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Environmental Impact Assessment Report
Development at Waterford Airport

Volume 2 – Chapter 12 - Biodiversity

Prepared for: Waterford City & County Council in Partnership with Waterford Regional Airport PLC

Comhairle Cathrach & Contae Phort Láirge
Waterford City & County Council

Waterford Airport
Serving the Southeast for 30 years

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Core House, Pouladuff Road, Cork
T12 D773, Ireland

T: +353 21 496 4133 E: info@ftco.ie

CORK | DUBLIN | CARLOW

www.fehilytimoney.ie

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12. BIODIVERSITY

12.1 Introduction

This Ecological Impact Assessment outlines the biodiversity (floral and faunal features) of the receiving environment within the planning application area and within a wider Zone of Influence (ZoI) in the vicinity of the proposed development at Waterford Airport. It comprises information as required by Annex IV to the EIA Directive to be contained in an EIA Report (EIAR), in respect of flora, fauna and avifauna.

The aims of this ecological impact assessment are to:

- Establish baseline ecological data for the proposed development site;
- Determine the ecological value of the identified ecological features;
- Identify, describe and assess the likely significant effects of the proposed development on biodiversity (flora and fauna);
- Propose effective mitigation measures to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on biodiversity; and
- Identify any residual effects predicted to arise after mitigation.

A full description of the development is provided in EIS Chapter 2: Description of the Development.

12.2 Methodology

This ecological impact assessment was carried out by Karen Banks, an ecologist with Greenleaf Ecology who has 14 years' experience in the field of ecological assessment. Karen holds a BSc in Environment and Development from Durham University, and is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Karen is experienced in the production of Ecological Impact Assessments (EcIA) including those for small to large scale housing and mixed-use developments, flood alleviation schemes, wind farms and transport infrastructure.

12.2.1 Desk Study

In addition to the documents listed in the References Section, the sources of published material that were consulted as part of the desk study for the purposes of the ecological review are as follows:-

- Review of the National Parks & Wildlife Service (NPWS) natural heritage database for designated areas of ecological interest and sites of nature conservation importance within and adjacent to the study area;
- Review of Ordnance Survey maps and ortho-photography;
- Review of the National Biodiversity Data Centre (NBDC) database for records of rare and protected species within 2km of the subject site;
- Aerial Photography;
- 1:50,000 Ordnance Survey (OS) Map; Discovery Series; and
- Environmental Protection Agency mapping (https://gis.epa.ie/EPAMaps).

12.2.1.1 Relevant Planning Policy and Legislation

The appraisal of the likely significant effects of the proposed development on ecological features has considered legislation, policy documents, and guidelines as outlined in **Appendix 12.1**, where relevant.

The Waterford County Development Plan 2011-2017[1] was reviewed. The Waterford County Development Plan (CDP) sets out Waterford County Council's policies and objectives for the development of the county over the Plan period. It prescribes policies and objectives in relation to infrastructure, including transport, water services, surface water and waste in Chapter 7 of the Plan; and environment and conservation in Chapter 8 of the Plan. Information on designated sites is set out in Appendix A10. Relevant Policies and Objectives of the CDP are outlined in **Appendix 12.1** of this Report.

12.2.2 Field Survey

12.2.2.1 Habitats and Flora Survey

The site and its environs were visited on 3rd July 2018 and 6th March 2020. Flora and habitats within the study area were surveyed using the methodology outlined in the guidance document Best Practice Guidance for Habitat Survey and Mapping (Smith *et al*., 2011).The habitats found in the study area (shown on **Figure 3.3**), were classified in accordance with the guidelines set out in '*A Guide to Habitats in Ireland*' (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. The classification is a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. The classification is hierarchical and operates at three levels, outlining the correlation between its habitat categories and the phytosociological units (plant communities) of botanical classifications. Dominant species, indicator species and/or species of conservation interest were recorded and species recorded were given both their Latin and common names, following the nomenclature as given in the 'New flora of the British Isles' (Stace, 2010). Habitat potentially linked to European Annex I habitats was assessed based on the *Interpretation Manual of EU Habitats* (European Commission, 2013) and *The Status of EU Protected Habitats and Species in Ireland* (NPWS, 2019).

12.2.2.2 Fauna Survey

Fauna were surveyed through observation of field signs such as direct observation, tracks, feeding signs and droppings. All species of bird that were seen or heard during the site walkovers were recorded, along with notes on location and abundance. Habitats were assessed for their potential for use, or confirmed use, by protected species of fauna and avifauna during the site walkovers undertaken on 3rd July 2018 and 6th March 2020. The results of the site walkover then informed the scope of tax on specific surveys as detailed in the following sections.

12.2.2.3 Avifauna

The avian surveys carried out for the proposed development are based on the methodologies given in the guidance documents *Bird Monitoring Methods – a manual of techniques for key UK species* (Gilbert et al, 1998) and *Recommended bird survey methods to inform impact assessment of onshore wind farms* (Scottish Natural Heritage, 2017), the latter of which provides methodologies that are also appropriate to assessment of airport developments. The following surveys were carried out:

[1] The lifetime of the CDP has been extended, and will remain in effect until the new Regional Spatial & Economic Strategy is made by the Southern Regional Assembly, thereafter a new County Development Plan will be prepared.

- Vantage Point Surveys (Breeding and Non-Breeding Season)
- Transects (Breeding Season)
- Hinterland/I-WeBs (Breeding Season)

Vantage Point Surveys

Vantage Point (VP) surveys were carried out at the proposed site between 2018 and 2020, during both the breeding and non-breeding seasons. These surveys took place within the summer and early autumn (June - September) seasons in 2018 and winter, spring and summer (February - May) 2020 seasons. *It should be noted that two watches per VP were undertaken in April 2020, and that the survey for March 2020 was undertaken in the first half of April 2020*.

Two fixed VP locations (VP1 and VP2) which overlook Waterford Airport and the surrounding study area were used during these surveys. When combined, the vantage points cover a comprehensive viewshed of the proposed development area, and also allow observation of the wider area surrounding the airport. VP 1 was located to the south of the existing runway (co-ordinates: 52.178952, -7.091636) and VP2 (co-ordinates 52.196135, -7.081525) was located to the north of the existing runway. The location of the two fixed VP positions is illustrated in **Appendix 12.2**.

The main purpose of the vantage point survey watches was to:

1. Collect data on *target species* that will enable estimates to be made of:
    a. The time spent flying over the defined survey area;
    b. The relative use of different parts of the defined survey area; and
    c. The height of flight.

Viewshed analysis was undertaken to select potential vantage point that allow for the maximum coverage of the study area. These vantage point locations were subsequently confirmed via walkover/reconnaissance surveys to confirm ground conditions and visibility.

Data recorded included flight activity of target species (flight height, duration, directionality) in addition to metrics such as flock size (per recorded transit) and time of observation. Detailed notes of each observation of a target bird species was recorded including behaviour, gender (where possible), numbers, flight height, associated habitat and the period of time spent within the study area. Successful foraging events were also noted if they arose. Other bird species seen or heard during the VP surveys were also noted as incidental records and were considered separately as additional species. Flight activity was annotated onto field maps. The activity of target species is summarised in **Section 12.3**; survey details such as weather conditions, visibility, and duration are detailed in **Appendix 12.2**. Binoculars and field scopes were used to scan the viewshed for target species.

Flight heights are estimated visually as allowed for in SNH (2017) guidance.

As previously mentioned, VP surveys were carried out at the site from June to September 2018 inclusive, and February to May 2020 inclusive, and involved carrying out 1-2 x 3-hour VP surveys at each VP location every survey month. This constitutes a total of 15 hours during the survey period June-September 2018, with 6 hours completed at each VP during the summer season, and 3 at VP2 during the winter season. A total of 36 hours VP survey was undertaken during the survey period February- May 2020, with 3 hours survey at VP 1 in the winter season and 9 hours at VP2; 12 hours survey at VP 1 and 12 hours survey at VP2 was undertaken in the summer season. The total VP survey effort between June 2018 and May 2020 was 51 hours.

The proportion of survey time that activity was recorded inside and outside the proposed site boundary was used as part of the overall analysis and assessment of target species usage of the study area. All surveys were conducted during suitable weather conditions.

Transects

For general breeding birds the method utilised was based on the British Trust for Ornithology (BTO) Breeding Bird Survey (BBS or CBS) (Bibby et al, 2000). The study area for this survey comprised a total of 2 no. transects. These transects were selected to allow for a representative sample of the different habitats present within the site (See **Appendix 12.2** for a transect map). For each transect, birds were counted over three visits during the early part of the breeding season (late March to mid-May 2020) with visits at least two weeks apart. All birds seen or heard were recorded as transect routes were walked methodically. Birds were noted in four distance categories, measured at right angles to the transect line (within 25m, between 25m-100m and over 100m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2018). Breeding bird transect details are included in **Appendix 12.2**.

Hinterland/Wetland Bird Surveys

To determine the species and numbers of wetland birds in the area, hinterland and I-WeBS surveys were undertaken monthly between the months of April to May. Hinterland/I-WeBs surveys were undertaken on the 15th April 2020, 23rd April 2020 and the 18th May 2020 covering the Back Strand, which is located c. 1.7km to the south of the proposed site. I-WeBs surveys focused on the Tramore Back Strand SPA during the high tide period from six observation points for the duration necessary to identify and obtain a count for all wetland bird species present.

Table 12-1: I-WeBS sites for the Tramore Back Strand SPA (004027).

Site Name	Description	Coordinates (ITM)
Site 1	Beach area offering views of south eastern part of SPA.	662751, 600540
Site 2	Beach Inlet offering views of eastern part of SPA	663260, 601296
Site 3	Coastal creek/inlet with views of north eastern part of SPA	663624, 602485
Site 4	Area of pools and fields on northern side of SPA	660205, 602915
Site 5	Views of western part of SPA from shore	659384, 602103
Site 6	Views of northern part of SPA from embankment	661127, 602428

The fields / habitats between the SPA and the Airport were also surveyed over the same period as part of the hinterland surveys for birds of conservation or qualifying interest for the SPA. Survey details and the location of observation points are detailed in **Appendix 12.2**.

12.2.2.4 Bats

A survey for bat potential at the proposed site was undertaken at the site in accordance with the following guidelines:-

- BTHK. 2018. Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK.;
- Bat Conservation Ireland, (2010). Guidance notes for Planners, Engineers, Architects, and Developers;
- Collins, J. (ed.) (2016). Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd ed.). The Bat Conservation Trust, London;
- Kelleher, C. & Marnell, F. (2006). Bat Mitigation Guidelines for Ireland; and
- NRA[2] (2006). Guidelines for the Treatment of Bats During the Construction of National Road Schemes.

Trees present on site were assessed for their suitability to support bats. This includes features with potential as roosting or resting places, such as frost cracks, damaged limbs, lifting bark plates and knot-holes. Trees were categorised according to the criteria described in **Table 12-2** below (Collins, J. 2016). The suitability of habitats for commuting, foraging or swarming was also assessed and categorised according to **Table 12.2.**

[2] Now known as Transport Infrastructure Ireland (TII)

Table 12-2: Suitability of Habitats for Bats

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

12.2.2.5 Terrestrial Mammals

A badger survey was conducted within the airport lands and adjacent fields to the north. Badger survey was conducted in accordance with Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).

Field signs of badger activity are characteristic and sometimes quite obvious and can include tufts of hair caught on barbed wire fences and scrub, conspicuous badger paths, footprints, small excavated pits or latrines in which droppings are deposited, scratch marks on trees, and snuffle holes, which are small scrapes where badgers have searched for insects and plant tubers (NRA, 2009).

Notes were made on signs of other mammals in order to deduce the likelihood of faint tracks and/or feeding signs belonging to badgers. The objectives of the badger survey were to:

- Confirm whether or not badger setts occur within the area surveyed.
- Confirm where possible the status of any setts identified in survey.
- Describe field signs of badger activity.

12.2.3 Impact Assessment

The information gathered from desk study and survey has been used to prepare an ecological impact assessment (EcIA) of the proposed development upon the identified ecological features. The EcIA has been undertaken following the methodology set out in CIEEM (2018) and with reference to BS 42020:2013. EcIA is based upon a source-pathway-receptor model, where the source is defined as the individual elements of the proposed development that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological features. An ecological feature is defined as the feature of interest, being a species, habitat or ecologically functioning unit of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and feature.

A significant effect is defined in CIEEM (2018) as:

"*an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'…. or for biodiversity in general*".

BS 42020:2013 states that if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be "significant" in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions.

Likely significant effects are predicted on the basis of the proposed development as set out in Chapter 2: Description of the Development.

The valuation of ecological features is in accordance with the methodology detailed in National Roads Authority Guidelines (2009) (**Table 12-3**). To qualify as an ecological feature (referred to as key ecological receptors in the NRA Guidelines), features must be of local ecological importance (higher value) or higher as per the geographical frame of reference detailed in **Table 12-3**. Ecological features might also be important because they play a key functional role in the landscape as 'stepping stones' for migratory species to move during their annual migration cycle, as well as for species to move between sites, to disperse populations to new locations, to forage, or move in response to climate change.[3] Features of lower ecological value are not assessed.

[3] Ref Article 10 of the Habitats Directive: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML

Table 12-3: Geographical Frame of Reference for Ecological Evaluation

Ratings for Ecological Sites
International Importance: • 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. • Proposed Special Protection Area (pSPA). • Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network. • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & the Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance: • Site designated or proposed as a Natural Heritage Area (NHA). • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Acts. • National Park. • Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance: • Area of Special Amenity. • Area subject to a Tree Preservation Order. • Area of High Amenity, or equivalent, designated under the County Development Plan. • Resident or regularly occurring populations (assessed to be important at the County level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list.

Ratings for Ecological Sites
• Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. • County important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value): • Locally important populations of Priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (BAP), if this has been prepared; • Resident or regularly occurring populations (assessed to be important at the Local level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value): • Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; • Sites or features containing non-native species that are of some importance in maintaining habitat links.

12.2.4 Consultation

On the 22nd of June 2018 the EIA scoping document was sent to the department of culture heritage & the Gaeltacht (NPWS). Receipt of scoping was received but no further comments.

12.3 Baseline Ecological Conditions

12.3.1 Site Summary and Context

Waterford Airport is located in Killowen, Co. Waterford, c. 5.5km to the north east of Tramore and c. 7.4km to the north west of Dunmore East in Co. Waterford. The airport infrastructure comprises built land. The lands surrounding the runway are dominated by semi-natural grasslands. Various types of grassland habitats are present, often in mosaics. Areas of bare/re-colonising ground are also present, either as distinct parcels, or interspersed with grassland habitats. Fields at the northern and southern ends of the site are bounded by hedgerows and a woodland/scrub mosaic is present in two areas within the site. The Kilmacleague West watercourse runs south from within the proposed development site.

12.3.2 Designated Sites

A review of European designated sites within a 15km radius of the site was undertaken (www.npws.ie). Special Areas of Conservation (SACs) are sites of international importance due to the presence of Annex I habitats and / or Annex II species listed under the EU Habitats Directive. Special Protection Areas (SPAs) are designated for birds based on the presence of internationally significant populations of listed bird species.

Natural Heritage Areas (NHAs) are sites deemed to be of national ecological importance and are afforded protection under the Wildlife (Amendment Act) 2000. The proposed Natural Heritage Areas (pNHA) have not been statutorily proposed or designated; however, do have some protection under Agri Environmental Options Scheme (AEOS), Coillte, County Development Plans and Licensing Authorities.

The proposed site does not comprise any protected areas. There are six European Sites within 15km of the proposed site. The closest are Tramore Dunes and Backstrand SAC and pNHA and Tramore Back Strand SPA, located c. 1.7km to the south of the proposed site. A list of designated sites recorded within 15km of the proposed site is presented in **Appendix 12.3**. European Sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) are illustrated in **Figure 12.1** and Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) in **Figure 12.2** below. A review of nationally designated sites indicates that there are twenty sites designated for nature conservation within 15km of the proposed site.

A Screening for Appropriate Assessment and Natura Impact Statement (NIS) for the proposed development, prepared in accordance with the requirements of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended and the Planning and Development Act, 2000 – 2019, is presented separately to this EIAR.

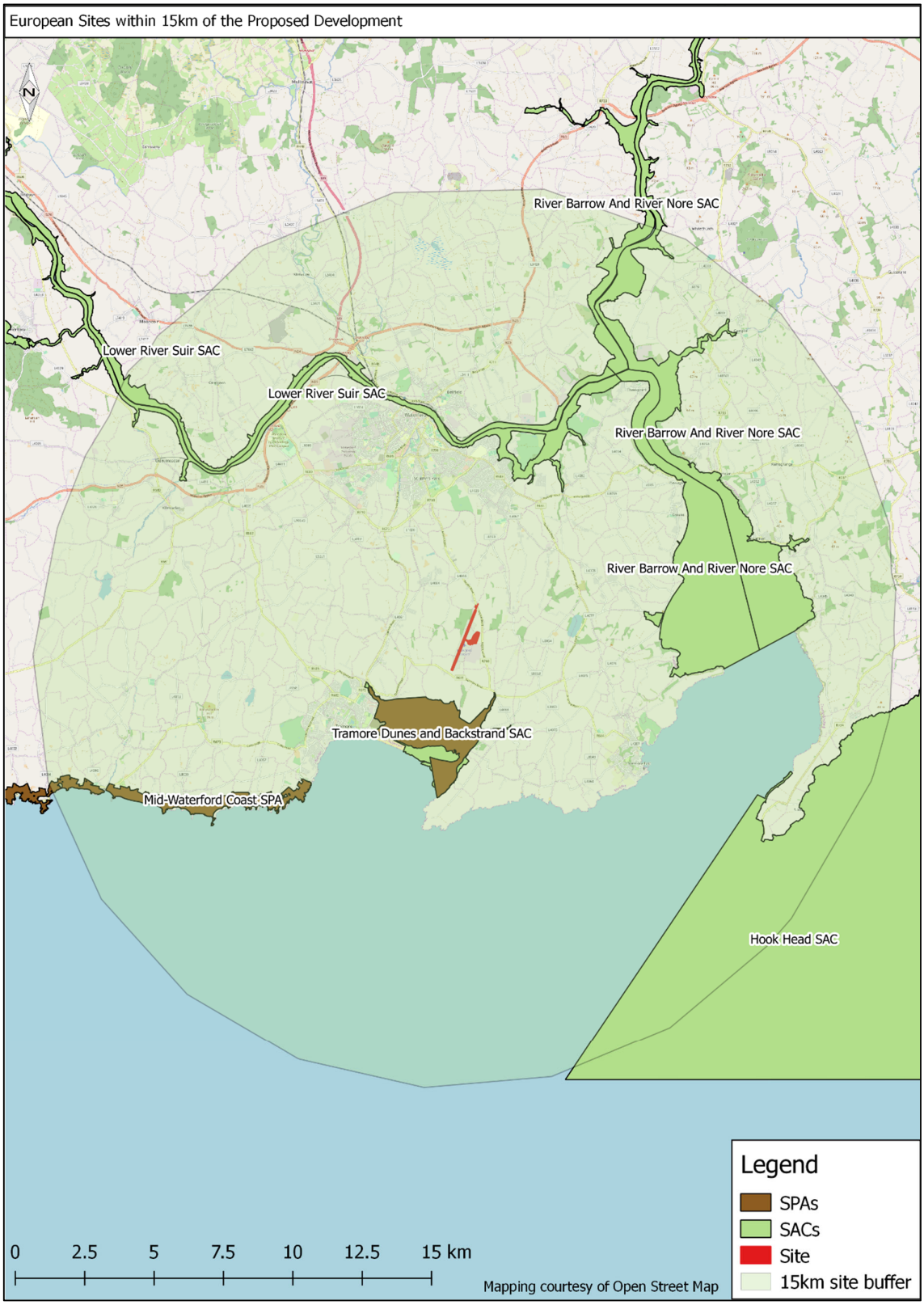

Figure 12-1: European Sites within 15km of the Proposed Site

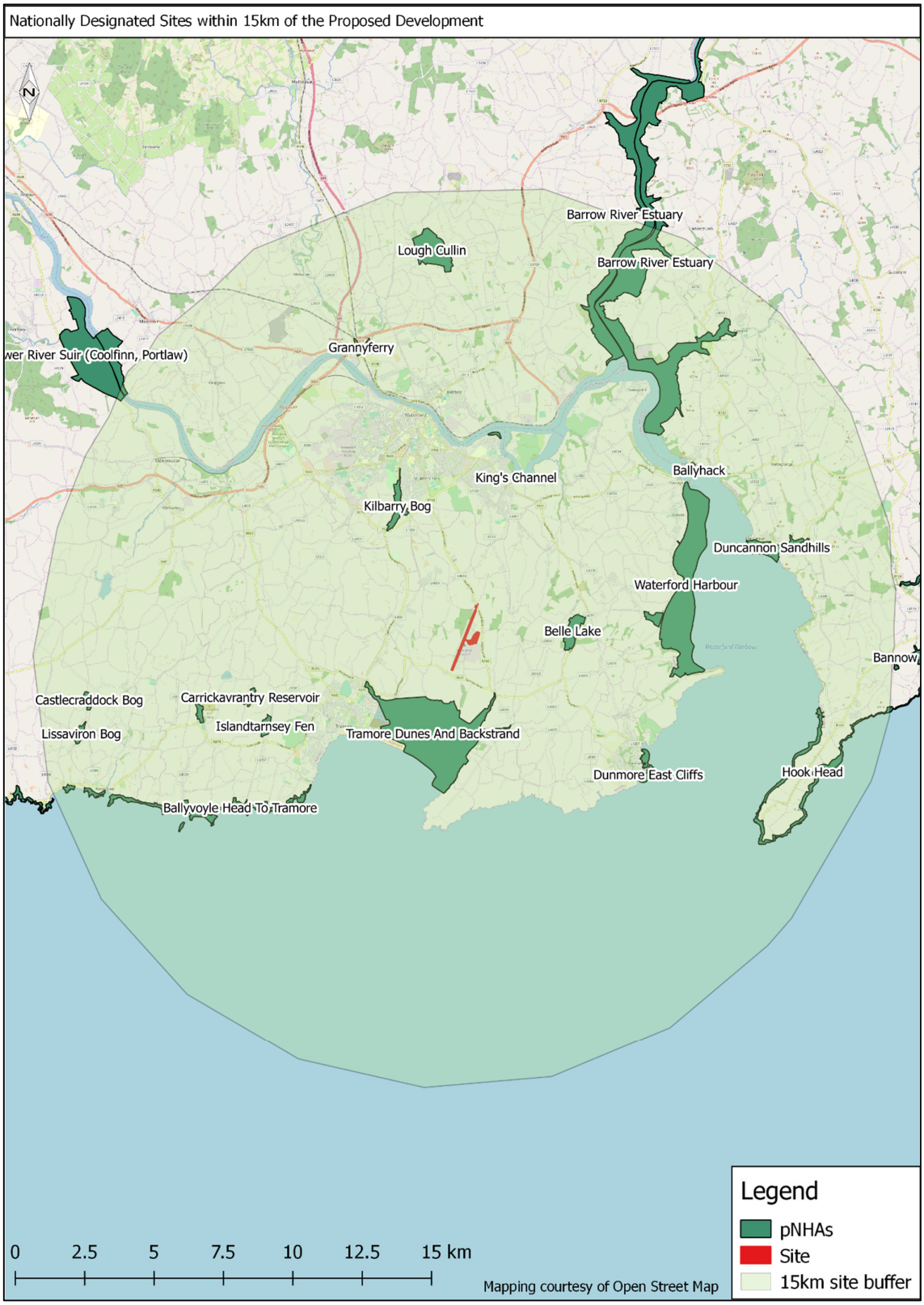

Figure 12-2: Nationally Designated Sites within 15km of the Proposed Site

12.3.3 Habitats

The following habitat types (codes according to Fossitt, 2000) were identified within the proposed site (see **Figure 12.3**):

- Improved agricultural grassland (GA1)
- Amenity grassland (GA2)
- Dry meadows and grassy verges (GS2)
- Dry meadows and grassy verges/ Wet grassland (GS2/GS4) Mosaic
- Dry meadows and grassy verges/ Dry-humid acid grassland/Wet grassland/ Spoil and bare ground (GS2/GS3/GS4/ED2) Mosaic
- Dry meadows and grassy verges/ Dry-humid acid grassland/Wet grassland (GS2/GS3/GS4) Mosaic
- Wet grassland/ Scrub (GS4/WS1) Mosaic
- Arable crops (BC1)
- Scrub (WS1)
- Hedgerows (WL1)
- Mixed broadleaved woodland/ Scrub (WD1/WS1) Mosaic
- Depositing/lowland rivers (FW2)
- Buildings and artificial surfaces (BL3)
- Spoil and bare ground (ED2)

Agriculturally Improved Grassland (GA1)

Fields within the footprint of the proposed northern runway extension and associated landing lights are covered by this habitat type. The sward had been closely cropped at the time of survey, Perennial Rye-grass (*Lolium perenne*) was identifiable, indicating these fields are managed for agriculture. Also of note in this area is the presence of existing landing lights.

Plate 12-1: Agriculturally Improved Grassland

Amenity grassland (not improved) (GA2)
A number of grassland areas are mowed regularly, including areas fringing carparks, adjacent to buildings, surrounding signal masts, and landing lights.

While these areas are kept tightly cropped, they have not been re-seeded and/or improved. As such they contain species occurring in the other grassland types within the site, such as Sweet Vernal-grass (*Anthoxanthum odoratum*), Creeping Cinquefoil (*Potentilla reptans*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Lesser Hawkbit (*Leontodon taraxacoides*), Common Knapweed (*Centaurea nigra*), and Selfheal (*Prunella vulgaris*), rather than the improved monocultures associated with formal parks or sports grounds.

These areas have been classed as GA2 primarily due to management (frequent mowing), rather than species composition; if left untended, they would develop into the semi-natural grassland types present throughout the rest of the site.

Plate 12-2: Amenity Grassland

Dry meadows and grassy verges GS2

A number of areas are dominated by False Oat-grass (*Arrhenatherum elatius*), with Cock's-foot (*Dactylis glomerata*) and Yorkshire Fog (*Holcus lanatus*) being common. Broadleaved Dock (*Rumex obtusifolius*) and Meadow Vetchling (*Lathyrus pratensis*) are also present. Species diversity was lower in these areas, with most vegetation being made up of a dense sward of grasses.

Plate 12-3: Dry Meadows and Grassy Verges

Dry meadows and grassy verges/ Wet grassland (GS2/GS4) Mosaic

Areas supporting a combination of these two habitat types are also present; False Oat-grass and Yorkshire Fog are the dominant grasses, while Common Knapweed, Rushes, Meadowsweet (*Filipendula ulmaria*), Purple Loosestrife (*Lythrum salicaria*) and Lesser Spearwort (*Ranunculus flammula*) are amongst the more common species.

Meadow Buttercup (*Ranunculus acris*), Bindweed (*Calystegia sepium*), Common Yellow-sedge (*Carex demissa*) and Timothy (*Phleum pratense*) are present; Reedmace (*Typha latifolia*) was also recorded in two locations.

Plate 12-4: Dry Meadows and Grassy Verges/Wet Grassland Mosaic

Dry meadows and grassy verges/ Dry-humid acid grassland/Wet grassland/ Spoil and bare ground (GS2/GS3/GS4/ED2) Mosaic

The predominant habitat surrounding the existing runway is waist-high grassland dominated by Sweet Vernal-grass and Creeping and Common Bent (*Agrostis stolonifera* and *A. capillaris*). Rushes (*Juncus effusus*, *J.inflexus*, *J.acutus/articulatus*) are common, and Marsh Thistle (*Cirsium palustre*) occurs throughout. Field Woodrush (*Luzula campestris*) was also recorded, and Sedges (including *Carex hostiana, C.binervis*) were common in places with a more open sward.

Other commonly recorded species included Common Knapweed (*Centaurea nigra*), Tormentil (*Potentilla erecta*), Creeping Cinquefoil, Silverweed (*Potentilla anserina*), Purple Loosestrife, Common Fleabane (*Pulicaria dysenterica*), Red Clover (*Trifolium pratense*), Greater Bird's-foot-trefoil (*Lotus pedunculatus*) and Lesser Spearwort. Yorkshire fog and Meadowsweet were abundant locally in parts; Meadow Vetchling, Common Couch (*Elymus repens*), Timothy, Crested Dog's-tail (*Cynosurus cristatus*), Common Cat's-ear (*Hypochaeris radicata*), and Slender St John's-wort (*Hypericum pulchrum*) were also recorded.

Areas of bare ground with dry, compacted soil were also present interspersed with areas of grassland and low-growing Gorse (*Ulex* sp.). Occasional Bent-grass and Hawkbits were recorded in these areas.

The areas of grassland surrounding the runway are cut once per year in September. While a number of species recorded are more commonly associated with Dry calcareous and neutral grassland (GS1), the management regime dictates classification as Dry meadows and grassy verges (GS2), despite the fact that the sward is not dominated by tussock-forming grasses. The grassland habitat in these areas does not correspond to the Annex I habitat *Lowland hay meadows* [6510].

Plate 12-5: Dry Meadows and Grassy Verges/Dry Humid Acid Grassland/Wet Grassland/Spoil and Bare Ground Mosaic

Dry meadows and grassy verges/ Dry-humid acid grassland/Wet grassland (GS2/GS3/GS4) Mosaic

An area to the south of the terminal building supports vegetation with a similar composition to that described above, however this area does not incorporate patches of bare ground. Yellow Iris (*Iris pseudacorus*) was also recorded in this area; this species was not recorded within grassland habitats surrounding the runway.

Plate 12-6: Dry Meadows and Grassy Verges/Dry Humid Acid Grassland/Wet Grassland Mosaic

Wet grassland/ Scrub (GS4/WS1) Mosaic

Areas of wet grassland/scrub mosaic are present along parts of the outer airside boundary; Grey Willow (*Salix cinerea*), Meadowsweet, Yorkshire Fog, Rosebay and Great Willowherb (*Epilobium angustifolium* and *E.hirsutum*), and Soft Rush (*Juncus effusus*) are common; Field Horsetail (*Equisetum arvense*) and Soft-shield Fern (*Polystichum setiferum*) are locally common, and bramble (*Rubus fruticosus*) thickets carpet other areas.

Gorse, Dog-rose (*Rosa canina*), Bindweed and Purple Moor-grass (*Molinia caerulea*) were recorded occasionally.

Plate 12-7: Wet Grassland/Scrub Mosaic

Arable Crops (BC1)
A field of arable crops bound by hedgerows is present to the north of the R708.

Plate 12-8: An Arable Field to the North of the Site

Scrub WS1

A mound of spoil to the north-east of the existing carpark is partially covered in dense Gorse scrub. Linear scrub dominated by grey willow and gorse is also present along the remnants of forestry and field boundaries in the north-west of the site. A roughly square block of scrub is located south west of the shingle-surfaced area (ED2) to the south-west of Waterford aero club's hangar.

Plate 12-9: Scrub

Hedgerows WL1

A number of hedgerows are present at the northern and southern ends of the site. Willow (*Salix* sp.) is the dominant species, with those in the southern section being more overgrown; those in the north are more managed and lower-growing. Other species present include Hawthorn (*Crataegus monogyna*), Gorse, Bracken (P*teridium aquilinum*), Honeysuckle (*Lonicera periclymenum*), False Oat-grass, and Creeping Thistle (*Cirsium arvense*).

Plate 12-10: Hedgerows

Mixed broadleaved woodland/ Scrub (WD1/WS1) Mosaic

Woodland/scrub mosaic is present in two areas within the site; one is where dense vegetation fringes the Kilmacleague West (EPA name) watercourse which runs south from within the proposed development site, beginning in an area lying between the southern half of the existing runway and the airport business park. Grey Willow and Ash (*Fraxinus excelsior*) account for the trees and shrubs making up this area of habitat. Ivy (*Hedera helix*), Bramble, and Soft Shield-fern (*Polystichum setiferum*) are present in the densely shaded understory.

The second area representative of this habitat mosaic lies to the east of the existing carpark, within the footprint of the proposed carpark. A linear strip of semi-mature Oak (*Quercus* sp.) (20-30 years old) is present along the western side facing the airport; the interior is dominated by Willow (*Salix* sp.), Gorse, and Bramble, with clearings dominated by Bramble and Great Willowherb; smaller Oak trees which have either regenerated naturally, or had their growth stunted by scrub encroachment are also present on the edges of a number of clearings. Ragged Robin (*Lychnis flos*-cuculi) was recorded under the canopy.

Plate 12-11: Mixed Broadleaved Woodland/Scrub Mosaic

Depositing/lowland rivers FW2

This habitat type is represented by the Kilmacleague West watercourse which runs south from within the proposed development site, beginning in an area lying between the southern half of the existing runway and the airport business park. The channel, which was observed at one point near its headwaters, is densely shaded by woodland/scrub as described above.

There is a minute flow (southwards) within the channel at this point, however this is mainly on the surface, parts of which is carpeted by fallen leaves; the majority appears almost stagnant. Channel wet width is c. 1m, wet depth is 0.3m, banks are vertical and have been modified as in drainage ditches. The substrate is mainly sandy, with occasional pebbles, and accumulations of fallen leaves from the canopy above.

Plate 12-12: Depositing/Lowland River

Buildings and artificial surfaces BL3

This habitat type is represented by the runways, internal road networks, hangars, sheds, carparks, terminal building and other built infrastructure that makes up the airport.

Plate 12-13: Buildings and Artificial Surfaces

Spoil and bare ground ED2

This habitat type is represented by areas of bare soil fringing internal airport roads, areas cleared in preparation for the permitted extension to the southern end of the runway, and areas surfaced with rock chippings.

Vegetation cover is sparse, however ruderal species such as Common Cat's-ear, Hawkbits, Great Willowherb and Ribwort Plantain (*Plantago lanceolata*) are found growing within these areas.

Plate 12-14: Spoil and Bare Ground

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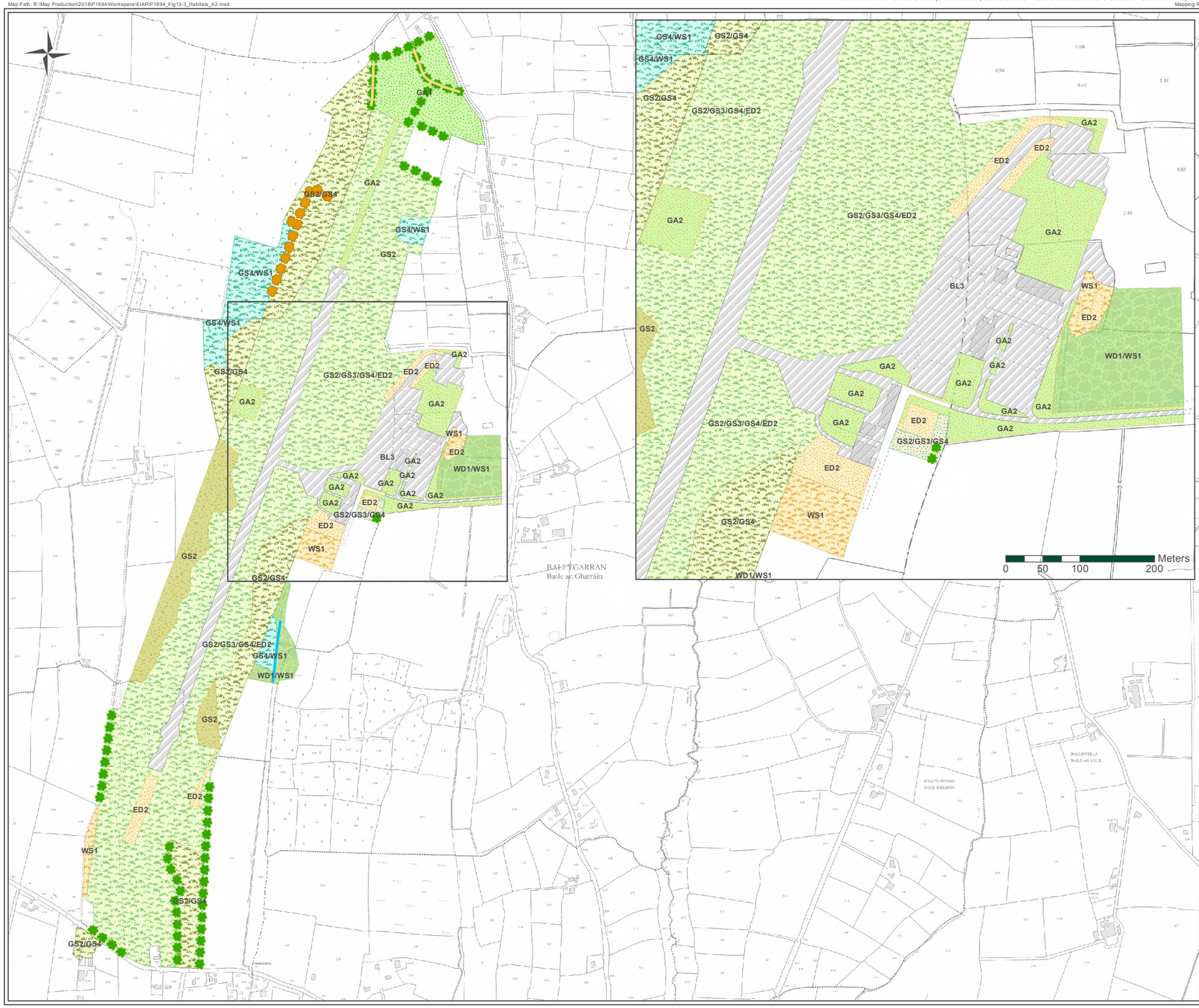

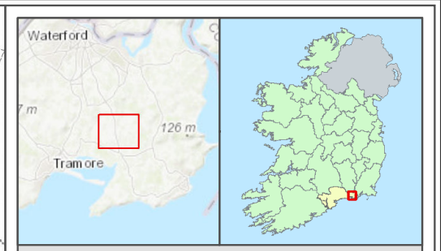

Legend

- FW2: Depositing/Lowland Rivers
- WL1/FW4 (Dry): Hedgerows / Drainage Ditches
- WL1: Hedgerows
- WS1: Scrub
- BL3: Buildings and Artificial
- GS2/GS3/GS4/ED2: Dry Meadows and Grassy Verges / Dry-Humid Acid Grassland / Wet Grassland / Spoil and Bare Ground
- ED2: Spoil and Bare Ground
- GA1: Improved Agricultural
- GA2: Amenity Grassland
- GS2/GS3/GS4: Dry Meadows and Grassy Verges / Dry-Humid Acid Grassland / Wet Grassland
- GS2/GS4: Dry Meadows and Grassy Verges / Wet Grassland
- GS2: Dry Meadows and Grassy Verges
- GS4/WS1: Wet Grassland /
- WD1/WS1: (Mixed) Broadleaved Woodland / Scrub
- WS1: Scrub

Figure Title
Habitats

Figure No. 12.3

Project
Waterford Airport Runway Extension

Client
Waterford Airport

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12.3.3.1 Habitat Survey Limitations

The area to the south and west of the permitted southern runway extension (outside of the development footprint) and the area to the north of the R708 were not traversed due to lack of access.

As such, habitat mapping for these areas is based on observations from a distance using binoculars and aerial imagery.

12.3.4 Aquatic Ecology

Figure 12.4 below shows a screenshot of EPA river network, Water Framework Directive (WFD) and water quality mapping for the site and surrounding area. The proposed site is located within the Colligan-Mahon WFD Catchment. The Kilmacleague West watercourse (IE_SE_17B290990), which is located to the east of the runway (see **Section 12.3.3**) is a 2nd order watercourse, which has not been assigned a status under the WFD. The Ballygunnermore, a 2nd order watercourse located to the east of the Airport Business Park (IE_SE_17B290990), has also not been assigned a status under the WFD. These watercourses join together south of Dunmore Road before discharging to the Tramore Back Strand Coastal Waterbody (IE_SE_120_0000), which is assigned as being of 'High' status under the WFD 2013-2018 round. The Keiloge Stream (IE_SE_17B290990, EPA name Ballygunnermore), is a 1st order stream located c. 450m east of the Airport Business Park which is unassigned under the WFD and also discharges to the Tramore Back Strand Coastal Waterbody.

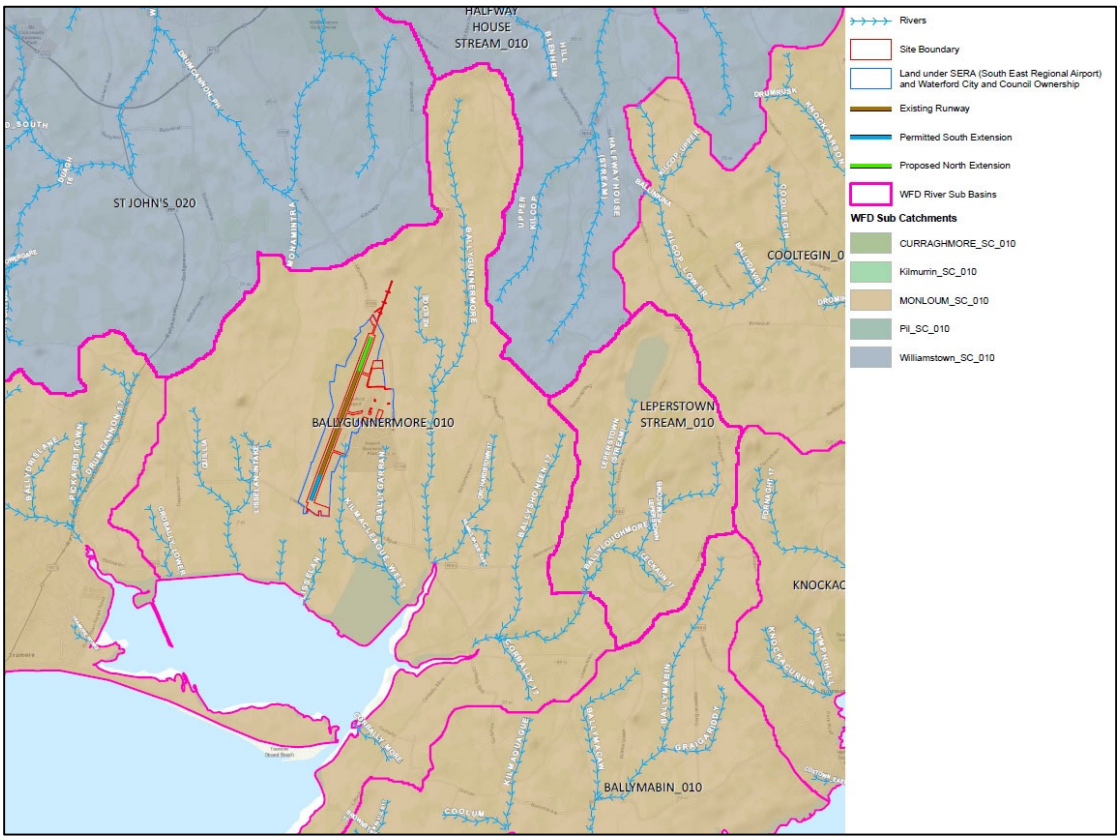

Figure 12-4: EPA Mapping of the Watercourses and Waterbodies at the Proposed Site and its Environs

The watercourses detailed above are not designated in the Salmonid Regulations (S.I. 293 / 1988).[4] There is no data on the IFI National Research Survey Programme database[5], and there are no records of protected aquatic species on the NBDC database from the vicinity of the proposed site.

12.3.5 Species

This section describes species that have been recorded historically within 2km of the proposed site, the potential for the site to support protected species and results of the site surveys. Species records extracted from the NBDC database are included in **Appendix 12.4**.

12.3.5.1 Flora

Four Flora Protection Order (FPO) species (namely Chives, Cottonweed, Lesser Centaury and Wild Asparagus) have been recorded within 2km of the proposed site (**Appendix 12.4**). No FPO species were recorded at the proposed site.

12.3.5.2 Invasive Species

There are records of five High Impact[7] invasive species (Cherry Laurel, Common Cord-grass, Japanese Knotweed, Rhododendron and Three-cornered Garlic) from within 2km of the proposed site (**Appendix 12.4**). However, no invasive species were recorded at the proposed site or its environs during the site walkovers.

12.3.5.3 Avifauna

The proposed site is within 2km of Tramore Back Strand SPA (Site Code: 004027). Therefore, a number of protected species of birds have been recorded within 2km of the proposed site (**Appendix 12.4**). The results of the bird surveys undertaken at the proposed site and its environs in 2018 and 2020 are described in the following sections.

12.3.5.3.1 Vantage Point Surveys

A total of twenty six species were recorded during the summer and early autumn vantage point surveys undertaken in 2018. Two species included in Annex I of the EU Bird's Directive, four BoCCI (Colhoun, K. and Cummins, S. (2013))Red List and nine BoCCI Amber listed species were recorded in 2018. Species recorded during VP surveys undertaken in 2018 are summarised in Table 12-4.

[4] WFD River Network Routes designated as Designated Salmonid Waters under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988, 14th August 1988
[5] https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb2991184842b7ef025
[7] http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Invasives_taggedlist_High Impact_2013RA.pdf

Table 12-4: Bird Species recorded within the Waterford Airport Study Area on Vantage Point Surveys between June and September 2018

Species	EU BD[8]	BoCCI[9]	Total Number of Sightings	Season
Blackbird		Green	3	Summer
Black-headed Gull		Red	4	Summer
Buzzard		Green	3	Summer
Curlew		Red	17	Summer
Feral Pigeon		Green	3	Summer
Goldfinch		Green	2	Summer
Herring Gull		Red	1	Summer
Hooded Crow		Green	3	Summer
House Sparrow		Amber	1	Summer
Jackdaw		Green	3	Summer
Lesser Black-backed Gull		Amber	4	Summer
Linnet		Amber	2	Summer
Little Egret	I	Green	1	Summer
Magpie		Green	1	Summer
Meadow Pipit		Red	5	Summer
Mediterranean Gull	I	Amber	1	Summer
Raven		Green	4	Summer
Redpoll (Lesser)		Green	4	Summer
Robin		Amber	3	Summer
Rook		Green	4	Summer
Skylark		Amber	4	Summer
Sparrowhawk		Amber	3	Summer
Starling		Amber	5	Summer
Swallow		Amber	4	Summer
Willow Warbler		Green	4	Summer
Woodpigeon		Green	5	Summer

A total of twenty six species were recorded during the winter and early summer vantage point surveys undertaken in 2020. No species included in Annex I of the EU Bird's Directive were recorded in 2020. Three BoCCI Red List and fourteen Amber List species were recorded in 2020. Species recorded during VP surveys undertaken in 2020 are summarised in **Table 12-5**.

Sightings of species of conservation concern in 2020 are described in **Section 12.3.5.3.2.**

[8] Annex I of the EU Bird's Directive
[9] Colhoun & Cummins, 2013

Table 12-5: Bird Species recorded within the Waterford Airport Study Area on Vantage Point Surveys between February and May 2020

Species	EU BD	BoCCI	Total Number of Sightings	Season
Blackbird		Green	7	Winter & Summer
Blackcap		Green	1	Summer
Blue Tit		Green	2	Winter & Summer
Buzzard		Green	31	Winter & Summer
Chaffinch		Green	5	Winter & Summer
Chiffchaff		Green	1	Winter
Collared Dove		Green	2	Summer
Cormorant		Amber	2	Summer
Cuckoo		Green	1	Summer
Dunnock		Green	3	Winter & Summer
Goldfinch		Green	7	Winter & Summer
Grasshopper Warbler		Green	1	Summer
Great Black-backed Gull		Amber	2	Winter
Great Tit		Green	3	Winter & Summer
Grey Heron		Green	3	Summer
Herring Gull		Red	3	Winter & Summer
Hooded Crow		Green	7	Winter & Summer
House Sparrow		Amber	2	Winter & Summer
Jackdaw		Green	5	Winter & Summer
Kestrel		Amber	14	Winter & Summer
Lesser Black-backed Gull		Amber	5	Winter & Summer
Linnet		Amber	6	Winter & Summer
Magpie		Green	7	Winter & Summer
Mallard		Green	21	Winter & Summer
Meadow Pipit		Red	5	Winter & Summer
Pheasant		Green	3	Winter & Summer
Pied Wagtail		Green	3	Winter & Summer
Redshank		Red	2	Winter
Reed Bunting		Green	1	Summer
Robin		Amber	3	Winter & Summer
Rook		Green	7	Winter & Summer
Sedge Warbler		Green	1	Summer
Skylark		Amber	7	Winter & Summer
Snipe		Amber	3	Winter & Summer
Sparrowhawk		Amber	3	Winter
Starling		Amber	2	Winter & Summer
Stonechat		Amber	7	Winter & Summer
Swallow		Amber	4	Winter & Summer
Swift		Amber	1	Summer
Willow Warbler		Green	4	Summer
Wood Pigeon		Green	6	Winter & Summer
Wren		Green	5	Winter & Summer

12.3.5.3.2 Sightings of Species of Conservation Concern during VP Surveys

Mediterranean Gull

There was one sighting of a Mediterranean gull recorded flying east across the existing runway during VP survey work undertaken on 29th June 2018, totalling 72 seconds below 20m in height (Table 12-6).

The amount of Mediterranean gull activity recorded within the proposed site was very low compared to the total amount of VP survey time. Between 2018 and 2020, a total of 183,600 seconds (51 hours) of VP surveys were conducted with a view over the proposed site. The duration of Mediterranean gull activity recorded within the proposed site (72 seconds) is 0.04% of the total survey time between 2018 and 2020. Based on these observations, it is concluded that Mediterranean gull usage of the proposed site is minimal.

Table 12-6: Mediterranean Gull Flight Data recorded within the Waterford Airport Study Area during VP Surveys

Date	No./Sex	Inside/outside site	Activity	Height (m)	Time (s)
29/06/2018	1	Inside	Flew east over site	<20m	72

Little Egret

There was one sighting of little egret recorded flying south-east across the existing runway on 19th July 2018, totalling 37 seconds below 20m in height (**Table 12-7**). This species is listed in Annex I of the Birds Directive, however this species is expanding its' distribution over Ireland and is Green listed on the BoCCI.

The duration of little egret activity recorded within the proposed site (37 seconds) is 0.02% of the total survey time between 2018 and 2020. Based on these observations, it is concluded that little egret usage of the proposed site is minimal.

Table 12-7: Little Egret Flight Data recorded within the Waterford Airport Study Area during VP Surveys

Date	No./Sex	Inside/outside site	Activity	Height (m)	Time (s)
19/07/2018	1	Inside	Flew south-east across site	<20m	37

Meadow Pipit

Meadow pipit was recorded on five occasions during the VP surveys undertaken between June and September 2018 and on five occasions during the VP surveys undertaken between February and May 2020. This species is likely to be nesting in the grassland around the existing runway and within the footprint of the proposed runway extension. Meadow pipit is Red listed on the BoCCI.

Herring Gull

Herring gull was recorded during the VP surveys undertaken in summer 2018, winter 2020 and early summer 2020. A total of ten individuals of this species were recorded within the site, flying across the runway at both below and above a height of 20m, with a total time of 345 seconds flying within the site (**Table 12-8**). The duration of herring gull activity recorded within the proposed site (345 seconds) is 0.19% of the total survey time between 2018 and 2020. Based on these observations, it is concluded that herring gull usage of the proposed site is minimal.

Table 12-8: Herring Gull Flight Data recorded within the Waterford Airport Study Area during VP Surveys

Date	No./Sex	Inside/outside site	Activity	Height (m)	Time (s)
29/06/2018	1	Outside	Flew east outside site	<20m	15
28/02/2020	1	Inside	Flew south from the south of the runway	<20m >20m	10 30
15/04/2020	1	Inside	Flew west across the south of the runway	>20m	25
21/04/2020	5	Inside	-	>20m	30
13/05/2020	1	Inside	Flew east across runway	>20m	50
15/05/2020	2	Inside	Flew west from the south of the runway	<20m >20m	60 140

Black-headed Gull

Black-headed gull was recorded on two occasions on 1st September 2018 flying south outside the site (**Table 12-9**). Based on these observations, it is concluded that black-headed gull usage of the proposed site is negligible.

Table 12-9: Black-headed Gull Flight Data recorded within the Waterford Airport Study Area during VP Surveys

Date	No./Sex	Inside/outside site	Activity	Height (m)	Time (s)
01/09/2018	3	Outside	Flew south outside site	<20m	22
01/09/2018	1	Outside	Flew south outside site	<20m	28

Curlew

A flock of curlew was recorded on 1st September 2018 circling north in a field outside the site boundary. Two curlew were also recorded on 1st September 2018 within the site gliding across the runway at less than 20m height, for a total of 23 seconds (**Table 12-10**). The duration of curlew activity recorded within the proposed site (23 seconds) is 0.01% of the total survey time between 2018 and 2020. Based on these observations, it is concluded that curlew usage of the proposed site is minimal. No evidence of breeding behaviour was observed and it is likely that the observation of curlew on 1st September 2018 was made as this species passed through the area.

Table 12-10: Curlew Flight Data recorded within the Waterford Airport Study Area during VP Surveys

Date	No./Sex	Inside/outside site	Activity	Height (m)	Time (s)
01/09/2018	2	Outside	Flew into adjacent field to forage	<20m	17
01/09/2018	12	Outside	Circled north in adjacent field	<20m	13
01/09/2018	2	Inside	Long glide across runway	<20m	23

Redshank

Two Redshank were recorded flying in a southerly direction at the south of the site at a height greater than 20m, for a total of 40 seconds, during the VP surveys undertaken on 28th February 2020 (**Table 12-11**). The duration of redshank activity recorded within the proposed site (40 seconds) is 0.02% of the total survey time between 2018 and 2020. Based on these observations, it is concluded that redshank usage of the proposed site is minimal.

Table 12-11: Redshank Flight Data recorded within the Waterford Airport Study Area during VP Surveys

Date	No./Sex	Inside/outside site	Activity	Height (m)	Time (s)
28/02/2020	2	Inside	Flew south from the south of runway	>20m	40

12.3.5.3.3 Transects

A total of thirty three species of bird were recorded during four transect surveys undertaken between March 2020 and May 2020. The species recorded were typical of the habitat types present (i.e. agriculturally improved and wet grassland). One species of High Conservation Concern (Red listed) was identified, namely meadow pipit. Meadow Pipit is currently on the BOCCI red list due to a short-term population decline of at least 50% between 1998 and 2011 (Colhoun & Cummins 2013). It is considered that the population in Ireland declined suddenly because of severe winters between 2009/10 and 2011/12. However, recent data from the Countryside Bird Survey (CBS) indicate that the population is showing recovery since 2011 (Crowe *et al*., 2017). Bird species recorded during the course of transect surveys undertaken at the site and their estimated distance from the transect is presented in **Table 12-12**. There is potential for ground nesting species to breed within the grassland present adjacent to the runway, there is also potential for species to nest in areas of scrub at the site boundary.

Table 12-12: Bird Species recorded during Transects undertaken between March and May 2020

Species	29/03/2020			15/04/2020			13/05/2020			15/05/2020		
	0-25m	25-100m	100m +	0-25m	25-100m	100m +	0-25m	25-100m	100m +	0-25m	25-100m	100m +
Blackbird	4			3	1	2	1	4		4		
Blackcap											1	
Blue Tit							1					
Buzzard		1				4			1			
Chaffinch	2	1		1	1		1	1			1	
Chiffchaff		3	1	1	1		2					
Cuckoo												1
Dunnock	1	1										
Goldfinch	1			6			2	8		4		
Great Tit							2					
Hooded Crow					2	2				1	1	4
Jackdaw								2	2		3	7
Lesser Black-backed Gull			1						2			
Lesser Redpoll								2				
Linnet	1	1		7	1			8		3	6	
Magpie			1	2		1					1	1
Meadow Pipit	4	4		6	4	2	9	9		18	9	
Pheasant			1									
Pied Wagtail				1								
Reed Bunting				2			1			2		
Robin	4											
Rook		11	1	1	1							1
Sedge Warbler							1					
Skylark	6	5		6	5	2	1	5	1	13	8	
Snipe										1		
Starling												3
Stonechat				2		2	1				2	
Swallow				5	2		2			1	2	
Swift								2				2
Whitethroat							1					

Species	29/03/2020			15/04/2020			13/05/2020			15/05/2020		
	0-25m	25-100m	100m +	0-25m	25-100m	100m +	0-25m	25-100m	100m +	0-25m	25-100m	100m +
Willow Warbler				1	3		1		1			
Wood Pigeon	2	5	8	2	2	4			5	1		2
Wren	3	3		3	1		2	1		1		

12.3.5.3.4 Tramore Back Strand

Tramore Back Strand is designated as Tramore Back Strand SPA. A total of thirty one species of bird were recorded at Back Strand during the course of three surveys undertaken in April 2020 and May 2020. Three Annex I species were recorded: sandwich tern, whooper swan and little egret; and five species red listed on the BoCCI were recorded: dunlin, curlew, redshank, black-headed gull and long-tailed duck. Five SCI species for Tramore Back Strand SPA were recorded, namely brent goose, dunlin, curlew, grey plover and black-tailed godwit. Of the SCI species for Tramore Back Strand SPA, only curlew was recorded within the proposed site during the course of the site surveys, as detailed above and summarised in **Table 12-13**. An Appropriate Assessment of the proposals has been prepared under separate cover and will be included with the planning application.

The number of bird species recorded at Tramore Back Strand and their conservation status are detailed in **Table 12-13**.

Table 12-13: Bird Species recorded at Tramore Back Strand in April 2020 and their conservation Status

Species	EU BD	BoCCI	QI Tramore Back Strand SPA	15/04/2020	23/04/2020	18/05/20
Black-headed Gull		Red			147	
Black-tailed Godwit		Amber	Yes		12	12
Brent Goose		Amber	Yes	257	299	
Common Gull		Amber			25	2
Coot		Amber				1
Cormorant		Amber			2	
Curlew		Red	Yes	4	1	8
Dunlin		Red	Yes	138	28	
Gadwall		Amber		5	5	
Gannet		Amber				1 (offshore)
Great Black-backed Gull		Amber			2	
Greenshank		Green		1	4	2
Grey Plover		Amber	Yes		1	
Little Egret	I	Green		2	2	11
Little Grebe		Amber			2	4
Long-tailed Duck		Red			2	
Mallard		Green		24	17	32
Moorhen		Green		1	4	2

Species	EU BD	BoCCI	QI Tramore Back Strand SPA	15/04/2020	23/04/2020	18/05/20
Mute Swan		Amber		4	6	13
Oystercatcher		Amber		162	99	79
Redshank		Red		34	14	2
Ringed Plover		Amber		4	18	1
Sand Martin		Amber			40	
Sanderling		Green		2		
Sandwich Tern	I	Amber		51	6	
Shelduck		Amber		35	19	10
Stock Dove		Amber			1	
Stonechat		Amber				2
Turnstone		Green			3	
Wheatear		Amber		3		2
Whimbrel		Green		73	475	19
Whooper Swan	I	Amber		2		

12.3.5.4 Bats

The NBDC database holds records of three species of bat within 2km of the site: Leisler's bat, common pipistrelle and soprano pipistrelle. The bat landscape association model (Lundy, M. et al (2011) examines the relative importance of landscape and habitat associations for bats across Ireland. The model uses a combination of analyses to provide a picture of broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. GIS layers illustrating the results of this study are provided on the NBDC website (https://maps.biodiversityireland.ie/Map).The bat landscape association model suggests that the proposed site is part of a landscape that is moderately favourable for bats in general (**Table 12-14**). However, the landscape model shows a high suitability for soprano pipistrelle, common pipistrelle and brown long-eared bat. Overall, the habitats present on site are of moderate suitability for foraging and commuting bats, and there is potential for pipistrelle species in particular to forage and commute along the hedgerows, treelines, scrub and watercourse present on site.

Table 12-14: Bat Suitability Index

Bat Species	Suitability Index
All Bats	33.89
Soprano pipistrelle (*Pipistrellus pygmaeus*)	50
Brown long-eared bat (*Plecotus auritus*)	49
Common pipistrelle (*Pipistrellus pipistrellus*)	48
Lesser horseshoe bat (*Rhinolophus hipposideros*)	1
Leisler's bat (*Nyctalus leisleri*)	44

Bat Species	Suitability Index
Whiskered bat (*Myotis mystacinus*)	28
Daubenton's bat (*Myotis daubentonii*)	38
Nathusius' pipistrelle (*Pipistrellus nathusii*)	11
Natterer's bat (*Myotis nattereri*)	36

There are no trees with features that may be of use as roosting or resting places for bats at the proposed site and the structures present within the airport comprise terminal buildings, hangars and sheds which are of low suitability for bats. Overall, the site is considered to be of low suitability for roosting bats.

12.3.5.5 Terrestrial Mammals

Badger (*Meles meles*), hedgehog (*Erinaceus europaeus*) pygmy shrew (*Sorex minutus*), otter (*Lutra lutra*) and fallow deer (*Dama dama*) have been recorded within 2km of the proposed site, but there are no records of these species from within the footprint of the site.

No evidence of deer was observed on site and while there is potential habitat for this species in forestry to the west of the site, it is unlikely that a fallow deer population would be supported by the habitats present within the proposed site. Further, the airport lands are bound by security fencing, restricting access to the lands by large mammals. The Kilmacleague West watercourse is densely shaded with a low flow, as such this watercourse is not suitable to sustain an otter population.

No badger sett was recorded during the site walkover, however a potential dropping was recorded and there is potential habitat present on site within the hedgerows and mixed broadleaved woodland and scrub. There is potential for hedgehog and pygmy shrew to be present in woodland, grassland and hedgerow habitats.

Unidentified droppings, potentially from pine marten were observed on site and there is potential for this species to forage and shelter within woodland and scrub on site and in forestry present adjacent to the north-west of the site.

12.3.5.6 Reptiles and Amphibians

There are historical records of smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*) within the 2km of the proposed site. However, there is no suitable breeding habitat for amphibians present within the proposed development site. No amphibians or common lizards (*Lacerta vivipara*) were observed during the survey.

12.3.5.7 Invertebrates

Marsh Fritillary (*Euphydryas aurinia*) has been recorded within 2km of the proposed site. Marsh Fritillary inhabits a range of different habitat types, but is mainly a species associated with wet grassland and heath habitat in Ireland. The habitats present on site are not suitable to support this species and no Devil's-bit Scabious (*Succisa pratensis*), which is the food plant of the caterpillar larvae, is present on site. The widespread butterfly species ringlet (*Vanessa atalanta*), speckled wood (*Pararge aegeria*) and meadow brown (*Maniola jurtina*) were observed on site. Small blue (*Cupido minimus*) and small heath (*Coenonympha pamphilus*) butterfly, classified as endangered and near threatened respectively on the Red List (Regan *et al*., 2010) were recorded on site. However, as the sole food plant of the small blue butterfly is Kidney Vetch, which was not recorded during the site walkover, the proposed site is not likely to sustain a population of this species.

12.3.6 Summary of Ecological Evaluation

The improved grassland and relatively species poor dry and wet grassland habitats at the proposed site are considered to be of relatively low ecological value in terms of botanical diversity and value. These habitats are considered to be of Local Importance (higher value) as they provide suitable habitat for mammals, invertebrates and avifauna.

Habitats such as streams, hedgerows, treelines, broadleaved woodland and scrub are considered to be of Local Importance (higher value) given their local importance to wildlife and biodiversity and their function as ecological corridors.

The built land within the development footprint is of negligible ecological value, however a structure outside of the development footprint, to the south-west of the site is noted as being of Local Importance (lower value) due to the presence of a swallows nest.

The faunal (mammals, avifauna, foraging bats, invertebrate) composition of the proposed site is considered to be of Local Importance (higher value), due to the presence of suitable badger habitat and the potential foraging and / or nesting or dwelling habitats for other species, such as meadow pipit.

12.4 Characteristics of the Proposed Development

The proposed development will comprise of an additional 491m of new runway to the north of the existing including a new hammerhead at its northern termination. A 363m extension to the southern end of the runway is also proposed[10]. The full length of the runway including proposed and existing sections will be 2,287m. The extension of the runway will also require the upgrading of ancillary development including car parking, terminal building, drainage, wastewater treatment unit and navigation lighting.

The proposed project for EIA purposes will consist of the following infrastructure:

- 491m of new runway extending north from the existing.
- 363m of new runway extending south from the existing.
- Widening of the entire length of the runway by 15m to extend the runway width to 45m.
- Widening of taxiway by 8m to provide a width of 23m.

[10] A 350m extension to the southern end of the runway was the subject of a previous planning application which was granted a 10-year permission in 2014 (Planning Ref. 14/89).

- Extension to car parking area to provide up to 205 no. additional spaces.
- Set down area for public transport within the demarcated area within the existing road layout at the airport terminal.
- Re-alignment of airport security fencing.
- New navigation lighting, aligned to runway, to be provided within airport lands and on adjoining lands, including associated ducting.
- Underground Holding Tank (cold weather storage).
- Alterations to drainage system.
- Extension of the existing terminal building of ca. 1,170sqm.
- Demolition of 2 no. houses adjacent to the north runway.
- Upgrade of existing wastewater treatment plant.

The proposed development will consist of the following operational changes:

- Alteration of take-off and landing position to extend into the proposed expansion.
- Take-off and landing of jets such as the Boeing 737/800 and Airbus 320.
- Capacity for up to 345,000 passengers per annum by year five of the operational phase.

12.5 Potential Effects of the Proposed Development

This section provides an assessment of likely significant effects on ecological features, as described in **Section 12.3**. An impact is considered to be significant when it supports or undermines biodiversity conservation objectives for important ecological features (see **Section 12.2.3**). In this section, all effects are described in the absence of mitigation.

12.5.1 Construction Phase

12.5.1.1 Designated Sites

Potential impacts on European Sites are considered in the Natura Impact Statement accompanying the Planning Application.

As detailed in **Section 12.3.2** and **Appendix 12.3**, there are nineteen sites designated nationally for nature conservation within 15km of the proposed site. An assessment of potential source-pathway-receptor links between the subject site and nationally designated conservation sites did not reveal links to fifteen of these designated sites (see **Appendix 12.3**). The proposed site is situated in the same Groundwater Body as Waterford Harbour pNHA (000787), Belle Lake pNHA (000659), Dunmore East Cliffs pNHA (000664). However, review of local topography indicates that the proposed site does not drain towards these pNHAs and there is no hydrological or habitat connectivity, therefore no significant effects on these sites are anticipated to arise from the proposed works.

There is no robust surface water or habitat connectivity between the proposed development footprint and Back Strand. However, the Kilmacleague West watercourse and Ballygarran watercourse, which drain the southern part of the site and the Ballygunnermore watercourse, which drains the northern part of the site all drain into Back Strand. There is therefore a remote and tenuous connectivity between the proposed site and Ballyvoyle Head To Tramore pNHA (001693), which is located c. 8.3km along the coast. However, in view of the significant distance between the proposed site and this pNHA and the dilution capacity of Tramore Bay, no significant effects on Ballyvoyle Head To Tramore pNHA are anticipated to arise from the proposals.

12.5.1.2 Habitats

The construction of the runway extensions and the runway widening will result in the loss of grassland that is considered to be Locally Important (Higher Value) as it provides habitat for birds, including the BoCCI Red List species meadow pipit. Given the retention of the rest of the grassland on the periphery of the runway, the loss of this area of grassland will not result in a significant adverse impact.

The construction of the proposed car park will result in the loss of the south-western corner of an area of broadleaved woodland and scrub to the east of the terminal building. This habitat is considered to be Locally Important (Higher Value) as it provides habitat for birds and mammals. However, the loss of this portion of the woodland/ scrub habitat will not result in the fragmentation of woodland habitats. Given the proposed retention of the rest of this woodland/ scrub parcel and the abundance of forestry habitats in the wider landscape, the loss of this area of woodland/ scrub will not result in a significant adverse impact.

The construction of the runway and navigation lights corridor may result on the loss of approximately 258m of hedgerows, considered to be Locally Important (Higher Value).

Surface water emissions from the proposed development area are generally limited to that of surface water run-off from hardstanding areas and overland flow during periods of heavy rainfall. Indirect effects may arise from the excavation and stockpiling of earth and construction material (sand, gravel, etc.) during the construction phase of the proposed development. Excavation and ground disturbance during the construction phase could potentially lead to suspended solids runoff to the Kilmacleague West, Ballygarran and Ballygunnermore watercourses. There is also potential for a range of pollutants to enter the Kilmacleague West, Ballygarran and Ballygunnermore watercourses during construction work and the transportation of materials to and from the construction site. This would be a significant adverse impact at the local geographic level.

12.5.1.3 Flora

No FPO or Red List species of flora were recorded within the footprint of the proposed development, therefore no significant adverse effects on flora are anticipated to arise during the construction phase.

No invasive species were recorded at the proposed site. Therefore, the proposed works are not expected to result in the spread of invasive species.

12.5.1.4 Avifauna

The removal of grassland for the construction of the proposed runway would result in the reduction of potential nesting habitat for meadow pipit and the removal of broadleaved woodland/ scrub for the construction of the proposed car park would result in a reduction of potential nesting habitat for species such as blackbird, dunnock and robin. If the runway construction and woodland/ scrub removal is not timed appropriately, nests containing eggs or young chicks could be destroyed. There is also potential for temporary disturbance of bird species across the site during the construction phase. This would be a temporary significant adverse impact at the local geographic level.

12.5.1.5 Bats

There is potential for pipistrelle species in particular to forage and commute along the hedgerows to the north of the proposed site and the broadleaved woodland and scrub present on site. The removal of these habitats has the potential to reduce foraging and commuting habitat for bats. This would be a significant adverse impact on a local geographic level.

While the buildings associated with the airport are considered to be of low suitability for roosting bats, the potential for disturbance to bats roosting in the terminal building cannot be discounted. This would be a significant adverse impact on a local geographic level. There is also potential for effects on roosting bats as a result of demolition works to the two dwellings located to the north of the runway. This would be a significant adverse impact on a local geographic level.

12.5.1.6 Terrestrial Mammals

No evidence of badger setts within the site was recorded during the course of the site surveys undertaken in 2018, therefore there will be no direct effects to badgers. However, badgers create new setts regularly, and the site provides suitable habitat for sett excavation in woodland/ scrub and earth banks associated with hedgerows at the site. Direct effects on badgers are therefore possible should badgers establish setts in hedge banks, woodland and scrub adjacent to or within areas of construction. This would be a temporary significant adverse impact at the local geographic scale.

The presence of hedgehog, pygmy shrew and pine marten was not confirmed at the proposed site, but there is suitable habitat for these species within or adjacent to the proposed site. However, in view of the mobility of hedgehog, pygmy shrew and pine marten, the presence of suitable habitats for these species in the wider landscape and the relatively small scale, temporary nature of the construction works for the proposals, effects on these species are likely to be negligible and not significant.

12.5.1.7 Invertebrates

Small heath butterfly, listed as 'Near Threatened' on the Red List, was recorded during the site survey, however, the extension of the runway to the north would be on regularly mown grassland and, as such, this area would be unlikely to sustain a population of small heath butterfly. There is potential that the removal of grassland habitat while widening the existing runway may reduce habitat available for this species. However, in view of the abundance of unmown grassland habitat over the airport lands it is considered unlikely that the widening if the runway would result in a significant adverse impact on small heath.

12.5.2 Operational Phase

12.5.2.1 Designated Sites

Potential impacts on European Sites are considered in the Appropriate Assessment accompanying the Planning Application.

No significant adverse impacts on nationally designated sites are anticipated to arise during the operational phase.

12.5.2.2 Habitats

No significant adverse effects on terrestrial habitats are anticipated to arise during the operational phase.

There is potential for the water quality of the Kilmacleague West, Ballygarran and Ballygunnermore watercourses to be reduced by contaminated discharge from the runway. Potential contaminants include hydrocarbons and agents from occasional de-icing of aircraft.

A drainage collector system is installed around the Apron and main airport buildings. The southern part of the site drains to the Kilmacleague West watercourse and the Ballygarran to the east. A drainage channel takes the surface water drainage from the northern part of the site to the Ballygunnermore watercourse. There is potential for contaminated run-off from the car parks to reduce the water quality of the Kilmacleague West, Ballygarran and Ballygunnermore watercourses. However, as outlined in section 7.5.5 of this EIAR, the run-off will drain to a new surface water sewer before travelling to an attenuation tank. The attenuation tank will control the outflow of 6.0l/s to the Ballygunnermore stream.

For foul, the capacity of the WWTP has to be determined and if enough capacity for future numbers of passengers, ultimately the treated discharge is to the Keiloge Stream. There is potential for contamination of the Keiloge waterbody should there be insufficient treatment of foul water during the operational phase of the proposed development.

12.5.2.3 Species

12.5.2.3.1 Flora

No significant adverse effects on flora are anticipated to arise during the operational phase.

12.5.2.3.2 Avifauna

The risk of adverse impacts on the Species of Conservation Interest for Tramore Back Strand SPA is considered separately in the NIS that has been prepared for the proposed development.

Aircraft can pose a risk of adverse effects on avifauna as a result of bird strike. Data collected by the Civil Aviation Authority (UK) between 2012 and 2016 showed that gulls were most at risk from bird strike, followed by swallows and martins. As reported by Goodwillie (2014), bird strike data from Waterford Airport between 2010 and 2014 correspond with these data, with gulls, swallows and swifts the predominant species recorded as being struck within the Waterford Airport boundary.

During the course of VP surveys undertaken for a total of 51 hours between 2018 and 2020, the Annex I species Mediterranean gull was recorded on one occasion, flying for a total of 72 seconds (0.04% of total VP survey time) within the site. Ten herring gulls were recorded flying within the site for a total of 345 seconds (0.19% of total VP survey time) and two black-headed gulls were recorded flying outside the site (both of these species of gull are red listed on the BoCCI). There is potential for the mortality rate of gulls to rise with an increase in air traffic. However, as detailed above, the results of the bird surveys undertaken at the proposed site indicate that there is a minimal level of gull flight activity within the site and its environs. Furthermore, the recorded rate of bird strike between 2010 and 2014 included 2 gulls over the four year period. Even with an increase in air traffic, this rate of bird strike is not expected to result in a significant adverse impact to Annex I or red listed gull populations. Other species of conservation concern recorded within the proposed site during the VP surveys include curlew (recorded within the site for 0.01% of total VP survey time), little egret (0.02% of total VP survey time) and redshank (0.02% of total VP survey time). The low percentage of overall observation times for curlew, little egret and redshank indicates minimal use of the proposed site by these species.

Meadow pipit (red listed on the BoCCI) was recorded within the proposed site during the course of the VP and transect surveys. While this species is not included in the list of species most at risk from bird strike, there is potential for the mortality levels of this species to rise with an increase in air traffic.

There is potential for ongoing mortality to birds of Moderate Conservation Concern (e.g. swallows and swifts) during the operational phase of the airport. As noted, the rate of recorded bird strikes (2010- 2014) was not significant, however there is potential for mortality levels to increase with an increase in air traffic.

12.5.2.3.3 Bats

The houses to the north of the runway provide potentially suitable habitat for roosting bats and there is potential for bats to commute and forage along the hedgerows to the north of the airport and woodland habitats present on site. The navigation light corridor proposed for the development will increase light levels within the proposed development area. When bats emerge from roosts, they tend not to echolocate but rely on eyesight to fly from the roost to adjoining treelines or hedgerows. Various studies have shown that bats' eyesight works best in dim light conditions; where there is too much luminance bats' vision can be reduced resulting in disorientation. Too much luminance at bat roosts may cause bats to desert a roost. Light falling on a roost exit point can delay bats from emerging and miss peak levels of insect activity at dusk: any delays of emergence can reduce feeding periods. Studies have also found that lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for *Myotis* species and brown-long-eared bats (Stone, 2013).

There is potential that light pollution would result in a significant negative impact to bats. In the absence of mitigation this would be significant at a local level.

12.5.2.3.4 Terrestrial Mammals

No significant adverse effects on terrestrial mammals are anticipated to arise during the operational phase.

12.5.2.3.5 Invertebrates

No significant adverse effects on invertebrates are anticipated to arise during the operational phase.

12.6 Mitigation

As part of the Construction Methodology and Environmental Management Plan, the appointed contractor will draw up a Method Statement (MS) to be informed by those guidance documents and best practice measures provided below. This method statement will be strictly adhered to by the contractors involved in the works and will be overseen by the project representative/foreman.

The following documents have formed the backbone of the specific additional measures proposed below:

- E. Murnane, A. Heap and A. Swain. (2006) *Control of Water Pollution from Linear Construction Projects. Technical Guidance* (C648). CIRIA;
- E. Murnane et al., (2006) *Control of Water Pollution from Linear Construction Projects. Site Guide* (C649). CIRIA; and
- H. Masters-Williams et al (2001) *Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors* (C532).

The proposed works will be carried out in accordance with best practice construction measures and the specific mitigation measures detailed below.

12.6.1 Construction Phase

12.6.1.1 Habitats and Flora

The removal of hedgerows, considered to be Locally Important (Higher Value)shall be kept to a minimum and a hedgerow planting scheme shall be undertaken in the fields to the north of Airport Road. The hedgerow planting shall link to other linear habitats (hedgerows, treelines) to provide connectivity to the wider landscape.

In order to avoid or minimise adverse effects on watercourses during construction, the control of surface water emissions and sedimentation shall be controlled by adherence to the guidance documents listed in **Section 12.6**. During construction, site run off will be prevented from entering the drainage network and nearby watercourses by employment of suitable sediment control measures, e.g. silt apron, settlement ponds, etc. Silt aprons and settlement ponds act as barriers to silts and suspended solids, preventing site run off from entering the drainage network and local watercourses. The necessary sediment control measures will be required for the duration of construction. Provision will be made for a sufficient land area to accommodate the necessary sediment control measures.

The risks of spillage of hydrocarbons will be mitigated by strict site management whereby the contractor will not refuel vehicles on site.

12.6.1.2 Invasive Species

No invasive species were identified on site during the site walkovers. However, in line with best practice, the following measures shall be undertaken:

- Undertake further invasive species survey prior to the commencement of construction;
- In the event that any such species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified; and
- Biosecurity measures shall be undertaken to prevent the importation of invasive species from contaminated areas into the study area.
- For any material entering the site, the supplier shall provide an assurance that it is free of invasive species.
- Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary.
- Ensure all site users are aware of invasive species management plan and treatment methodologies. This can be achieved through "toolbox talks" before works begin on the site.
- Adequate site hygiene signage shall be erected in relation to the management of non-native invasive species material.

12.6.1.3 Avifauna

No scrub clearance, tree felling or other removal of vegetation, including grassland, will occur during the bird breeding season from 1st March to 31st August.

12.6.1.4 Bats

The removal of trees, scrub and hedgerow habitats shall be kept to a minimum. Areas of scrub at the periphery of the site, away from the runway, shall be left to develop to provide darker areas that have potential for bats to forage. A hedgerow planting scheme shall be undertaken in the fields to the north of Airport Road, which are away from the runway. The hedgerow planting shall link to other linear habitats (hedgerows, treelines) to provide connectivity to the wider landscape.

The terminal building and dwellings to the north of the runway shall be surveyed prior to commencement of development to determine the presence or absence of bats. In the event that no evidence of bat usage is found during the inspection, development can commence. Should bats be found, development will be delayed and a derogation license will be required from NPWS wildlife licencing section.

12.6.1.5 Terrestrial Mammals

No evidence of badger setts within the site was recorded during the course of the site surveys undertaken in 2018 and 2020, therefore there will be no direct effects on badgers. However, badgers create new setts regularly, therefore a pre-construction survey shall be undertaken prior to the commencement of construction to identify active badger setts occurring within the site.

In the event of badger setts being identified within proximity to the proposed works area, the following mitigation measures are proposed to ensure no disturbance of the local badger population during the construction phase of the proposed works (NRA 2009):-

- A buffer distance of 10m from sett entrances should be employed in instances where light works such as digging by hand or in the event of scrub clearance.
- A buffer distance of 20m from Badger sett entrances should be incorporated where light machinery (generally wheeled vehicles) are in operation within the site.

- A buffer distance of 30m from Badger setts should be employed where heavy machinery is in operation within the site.
- None of the above activities should be undertaken within 50m of active setts during the breeding season (1st December to 31st June inclusive).

In the unforeseen event that the project requires works to be undertaken within the recommended buffer distances outlined above, further measures as outlined in NRA (2009) will be adopted in liaison with local NPWS staff.

12.6.2 Operational Phase

12.6.2.1 Habitats

Suitable drainage systems will be installed to ensure that contaminants do not enter watercourses. Suitable systems may include closed drains and the use of petrol/ oil interceptors.

Sufficient capacity of the WWTP shall be ensured prior to commencement of the operational phase.

12.6.2.2 Avifauna

It is recommended that bird strike statistics are monitored on an ongoing monthly basis and mitigation measures such as bird scaring devices are utilised as necessary based on the results of the bird strike statistics.

12.6.2.3 Bats

As per Section 12.6.1.4., areas of scrub at the periphery of the site, away from the runway, shall be left to develop to provide darker areas that have potential for bats to forage and a hedgerow planting scheme shall be undertaken in the fields to the north of Airport Road linking to other linear habitats (hedgerows and treelines) to provide connectivity to the wider landscape and foraging and commuting habitat for bats during the operational phase.

12.7 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location[11]. A search of Myplan (Myplan.ie) and Waterford County Council planning enquiry system (http://www.eplanning.ie/WaterfordCCC) was conducted for developments that may have in-combination effects on ecological features with the proposed works at Waterford Airport. Plans relevant to the area were searched in order to identify any elements of the plans that may act cumulatively or in-combination with the proposed development.

Based on this search a list of those projects and Plans which may potentially contribute to Cumulative or In-Combination Effects with the proposed works at Waterford Airport was generated, as listed in **Table 12-15** below.

[11] CIEEM (2018). Guidelines For Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine

Table 12-15: Cumulative and In-Combination Effects of Other Plans and Projects

Plan / Programme / Project	Key Objectives / Policies / Proposals	Potential Impact
Waterford County Development Plan 2011-2017	Objective INF4 relates specifically to Waterford Airport and states that the Council will support the lengthening and widening of the runway, subject to compliance with proper planning and sustainable development and in compliance with Article 6 of the Habitats Directive. Policies and objectives NH1, NH6, NH7 and NH8 provide specific protection for European Sites. Policies NH1, NH2, NH3, NH4, NH9, NH10, NH11, NH13, NH15, NH16, NH17, NH25 and NH26 all provide support and protection for the ecology of the wider landscape within the Waterford County development plan area. Refer to Appendix 12.1 for details of the above policies and objectives.	Policies and objectives of the Waterford CDP 2011 - 2017 ensure that local planning applications will comply with proper planning and sustainability of the area and with the requirements of relevant EU Directives and environmental considerations. There is no potential for adverse in combination effects on biodiversity.
River Basin District Management Plan 2018- 2021	The plan establishes the following priorities: ▪ Ensure full compliance with relevant EU legislation; ▪ Prevent deterioration; ▪ Meet the objectives for designated protected areas; ▪ Protect high-status waters; and Implement targeted actions and pilot schemes in focused sub-catchments aimed at (1) targeting water bodies close to meeting their objective and (2) addressing more complex issues that will build knowledge for the third cycle.	Implementation of the environmental objectives of the RBDMP and compliance with the EU Water Framework Directive 2000 (2000/60/EC) and any associated Programmes of Measures, ensure that projects shall only be permitted where it can be clearly demonstrated that the proposal would not have an unacceptable impact on the water environment, including surface waters, groundwater quality and quantity, river corridors and associated wetlands, estuarine waters and coastal waters. Compliance with this Plan will result in net positive in-combination effects on biodiversity.

Plan / Programme / Project	Key Objectives / Policies / Proposals	Potential Impact
Inland Fisheries Ireland Corporate Plan 2016 - 2020 The Inland Fisheries Act 2010	▪ Vision: To provide an accessible and sustainable, world class, inland fisheries resource for all. ▪ Mission: To ensure the valuable natural resources of Inland Fisheries and Sea Angling are protected, conserved, managed, developed and promoted to enable them to achieve their full potential. High Level Objective 1 – Fish: To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product, and that pristine aquatic habitats are also enjoyed for other recreational uses. High Level Objective 2 – Habitats: To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected. EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning salmon and trout.	Implementation and compliance with the goals of the IFI corporate plan and legislation will result in net positive in-combination effects on biodiversity.
Extension of runway at Waterford Airport to the south	Phased extensions to the existing airport runway and turning circle within the airport (150m and 200m runway extensions; 350m total runway extension and 375m including turning circle) and all associated works	The AA Screening undertaken for the proposals concluded that there is no likelihood of significant effects on European Sites, either alone or in combination with other Plans and projects. Adherence to the overarching policies and objectives of the Waterford County Development Plan 2011 -

Plan / Programme / Project	Key Objectives / Policies / Proposals	Potential Impact
		2017 ensure that the planning permission for extension of runway to the south will comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations; there is no potential for adverse in combination effects on biodiversity.
Kilbarry Residential & Solar Energy Park	Residential and solar energy park consisting of 855 residential dwellings and a solar energy park of c.3.6ha.	The Biodiversity Chapter of the EIAR undertaken for the proposals concluded that, with the implementation of mitigation measures, the development would have a moderate residual impact on habitats, flora and fauna. The permitted development is located c.4.7km north-west of the proposed development at Waterford Airport and is separated from the airport by a network of local and regional roads. There is no connectivity between the permitted development at Kilbarry and Waterford Airport. No cumulative or in-combination effects are expected on biodiversity.
SHD, Knockboy, Waterford	Residential development of 361 units with creche, car and cycle parking, all ancillary works.	The Biodiversity Chapter of the EIAR undertaken for the proposals concluded that, with the implementation of mitigation measures, the development would have a residual impact on hedgerows and treelines, bats and birds, which would be significant at a local level. The permitted development is located c.3.9km north-east of the proposed development at Waterford Airport and is separated from the airport by a network of local roads. There is no connectivity between the permitted development at Knockboy and Waterford Airport. No

Plan / Programme / Project	Key Objectives / Policies / Proposals	Potential Impact
		cumulative or in-combination effects are expected on biodiversity.
Local Planning Applications[12]	Local planning applications in proximity and within the zone of influence of the proposed works at Waterford Airport mainly relate to residential dwellings, many with site foul effluent treatment systems associated with them and some agricultural related applications. Planning applications within the Airport business park include erection of warehouse units, construction of a builders compound, retention of a telecommunications mast, and the construction of a waste transfer facility.	Adherence to the overarching policies and objectives of the Waterford County Development Plan 2011 - 2017 ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations; there is no potential for adverse in combination effects on biodiversity.

12.8 Residual Effects

A summary of residual Effects is presented in Table 12-6 below.

[12] The Local Planning Applications included in this potential in-combination effects assessment support the following criteria; planning applications granted within the past five years that may contribute to potential cumulative effects on ecological features within the zone of influence of the proposals at Waterford Airport. The search was undertaken on 15th June 2020.

Table 12-16: Residual Effects of the Proposals at Waterford Airport

Ecological Features	Residual Effects
Designated Sites	Potential residual impacts on European Sites are assessed separately in the NIS accompanying the Planning Application. There will be no residual effects on nationally designated sites from the proposed works.
Habitats	The proposed works will not result in a significant negative effects on grassland habitats. Hedgerows are considered to be of Local Importance (higher value) given their value to wildlife and biodiversity. The proposals will potentially result in the loss of hedgerows. However, with the successful implementation and establishment of a planting scheme in the fields to the north of the runway, no significant residual effects on hedgerow habitat are anticipated. There is potential for adverse effects on the water quality of watercourses within the zone of influence of the proposed works. However, with the effective implantation of standard good practice construction methodologies and the specific mitigation measures outlined in Section 12.6, no significant residual effects on aquatic habitats are anticipated.
Fauna	In the absence of mitigation, the proposals have the potential to effect protected/notable species, through loss of habitat, damage to habitat and potential disturbance during the construction and operational phase. However, with the effective implementation of a hedgerow planting scheme in the fields to the north of the runway and the specific mitigation measures outlined in Section 12.6, including pre-construction surveys for bats, no significant adverse residual effects on fauna are anticipated.

12.9 References

Bat Conservation Ireland, (2010). Guidance notes for Planners, Engineers, Architects, and Developers.

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Ireland
+353 1 658 3500

Carlow Office
The Grain Store
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Co. Carlow, R21 XA66,
Ireland
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