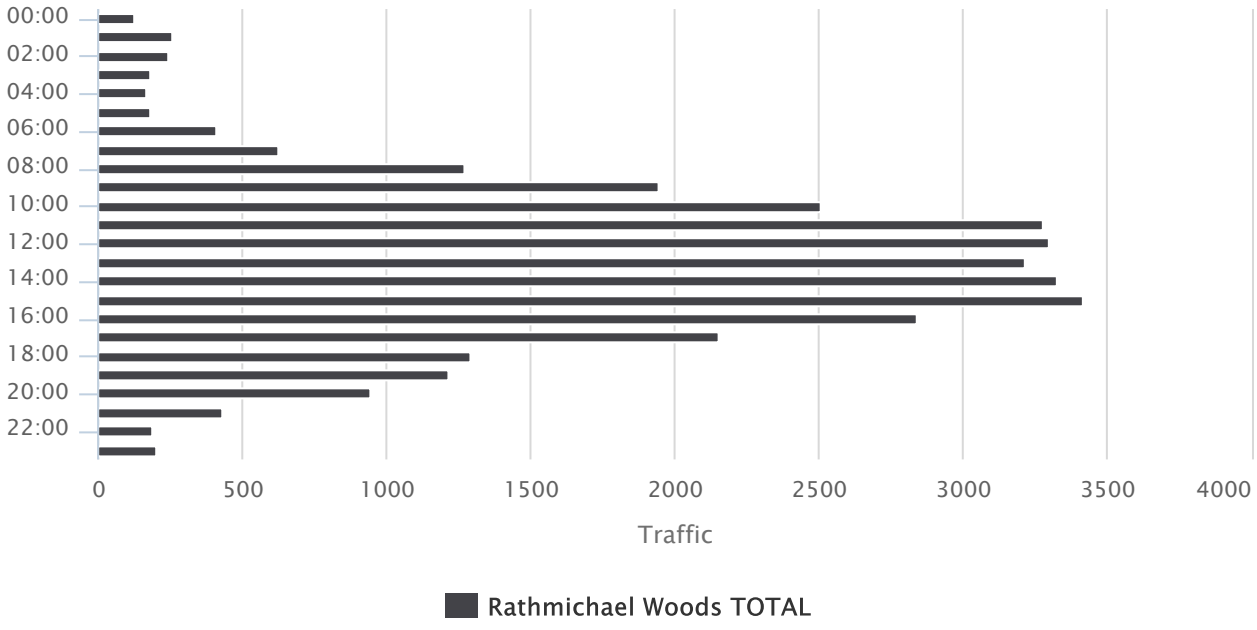
Totals for each day of the week

1st July 2015 to 30th June 2019



Totals for each hour of the day

1st July 2015 to 30th June 2019



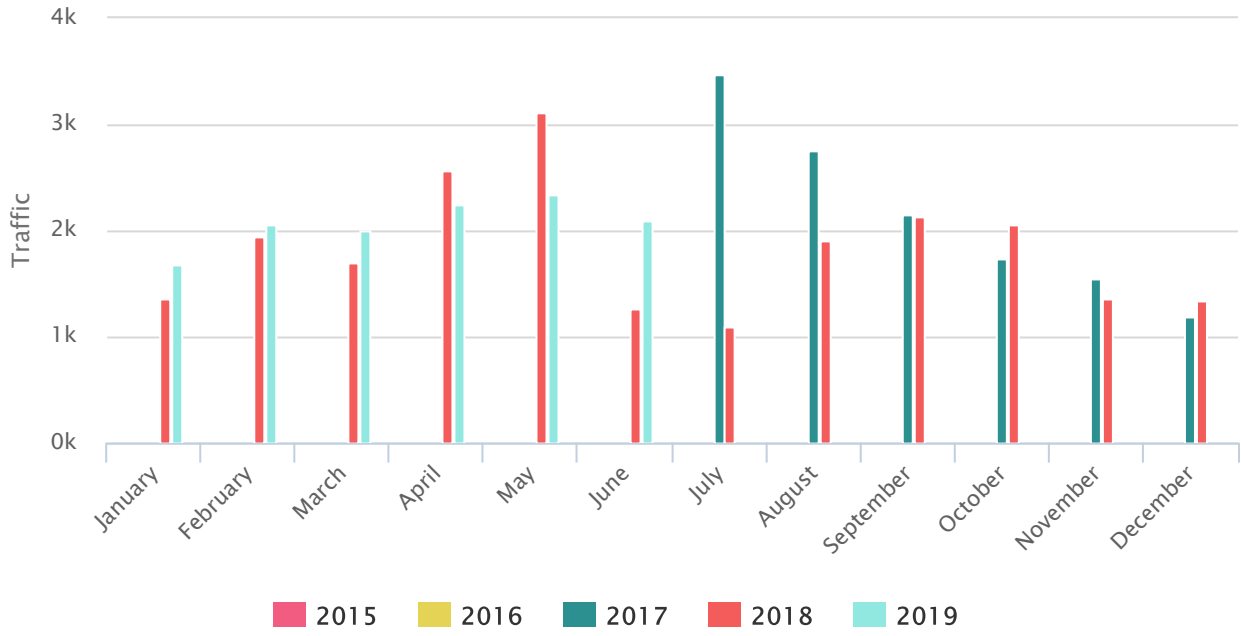
Kiltipper Park TOTAL 0026A

Data Summary

	Kiltipper Park TOTAL
Total Traffic for Period	47,158
Monthly Average	1,970
Weekly Average	452
Daily Average	65
Busiest day of the year	2018-04-21
Busiest day of the week	Sunday
Busiest hour of the day	14
Device Type	pedestrian
Installation Date	2017-07-01
Site ID	0026
Calibration Factor	0.5
GPS Co-ordinates	,

Totals for each month of the year

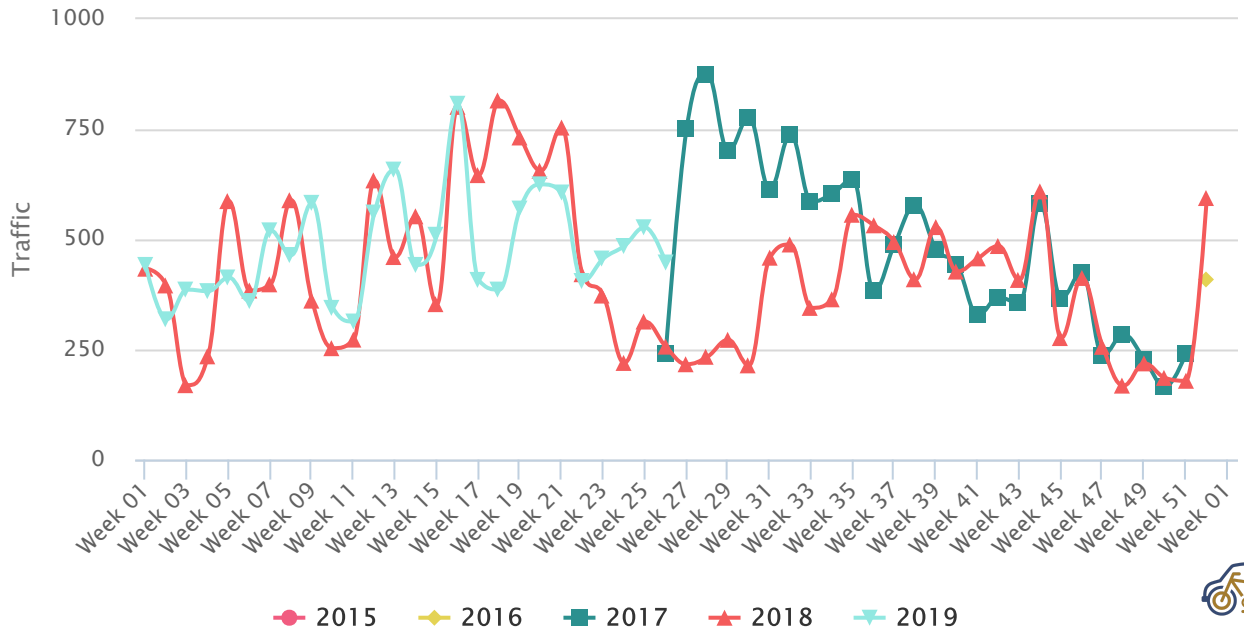
1st July 2015 to 30th June 2019



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015												
2016												
2017							3,479	2,764	2,158	1,743	1,546	1,194
2018	1,366	1,946	1,698	2,566	3,104	1,259	1,098	1,910	2,142	2,065	1,355	1,345
2019	1,679	2,061	2,009	2,251	2,341	2,087						

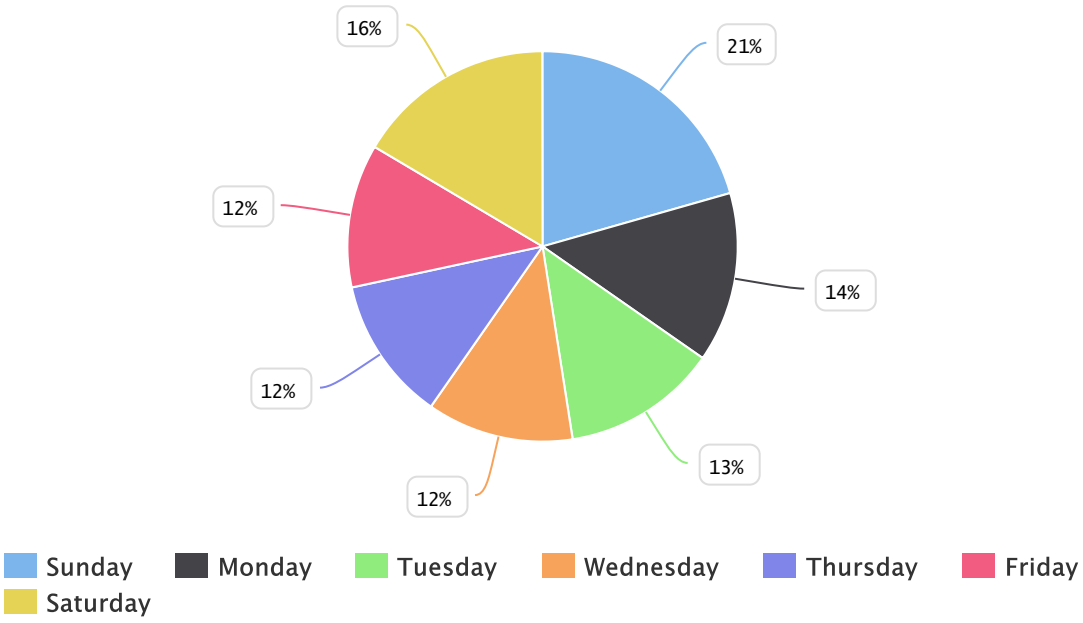
Weekly Totals

1st July 2015 to 30th June 2019



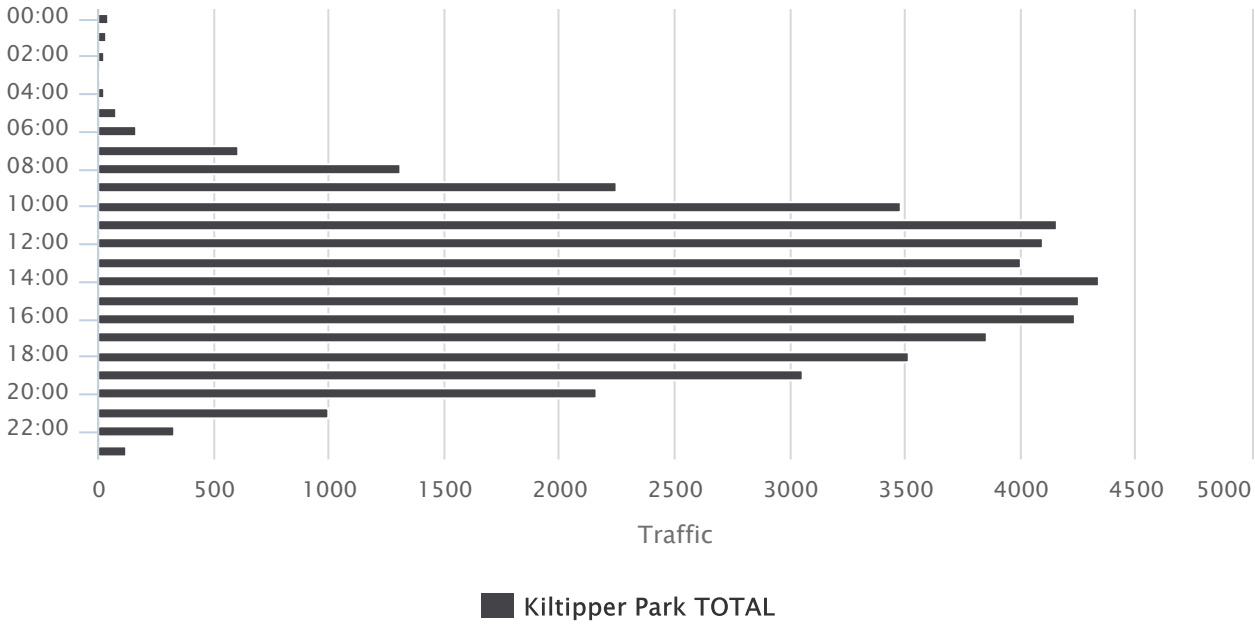
Totals for each day of the week

1st July 2015 to 30th June 2019

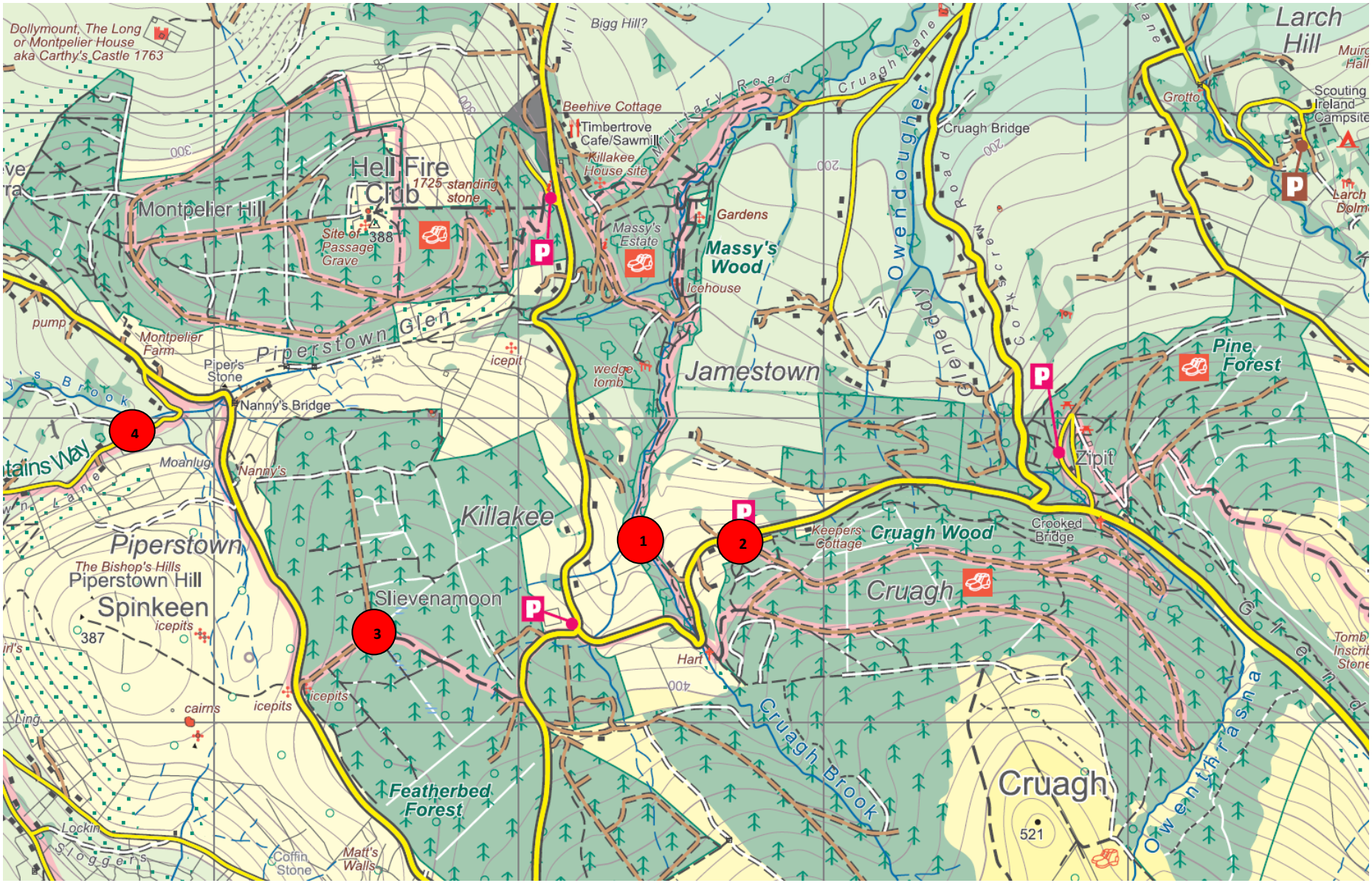


Totals for each hour of the day

1st July 2015 to 30th June 2019



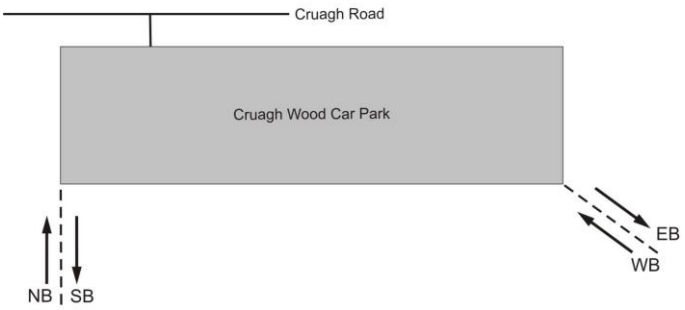
APPENDIX B
2017 Walker Survey Map



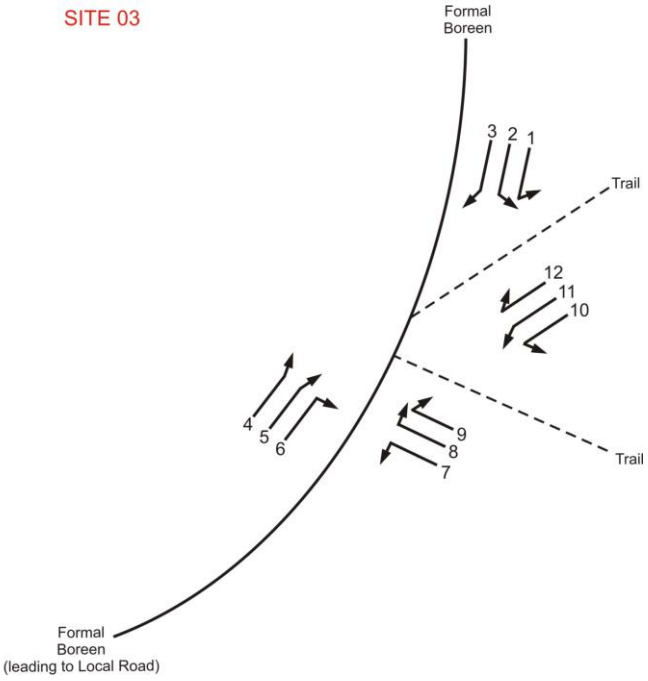
Dublin Mountains Walker Survey Locations 3rd-6th November 2017.

Movements Directions/Numbers

SITE 02



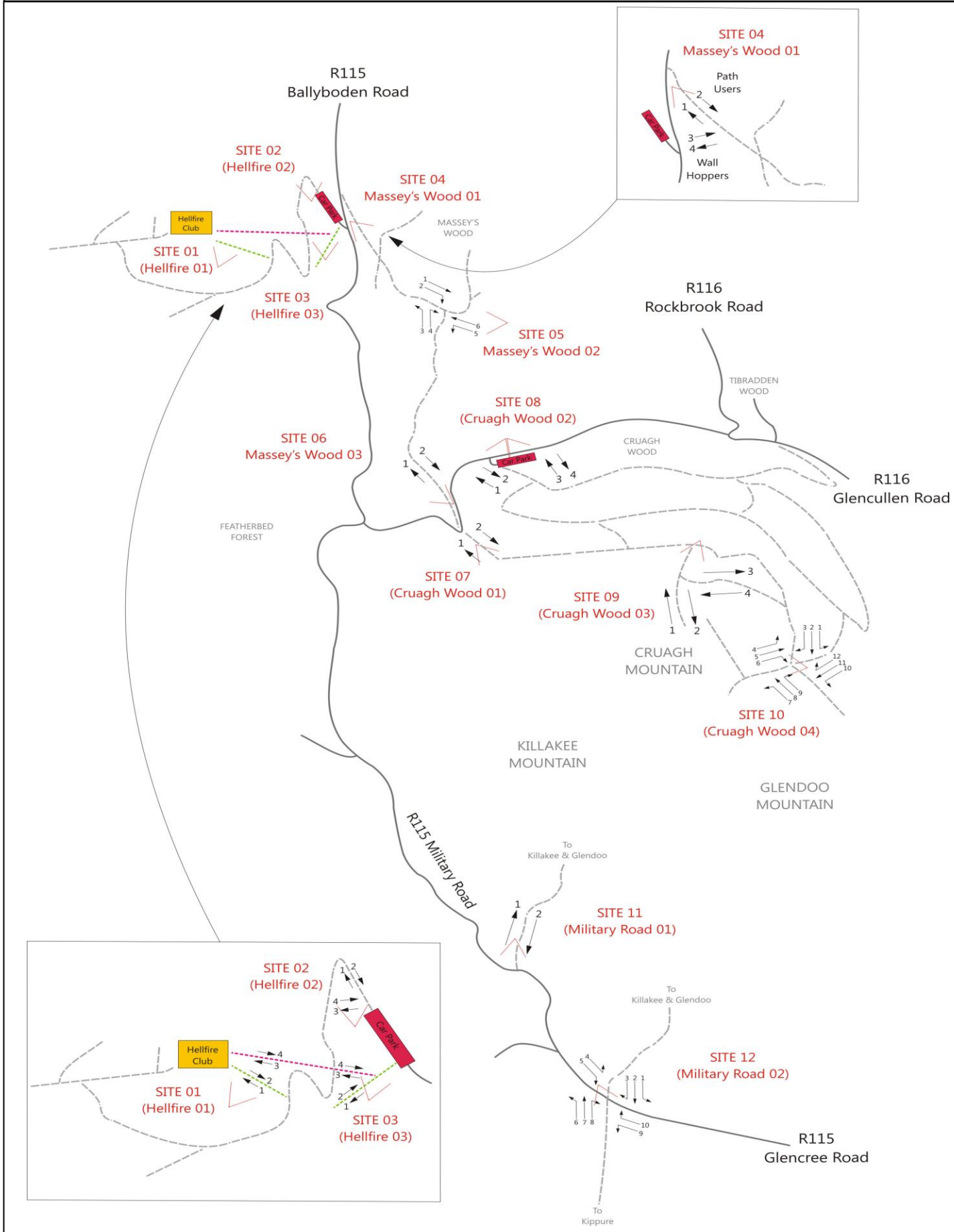
SITE 03



	Job number: Ath/17/162	Job date: Friday 3rd through Monday 6th November 2017	Drawing No: Ath/17/162-2	abacus Transportation Surveys
	Client: ROD		Author: SPW	

APPENDIX C
2019 Walker Survey Map

Site Locations/Movement Numbering



	Job number: TRA/19/143	Job Date: Fri 7th to Mon 10th June 2019 Fri 5th to Mon 8th July 2019 Fri 9th to Mon 12th August 2019	Drawing No: TRA/19/143-02	traffinomics.ie
	Client: Roughan O'Donovan		Author: SPW	

APPENDIX 3
Merlin Survey Reports

AlanLauderConsulting
ornithology | wildlife | projects | research | management | training | advisory

Ornithological Survey Report

Merlin (Falco columbarius) survey of the Dublin Mountains

for Roughan O'Donovan, Consulting Engineers

Author: Alan Lauder BSc (hons)
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Version Control

Version	Date	Changes	Confidentiality	Prep	Rev	Auth
Draft	15/09/2019		Not confidential	AL		
Final	29/10/2019		Not confidential		Client	AL

Acknowledgements

Staff of ROD assisted with fieldwork and Patrick O'Shea advised and assisted with location of VPs.

John Lusby provided comments on findings. The cover image of a Merlin over moorland was provided by Tim Melling for sole use within this report (all other rights reserved)

Field Investigations and Data

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work. Where any data supplied by the client or from other sources may have been used it has been assumed that the information is correct. No responsibility can be accepted by Alan Lauder Consulting for inaccuracies in the data supplied by any other party.

Declaration of Compliance

"The information which we have prepared and provided is true and has been prepared and provided in a manner consistent with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed within this document are our true and professional *bona fide* opinions."

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APPENDICES

1. Background

This report details fieldwork undertaken to determine the presence, status and distribution of breeding Merlin in the Dublin Mountains in relation to the development of a proposed Dublin Mountains Visitor Centre.

The need for the survey arises from a request for further information from An Bord Pleanála (Ref. 06S JA0040) to "undertake additional bird surveys in optimal conditions…"

2. Methodology

2.1 Survey Methods

2.1.1 General Approach

The general approach to fieldwork was similar to that used within the National Merlin Survey 2018 (IRSG/BWI 2018[1]) and which is based on or derived from, standard published methods for Merlin within the UK and from studies within Ireland which have helped refine methods for this difficult to detect, near cryptic, species (Hardy et al 2013[2], Norris et al 2009[3], Lusby et al 2011[4]).

This survey, with a more localised focus than the national survey and many Irish studies, allowed for an approach which, within reason, maximised the likelihood of detection of Merlin while also collecting all information relating to Merlin activity observed in the area and which would inform the an assessment of the likelihood of detection and the suitability of the area for breeding.

The general approach consisted of fieldwork carried out by skilled and experienced field observers, to determine presence and location of breeding Merlin by carrying out timed and focused vantage point watches within all areas of suitable habitat within the study area, undertaking detailed searches of open ground and perches for any signs or prey remains from Merlin kills and recording the presence of prey species, conflict species and the presence of hooded crow (which can give rise to nest sites).

2.1.2 Survey Area

This area was defined by the client but not mapped and takes consideration of the likely zone of impact of the proposed Dublin Mountains Visitor Centre and the presence of suitable Merlin nesting habitat.

The likely zone of impact was defined as the entire area within 5 km of the proposed development, and, the Glendoo Brook downstream as far as The Liffey Estuary Lower transitional waterbody as far as the North Bull and Poolbeg Lighthouses. The likely zone of impact covers the trails leading into the Wicklow Mountain SPA, from the Hellfire Wood car park, to a distance of at least 5 km i.e. a 10 km round trip.

The area consists of upland ground with a mix of open ground habitats, mainly heather moorland and blanket bog, and forestry cover. At lower altitude the area is bounded by a range of agricultural habitats, mainly improved or semi-improved grassland.

Figure 1 illustrates VP locations within the study area with the outer VPs and their viewsheds (Appendix 3) roughly equivalent to the outer boundary.

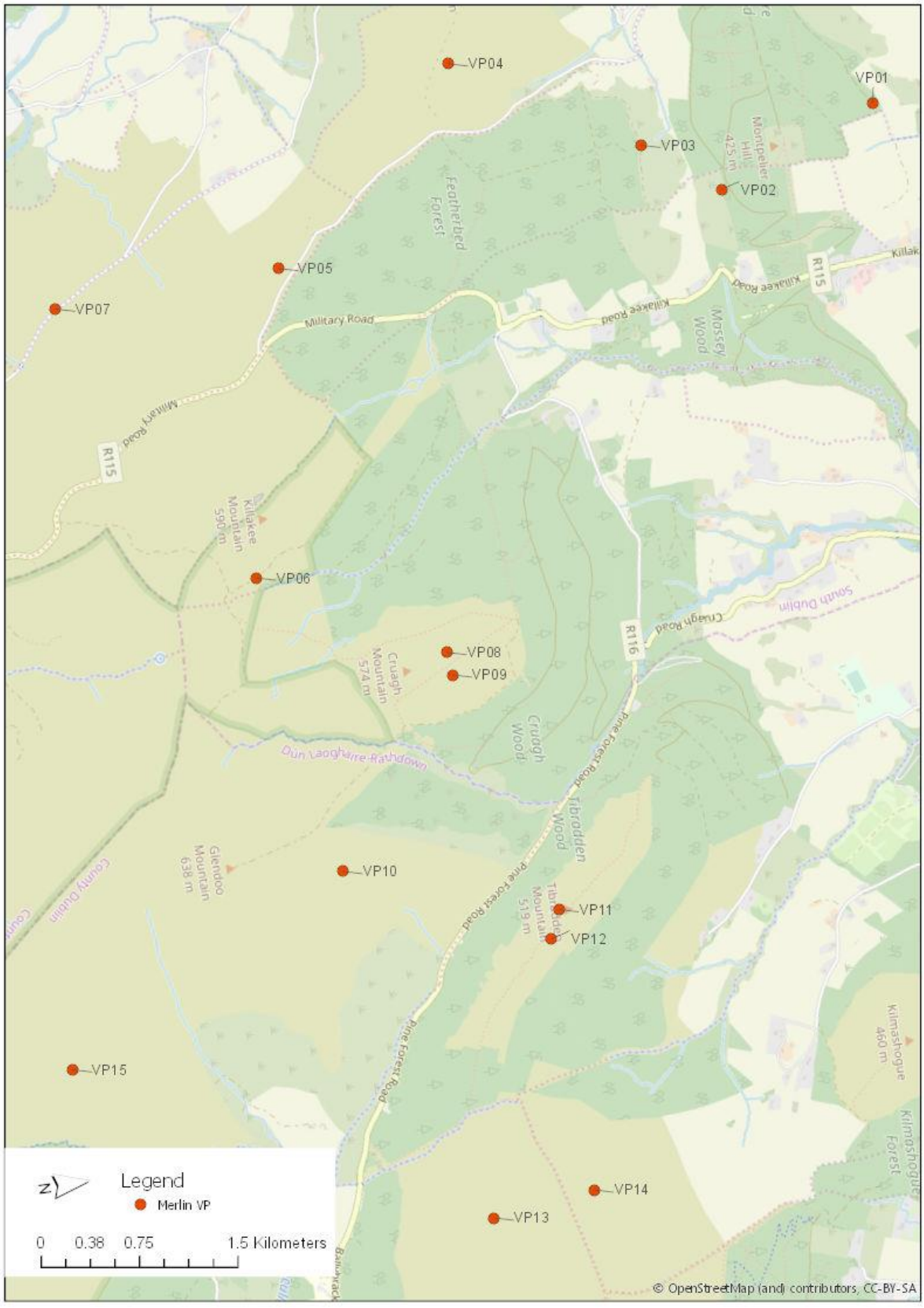


Figure 1 Merlin VP locations

2.1.3 Vantage point selection

The locations of all vantage points are shown in Figure 1.

Each vantage point was selected initially from a map search and then through ground truthing to ensure all areas of apparently suitable Merlin breeding habitat was able to be observed from at least one vantage point within 1.5 kilometres. This is similar to the National Merlin Survey, where vantage points were also located at a maximum distance of 1.5 km from the area of potentially suitable breeding habitat which was being watched. This increased confidence of recording Merlin which may be associated with that habitat where being more distant can potentially further reduce detection of this small fast flying falcon (author's pers obs).

The approximate viewshed of all VPs extending to 1.5 km radius in a, roughly, 180-degree arc is shown in Appendix 3.

Suitable Merlin nesting habitat is well defined by the National Merlin Survey 2018 guidelines and in summary consists of:

- Trees adjacent to, or in close proximity to unenclosed lands particularly moors and heathland. Plantation edges, notably those plantations aged between 31 to 40 years but also forests as young as 11 years and over 50 years in age are possible (Lusby et al. 2017[4]).
- Trees in open woodland, shelter belts, copses, tree lines, wooded islands on inland lakes and isolated trees in open upland areas provided there is a suitable stick nest available
- Merlin may also nest on the ground in moorland where heather is 30 – 70 cm high typically on sloping ground.

A typical view from a Vantage point is illustrated in figures 2 and 3, showing key features within the observer's view

2.1.4 Vantage point watches

Vantage Point (VP) watches are commonly used in surveys of raptors where occurrence or detectability can be low and thus long periods of focussed observation are necessary to detect presence and behaviour types to enable the breeding status of a species to be determined. Locating vantage points within Merlin breeding habitat enables observations to be targeted at this species. These vantage points are not necessarily ideal for observations of other species though additional helpful records of other bird species in the area can be collected incidentally. Hardey, 2013[2] and the National Merlin Survey 2018[1] used 3 hours as the minimum recommended viewing period noting that observations prior 1000h or after 1600h were of highest value. Lusby *et al*. 2011[5] indicates that there was no significant variation in detection rate through daylight hours.

Figure 2 View from VP3 – overlooking distant forest edge and moorland – the lower grassland creating a mosaic with the heather is less typical for Merlin but the moorland abutting the forest is more suitable

Figure 3 View from VP 14 – suitable Merlin breeding habitat on the mature forest edge, adjacent to high quality moorland

In this study, surveyors were given the following guidance for carrying out vantage point watches:

- Four visits to each VP through the season, wherever possible these to be roughly evenly spaced each month from April to July. Where this was not possible due to logistics or weather, weighting the preference for visits to before 15 May or after 15 June was also acceptable as this provided the highest chance of detectability of any occupied Merlin nesting areas as it coincides with the periods of greatest visibility of breeding Merlin (Lusby *et al.* 2011[5], Lusby *et al. 2017*[4]*)*

- Six-hour VP watches were carried out ideally starting early morning or ending late evening – midday watches were acceptable where this was not possible due to e.g. weather
- Plot all Merlin activity on maps and forms provided - the purpose is to record breeding evidence therefore heights and detailed timings are not needed while notes on breeding behaviour and flight lines are most important
- Record other raptor sightings (on form provided)
- Record a complete list of all bird species encountered during the VP (on form provided) indicating the code for breeding evidence

The recording forms used are shown at Appendix 2.

As noted in the last bullet point, field surveyors were asked to record a list of all species seen or heard within the viewshed, or very close to, each VP including coding for breeding evidence. The aim of this was to ascertain the general composition of the bird community within the area with a view to identifying the presence of:

- Key Merlin prey species
- Species whose old nests are known to be used by Merlin
- Species which may be mobbed by breeding Merlin
- Species which may be antagonistic to Merlin
- Species of high conservation priority which may not have been located by other surveys

2.1.5 Searching for signs of Merlin

Merlin typically leave a range of signs such as prey remains and pluckings on perches within close proximity of nests, most often within c. 300 m. Perches are usually located on boulders, fence posts, hummocks and less commonly on branches. They are usually in open ground.

Observers were asked to search all open ground within 300 m. of potential breeding habitat (forest edge) for signs of Merlin. Spending approximately 1-2 hours after each visit or on a separate day, searching suitable perches such as rocks, fence posts and tree stumps.

Observers were asked to record the location and type of remains to assist with ascertaining whether these were from Merlin or from other raptor species.

2.2 Survey Team

2.2.1 Personnel (Non-ROD staff)

Non-ROD personnel selected for the project had high levels of Merlin, general raptor and VP survey experience.

Personnel were given survey technique training in advance of survey commencement to ensure consistent survey standards and were mentored throughout by AL.

The staff listed carried out all survey work at Vantage points 7-15

Alan Lauder (AL): Project manager and Fieldwork
Alan is a professional ornithologist and nature conservation specialist with over 30 years' experience working across state and non-governmental wildlife and conservation organisations in the UK and

Ireland and more recently in commercial ornithological services. He has extensive experience of a wide range of ornithological research, survey and monitoring techniques, is a skilled field worker as well as being experienced in habitat and wildlife management projects. As a senior level leader and manager in a range of organisations he developed extensive skills and experience in the management of large-scale ornithological research and survey programs, project, organisational and strategic development, communications and policy.

His specific raptor experience is extensive. He was the organiser of the 2001/2002 UK National Peregrine Survey, steering group member on the 2017 Irish National Peregrine Survey, Steering group member and local organiser (Wicklow) for the Irish National Merlin Survey 2018 and has been involved in raptor surveying and research both in Scotland and more recently in Ireland over a 35 year period including; membership of Tayside Raptor Study Group in the 1990s, involvement with co-ordinating raptor license reporting for SNH in the 1990s, initiating the Scottish Raptor Monitoring scheme in 2000 with the BTO, lead on raptor conservation projects in S&W Scotland for RSPB in 2002-2008 and oversight of BirdWatch Ireland raptor survey programs from 2008-2013 including those for Merlin. Alan continues active field involvement with raptor studies, particularly Peregrines, Ravens and Merlin in County Wicklow.

John Lusby (JL) – Fieldworker and methods advice
John is an experienced raptor ecologist with specialisms in Barn Owl, Kestrel and Merlin and an extensive publishing record on Irish Merlin. He was lead organiser of the National Merlin Survey 2018 and has been BirdWatch Ireland's lead officer on Merlin studies.

Hannah Keogh (HK) - Fieldworker
Hannah is a professional field ornithologist and has wide experience of bird survey techniques. She has participated in many VP-based bird surveys for renewable energy projects and has been a participant in national Merlin and Peregrine surveys.

2.2.2 ROD Staff

Staff from ROD carried out all survey work for Vantage Points 1-6.

Patrick O'Shea (POS)-Fieldworker

Patrick O'Shea is an ecologist with experience in bird surveying for infrastructure projects including VP surveys. Patrick carried out the 2018 Merlin survey for the Dublin Mountains Visitor Centre and was a participant in the national Peregrine Survey.

Mike Bailey (MB)- Fieldworker

Mike is an ecologist with a background in raptor research. Mike has coordinated and carried out bird surveys including monitoring for development projects in Africa, the UK and Ireland.

3. Results & analysis

3.1 Duration and coverage of fieldwork

Table 1 shows the dates of survey work at all VPs. In a few cases survey visits were cut short due to changing weather making conditions unsuitable for survey work and the deficit in hours was added on alternative days as close as possible to the original date – these are not contained in the table but are held in original data files. This ensured that a minimum of 24 VP survey hours were carried out at each VP through the season.

A map of VP locations is contained at Figure 1.

Table 1 Dates of survey work at all Vantage Points

	Visit dates				
Vantage Point	Visit 1	Visit 2	Visit 3	Visit 4	additional visits
1	25/04/2019	30/05/2019	25/06/2019	25/07/2019	
2	03/04/2019	03/05/2019	07/06/2019	05/07/2019	
3	29/04/2019	31/05/2019	27/06/2019	26/07/2019	
4	29/04/2019	28/05/2019	17/06/2019	16/07/2019	
5	26/04/2019	28/05/2019	18/06/2019	10/07/2019	
6	02/05/2019	31/05/2019	20/06/2019	24/07/2019	
7	25/04/2019	15/05/2019	16/06/2019	27/07/2019	
8	19/04/2019	01/06/2019	30/06/2019	23/07/2019	07/06/2019
9	29/04/2019	30/05/2019	30/06/2019	23/07/2019	
10	01/05/2019	24/05/2019	16/06/2019	15/07/2019	
11	29/04/2019	08/06/2019	22/06/2019	18/07/2019	
12	01/05/2019	07/06/2019	04/07/2019	13/07/2019	
13	04/05/2019	22/06/2019	12/07/2019	17/07/2019	
14	10/05/2019	21/06/2019	13/07/2019	18/07/2019	27/07/2019
15	15/05/2019	28/05/2019	13/07/2019	27/07/2019	

Additional visits were carried out at VPs 8 and 14 as a single Merlin was seen at VP 8 and signs of Merlin were detected at VP 14 both warranting follow up visits to ensure detection of Merlin was high

3.2 Merlin records

Only one sighting of a Merlin was obtained during the fieldwork. This was at VP 8 and is detailed in Table 2 below:

Table 2 Merlin sightings

Date	Time	Duration (s)	VP#	No. birds	Age	Sex	Activity	Comments	Observer	Breeding evidence?
01/06/2019	09:45	15	8	1	Adult	M	F	Rapid flight to and over Cruagh Wood (to SW)	HK	Habitat

This record is coded as H for breeding evidence. This equates to a sighting of a single bird during the breeding season in suitable 'habitat' and is classed as "possible" breeding. This is plotted in Figure 4 below.

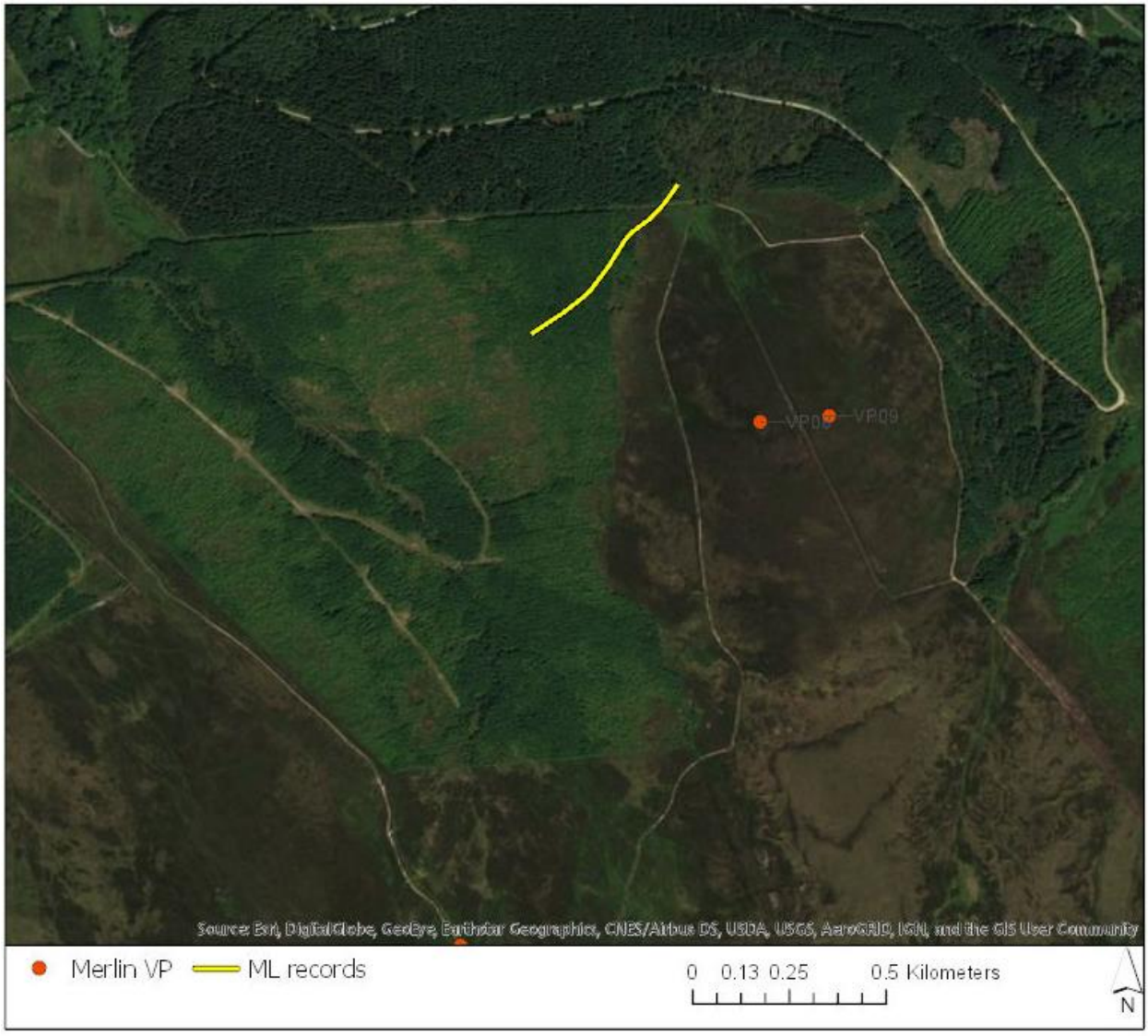


Figure 4 Location and track of Merlin sighting

3.3 Other raptors

Fieldworkers recorded the incidence of raptor occurrence at all VPs and a summary of all records is contained at table 3.

This table shows the occurrence of 4 raptor species. All VPs showed some level of raptor presence, with the commonest raptor present being Buzzard but with frequent sightings of Sparrowhawk and Kestrel. In a few cases frequent or near continual, observations of common species were seen during VP watches.

The incidence and behaviour of these other raptors indicate all species were common breeders within or close to the survey area.

One sighting of an adult male Hen Harrier was recorded. No Hen Harrier are known to nest in the Wicklow or Dublin Mountains and the timing of this sighting suggests it was either a non-breeder or potentially a failed breeder from elsewhere. Records of non-breeding Hen Harrier in the Wicklow and Dublin mountains are not unusual during the summer months (author pers. obs.).

Table 3 Raptor sightings summary at all VPs

Date	VP#	visit	Species	No. sightings in VP	Min. no. birds	Max. no. bird	Activity seen	Status/comments	Breeding evidence
25/04/2019	1	1	no birds	0	0				
30/05/2019	1	2	no birds	0	0				
29/06/2019	1	3	Buzzard	7	1	5	H		H
12/07/2019	1	4	Buzzard	1	1	1	D, F	agitated calls over forest	A
12/07/2019	1	4	Kestrel	5	2	3	H	pair hunting	P
03/04/2019	2	1	Buzzard	3	1	3	F	soaring/flying	D
03/04/2019	2	1	Kestrel	2	1	2	F	flying	H
03/04/2019	2	1	Sparrowhawk	1	1	1	F	female flying	H
03/05/2019	2	2	Buzzard	2	2	2	F, D		H
03/05/2019	2	2	Kestrel	1	1	1	F		H
07/06/2019	2	3	no birds	0	0				
05/07/2019	2	4	no birds	0	0				
29/04/2019	3	1	Buzzard	3	2	3	F		H
31/05/2019	3	2	Buzzard	3	1	3	F,H		H
17/06/2019	3	3	Kestrel	1	1	1	F, H		H
26/07/2019	3	4	Buzzard	2	1	2	H, F		H
26/07/2019	3	4	Kestrel	2	2	3	F		P
26/07/2019	3	4	Sparrowhawk	2	1	2	F		H
29/04/2019	4	1	Kestrel	1	1	1	H	hunting over clear fell	H
30/05/2019	4	2	Kestrel	2	1	1	H		H
28/05/2019	4	2	no birds	0	0				
17/06/2019	4	3	no birds	0	0				
16/07/2019	4	4	Buzzard	1	1	1	P	heard only	H
16/07/2019	4	4	Kestrel	4	2	4	H	fledged young	FL
26/04/2019	5	1	Buzzard	4	1	4	H	hunting	H
26/04/2019	5	1	Kestrel	4	2	5	H	flying and hunting	P
28/05/2019	5	2	Buzzard	2	1	2	F		H
14/06/2019	5	3	Buzzard	1	1	1	F		H
14/06/2019	5	3	Kestrel	6	1	4	H, F		H
18/06/2019	5	3	Kestrel					included in 14/06	
10/07/2019	5	4	Kestrel	4	2	3	H		P
02/05/2018	6	1	Buzzard	1	2	2	D	soaring display	D

Date	VP#	visit	Species	No. sightings in VP	Min. no. birds	Max. no. bird	Activity seen	Status/comments	Breeding evidence
02/05/2018	6	1	Kestrel	7	1	4	H	hunting	H
31/05/2019	6	2	no birds	0	0				
20/06/2019	6	3	no birds	0	0				
24/07/2019	6	4	no birds	0	0				
25/04/2019	7	1	Buzzard	20	2	2	F, P, H	soaring display	P
25/04/2019	7	1	Kestrel	1	1	1	H	male	H
15/05/2019	7	2	Buzzard	2	1	2	H		H
15/05/2019	7	2	Kestrel	1	1	1	H		H
16/06/2019	7	3	Buzzard	1	2	2	D	soaring	P
16/06/2019	7	3	Kestrel	1	2	2	H	2x male	H
27/07/2019	7	4	Buzzard	4	3	4	F	Newly fledged young	FL
19/04/2019	8	1	no birds	0	0				
01/06/2019	8	2	Hen Harrier	1	1	1	F	mobbed	H
30/06/2019	8	3	no birds	0	0				
27/07/2019	8	4	Buzzard	2	1	2	F	soaring	H
27/07/2019	8	4	Sparrowhawk	1	1	1	F	juvenile	H
07/06/2019	8	addn	no birds	0	0			Raven only	
29/04/2019	9	1	no birds	0	0				
30/05/2019	9	2	no birds	0	0				
30/06/2019	9	3	no birds	0	0			Raven only	
23/07/2019	9	4	no birds	0	0			Raven only	
01/05/2019	10	1	no birds	0	0			Raven only	
24/05/2019	10	2	Kestrel	2	1	2	H, F		H
16/06/2019	10	3	no birds	0	0			Raven only	
15/07/2019	10	4	no birds	0	0			Raven only	
29/04/2019	11	1	Kestrel	2	1	2	H	male	H
29/04/2019	11	1	Sparrowhawk	1	1	1	F	Flying over forest	H
08/06/2019	11	2	Buzzard	1	1	1	F		H
08/06/2019	11	2	Kestrel	2	2	2	H	pair hunting	P
08/06/2019	11	2	Sparrowhawk	1	1	1	F		F
22/06/2019	11	3	Buzzard	2	1	2	F, H		H
18/07/2019	11	4	Sparrowhawk	1	1	1	F	juvenile	H
01/05/2019	12	1	Buzzard	3	4	5	H, F		P
01/05/2019	12	1	Kestrel	4	1	4	H, F	male only	H
07/06/2019	12	2	no birds	0	0				
04/07/2019	12	3	Buzzard	1	1	1	F, H		H
13/07/2019	12	4	Buzzard	1	1	1	F, H		H
13/07/2019	12	4	Kestrel	3	2	3	F, H	Incl. at least 1 juv.	H
04/05/2019	13	1	Buzzard	1	1	1	P		H
04/05/2019	13	1	Kestrel	1	1	1	H		H
22/06/2019	13	2	Buzzard	1	1	1	F	heard only	H
12/07/2019	13	3	no birds	0	0			Raven only	
17/07/2019	13	4	Buzzard	1	1	1	F		H
17/07/2019	13	4	Kestrel	1	1	1	H		H
17/07/2019	13	4	Sparrowhawk	1	1	1	F, S	briefly soaring	H
10/05/2019	14	1	Kestrel	1	1	1	FF	carrying prey	FF
21/06/2019	14	2	Kestrel	8	2	4	F, H		P
13/07/2019	14	3	Kestrel	1	1	1	H		H
18/07/2019	14	4	Buzzard	1	1	1	H		H
27/07/2019	14	addn	no birds	0	0				
15/05/2019	15	1	Kestrel	2	1	2	H		H

Date	VP#	visit	Species	No. sightings in VP	Min. no. birds	Max. no. bird	Activity seen	Status/comments	Breeding evidence
28/05/2019	15	2	no birds	0	0			Raven only	
13/07/2019	15	3	Kestrel	1	1	2	D	alarming/mobbing	P
27/07/2019	15	4	no birds	0	0				

3.4 Bird community of the survey area

The cumulative seasonal lists, frequency occurrence[a] and highest recorded breeding evidence for each species on each VP is shown in Table 4.

The species shown in table 4 are ranked in order of frequency of occurrence across the survey season at all VPs with the most frequently recorded first. From this list, the frequency occurrence and the breeding evidence recorded for each species the bird community at and around each VP area is characterised and the following key findings are noted:

The bird community is typical of upland areas, forestry, scrub and upland marginal grassland.

Key Merlin prey species are small and medium sized passerines, notably those frequenting open ground and forest edge and in this study Meadow Pipit and Skylark were recorded on most VPs and these are commonly found as major prey items in Merlin diet in Ireland (Fernandez-Bellon & Lusby, 2011[6]).

A wide range of other small passerines represented at some level in Merlin diet were seen commonly including Swallow, Song Thrush and Chaffinch.

Upland waders were only represented by Snipe, and these were seen on only three VPs. Snipe are a regular prey species taken by Merlin and can make up a large portion of the biomass recorded in diet studies[6].

Hooded Crow, the primary provider of old nests that are subsequently used by Merlin were common.

Raptors such as Buzzard and Kestrel and corvids, including Raven, were common. These are typically species which are mobbed by Merlin where they occur within their territories, though the level of response can vary considerably[2, 5, 7]. Kestrels were seen in nearly 40% of VPs and antagonistic or competitive interactions are often seen between Kestrel and Merlin where they are in close proximity (author pers. obs., K.D. Shaw pers comm.).

[a] Frequency of the species recorded across all visits (range 0-4)

Table 4 Frequency occurrence and breeding evidence for all species (except Merlin) at all VPs

	VP1		VP2		VP3		VP4		VP5		VP6		VP7		VP8		VP9		VP10		VP11		VP12		VP13		VP14		VP15		%
Species	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**F**	**B**	**occurrence**
Meadow Pipit	3	FF	1	H	2	T	4	ON	4	FF	4	FF	4	FL	4	FF	4	T	4	A	4	FF	3	D	4	FF	3	FF	4	FF	86.7
Chaffinch	3	FL	4	T	2	T	1	S	3	T	3	T	2	T	4	T	2	H	3	S	4	T	4	T	4	T	4	T	1	H	73.3
Woodpigeon	2	f	3	H	4	P	3	H	3	P	1	H	1	H	3	H	2	H	3	H	4	H	3	FL	4	P	4	T	3	H	71.7
Hooded Crow	2	P	4	P	2	P	2	H	4	P			3	P	3	P	1	P			3	FL	4	H	4	FL	4	T	3	H	65.0
Blackbird	2	T	3	A	4	T	1	H	1	T	2	T	1	H	2	S			2	T	4	FF	4	T	4	P	1	H	3	S	56.7
Raven	2	H	2	f	3	f	4	P	4	P	1	f	1	f	2	P			1	T	4	H	3	H	3	H	2	H	3	H	58.3
Wren	2	T	3	T	2	T			3	T			4	T			2	S	1	S	3	T	3	T	3	T	3	T	1	S	50.0
Swallow	1	f	2	f	4	P	1	f	1	f	1	f	3	ON	1	f	2	f	2	f	1	H	4	H	3	f	2	f	3	f	51.7
Skylark	2	T			1	S	4	T	3	T	4	T	3	T	2	P	3	T	3	T			1	S	3	ON	3	ON	3	T	58.3
Mistle Thrush	2	FL	1	A					1	FF			1	H			1	S	2	H	4	FL	3	FL	3	FL	3	P	3	FL	40.0
Robin	1	S	3	FL	1	H			1	S	1	S					1	S	1	H	3	T	3	T	3	T	3	T	1	S	36.7
Willow Warbler	2	T	3	T					3	FF	1	S	2	T	1	S					3	T	4	T	1	H	3	T	2	S	41.7
Coal Tit	2	T	3	T	4	T			2	H			1	S	2	T			1	S	2	FL	3	FL	1	H	1	H			36.7
Song Thrush	3	P	4	P	2	T	1	H	3	FF	1	S	1	H	1	S					1	FL	2	T	1	S	2	T			36.7
Jay	2	T	4	FL	2	T	1	H	1	P					1	H					4	FL	2	A	2	T	2	A			35.0
Swift	1	f	1	f			1	f	1	f	1	f			1	f	1	f	2	f	1	f	4	f	2	f	3	f	2	f	35.0
Buzzard	2	H	1	D	2	H	1	f	3	H	1	P	4	FL							2	H	3	P	3	H	1	H			38.3
Kestrel			1	H	2	P	2	FL	2	H	1	H	2	H					1	H	2	H	2	FL	2	H	3	H	2	H	36.7
Jackdaw	1	H	2	f	3	H	1	f	3	P											1	H	2	f	2	f	1	f	2	H	30.0
Magpie	1	H	3	P	3	H	1	H	1	P									1	P	1	f	2	H	2	H	2	H			28.3
Red Grouse											2	A			2	T	1	H	3	P			3	T	3	T	3	T	1	H	30.0
Lesser Redpoll													2	P	1	H					4	P	2	H	3	H	3	T			25.0
Dunnock	2	T	2	P															1	S	3	T	1	S	1	S	1	H			18.3
Great Tit			3	P	1	S									1	H	1	H			2	FL	1	FL	2	T					18.3
Siskin													2	H							3	P	3	H			4	T			20.0
Mallard	1	F	3	f	1	f			1	f	1	f	1	F									1	f			1	f			16.7
LBB Gull			1	f	2	f			2	f			1	f							2	f			2	f					16.7
Goldcrest			1	H																	2	T	3	T	2	T	1	H			15.0

Table 4 Frequency occurrence and breeding evidence for all species (except Merlin) at all VPs

	VP1		VP2		VP3		VP4		VP5		VP6		VP7		VP8		VP9		VP10		VP11		VP12		VP13		VP14		VP15		%
Bullfinch			1	P																	2	P	3	FL	1	H	2	P			15.0
Blackcap			1	S																	4	T	2	T	1	S					13.3
Goldfinch			1	H									1	f									1	f	2	H	3	T			13.3
Pheasant	3	T			2	H													1	S											10.0
Sparrowhawk			1	H	1	H															3	H			1	H					10.0
Blue Tit	1	H	2	T	1	H																	1	H	1	FL					10.0
Chiffchaff			3	T	2	H									2	S															11.7
Cuckoo											1	H	1	H	2	S	1	H	2	H									1	S	13.3
Whitethroat			2	T																					3	T					8.3
House Martin			1	f									1	H							1	f	1	f	1	f	1	f			10.0
Herring Gull	1	f	1	f			1	f	1	f											1	f									8.3
Stonechat							3	P	1	T	1	H	2	FL			1	S											1	H	15.0
Linnet	2	P	1	P			1	H					1	H																	8.3
Long-tailed Tit			2	P	1	H																									5.0
Starling	1	H											1	H					1	f					1	f					6.7
Greenfinch			1	f																			1	f			1	f			5.0
Feral Pigeon	1	f			1	f											1	f													5.0
Grey Heron			1	f	1	F																									3.3
Rook									1	f																			1	H	3.3
Snipe							1	H					1	D											1	H					5.0
Wheatear													2	T													1	FL			5.0
Sand Martin													1	f																	1.7
Grey Wagtail													1	H																	1.7
Hen Harrier															1	H															1.7
Grt Spt Woodpecker															1	f															1.7

3.5 Prey remains and other signs

Searches for prey remains were carried out across all VP viewsheds in suitable habitat as described in the methods section.

No prey remains were found within viewshed search areas but one old set of “pluckings” (>1 month and possibly significantly older) was found on a rock perch at approximately O 17602 21950 and was thought to be “likely Merlin” (J. Lusby pers comm.).

This site is c. 1.5 km east of the nearest part of the study area.

No other signs suspected to be of Merlin were found despite extensive and regular searching.

This is relatively close to the location of the single sighting and given the age of the remains may relate to the same time period.

No other signs or prey remains were found which indicated the presence of Merlin.

4. Discussion & conclusions

4.1 Status of Breeding Merlin in the Dublin Mountains in 2019

Merlin are known to breed in the wider upland massif of the Wicklow and Dublin Mountains[8] and are listed as a qualifying feature of the SPA which encompasses much of this area. The areas covered by VPs in our study were selected on the basis of the guidance from the National Merlin Survey 2018[1] regarding selecting survey areas based on habitat characteristics of recognised Merlin breeding sites. Areas of unsuitable habitat were excluded.

In 372 hours of fieldwork across all suitable Merlin breeding habitat within the study area only one Merlin sighting was obtained. This short view of a male bird flying rapidly over and through forest and forest edge was indicative of hunting and showed no notable behaviours to indicate local breeding. A single set of pluckings of prey which were likely to have come from a Merlin "kill" were found on an area of forest edge/open ground approximately 1.5 km east of the study area. These were thought to be old and though found in July are likely to have originated in June or perhaps before that, possibly around the time of the Merlin sighting at VP8.

Merlin typically defend areas close to the nest as nest territories (up to perhaps around 0.8 km radius) but are known to hunt much more widely, distances of 5-10 km and potentially further are thought to be not uncommon, to provision the female and young on a nest[2]. It is reasonable to conclude, given the lack of Merlin sightings across the study area, that the male bird seen in the single sighting event is likely to have originated from a nest which is likely to be a significant distance away.

There are known historical breeding sites to the southern fringes of the Dublin mountains at Glencree and Prince William Seat[8], neither of which are in the study area described in Section 2.1.2 of this report. It is not known whether these have been occupied in recent years. But are within relevant "hunting" distance of the sighting. There were also at least 2 active territories in 2 5-km squares to the south west of the study area (at Kippure and Coronation Plantation areas) during the 2018 National Merlin Survey (unpublished data per IRSG[b]) and these are within 8 - 10 km of the location of the sighting noted in our study which is also within a feasible foraging range for Merlin.

5. Conclusions

The Dublin Mountains contain a range of habitats which can be utilised by Merlin, including forest edge for nesting and suitable upland open ground for hunting. This study attempted to locate the presence of breeding Merlin in the study area described in Section 2.1.2. The approach used standard methods as applied in other studies in Ireland but these were enhanced, by longer observation times, to provide an increased likelihood of locating any breeding birds of this difficult to observe species. In addition, the survey team included highly experienced Merlin fieldworkers to ensure any Merlin sightings could be readily detected and followed up.

Only one sighting was obtained and this is likely to have been a bird foraging from a nest elsewhere, potentially up to 10 km away from the study area. Given the lack of other sightings and no signs

[b] Irish Raptor Study Group

within the study area and the intensity of survey effort, it is reasonable to conclude that Merlin did not breed within the study area in 2019.

The habitat across the study area remains apparently suitable for Merlin and the bird community offers opportunities both for nests (from crows, Sparrowhawks etc) and for potentially adequate prey opportunities with typical prey species seen in most areas. The lack of traditional sites in the area, as noted by McElheron, 2005[8] and the relatively young age of the forests bordering onto moorland ground may at least partly explain the absence of Merlin in the area at the current time though there may be other factors including prey density factors, inter-specific competition (e.g. with Sparrowhawk and Peregrine) or potentially subtle habitat issues, among others, which may be implicated.

APPENDIX 1 - References

[1] BirdWatch Ireland & The Irish Raptor Study Group. 2018. *Irish Merlin Survey 2018; Survey Methods & Recording Guidelines* – unpublished document

[2]Hardey, J., Crick, H., Wernham, C.,Riley, H., Etheridge, B., Thompson, D. 2013. *Raptors: A field guide for surveys and monitoring (3rd edn.)* The Stationery Office, Edinburgh

[3] Norriss, D.W., Haran, B., Hennigan, J., McElheron, A., McLaughlin, D.J., Swan, V., Walsh, A. 2010. Breeding Biology of Merlins *Falco columbarius* in Ireland 1986-1992. *Irish Birds* 9:1, 23-30

[4] Lusby, J. , Corkery, I., McGuiness, S., Fernández-Bellon, D., Toal, L., Norriss, D., Breen, D., O'Donaill, A., Clarke, D., Irwin, S., Quinn, J.L., & O'Halloran, J. 2017. Breeding ecology and habitat selection of Merlin *Falco columbarius* in forested landscapes. Bird Study 64:4, 445-454, DOI: 10.1080/00063657.2017.1408565

[5] Lusby, J. Fernandez-Bellon, D., Norriss, D. & Lauder, A. 2011. Assessing the Effectiveness of monitoring methods for Merlin *Falco columbarius* in Ireland: the Pilot Merlin Survey 2010. *Irish Birds* 9:2, 143-154

[6] Fernandez-Bellon, D. and Lusby, J. 2011. The feeding ecology of Merlin *Falco columbarius* during the breeding season in Ireland, and an assessment of current diet analysis methods. *Irish Birds* 9:2, 159-164.

[7] Ratcliffe, D. 1997. *The Raven*. T & A.D. Poyser

[8] McElheron, A. 2005. *Merlins of the Wicklow Mountains*. Currach Press, Dublin

APPENDIX 2 – recording forms

Merlin Survey – VP Recording

VP		Date		Start time		End Time	

Sheet no.	
Total sheets	

Merlin records

Map code	No. birds	Age (if known)	Sex (M/F/U)	Time (24h)	Duration (sec)	Activity (record all applicable) F: Flying P:perched D: display H: hunting M:mobbing N: nest material FF: carrying food ON: visiting occupied nest	Comments (record anything of significance, behavioural notes, interactions with other species, location notes in relation to perches or forest areas used etc.)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Merlin Signs searching

Mark area searched on map		Start time		Duration	

Locate and mark each site of remains found and photograph (in situ) and collect remains (bags provided - mark with date and grid ref)

map code	perch type (rock, post, hummock, other)	Age of signs (Fresh/ up to 1 Mth old/ >1 mth OLD)	remains (Feathers, Mammal, Invertebrates, Pellets)	Grid Ref (10 fig)	Notes/comments	Collected ? (Y/N) - mark bag with date and map code	Photo? (Y/N)
A							
B							
C							
D							
E							

Additional Raptor records - record all additional raptors seen on this form

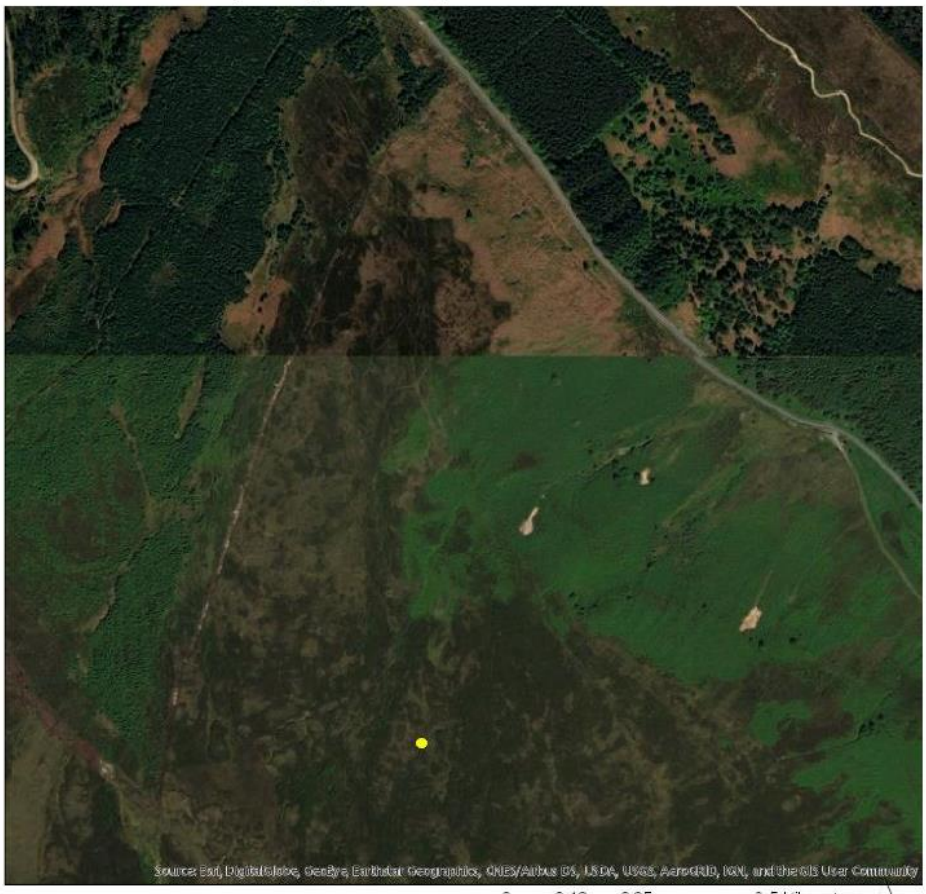
BTO code	No. birds	Age (if known)	Sex (M/F/U)	Time (24h)	Duration (sec)	Activity (record all applicable)	Comments

Office use only					
chk		scan		data	

VP species list - record all species seen or heard from the VP and breeding evidence or "✓" for "present – unknown status"

Species List					
BTO Code	Max. breed code	BTO Code	Max. breed code	BTO Code	Max. breed code

VP 10 Glendoo N(looking W – N- NE)



Date		Start time		End Time	
Observer					
Notes on VP location					

Hour	1	2	3	4	5	6	Notes
Wind Force							
Wind Dir.							
Vis.							
Precip'n							
Cloud (%)							

Sightings summary, disturbance events, comments:

Weather codes:	1	2	3	4	5
Wind Force	Use Beaufort scale (1-5 - no surveying above force 5)				
Wind Direction	Use compass points (N, NNE, NE, ENE, E etc.)				
Visibility	<500m	0.5-1km	1-2km	>2km	
Precipitation	None/ dry	Drizzle/ mist	Light/ short showers	Heavy/ long showers	Persistent rain (no survey in prolonged rain)

APPENDIX 3 VP Approximate viewshed arcs

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Proposed Dublin Mountains Visitor Centre

Merlin Survey Report

August 2018

ROD
ROUGHAN & O'DONOVAN

PROPOSED DUBLIN MOUNTAINS VISITOR CENTRE

Merlin Survey Report

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1. INTRODUCTION

1.1 Background

Roughan & O'Donovan was appointed by South Dublin County Council to undertake a bird survey, particularly in relation to the features of interest of the Wicklow Mountains SPA, to enable An Bord Pleanála to fully assess the impacts of the proposed Dublin Mountains Visitor Centre on the Conservation Objectives of this European Site.

The Department of Culture, Heritage and the Gaeltacht (The National Parks and Wildlife Service) provided a submission to the Bord on the planning application. In the submission, the Department requested that a bird survey be undertaken, with a focus on Merlin and Peregrine Falcon, the two Qualifying Interests of the Wicklow Mountains SPA. The purpose of the survey was to inform the conclusion of the Appropriate Assessment Report.

The Bord determined that the surveys should be undertaken to prove, beyond reasonable scientific doubt, that the proposed development would not lead to likely significant effects on the Qualifying Interests of the Wicklow Mountains SPA.

A planning application for the development included an Environmental Impact Assessment Report and Screening for Appropriate Assessment Report which were submitted to An Bord Pleanála in July 2017.

The Wicklow Mountains SPA is designated for two species, namely Peregrine Falcon and Merlin. The purpose of the Survey was to confirm if Merlin and/or Peregrine Falcon are breeding within the site of the proposed development and to ascertain what impacts, if any, the development would have on these populations in the Wicklow Mountains Special Protection Area (SPA). A description of the Site, it's Qualifying Interests and other species of interest is provided in the Site Synopsis (NPWS, 2014) (Appendix E). Conservation Objectives for the Wicklow Mountains Special Protection Area have not been developed, however they are considered to be favourable for Merlin when:

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

In Ireland, the vast majority of Peregrine Falcons nest on coastal and inland cliffs. These habitats do not occur within 500m of the site and therefore the chances of this species breeding within or close to the site were considered to be low. For this reason, the focus of the survey was on Merlin.

1.2 Site Description

The site of the proposed development is located partially in the Hell Fire Woods, on Montpellier Hill and in the Massy's Estate area of the Dublin Mountains in South County Dublin (Appendix D). Montpelier Hill rises to 388m and is the most north westerly outlying hill of the Dublin Mountains. The slopes around the hill are comprised of agricultural grasslands on the north side and either conifer plantation or recently felled conifer plantation on the remaining sides. The Hell Fire Woods are working, commercial forests and will remain so into the foreseeable future. The construction of a new visitor facility with an enhanced amenity function would result in some localised changes in land use and management to ensure the commercial forest and the planned amenity can coexist. It is proposed to increase the area of car-parking in the northern section of the site through the provision of new terraces on the upper slopes.
At present some mature conifer trees have been retained adjacent to the car-park for aesthetic reasons and screening of the car-park, however, the retention of these trees will not be feasible into the future due to the potential for them to become overly tall and prone to wind throw.

A number of middle aged broad-leaved trees are found at the Hell Fire Woods as well as some mature trees which pre-date the forest and clearly grew in open ground in the past.

Massy's Woods, in contrast to Hell Fire Woods, is predominantly a broadleaved woodland. There are some areas of coniferous plantation and specimen trees from the original Killakee demesne. Mature specimen trees are found throughout the woodland.

Whilst predominantly a recreational forest with a high biodiversity function, woodland management works are ongoing with the thinning of areas of beech. It is expected that the management of the woodland can be adapted to accommodate the amenity value that may be required. Stone Bridges and an area which consists of a walled garden which was originally part of the Killakee demesne are located to the eastern extremity of the site.

The Glendoo Brook flows in a south-north direction along the eastern extremity of the Massy's Woods section of the site, with one tributary flowing east through Massy's Woods into the Glendoo Brook. The river connects into the River Dodder approximately 6km downstream.

1.3 The Proposed Development

The 2015 South Dublin Tourism Strategy proposed, as its principal recommendation, the creation of a Dublin Mountains Flagship Project. This was in keeping with the 2007 report, Dublin Mountains Strategic Development Plan for Outdoor Recreation, which introduced the proposal to provide a flagship welcoming and orientation point in the Dublin Mountains. The Dublin Mountains Partnership (DMP) also has a key objective to develop a flagship facility that will act as a focal tourism attraction in the area. A key element of the Project is to retain the attractive characteristics of the location, the environment and the landscape.

In response, a Steering Group consisting of representatives of South Dublin County Council, Coillte and the DMP issued tender invitations for a multi-disciplinary approach to the preparation of a feasibility study and masterplan for a flagship tourism facility in the Dublin Mountains.

The Project will comprise the following elements:

- Conservation works to protected structures including the Hell Fire Club building;
- Visitors Centre and Events Building located downhill on eastern side of Montpelier Hill;
- Tree canopy bridge linking Hell Fire Woods and Massy's Woods;
- Redevelopment of walled garden (Massy's Garden) in Massy's Woods;
- Conversion of commercial conifer forest to permanent mixed woodland and development of parkland amenity areas within this woodland
- Landscape development including boundary treatment;
- Facilities for drainage, water provision, foul water treatment, electricity and gas provision;
- Upgrading of existing trails and forestry access routes where necessary; and
- Extension to existing car park to accommodate approximately 300 additional spaces. Parking surfaces could be of a range of materials from loose gravel to reinforced grass to blacktop, depending on design objectives.

2. MERLIN (*FALCO COLUMBARIUS*)

2.1 Introduction

Merlin (*Falco columbarius*) is Ireland's smallest species of falcon and has a wingspan of 55-65cm, with females being larger than males. The species is similar in shape to Peregrine Falcon (*Falco peregrinus*) but much smaller. Males have blue-grey upperparts and an orange/ yellow breast; females are a brown/ grey colour overall. The diet of Merlin is small birds, primarily Meadow Pipits, and day flying moths. Merlin pursue prey in high speed chases over open ground.

Traditionally Merlin are ground nesting birds and nest in the heather uplands. However, recent studies in Ireland have shown that Merlin now have a strong preference for conifer plantations close to suitable hunting habitat such as blanket bog, heath and semi-natural grassland. Merlin usually nest in old nests of corvid species such as Hooded Crow and raise one brood per year consisting of 3-5 chicks.

2.2 Status

Merlin is listed on Annex 1 of the Birds Directive 2009/147/EC and is amber listed in Ireland based on a moderate decline of it breeding range (Lynas et al., 2007) and the small breeding population in Ireland, estimated at 200-400 pairs.

Six Special Protection Areas (SPAs) have been designated for the species, namely the Connemara Bog Complex SPA; the Derryveagh and Glendowan Mountains SPA; Killarney National Park SPA; the Owenduff/ Nephin Complex SPA; the Slieve Aughty Mountains SPA; and, the Wicklow Mountains SPA. The species is found sporadically in these sites and other upland areas in Ireland during the breeding season. Outside the breeding season, Merlin leave the uplands and overwinter in coastal areas. The threats to Merlin are land use changes, particularly afforestation and overgrazing by livestock.

3. SURVEY METHODOLOGY

3.1 Desk Study

The first step was to review aerial photography and to search published records for Merlin in the Wicklow Mountains SPA and the surrounding area including the Dublin Mountains. Studies of Merlin yielded useful information of the status of breeding Merlin in County Wicklow. A detailed account of Merlin in Wicklow contained in McElheron (2005), as cited by the Department in their submission, was particularly useful. The main sources of information in designing the survey methodology were the following:

- Fernandez-Bellon, D. & Lusby, J. 2011. *The feeding ecology of Merlin Falco* columbarius *during the breeding season in Ireland, and an assessment of current diet analysis methods*. Irish Birds 9: 159-164.
- Lusby, J., Corkery, I., McGuiness, S., Fernández-Bellon, D., Toal, L., Norriss, D., Breen, D., O'Donaill, A., Clarke, D., Irwin, S., Quinn, J.L., & O'Halloran, J. (2017) *Breeding ecology and habitat selection of Merlin Falco columbarius in forested landscapes*, Bird Study.
- Lusby, J., Fernandez-Bellon, D., Noriss, D. & Lauder, A (2011) *Assessing the effectiveness of monitoring methods for Merlin Falco columbarius in Ireland: the Pilot Merlin Survey 2010*. Irish Birds 9:143-154.
- McElheron, A. (2005). *Merlins of the Wicklow Mountains.* Currach Press, Dublin.

3.2 Field Studies

The survey followed the methodologies described in Hardey et al. (2009), Lusby et al. (2010) and Lusby et al. (2011). The surveys were carried out by ecologists from Roughan & O'Donovan, Patrick O'Shea ACIEEM and Mike Bailey MCIEEM. Both surveyors had experience of surveying raptors.

Due to their low population densities, remote habitats, rough terrain and discrete breeding ecology, it is widely accepted that Merlin is difficult to survey (Ayers and Anderson, 1999). A pilot study was undertaken in 2010 (Lusby et al, 2011) in Ireland to test the effectiveness of monitoring, with a view to establishing a standard survey methodology for Ireland. The contrast in findings between two teams of surveyors highlighted the difficulties in accurately surveying for this species.

3.2.1 Plucking Post Search

The entire area within 500m of suitable nesting habitat, where accessible, was searched for feeding signs. Following the habitat study undertaken by Lusby et al (2017), suitable habitat was considered to be mature coniferous plantation. The outer 10m of all of the mature plantation within the project site were searched for signs of 'plucking posts' and nests that could be used by Merlin. All prominent plucking post features, in this case fence posts, stone walls, tree stumps and boulders, were searched for signs of prey remains. Notes were recorded on the location, field signs, type of plucking post and whether the signs were recent or old. All plucking posts identified were recorded on a hand-held GPS unit. This search was undertaken once per month from April to July 2018. During the plucking post search, casual records of all raptors species were made including behaviour.

3.2.2 Vantage Point Surveys

Following the first plucking post search in April 2018, six vantage points (VPs) were selected based on their position for overlooking suitable nesting habitat and on the location of potential plucking posts. Suitable habitat included areas of mature conifer plantations and habitat mosaics containing scrub, heath and dense bracken. The position of each VP was reviewed each month and, where appropriate, changed in order to improve the chances of detecting Merlin.

Vantage point surveys were undertaken at each position once per month from April to July and lasted for three hours each. Surveys were undertaken in the morning or evening during the peak times of Merlin activity (Hardey et al., 2009). The surveys in the morning began before 7am and the surveys in the evening began after 4pm. Notes were made of all bird species that might induce a mobbing reaction from Merlin such as other raptors, corvids, gulls and herons. Mobbing events by Merlin could allude to a nest site and similarly, high concentrations of corvids could also allow for a specific area to be discounted as a Merlin nesting site. A list of all bird species was also compiled.

The locations of the vantage points are present in Table 3.1 below and on the drawings in Appendix A.

Table 3.1: Location of Vantage Point used during the Merlin surveys

VP	Easting	Northing	Aspect	Description
1	53.251967	-6.324866	East	VP looking over Hell Fire Wood Car Park from Montpelier Hill.
2	53.253238	-6.333271	North-West	VP on north side of Montpelier Hill looking NW over clearfell.
3	53.249332	-6.327894	South	VP on south side of Montpelier Hill looking south over valley.
4	53.246174	-6.331246	North	VP in heath to the south of Montpelier Hill looking north towards conifer plantations.
5	53.250947	-6.3419427	West	VP at west side of Montpelier Hill looking west over clearfell.
6	53.247034	-6.3344021	North	VP in heath to the south-west of Montpelier Hill looking north and north-west.

4. RESULTS

4.1 Desk Study

McElheron (2005) identified 24 pairs of Merlin in Wicklow. This book provided the most useful narrative of breeding Merlin in the Wicklow Mountains, which adjoins the site of the proposed development. The nearest records of nesting Merlin to the Project site were on Corrig Mountain, 2km west, and in Glencree, 4km south-east.

4.2 Field Surveys

The site contains suitable habitat for breeding Merlin. Mature conifer plantations, particularly on the south side of Montpellier Hill are relatively undisturbed and have the potential to support nesting sites. The habitat in the valley immediately to the south of Montpelier Hill is made up of heather and low growing gorse. The Site in general had high number of Meadow Pipits, Swallows and other small birds.

4.2.1 Plucking Post Search

The search for plucking posts from April to July yielded two potential plucking posts. Both had old feathers. One post was on the raised base of an upturned tree (Plates 4.1 & 4.2). The second was on a raised part of a wall of a ruined cottage south of Montpellier Hill. Table 4.1 below describes the locations and details of the plucking posts. No fresh remains were observed over the course of the breeding season.

Table 4.1: Location of Plucking Posts

Reference	Type	Easting	Northing	Prey Remains
P1	Tree Stump	53.249527	-6.3385481	Feathers
P2	Rock pile	53.247300	-6.3265172	Feathers

Plate 4.1: Potential plucking post on a tree stump in an open area of woodland

Plate 4.2: Feathers on plucking post

4.2.2 Vantage Point Surveys

A total of 24 vantage point (VP) surveys were undertaken between April and July. Two surveys were abandoned because of poor visibility and were repeated at a later date. Four species of raptor were recorded during the VP surveys, namely Peregrine Falcon, Buzzard (*Buteo buteo*), Sparrowhawk (*Accipiter nisus*) and Kestrel (*Falco tinnunculus*). Merlin was not recorded during any of the surveys. Peregrine Falcon was recorded on one occasion (See Appendix B/ April/ VP5). This species was noted by the Department in their submission. As described in Section 1.1, the site contains no suitable breeding habitat for this species. Peregrine Falcon can have large breeding ranges and therefore it is expected that this species would be recorded within the site. Table 4.2 below illustrates the number of sightings of each species of raptor recorded in each month. Jays (*Garrulus glandarius*), Magpies (*Pica pica)* and Hooded Crows (*Corvus cornix*) were regularly recorded in the mature conifer plantations on Montpellier Hill during the VP surveys. Other raptors, gulls, heron (*Ardea cinerea*) and Ravens (*Corvus corax*) were also recorded flying across the site.

Appendices A and B provide the details and findings of each VP survey.

Table 4.2: Summary of raptor sightings April-July 2018.

Species	April	May	June	July	Total
Merlin	0	0	0	0	**0**
Peregrine Falcon	1	0	0	0	**1**
Buzzard	3	2	10	5	**20**
Kestrel	0	3	2	5	**10**
Sparrowhawk	0	1	0	0	**1**

4.3 Other Species

All bird species seen or heard were recorded during the surveys. In addition, Red Squirrel (*Scirius vulgaris*), Irish Hare (*Lepus timidus hibernicus*) and Sika Deer (*Cervus nippon*) were frequently seen during the surveys. Pine Marten (*Martes martes*) scat was also recorded along the paths on the east and west side of Montpelier Hill. Table 4.3 below lists the bird species recorded during the VP and plucking post surveys. The Site Synopsis for the Wicklow Mountains SPA notes two other species of interest at the Site, although not Qualifying Interests. These are Ring Ouzel *(Turdus torquatus)* and Red Grouse (*Lagopus lagopus scoticus*). Neither of these species were recorded and would not have been expected in the area due to their breeding habitats of scree slopes and extensive areas of heather such as blanket bog.

Table 4.3: Bird species recorded during VP surveys

Common Name	Latin Name
Barn Swallow	*Hirundo rustica*
Blackbird	*Turdus merula*
Blackcap	*Sylvia atricapilla*
Blue Tit	*Cyanistes caeruleus*
Bullfinch	*Pyrrhula pyrrhula*
Buzzard	*Buteo buteo*
Chaffinch	*Fringilla coelebs*
Chiffchaff	*Phylloscopus collybita*
Coal Tit	*Periparus ater*
Collard Dove	*Streptopelia decaocto*
Common Crossbill	*Loxia curvirostra*
Cuckoo	*Cuculus canorus*
Dunnock	*Prunella modularis*
Eurasian Jay	*Garrulus glandarius*
Goldfinch	*Carduelis carduelis*
Great Spotted Woodpecker	*Dendrocopus major*
Great Tit	*Parus major*
Grey Heron	*Ardea cinerea*
Herring Gull	*Larus argentatus*
Hooded Crow	*Corvus cornix*
House Sparrow	*Passer domesticus*
Jackdaw	*Corvus monedula*
Kestrel	*Falco tinnunculus*
Lesser Black-backed Gull	*Larus fuscus*

Common Name	Latin Name
Linnet	*Linaria cannabina*
Magpie	*Pica pica*
Mallard	*Anas platyrhynchos*
Meadow Pipit	*Anthus pratensis*
Peregrine Falcon	*Falco peregrinus*
Pheasant	*Phasianus colchicus*
Raven	*Corvus corax*
Rook	*Corvus frugilegus*
Robin	*Erithacus rubecula*
Skylark	*Alauda arvensis*
Snipe	*Gallinago gallinago*
Song Thrush	*Turdus philomelos*
Sparrowhawk	*Accipiter nisus*
Willow Warbler	*Phylloscopus trochilus*
Woodcock	*Scolopax rusticola*
Wood Pigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*

5. CONCLUSION

No Merlin were recorded during the 2018 breeding season. Searches for plucking posts and vantage point surveys are recognised as the best method for surveying Merlin; however, this does not detract from the difficulties associated with surveying for this species. The efficacy of searches for plucking posts is made more difficult by the Irish Merlin's preference for tree nesting and using branches for plucking prey, as opposed to prominent features on the ground.

The surveys found no evidence of Merlin breeding on Montpellier Hill, the site of the proposed Dublin Mountains Visitor Centre. This conclusion has been reached on the basis that no confirmed Merlin plucking posts or suitable nests were identified during the walkover surveys and no Merlin were recorded during the vantage point surveys. In addition, a range of other species were present which could have triggered a mobbing response but did not. The proportion of mobbing responses by nesting Merlin, relative to potential responses was reported as 12% in Lusby et al. (2010). Although this figure is low, the high numbers of Jays, Buzzards and Hooded Crows on Montpellier Hill would have been expected to induce a mobbing response during the surveys.

Four other species of raptor were recorded during the surveys (Peregrine Falcon, Buzzard, Kestrel, and Sparrowhawk). These species are relatively widespread and common in Ireland, even in suburban and urban areas. There was no evidence of these species breeding within the site. Two other species mentioned in the Site Synopsis (although not Qualifying Interests) are Ring Ouzel and Red Grouse. These species were not recorded during the surveys and would not be expected to be present within the site due on account of the habitats present.

The surveys conclude that Merlin do not breed within the site of the proposed Dublin Mountains Visitor Centre.

6. REFERENCES

- Ayers, L.W. & Anderson, S.H. 1999. Reoccupancy and use of historic breeding sites by Richardson's Merlin (*Falco columbarius richardsonii*) in Wyoming. Final report to Wyoming Cooperative Fish and Wildlife Research Unit. University of Wyoming, Laramie.
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- J., Corkery, I., McGuiness, S., Fernández-Bellon, D., Toal, L., Norriss, D., Breen, D., O'Donaill, A., Clarke, D., Irwin, S., Quinn, J.L., & O'Halloran, J. (2017) *Breeding ecology and habitat selection of Merlin Falco columbarius in forested landscapes*, Bird Study.
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APPENDIX A
Survey Details

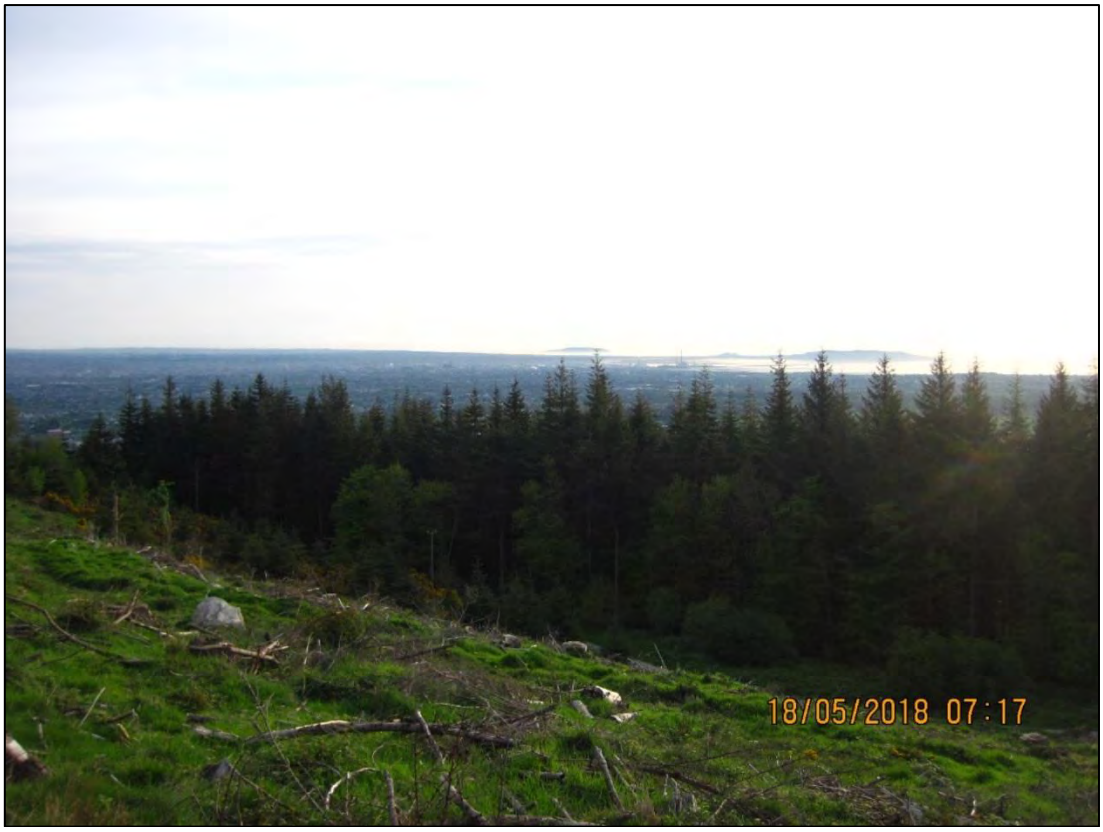
Month	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6
April	17th	17th	18th	18th	2th	25th
Time	07.00 - 10.00	16.00 - 19.00	07.00 - 10.00	16.00 - 19.00	16.10- 19.10	07.00-10.00
Weather	Cloudy, scattered showers with sunny intervals, windy (SSE), 10 -11°C	Blistery conditions with stiff breeze and scattered clouds and occasional shower	Windy, scattered clouds and v occasional shower. Drying but constant wind 11°C	Sunny with light clouds. Strong wind from SE but sheltered in valley below VP	Light rain for first 30 mins and last 30 mins. Generally, overcast with sunny spells. Westerly breeze.	Strong breeze overcast and dry throughout. Cloud on top of hills to the south and west.
Surveyor	M Bailey	M Bailey	M Bailey	M Bailey	P O'Shea	P O'Shea
May	18th	16th	16th	21st	21st	5th (June)
Time	06:50-09:50	16:10-19:10	07:00-10:00	16:00-19:00	07:00-10:00	16:00-19:00
Weather	5-12^{0}C, occasional slight breeze, cloudy with sunny spells.	12^{0}C, clear and sunny, light breeze.	10^{0}C, no wind, sunny and clear.	12^{0}C, overcast.	12 degrees, overcast, southerly breeze throughout survey	17-20°C, clear skies, gentle breeze
Surveyor	P O'Shea	P O'Shea	P O'Shea	P O'Shea	P O'Shea	M Bailey
June	27th	4th (July)	10th (July)	3rd (July)	28th	4th (July)
Time	17.00-20.00	06:45-09:45	17:00-20:00	17.15-20.15	05.30-08.30	05.45-08.45
Weather	Clear skies, very little breeze, 23^{0}C	Clear, Sunny, no wind, 18 degrees.	Clear, sunny, 20 degrees, no wind.	Clear, sunny, 20 degrees, no wind.	Completely clear skies. No wind. 17 ^{0}C	Completely clear skies. Gentle breeze. 15 -18 ^{0}C
Surveyor	M Bailey	P O'Shea	P O'Shea	M Bailey	M Bailey	M Bailey
July	18th	24th	26th	25th	23rd	18th
Time	05:45-08:45	16:00-19:00	07:00-10:00	16:00-19:00	17:30-20:10	16:10-19:10
Weather	15 degrees, no wind, mostly sunny with odd cloud	23 degrees, sunny in general with odd cloud, light westerly breeze.	15-20 degrees, clear with strong breeze from south west.	25 degrees, very sunny with very light westerly breeze.	Breezy, 20 degrees, cloudy with odd sunny spell. Rain from 20:00. Survey abandoned.	20 degrees, cloudy with sunny spells. Breezy.
Surveyor	P O'Shea	P O'Shea	P O'Shea	P O'Shea	P O'Shea	P O'Shea

APPENDIX B
SURVEY RESULTS

	VP1	VP2	VP3	VP4	VP5	VP6
April	No raptors seen. Magpie nest in immature woodland. Hooded Crow building nest in northern end of the conifer plantation near Car Park.	No raptors seen. Numerous crows and gulls in field 400m downhill from site but none were seen flying near conifer plantations on site. Blackbird nesting in gorse in edge of cleared plantation.	No raptors seen. Two Hooded Crows flew past plantation to right of VP and down valley but did not enter trees. No corvid nests seen or suspected. One cuckoo seen flying into plantation from opposite side of valley.	No raptors seen. One raven mobbed by Hooded Crow above plantation on opposite side of valley but neither birds entered trees. Swallows constantly flying up valley and cuckoo seen twice also following valley first going east and second pass west. Four Mallards (3 males and 1 female) in pond on valley bottom to left of VP.	One Peregrine and two Buzzard seen during survey. Lots of corvid activity including mobbing of raptors. General raptor flight lines east to west along valley south of Hill. 16:30: Hooded Crow mobbing Buzzard in field to the south (710462, 723237) Buzzard flew west.16:40: Hooded Crow flew across VP West to East. Lots of Hooded Crow activity in stand of conifers directly to the west c400m from VP. 17:20: Two rooks fly past east to west near hooded crows and land briefly. Magpies 400m west. 17:30 Male peregrine flying east to west down valley. Mobbed by hooded crows for c.10 mins before flying east. Hooded Crow activity much less after this. 17:50: single calling raven flies south to north directly over VP. Single magpies in general area of VP. 18:25: Hooded Crow flies down valley east to west. 18:35: c.10 Hooded Crows in treeline calling south of VP. 18:36: Buzzard mobbed flying down valley east to west.	07:05 Hooded Crow and Mallard fly down valley east to west. 07:34: Magpies in valley for first 30 mins. Buzzard flies down valley east to west landing briefly in a field close to the VP. 07:38: Raven flies past east to west over/behind VP.
May	No raptors seen. Magpies leaving and entering one area of the plantation by the car park throughout survey from start to finish approx. 25 times. Jackdaws flying along woodland occasionally during survey. Ravens seen twice at northern end of wood flying over. Jay emerged from woodland and was seen foraging on broadleaf trees standing in clear-fell.	Approx. 20 hooded crows at base of hill around Carthy's Castle. 16:20: Buzzard flies west to east in front of VP (half way down hill) and was seen hunting over fields to the east between Montpellier Hill and the housing estates. 18:15: Hooded crow flies south to north over VP (from behind). Other Hooded Crow heard calling from woodlands behind VP. 18:20: Female Sparrowhawk flies from young plantation c. 50m west of VP. Sparrowhawk seen landing on fallen tree next to tall trees and is observed for 2-3 mins preening. Sparrowhawk then flies out of sight.	07:30: Two Jackdaw flew west to east along valley. 07:36: Two Jackdaw fly east to west along valley. 07:56: Two mallard fly east to west down valley. 07:57: Lesser Black-backed gull flies east to west along valley. 08:10: Kestrel flew from west to east and landing in small area of tall conifers in the corner of the young conifer plantation on the south side of the valley across from VP. Kestrel perched for 1-2mins then flew south and was seen hovering near mature conifers to the south. 08:15: Two Lesser black-backed gulls fly east west along immature conifers approx. 20m high. 08:26: Kestrel seen flying from immature conifers across from VP and landing in a hawthorn tree in the heather covered area briefly before flying straight down the valley at speed. three minutes later the bird was seen perched on a fencepost on the valley floor. It then flew east out of view along the bottom of the valley. 08:35: Hooded Crow perches on dead tree in young conifer plantation across from VP. Three Jackdaws fly east to west on south side of VP. 08:55: Magpie flies along valley west to east. 09:02: Kestrel seen briefly flying west to east about half way up the north side of the valley. 09:10: Buzzard heard calling behind VP- not seen. 09:30: Raven flew over immature conifers west to east.	No raptors seen. Hooded crows calling from trees behind VP. First hour was quiet with occasional wood pigeons flying up and down valley. Two Lesser Black-backed gulls fly west to east at 17:00. 18:30: three Mallard fly east west along valley. 18:45 four Mallard land in ponds along conifer edge behind VP. Heron flies west to east along valley.	No raptors seen. 2 deer seen on path on Montpellier Hill. Red squirrel seen at beginning of survey in treeline to the east of VP. Occasional Hooded Crows and Jackdaws flying over clear-fell and recently planted woodland in front of VP as well as up and down the valley to the south. Up to three magpies seen in clear-fell. Cuckoo flew past VP to south at 09:05 and could be heard calling from the south from 10am.	No raptors seen. Numerous Jackdaws seen flying over trees around farms to the SW of Montpellier Hill and Hood Crows were seen flying from south and into conifers on the south of Montpellier Hill. One buzzard seen in valley approx. 2km from Montpellier Hill but no raptor observed close to survey site.

	VP1	VP2	VP3	VP4	VP5	VP6
June	Jay and several magpies in trees above car park. Two Jackdaws and one Hooded Crow flew past. One cuckoo flew past left to right. Two Buzzards seen on four occasions flying to the left of VP on the northern side of Montpellier Hill.	Two Buzzards seen on walk up Montpellier Hill. Two Jays also seen near VP1 on walk up and down. 07:15: Occasional Lesser Black-backed gulls flying down valley across VP. Two Hooded Crows on Carthy's Castle below and approximately 50 in recently cut meadow next to it. 08:25: Hooded Crow perched on dead tree 50m below VP calling for 10 mins before flying 200m west of VP and calling again for 10 mins.	17:20 Buzzard seen flying over immature woodland across valley at c. 500m and flying left to right. 17:35 Lesser Black-backed gull flew across VP right to left. 17:35 Buzzard heard calling- not seen. 19:00: Jay calling from woodland on right of VP. 19:09 Raven flies up valley right to left. 19:40 Raven flies over VP from behind (north to south) and lands in taller trees at corner of immature plantation and calls for 10 mins.	Three Magpies in field with sheep feeding on rabbit carcass. 19:25: Buzzard seen flying over valley >300m west of site but did not approach Montpellier Hill. 19:35: Two Jackdaws emerged from woodland at western end of Montpellier Hill and followed edge of woodland before entering conifer plantation on southern boundary.	Lesser Black-backed gulls and hooded crows in valley below VP. One Hooded Crow perched on fence-pole at the edge of the cleared area and did not move when a Kestrel landed in the next post. Kestrel remained for 15mins before flying down into the valley.	Jays calling from conifer plantation on southern boundary of site but only one seen, briefly. 7:12: Buzzard seen flying high over eastern end of Montpellier Hill. After 07:15 decrease in number of active birds. 3-4 Hooded Crows and 6-7 Jackdaws seen flying to the west in valley below site but did not approach Montpellier Hill. 07:46: Kestrel seen briefly to east of VP, flew swiftly from Montpelier Hill and disappeared south behind VP.
July	05:47 and 05:50 Jay flies into wood from behind VP. 06:20 Jay foraging in clear-fell in front of VP. 06:45 Buzzard heard not seen from the south. 07:00 Four Raven fly right to left in front of VP behind woodland and turn following the hill towards Carthy's Castle. 07:13: Jay flies from ash treeline behind VP to woodland. 07:23 Juvenile cuckoo in clearfell area for 5 minutes. 07:55. Buzzard flies in from south and lands on telegraph pole to south of VP along forest track. 08:10 Jay begins mobbing Buzzard for 3-4 minutes. 08:14 Buzzard flies to pole south of previous pole. 08:35 Buzzard flies south out of sight. Jays and Magpies present throughout survey in woodland and clearfell areas.	Approximately 50 Rooks in the field by Carthy's Castle. 18:20 kestrel seen flying out of wood behind VP to the left, then flying south along trees before making sharp left out of sight. Very little activity.	07:20: Juvenile Kestrel flies left to right over VP and over larch trees disappearing briefly before reappearing in the valley after <10 seconds and hovering. It then drops and flies along the far side of the valley across the heath landing in a small isolated conifer tree half way up the south side of the valley. It sits there for 15 mins. It then flies east behind the sycamore tree at the ruined cottage and disappears. 07:37: Kestrel reappears and lands on a 1.5m dead hawthorn tree stump 30m west of ruined cottage. 07:59 Juvenile Kestrel still sitting on tree and a Buzzard flies down the valley east to west and over the wood to the right. 08:07 Kestrel leaves perch and flies east behind sycamore. 08:10 Kestrel flies fast and low over the heath from the ruined cottage along the south side of the valley. It lands briefly then continues west as before landing in small conifers and is eventually lost from sight approx. across from the VP. 09:48 Buzzard flies up valley west to east (opposite flight path to first Buzzard seen on the survey).	16:20 Jays heard calling in western end of wood. 17:00 Two raven fly from near VP5 and fly south turning to fly behind VP4 and over the clearfell behind and then south out of sight. 17:15 Jays calling in wood at the western side. 17:50 Jays seen at woodland edge. Four jays seen together over next 20 mins. 18:05 BZ heard from direction of VP5.	17:30-18:30 Very little activity. About 6 Magpies seen near small conifer stand at west end of site 200m from VP. 18:35 Kestrel flies in from the west and flies up valley landing on top of a conifer tree that forms part of the treeline at the site boundary and preens for 10 minutes. Kestrel flies off perch and hunts, hovering, along treeline/ site boundary, first further west and then back east up the valley and almost out of site. It hovers about 5 more times and then flies east up the valley and out of sight at 18:50. 19:00 Kestrel seen flying in from the west. First spotted just west of farm south of VP. It hovers three times and flies east up the valley. 19:29: Buzzard hunting (also having) behind VP over cleared area. Buzzard flies over VP and continues to hunt over the clearfell to the west of the VP. It gains altitudes and disappears west over Glenasmole at 19:36.	Two Kestrel seen on route to VP. The first was seen hunting along military road and the second was seen over the valley south of Montpellier Hill. 16:10 Buzzard flies from SW quadrant of larch wood west disappearing over hill top. 16:40 Jays calling from east end of larch wood. Summary: very little activity during survey. Jays heard in wood occasionally and magpies calling from valley floor, mostly west of wood in more open area.

APPENDIX C
VP Location Photographs



VP1 (A)

VP1 (B)

VP2 (A)

VP2 (B)

VP3 (A)

VP3 (B)

VP4 (A)

VP4 (B)

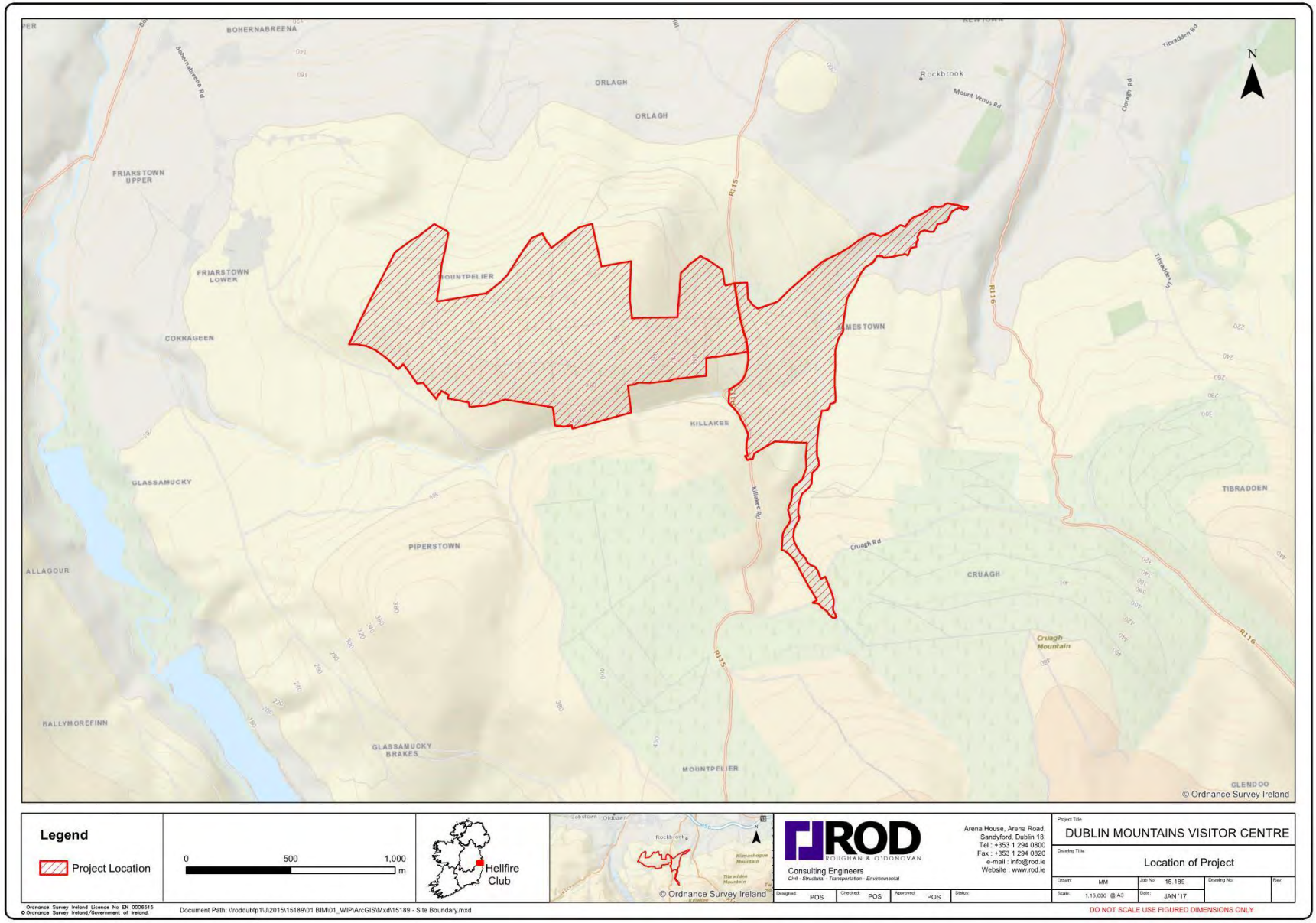
VP5 (A)

VP5 (B)

VP6 (A)

VP6 (B)

APPENDIX D
SITE LOCATION


BOHERNABREENA
ORLAGH
ORLAGH
Rockbrook
Mount Venus Rd
Tibradden Rd
Cruagh Rd
FRIARSTOWN UPPER
FRIARSTOWN LOWER
MOUNTPELIER
CORRAGEEN
MESTOWN
R115
R116
HILLAKEE
Killakee Rd
GLASSAMUCKY
TIBRADDEN
PIPERSTOWN
CRUAGH
ALLAGOUR
Cruagh Mountain
BALLYMOREFINN
GLASSAMUCKY BRAKES
MOUNTPELIER
GLENDOO
N
© Ordnance Survey Ireland
Legend
Project Location
0
500
1,000
m
Hellfire Club
© Ordnance Survey Ireland
ROD
ROUGHAN & O'DONOVAN
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Civil - Structural - Transportation - Environmental
Arena House, Arena Road, Sandyford, Dublin 18.
Tel : +353 1 294 0800
Fax : +353 1 294 0820
e-mail : info@rod.ie
Website : www.rod.ie
Designed: POS
Checked: POS
Approved: POS
Status:
Project Title
DUBLIN MOUNTAINS VISITOR CENTRE
Drawing Title
Location of Project
Drawn: MM
Job No: 15.189
Drawing No:
Rev:
Scale: 1:15,000 @ A3
Date: JAN '17
Ordnance Survey Ireland Licence No EN 0006515
© Ordnance Survey Ireland/Government of Ireland.
Document Path: \\roddubfp1\IJ\2015\15189\01 BIM\01_WIP\ArcGIS\Mxd\15189 - Site Boundary.mxd
DO NOT SCALE USE FIGURED DIMENSIONS ONLY

APPENDIX E
WICKLOW MOUNTAINS SPA
SITE SYNOPSIS

SITE SYNOPSIS

SITE NAME: WICKLOW MOUNTAINS SPA

SITE CODE: 004040

This is an extensive upland site, comprising a substantial part of the Wicklow Mountains. Most of the site is in Co. Wicklow, but a small area lies in Co. Dublin. The underlying geology of the site is mainly of Leinster granites, flanked by Ordovician schists, mudstones and volcanics. The area was subject to glaciation and features fine examples of glacial lakes, deep valleys and moraines. Most of site is over 300 m, with much ground being over 600 m; the highest peak is Lugnaquillia (925 m). The substrate over much of site is peat, with poor mineral soil occurring on the slopes and lower ground. Exposed rock and scree are features of the site. The predominant habitats present are blanket bog, heaths and upland grassland.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Merlin and Peregrine.

A series of surveys of the Wicklow Mountains SPA indicates that up to 9 pairs of Merlin breed within the site in any one year. Traditionally a ground-nesting species, Merlin in the Wicklow Mountains are usually found nesting in old crows nests in conifer plantations. The open peatlands provide excellent foraging habitat for Merlin with small birds such as Meadow Pipit being their main prey. The cliffs and crags within the site also provide ideal breeding locations for Peregrine (20 pairs in 2002). Other birds of the open peatlands and scree slopes that have been recorded within the site include Ring Ouzel and Red Grouse.

The Wicklow Mountains SPA is of high ornithological importance as it supports nationally important populations of Merlin and Peregrine, both species that are listed on Annex I of the E.U. Birds Directive. Part of Wicklow Mountains SPA is a Statutory Nature Reserve.

7.7.2014

APPENDIX 4
Outline Construction and Traffic Management Plan

Dublin Mountains Visitor Centre

Outline Construction & Traffic Management Plan
DMVC-ROD-XX-XX-RP-C-OCTMP

JULY 2017

ROD
ROUGHAN & O'DONOVAN

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Dublin Mountains Visitor Centre

Outline Construction & Traffic Management Plan

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Appendix A Possible Compound Locations

1. INTRODUCTION

This document sets out the Outline Construction & Traffic Management Plan (OCTMP) for the construction of the proposed Dublin Mountains Visitor Centre (DMVC) at Montpellier Hill (commonly referred to as the Hell Fire Club) in Dublin, on behalf of South Dublin County Council (SDCC). This OCTMP applies to all works associated with the construction of the DMVC.

As a contractor has not yet been appointed this OCTMP has not yet been formally adopted and further development and commitment to the OCTMP will be undertaken following selection of a Contractor prior to commencement of site works. The appointed contractor will consult with all relevant stakeholders with respect to the developed OCTMP.

The OCTMP and its associated and supporting documents (see below) provide the construction and traffic management framework for the appointed PSCS/Contractor and Sub-contractors as they incorporate the mitigating principles to ensure that the work is carried out with minimal impact on the environment. The construction management staff as well as Contractors and Sub-contractors staff must comply with the requirements and constraints set forth in the OCTMP in developing their site-specific Construction & Traffic Management Plan (CTMP).

The implementation of the requirements of the OCTMP will ensure that the construction phase of the project is carried out in accordance with the commitments made by the SDCC in the various application processes for the development. Once commenced the CTMP is considered a live document that will be updated according to changing circumstances on the project and to reflect current construction activities. The CTMP must be reviewed and monitored on an on-going basis during the construction process and will include information on the review procedures.

2. DESCRIPTION OF PROJECT

The development site consists of two large hillside woodland areas, the Hell Fire Woods (105 hectares) and Massy's Woods (42 hectares), located 2.5km to the south of Dublin's urban fringe to the west and east of the R115 road respectively.

To the north the site is bounded by the townlands of Oldcourt, Woodtown and Newtown and by the Dublin Mountains, culminating at Kippure (Co. Wicklow) in the south. The Hell Fire Woods are bounded to the west by the R114 and the Ballymorefinn Road and to the east partially by the R116, which runs into the Wicklow Way. This area is the most mountainous in Dublin and is also where the River Dodder rises, feeding into the reservoirs at Bohernabreena and giving rise to the picturesque linear parks along the Dodder Valley.

The site contains a number of protected structures including the Hell Fire Club, passage tombs, wedge tombs, standing stones and Massy's Estate walled gardens and associated ruins.

The proposed development will consist of:

- Improvements to existing entrance to Hell Fire Woods from the R115, with provision of pedestrian footpaths. The R115 will be a two-way road, 5-6m wide with a 1.5m wide footpath. Some isolated section will be a 3-3.5m single lane road, with traffic calming markings.

- Upgrade works to existing car park to increase parking provision from 80 no. car parking spaces to 275 no. car parking spaces and 5 no. coach parking spaces.

- Replacement of conifer trees around the parking area that is due for felling by sustainable forest planting.

- Construction of visitor centre building at the Hell Fire Woods (Gross floor area: 966 sqm) (Dublin Mountains Visitor Centre), to consist of two buildings side by side, situated parallel to the existing forest road, at a level of approx. 300m above sea level to contain basic facilities for walkers and casual visitors, a seated café for 80 no. people and an interpretation, exhibition and education facility.

- Construction of pedestrian footbridge and 'bridge house' to link Hell Fire Woods to Massy's Woods, crossing over the R115.

- Development of new trails including a circular walkway to the summit of Montpelier Hill, encircling the Hell Fire Club (protected structure) and the neolitihic passage tombs. The circular walkway will incorporate information panels for visitor orientation and interpretation.

- General upgrading of existing trails and routes in correspondence with guidelines produced by Irish Trails.

- Conservation works to the Hell Fire Club building, a protected structure. To be conserved as a ruin with minimal intervention, with discreet lighting proposed on the interior of the building as part of a long-term monitoring and management programme.

- Conservation works to Massy's Woods walled gardens, a protected structure. To be conserved as a ruin with minimal intervention through removal of overgrowth currently causing damage to the structure(s).

- Conversion of coniferous forest to northern and eastern slopes of Montpelier Hill into a permanent broadleaved/ mixed woodland landscape. Commercial forestry to the west will be retained.

- Installation of a 150mm diameter sewage pipe running under the R115 which will connect the proposed site to the existing sewer network.

- Construction of a series of seven small storage ponds / wetlands across the lower areas of Montpelier Hill as part of a sustainable drainage strategy.

- Provision of discreet lighting to the car park area, along the treetop bridge and along the forest road route to the visitor centre building.

The site falls into the administrative area of South Dublin County Council.

Dublin Mountain Visitor Centre – Location Plan

The construction of the proposed development will require a variety of construction methodologies on a live road and an existing, open recreational site.

There will be a requirement on the Contractor to maintain the current level of parking that is available to the public throughout the works. The Contractor's staff and other personnel associated with the works will not be allowed to use the existing car parking spaces.

The Contractor will be required to maintain two way traffic on public roads though the use of shuttles, temporary lights and any other required temporary traffic management.

2.1 Site Preparation

Preliminary site clearance will be carried out on the site. Scrub and vegetation removal will be required as part of site preparation. Vegetation cleared from the site to facilitate construction works will be collected and stored on site wherever possible. For any non reusable vegetation this will be disposed of at an appropriately licensed waste facility.

2.2 Site Construction Compound

A main site construction compound will be required during the construction phase to provide office, canteen, washroom and toilet facilities. The compound will also provide facilities for materials and plant storage and the maintenance of same. The principal site construction compound will be established at the commencement of the contract and remain in place throughout the construction period. It is envisaged that the site for the compound will be in the vicinity of the area marked as 'Location 1'on Sketch No 0003 in Appendix A. Another possible location of the site compound is marked as 'Location 2' on Sketch No 0003 in Appendix A.

Potential impacts that need to be guarded against include:

- Accidental spillage of pollutants into the surface water drainage system and woodlands.
- Damage to existing trees, plants and the woodland habitat.

Bunded storage units for oil/fuel/hydrocarbons/chemical are to be provided on impermeable surfaces with a minimum 110% capacity.

There will be designated refuelling points selected which will be located on hard standing areas with no pathway to the surface water drainage system.

Oil interceptors will be provided in order to prevent runoff of pollutants to the river. The use of interceptors will be in compliance with Pollution Prevention Guidelines (PPG) 3. No detergents will be discharged to interceptors as this practice renders the interceptor useless.

A designated vehicle wash down area will be identified with consideration to drainage arrangements and will be located away from surface water discharge point. Wash water will be collected and contained for disposal off site. Concrete washout will not be permitted to enter the surface water system.

The exact location and mode of operation of the site construction compound is selected by the contractor with regard to relevant guidelines of the Statutory Authority and the relevant agencies. There will be an early consideration of location of

material stockpiles, which will be covered with geo-textile or similar to prevent mobilisation of suspended solids.

Embankment and cut slopes which are considered at risk from erosion are to be top soiled and seeded as soon as possible to prevent the deterioration due to weather events. Lining with hessian and maintenance will need to be considered if required.

Furthermore, the sites of the compounds will be cleared, reinstated and landscaped upon completion of the works to the satisfaction of the Statutory Authority.

3. PROJECT PROGRAMME

It is estimated that it will take approximately 15 months to complete the construction of the DMVC including the associated road upgrades.

4. ENVIRONMENTAL MANAGEMENT

The requirement for environmental management for the construction stage is outlined in the project Environment Impact Assessment (EIA).

This document must be read in conjunction with the project EIA.

5. TRAFFIC MANAGEMENT

The Design Team has addressed the potential impacts of construction traffic to the local area of the R115 Stocking Lane/Killakee Road and existing carpark.

There is no restriction on the Contractor in terms of the sequencing of construction activities. However, the current level of parking that is available to the public must be maintained throughout the works.

Construction traffic may enter through the existing entrance; however, parking spaces that are made available for use by the public **must** not be occupied by construction traffic.

Typical construction associated traffic would include operatives travelling to and from work and deliveries and removal of materials.

All Traffic Management proposals shall be agreed with South Dublin County Council, An Garda Síochána and Employer's Representative prior to construction of the development. Any temporary barriers placed around the working area should be clearly defined by temporary road markings, signage and coning as specified in the Traffic Signs Manual. The PSCS/ Contractor must carry out a risk assessment before commencement of works on site, to determine the type of barriers (if any), and cones most suitable for the works.

It is envisaged that advance traffic information on traffic proposals will be communicated to the public via local radio and newspapers. It is also envisaged that the Contractor will erect Variable Message Signs (VMS) at key locations in and around the R113 Mount Venus Road, R115 Stocking Lane/Killakee Road and Stocking Avenue.

All Construction Stage Traffic Management must comply with the following:

- Department of the Environment Traffic Signs Manual – Chapter 8 Temporary Traffic Measures and Signs for Road Works, and
- Department of the Environment Guidance for the Control and Management of Traffic at Road Works.

5.1 Constraints

Considering the relatively high volume of visitors to the Hell Fire Club at the weekends and on Bank/Public Holidays, constraints to the construction process may apply during these times.

Construction works and deliveries on weekdays will be restricted to between 07:00 and 19:00 subject to planning approval. Construction works and deliveries on Saturdays will be restricted to between 08:00 and 13:00 subject to planning approval. No works or deliveries will take place on Sundays or Bank/Public Holidays without prior written approval from the Employers Representative.

5.2 Temporary Traffic Management Road Safety Audit

The PSCS's/Contractor's Construction Stage Traffic Management Plan including all construction accesses, merges and diversions will be subject to a full Stage 2 (design) and Stage 3 (post erection) Temporary Traffic Management Road Safety Audit by an independent Road Safety Audit Team.

The Construction Stage Traffic Management Plan must include:

- Construction vehicle accesses
- Location and details of all temporary roadworks signage including mobile VMS and road markings
- Location and details of all temporary safety barriers
- Details of works deliveries and storage of materials
- Risk Assessments for design and construction of temporary traffic management where relevant
- Details of any proposed construction phasing and associated temporary traffic management measures.

5.3 Temporary Road Surfaces

It is currently not envisaged that temporary road surfaces will be required. However, this will be a matter for the Contractor to determine in line with their proposed Construction Management Plan.

5.4 Associated Civil Works

It is proposed to carry out all works on the main road at the same time to minimise the impacts on the surrounding road network.

5.5 Vehicular Access to Site

Deliveries and general HGV traffic will access the DMVC site from the R115 Stocking Lane/Killakee Road.

The location of the site compound is unlikely to change during the different construction phases. HGV's will be directed to an appropriate location and an appropriate member of staff from the contractor will be notified to meet the delivery and arrange offloading. Security of the site will be the responsibility of the Contractor and particular attention must be given to the continued use of the surrounding areas by the public. Pedestrian safety barriers will be erected at the entrance to the site to permit safe passage for pedestrians across the access to the development, segregating members of the public from HGV's and other vehicles entering the development.

5.6 Construction Traffic

During the construction phase the project will generate a range of traffic, which can be broken down into the main phases of construction as outlined below.

5.6.1 Site Clearance and Set-up

Earthworks plant will be required to prepare the compound area and install services. Portacabins will be required for the site compounds, as well as portable toilets/welfare facilities, and lock-up containers.

5.6.2 Proposed Development

The commencement of the main construction works will require significant additional construction plant. Regular deliveries of materials and ready mixed concrete will take place during these works. There will also be a minor increase in the construction workforce resulting in more cars and vans accessing the site. However, the Contractor will be required to provide a shuttle service for site operatives.

All HGV's will access the site from the R115 Stocking Lane/Killakee Road. Safe access must be facilitated to construction traffic with additional specific measures employed to ensure safe access during darkness.

It is assumed that the Contractor will have sufficient resources to facilitate safe access during hours that the car park is in use by the public.

Sufficient space must be allocated to allow construction vehicles to turn around safely on-site to avoid vehicles reversing out of site access points.

5.7 Maintenance of Public Roads

There will be potential for delivery vehicles and other site traffic to carry mud and silt onto the public roads when exiting the site. In order to prevent this, a wheelwash facility will be utilised on site. This will be used as required to wash down vehicles prior to leaving the site.

A road sweeper should also be deployed on the accesses to the site to keep this clean and prevent vehicles carrying mud onto the public roads and publically used carparks. Roadside gullies and drainage channels will need to be maintained by the road sweeper contractor. Road line markings will require monitoring and markings that require replacement throughout the duration of the project will be replaced by a specialist contractor.

Close supervision of haul vehicle loading must be carried out on a full time basis by the PSCS/Contractor personnel to ensure there is no over-loading of vehicles.

5.8 Dust

Dust is a nuisance and can be damaging to humans, machinery, plants and animals. All workers on site are to consider the nuisance caused by the impacts of dust. The effects of dust will be minimised using the following techniques;

- Avoid creating unnecessary dust.
- Cover materials which could create dust when windy.
- Dampen down dust in operations which create dust.
- Ensure that vehicles leaving site do not leave mud on the road.

Activity-specific Method Statements will be prepared by the Contractor and reviewed by the Design Team and the HSE.

6. SUMMARY

This Outline CTMP is indicative only, however, it is expected that the final CTMP will be prepared by the PSCS/Contractor will incorporate the items outlined above and ensure that all requirements identified as part of the planning consents will be included in the CTMP.

The PSCS's/Contractor's Construction Stage Traffic Management Plan including all construction accesses, merges and diversions will be subject to a full Stage 2 (design) and Stage 3 (post erection) Temporary Traffic Management Road Safety Audit by an independent Road Safety Audit Team.

Appendix A
Possible Compound Locations

TO
HELLFIRE

STANDING STONE

LOCATION 1

LOCATION 2

FOREST ROAD

VISITOR CENTRE

EQUESTRIAN TRAIL

TREETOP BRIDGE TO
MASSY'S

ENTRANCE

CAR & BUS PARKING
272 CAR SPACES
3 BUS SPACES

STEWARD'S HOUSE

TIMBERTROVE

MASSY'S
ESTATE

Job No: 15.189

Project Title: DMVC

Sketch Title: Possible Compound Location

Sketch No: 003

By: kieran.oriordan

Date: 19/06/2017

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APPENDIX 5
Operational Management Plan

The Dublin Mountains Visitor Centre

Operational Management Plan for South Dublin City Council

July 2017

Design Team Members

Design Team Lead	Paul Keogh Architects
Project Engineer	Roughan O'Donovan Consulting Engineers
Landscape Designer	Cunnane Stratton Reynolds
Business Consultants	CHL Consulting
Conservation Architect	Cathal Crimmins

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2 Management Structure and Responsibilities

2.1 Private Operator of the Parking Area, Visitor Centre and Pedestrian Bridge
2.2 Exclusion of Certain Facilities from Commercial Operation
2.3 Waste Management
2.4 Dublin Mountains Partnership Volunteer Rangers

3 Opening Hours

3.1 Parking Area
3.2 Visitor Centre
3.3 Special Events

4 Trails Monitoring and Management

5 Archaeological and Architectural Heritage Monitoring and Management

6 Ecological Monitoring and Management

7 Access and Parking Management

7.1 Car Park Monitoring and Variable Message Signs
7.2 Proposed Shuttle Bus from Tallaght
7.3 Proposed Park & Ride Facility at Tallaght Stadium
7.4 Promotion of Park & Ride Service
7.5. Potential Special Tourist Bus Route

1 Introduction

The report has been prepared to outline the management structure and the management and operational aspects of the proposed Dublin Mountains Visitor Centre project. It should be read in conjunction with the Design Report and the Environmental Impact Assessment (EIA) Report submitted under separate cover.

The report explains how it is currently envisaged that the facility would be managed in the event of development consented by An Bord Pleanála (subject to any conditions of consent). It also addresses key commitments to monitoring and management of the cultural and natural heritage resources and the landscape of the proposed facility, which have emerged from the EIA process.

2 Management Structure and Responsibilities

It is proposed to establish a permanent management steering group comprised of SDCC, Coillte and the DMP. This steering group would have responsibility for:

a) Managing the contract, lease or license of the private operator of the facilities;

b) Management and maintenance of the Hell Fire and Massy's Wood properties. Such management will include:

- Maintenance of all areas outside of the responsibility of the private operator;
- Annual inspections of (a) the trails, (b) the archaeological and architectural heritage features, (c) identified Key Ecological Receptors (species and habitats), and implementing any repair, improvement or protection works required;
- Carrying out an ongoing programme of works for the conversion of existing conifer plantations (on the 26 ha portion of the Hellfire property the subject of a Memorandum of Understanding between Coillte and SDCC) to permanent native mixed woodland, until the conversion is completed;
- Coordination of all forest operations to ensure minimal conflicts with recreational use of the site and vice versa.
- Liaison with neighbouring landowners, residents and other stakeholders, facilitated through the consultation forum of the Dublin Mountains Partnership.

c) Responding to any issues raised by the operator to do with the area outside of the operator's area of responsibility (e.g. issues that might be brought to the operator's attention by users, such as issues with the trails).

2.1 Private Operator of the Parking Area, Visitor Centre and Pedestrian Bridge

It is envisioned that the core built visitor facilities, i.e. the parking area, the visitor centre and the pedestrian bridge, will be managed by a private operator with commercial experience in the leisure / tourism sector. The private operator would have responsibility for management, maintenance and operation of:

- Non-commercial facilities: These include the parking area, the pedestrian bridge / tree canopy walk, the Ramblers' Lounge, public toilets and amenity areas.

- Commercial facilities: These include the audio-visual and exhibition facility, educational facility, the café, kiosk and shop.

The Business Plan prepared by CHL Consulting Ltd (submitted with the application for development consent) suggests three possible arrangements which might be made between the management steering group and the private operator following a public call for expressions of interest, subject to negotiation:

- Contract Management: The steering group makes an annual payment to the preferred bidder in order to have the required services delivered on site.

- Operator Lease: The steering group leases the facilities to the preferred bidder for a defined period of time at prevailing market rates.

- License with Profit Share: The steering group lets the facilities to an operator for a token / minimum rent.

Subject to development consent, once the management steering group is formed it will decide on the optimal means of forming an arrangement with a private operator.

2.2 Exclusion of Certain Facilities from Commercial Operation

It is proposed that certain elements of the facilities for which the private operator will have management responsibility be identified in the constitution of the steering group and in any arrangement with the operator, as being non-commercial. This is to ensure that they are not operated on a commercial basis, i.e. that payment never be required for their use by the public.

These elements include the parking area, the pedestrian bridge / tree canopy walkway, the Ramblers' Lounge and public toilets.

The reason that these elements are proposed to be included in the private operator's area of responsibility is that they may require day-to-day management and maintenance and the operator will have a daily staff presence on site during operating hours.

It is proposed that the education facility be the subject of bespoke conditions regarding its commerciality. Such conditions may limit the cost of the facility's use to schools and other selected groups (e.g. local community groups, scouts, historical societies, etc.).

It is proposed that the café and audio-visual and exhibition facility be the subject of bespoke conditions to ensure that any exclusive corporate use not restrict access by the public excessively.

2.3 Waste Management

It is proposed that bins will be provided on the site in the following locations:

- In the parking area;

- At the visitor centre: On the terrace outside the Rambler's Lounge and the kiosk, and in the courtyard between the café and the AV-exhibition facility;

- At the Hell Fire end of the pedestrian bridge.

The bins will allow for separation of general, recyclable and compostable waste.

It will be the responsibility of the private operator of the facility to ensure that the bins are emptied on a regular basis - as often as is required.

The waste will be temporarily stored in the waste storage area of the visitor centre, along

with the waste generated by the centre, and collected from the site as often as required by a private waste collection company.

The waste management procedures will be specified in the contract, lease or license of the private operator of the facility.

Signage at the facility and any pamphlets, trail maps and online information for visitors / facility users will promote a 'Leave-no-Trace' policy.

2.4 Dublin Mountains Partnership Volunteer Rangers

It is proposed to provide a base for the Dublin Mountains Partnership Volunteer Rangers Service[1] in the visitor centre. It is envisioned that the rangers will be present at the visitor centre at busy times, stationed in the Ramblers' Lounge and at the trail head or at features of the site, to provide information and advice to walkers / visitors, assist in educational activities, guided walks, etc. The rangers may also assist in marshalling of traffic at peak periods if required.

3 Opening Hours

It is proposed that the facilities will operate approximately during daylight hours.

3.1 Parking Area

- April to September: 7am to 10pm.
- October to March: 8am to 6pm.

There will be an emergency phone number provided at the entrance for any walkers returning to their cars after closing time, and a call-out / opening charge will be payable.

3.2 Visitor Centre

- April to September: 8am to 8pm.
- October to March: 9am to 5pm.

3.3 Special Events

With its unique characteristics (facilities and heritage features) it is anticipated that there may be opportunities for the site to host special events occasionally, and such events may require opening of the facilities outside of the normal opening hours described above. For example, there may be opportunities for cultural events such as Halloween story-telling at the Hell Fire Club, or sports events such as a trail running competition. Such usage would enhance the value of the facility to residents of South Dublin and make optimal use of the upgraded facilities and investment.

It is proposed that such occasional special events usage would be facilitated by means of the normal outdoor events licensing procedures operated by SDCC, with input from the facility management steering group and the private operator.

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[1] http://www.dublinmountains.ie/volunteer_rangers/volunteer_ranger_service/: The Volunteer Ranger Service aims to:

- Assist the public in appreciating the Dublin Mountains through education and communication
- Increase community involvement in, and awareness of, the management of the forest and mountain lands
- Develop volunteers' personal understanding, knowledge and sense of belonging to the Dublin Mountains
- Promotion of the Leave No Trace principles
- Assist in practical conservation tasks

4 Trails Monitoring and Management

It is proposed that the management steering group carry out an annual inspection of the site trails. The inspections will be carried out by the DMP and Coillte.

The annual inspections will establish the condition of all trails with reference to National Trails Office standards. If necessary, repair works will be specified and implementation will be supervised by the DMP and Coillte.

The trails inspection and specification of works will be informed by the results of the annual archaeological and architectural heritage inspection and the annual ecological surveys in order that any necessary protection measures for heritage resources are incorporated.

5 Archaeological and Architectural Heritage Monitoring and Management

It is proposed that - for an initial period of five years - the management steering group carry out or arrange to have carried out an annual inspection and repair (if necessary) of all architectural and archaeological features (visible on the ground) of the site. The inspections will be carried out by a conservation architect and archaeologist.

The inspections will establish the condition of each structure / feature and its setting.

If necessary, i.e. if deterioration of the feature is evident, repair works will be specified and implementation will be supervised by the conservation architect or archaeologist. If necessary, management measures will be prescribed to protect the feature. This might take the form of additional signage/information requesting visitors' assistance in conserving the features. Alternatively or additionally, trails might be re-routed away from the feature, and/or the feature might be sensitively enclosed by fencing or the feature might be hidden with vegetation to reduce its exposure.

After the initial five year monitoring period, the requirement for annual cultural heritage inspections will be reviewed and a new regime of inspections at wider (or shorter) intervals will be implemented.

6 Ecological Monitoring and Management

It is proposed that - for an initial period of five years - the management steering group carry out or arrange to have carried out an annual inspection/survey of all Key Ecological Receptors[2] (habitats and species) on the site. The inspections will be carried out by an ecologist.

The inspections will establish the condition / prevalence of each habitat or species on the site. If necessary, e.g. if deterioration of a habitat, or significant reduction in the number of a species, or significant increase in the spread of an Invasive Alien Plant Species (IAPS) is identified, management measures will be prescribed by the ecologist. Such measures might take the form of additional habitat development, or restriction of public access to certain areas for a prescribed period, or IAPS clearance programmes.

After the initial five year monitoring period, the requirement for annual ecological inspections/surveys will be reviewed and a new regime of inspections / surveys at wider (or

[2] KER1: Red Squirrel
KER2: Badger
KER3: Otter
KER4: Bats (all Irish species except Lesser Horseshoe Bat Rhinolophus hipposideros)
KER5: Ponds
KER 6: Invasive Alien Plant Species (IAPS)
KER7: Glendoo Brook

shorter) intervals will be implemented.

7 Access and Parking Management

7.1 Car Park Monitoring and Variable Message Signs

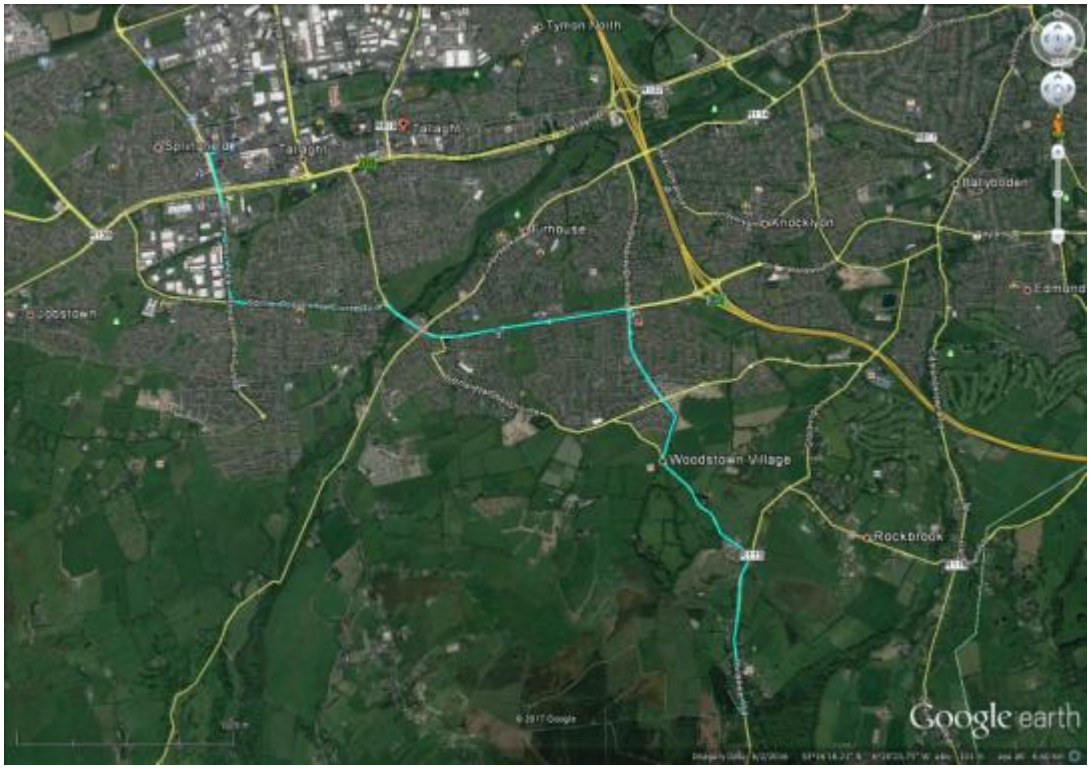
A permanent electronic car park monitoring system will be provided to record the occupancy rate at the Hell Fire Car Park. This will link to Variable Message Signs (VMS) to the north on the two main approach routes from the city and M50 directions. At unusually busy periods the VMS signs will alert drivers to the lack of parking spaces at Hell Fire and will instead direct them to the Park & Ride site (refer to 4.3 below).

As the visitor centre will be manned (by the staff of the private operator and by volunteer rangers of the DMP, who will have a base in the visitor centre), during opening hours there will be personnel on hand to marshal traffic at peak periods and to manage any risk of overspill parking on Killakee Road. Such arrangements are in place at Sliabh Gullion Forest Park in County Armagh, which is operated by a similar arrangement joint venture between the local authority and the Forestry Service.

7.2 Proposed Shuttle Bus from Tallaght

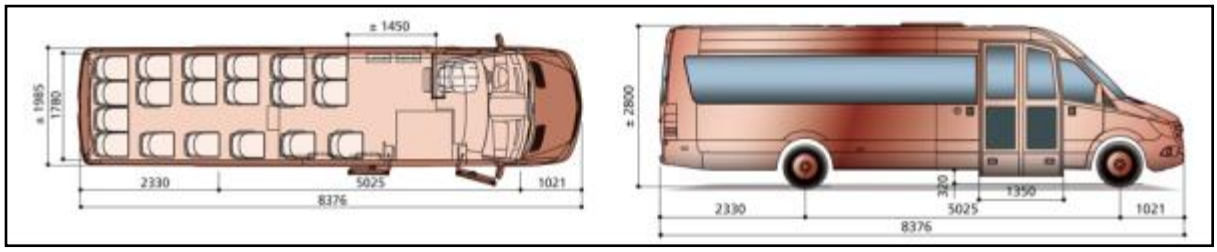
In order to make the proposed visitor centre properly accessible by public transport, South Dublin County Council proposes to operate a shuttle bus service from Tallaght LUAS stop and Public Transport Hub at Tallaght Town Centre. The proposed route will be 7.5km long via Oldbawn and Ballycullen as shown in the following map. It will also serve a proposed Park & Ride facility at Tallaght Stadium (details described later in this report), which is owned by South Dublin County Council. At Woodstown Village the shuttle bus can also interchange with the No.15/15B Dublin Bus route.

This shuttle bus service will operate 7 days a week year round, with a frequency of 15 to 30 minutes according to varying seasonal and daily demand. A public transport operation licence will be required from the National Transport Authority for this service, which will determine details such as fares, capacity and operating hours. The potential demand for the bus service has been determined as part of the overall transport demand assessment. The estimated journey time is 12 to 15 minutes at an average speed of 30km/h to 40km/h. Two vehicles will be required for a 15 minute frequency service.



Proposed Shuttle Bus Route from Tallaght to Hell Fire Wood (in light blue)

A suitable vehicle will be a 20 to 30 seater midi-coach that will have sufficient capacity for the peak period demand. This type of vehicle is 2.0m wide (as shown in the following photograph), compared to over 2.5m for a full-size coach, and can therefore fit more easily on the narrow roads in the Dublin Mountains.



Typical Midi-Coach Vehicle with full wheelchair accessibility and 22 seats

Such a shuttle bus arrangement is provided from the town of Llanberis to Pen-Y-Pass in Snowdonia in North Wales as shown in the following photograph.

7.3 Proposed Park & Ride Facility at Tallaght Stadium

It is proposed to encourage a proportion of visitors to transfer to public transport for the last part of the journey, especially at peak periods. The proposed shuttle bus service from Tallaght LUAS stop and Public Transport Hub at Tallaght Town Centre to Hell Fire Wood will provide the required service for a Park & Ride facility located along the route. South Dublin County Council therefore proposes to provide a Park & Ride facility at Tallaght Stadium, which is owned by the County Council.

There are 400 parking spaces available at this site, which is accessed from Whitestown Way just south of the N81 Tallaght Bypass. The charge for this service will be determined under licence from the National Transport Authority on the same basis as for the proposed shuttle bus service. The stadium parking is only used occasionally for football matches on Saturday afternoons or mid-week evenings, and will therefore be available most of the time for the Park & Ride activity.

7.4 Promotion of Park & Ride Service

Marketing for the proposed Dublin Mountains Visitor Centre will actively promote the Park & Ride service to visitors, and will advise of potential peak period capacity limits at Hell Fire Wood. Fixed direction signs will direct motorists towards the visitor centre on the main approach routes and will also show the direction to the Park & Ride site at Tallaght.

7.5. Potential Special Tourist Bus Route

In the event of development consent a specially themed tourist bus service could be developed from the city centre to the new Dublin Mountains Visitor Centre. This could be called the "Art O'Neill Tour Bus" service from Dublin Castle direct to Hell Fire generally following the historical escape route taken by Art O'Neill and Red Hugh O'Donnell in January 1592. The route could follow the historical Military Road that was constructed after the 1798 Rebellion to enable access to the wild rebel Wicklow Mountain fastness from which raids were launched on The Pale. Intermediate stops could be made at Rathfarnham Castle and the Pearse Museum at St. Enda's Park. Such a special service could encourage visitors to Dublin to undertake a wider experience of the city and surroundings.