

APPROPRIATE ASSESSMENT (HABITATS DIRECTIVE) SCREENING
REPORT FOR A PROPOSED DEVELOPMENT AT BLACKHILL CRESENT,
DONACARNEY, BETTYSTOWN, CO MEATH
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Prepared
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Forest, Environmental Research and Services Ltd. (www.fers.ie)
Silloogue
Kilberry
Navan
Co. Meath
087 7573121
pat.moran@fers.ie
OSI License No.: EN0064509

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EXECUTIVE SUMMARY

Meath Co Council are proposing a development at Blackhill Crescent, Donacarney, Bettystown, Co. Meath. The proposed development will comprise:

- Construction of 2 no single storey dwellings, associated roads, open space and site development works.

The proposed development location is situated within 15 km of six Natura 2000 site and, as such, requires Appropriate Assessment screening in accordance with Article 6(3) of the EU Habitats Directive.

Screening having identified no significant potential negative impacts Phase II Appropriate Assessment was deemed not to be required in this instance. Following an examination, analysis, and evaluation of the relevant information, and applying the precautionary principle, it is considered that there would be no potential for significant adverse impact of the proposed development on the Qualifying Interests, nor the attainment of specific conservation objectives, either alone or in-combination with other plans or projects on the Natura 2000 sites described herein.

1 Introduction

1.1 FERS Ltd. Company background

Forest, Environmental Research and Services have been conducting ecological surveys and research since the company's formation in 2005 by Dr Patrick Moran and Dr Kevin Black. Dr Moran, the principal ecologist with FERS, holds a 1st class honours degree in Environmental Biology (UCD), a Ph.D. in Ecology (UCD), a Diploma in EIA and SEA management (UCD) a Diploma in Environmental and Planning Law (King's Inn) and a M.Sc. in Geographical Information Systems and Remote Sensing (University of Ulster, Coleraine). Patrick has in excess of 20 years of experience in carrying out ecological surveys on both an academic and a professional basis. Dr Emma Reeves, senior ecologist with FERS holds a 1st class honours degree in Botany, and a Ph.D. in Botany. Emma has in excess of 10 years of experience in undertaking ecological surveys on an academic and professional basis. Ciarán Byrne, a senior ecologist with FERS holds a 1st class honours degree in Environmental Management (DIT) and a M.Sc. in Applied Science/Ecological Assessment (UCC). Ciarán has in excess of 5 years in undertaking ecological surveys on both an academic and a professional basis.

FERS client list includes National Parks and Wildlife Service, An Bord Pleanála, various County Councils, the Heritage Council, Teagasc, University College Dublin, the Environmental Protection Agency, Inland Waterways Association of Ireland, the Department of Agriculture, the Office of Public Works and Coillte in addition to numerous private individuals and companies. FERS Ltd. has prepared in excess of 300 Appropriate Assessment Screenings/Natura Impact Statements for a wide range of plans and projects.

1.2 The aim of this report

This report has been prepared in compliance with Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DoEHLG 2009, February 2010) and the European Communities (Birds and Natural Habitats) Regulations 2011 (DoEHLG 2011) in support of the Appropriate Assessment of a proposed development at Blackhill Crescent, Donacarney, Bettystown, Co Meath. This report provides the information required in order to establish whether or not the proposed plan is likely to have a significant ecological impact on any Natura 2000 sites, in the context

of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

This report has similarly been prepared with regard to relevant rulings by the Court of Justice of the European Union (CJEU), the High Court, and the Supreme Court including but not limited to:

- [2013] C-258/11 Peter Sweetman and Others v An Bord Pleanála. The CJEU ruled that Article 6 (3) of Council Directive 92/43 / EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that a project not directly linked to it is not immediately necessary for the management of a site to prejudice the integrity of that site if it is likely to prevent the preservation of the constituent characteristics of the site concerned in relation to the presence of a natural priority habitat whose purpose is to maintain gave the reason for registering that site in the list of sites of Community importance within the meaning of that directive. For this verification, the precautionary principle must be applied;
- [2018] C – 164/17 Edel Grace and Peter Sweetman v An Bord Pleanála. The CJEU ruled that Article 6 of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, where it is intended to carry out a project on a site designated for the protection and conservation of certain species, of which the area suitable for providing for the needs of a protected species fluctuates over time, and the temporary or permanent effect of that project will be that some parts of the site will no longer be able to provide a suitable habitat for the species in question, the fact that the project includes measures to ensure that, after an appropriate assessment of the implications of the project has been carried out and throughout the lifetime of the project, the part of the site that is in fact likely to provide a suitable habitat will not be reduced and indeed may be enhanced may not be taken into account for the purpose of the assessment that must be carried out in accordance with Article 6(3) of the directive to ensure that the project in question will not adversely affect the integrity of the site concerned; that fact falls to be considered, if need be, under Article 6(4) of the directive;
- [2018] C-323/17 People Over Wind and Sweetman v Coillte Teoranta - The (CJEU) ruled that Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site;

- [2018] C-461/17 Holohan v An Bord Pleanála – The CJEU ruled that:
 1. Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that an ‘appropriate assessment’ must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.
 2. Article 6(3) of Directive 92/43 must be interpreted as meaning that the competent authority is permitted to grant to a plan or project consent which leaves the developer free to determine subsequently certain parameters relating to the construction phase, such as the location of the construction compound and haul routes, only if that authority is certain that the development consent granted establishes conditions that are strict enough to guarantee that those parameters will not adversely affect the integrity of the site.
 3. Article 6(3) of Directive 92/43 must be interpreted as meaning that, where the competent authority rejects the findings in a scientific expert opinion recommending that additional information be obtained, the ‘appropriate assessment’ must include an explicit and detailed statement of reasons capable of dispelling all reasonable scientific doubt concerning the effects of the work envisaged on the site concerned.
 4. Article 5(1) and (3) of, and Annex IV to, Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, must be interpreted as meaning that the developer is obliged to supply information that expressly addresses the significant effects of its project on all species identified in the statement that is supplied pursuant to those provisions.
 5. Article 5(3)(d) of Directive 2011/92 must be interpreted as meaning that the developer must supply information in relation to the environmental impact of both the chosen option and of all the main alternatives studied by the developer, together with the reasons for his choice, taking into account at least the environmental effects, even if such an alternative was rejected at an early stage.
- [2018] IESC 31 Connelly v An Bord Pleanála – Appropriate Assessment must contain complete, precise, and definitive findings;
- [2019] IEHC 84 Kelly v An Bord Pleanála - The Irish High Court concluded that SUDS form part of the development and are not mitigation measures which a competent authority cannot consider at the screening for AA stage.

Furthermore, there have been a number of recent Judicial Reviews that are pertinent as regards this report (e.g. [2020] No. 238 J.R.).

1.3 An outline of the Appropriate Assessment process

The “Habitats Directive” (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A “Special Conservation Area” or SAC is a designation under the Habitats Directive.

The “Birds Directive” (Council Directive 2009/147/EC on the Conservation of Wild Birds) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting, and wintering areas. This directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection. A “Special Protection Area” or SPA, is a designation under The Birds Directive.

Special Areas of Conservation and Special Protection Areas form a pan-European network of protected sites known as Natura 2000 sites.

The Habitats Directive sets out the protocol for the protection and management of SACs. The Directive sets out key elements of the system of protection including the requirement for Appropriate Assessment of plans and projects. The requirements for an Appropriate Assessment are set out in the EU Habitats Directive. Articles 6(3) and 6(4) of the Directive respectively, state:

“...Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public...”

“...If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of over-riding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted...”

1.4 Methodology for Appropriate Assessment

A number of guidance documents on the appropriate assessment process have been consulted during the preparation of this NIS. These are:

- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000);
- Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (Nov. 2001 – published 2002);
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG 2009, Revised February 2010);
- European Communities (Birds and Natural Habitats) Regulations 2011 (DoEHLG 2011); and
- Commission notice "Managing Natura 2000 sites The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Brussels, 21.11.2018 C (2018) 7621 final.

The assessment requirements of Article 6 are generally dealt with in a stage-by-stage approach. The stages as outlined in "Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities" are:

1.4.1 Stage (1) Appropriate Assessment (Habitats Directive) Screening

This initial process identifies the likely impacts of a proposed project or plan upon a Natura 2000 site, either alone, or in combination with other projects or plans and considers whether these impacts are likely to be significant. A recent judgement in the ECJ (C323/17) that has large implications for appropriate assessment screening in Ireland has found that:

"...Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site..."

1.4.2 Stage (2) Preparation of Natura Impact Statement

The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

1.4.3 Stage (3) Assessment of Alternative Solutions

The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.

1.4.4 Stage (4) Assessment where Adverse Impacts Remain

An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

At each stage, there is a determination as to whether a further stage in the Appropriate Assessment process is required. If, for example, the conclusions of the Screening stage indicate that there will be no significant impacts on the Natura 2000 site, there is no requirement to proceed further. Appropriate Assessment stages 1 and 2 deal with the main requirements for assessment under Article 6.3. Stage 3 may be part of Article 6(3) or a necessary precursor for Stage 4. This report is comprised of the ecological impact assessment and testing required under the provisions of Article 6(3) by means of the first stage of Appropriate Assessment, the screening process (as set out in the EU Guidance documents).

EU guidance states:

“...This stage examines the likely effects of a project or plan, either alone or in combination with other projects or plans, upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant...”

This report has been undertaken in accordance with the European Commission’s Guidance on Appropriate Assessment (European Commission, 2001) which comprises the following:

1. Description of the Plan.
2. Identification of Natura 2000 sites potentially affected by the Plan.
3. Identification and description of individual and cumulative impacts likely to result from the Plan.
4. Assessment of the significance of the impacts identified on the conservation objectives of the site(s).

5. Exclusion of sites where it can be objectively concluded that there will be no significant impacts on conservation objectives.

1.5 Consultations

1.5.1 NPWS

The primary body consulted with regard to matters involving Natura 2000 sites is the National Parks and Wildlife Service (NPWS). The role of the NPWS is:

- To secure the conservation of a representative range of ecosystems and maintain and enhance populations of flora and fauna in Ireland.
- To implement the EU Habitats and Birds Directives.
- To designate and advise on the protection of Natural Heritage Areas (NHA) having particular regard to the need to consult with interested parties.
- To make the necessary arrangements for the implementation of National and EU legislation and policies and for the ratification and implementation of the range of international Conventions and Agreements relating to the natural heritage.
- To manage, maintain and develop State-owned National Parks and Nature Reserves.

Information pertaining to Natura 2000 sites within the Republic of Ireland is typically held by NPWS and is publicly accessible through their on-line database at www.npws.ie . Consultations carried out involved querying the NPWS database for information pertaining to Natura 2000 sites within 15 km of the proposed development.

1.5.2 NBDC Database

The National Biodiversity Database Centre database was queried for records of species of conservation concern present within the immediate vicinity of the proposed development.

1.5.3 Other relevant data-sources

Other relevant data-sources were queried, as necessary.

2 Screening

Following the guidelines set out by NPWS (2009), Appropriate Assessment Screening (Phase I Appropriate Assessment) is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the EU Habitats Directive. According to the guidelines as laid by NPWS (2009), Appropriate Assessment Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

- (1) Is the plan or project directly connected to or necessary for the management of the site?
- (2) Is the plan or project, alone or in combination with other such plans or projects likely to have significant negative effects on a Natura 2000 site(s) in view of the conservation objectives of that site(s)?

The proposed development does not comply with the first screening test (i.e., the proposed development is not directly connected to, or necessary for the management of any Natura 2000 site). The screening exercise will therefore inform the Appropriate Assessment process in determining whether the proposed plan, alone or in combination with other plans and projects, has any potential to have significant effects on the Natura 2000 sites within the study area. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, a Stage 2 Appropriate Assessment is required stage, i.e., *“The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.”*

2.1 Description of proposed development

Meath Co. Council propose a development comprising the construction of 2 no single storey dwellings, associated roads, open space and site development works at Blackhill Crescent, Donacarney, Co. Meath.

The approximate location of the proposed development site is indicated in Figure 1, Figure 2, Figure 3, Figure 4 and Figure 5. A layout plan of the proposed development is illustrated in Figure 6.

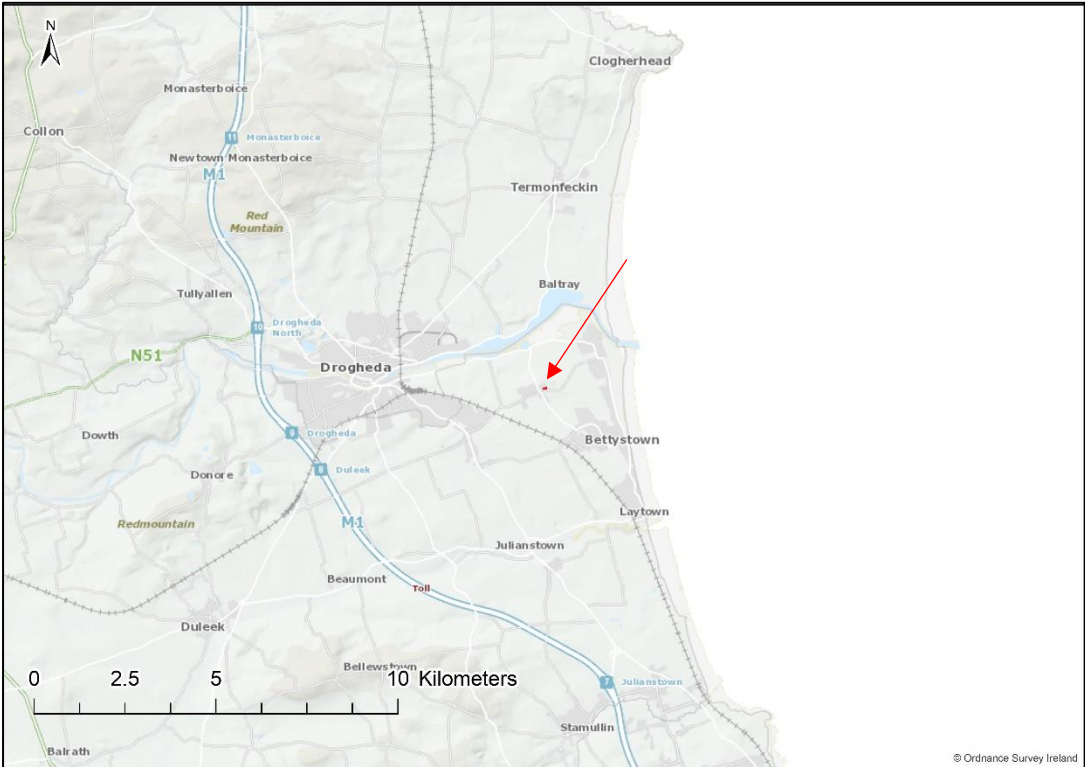


Figure 1: Approximate location of proposed development (1:100,000)

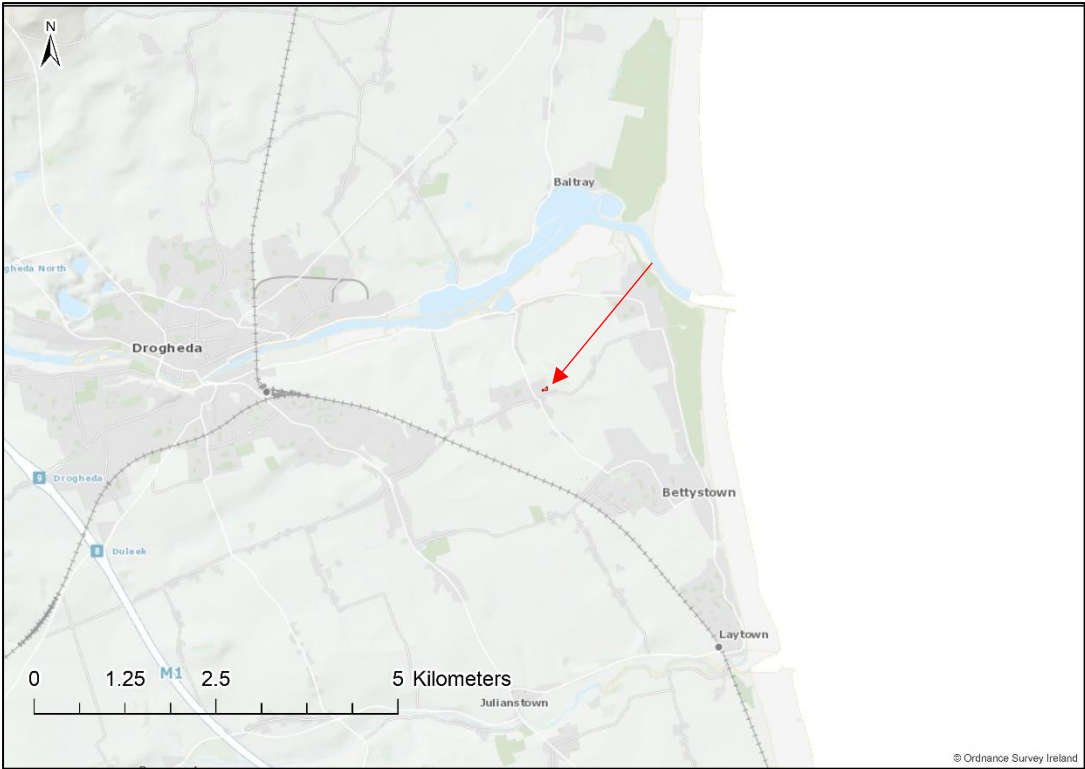


Figure 2: Approximate location of proposed development (1:50,000)

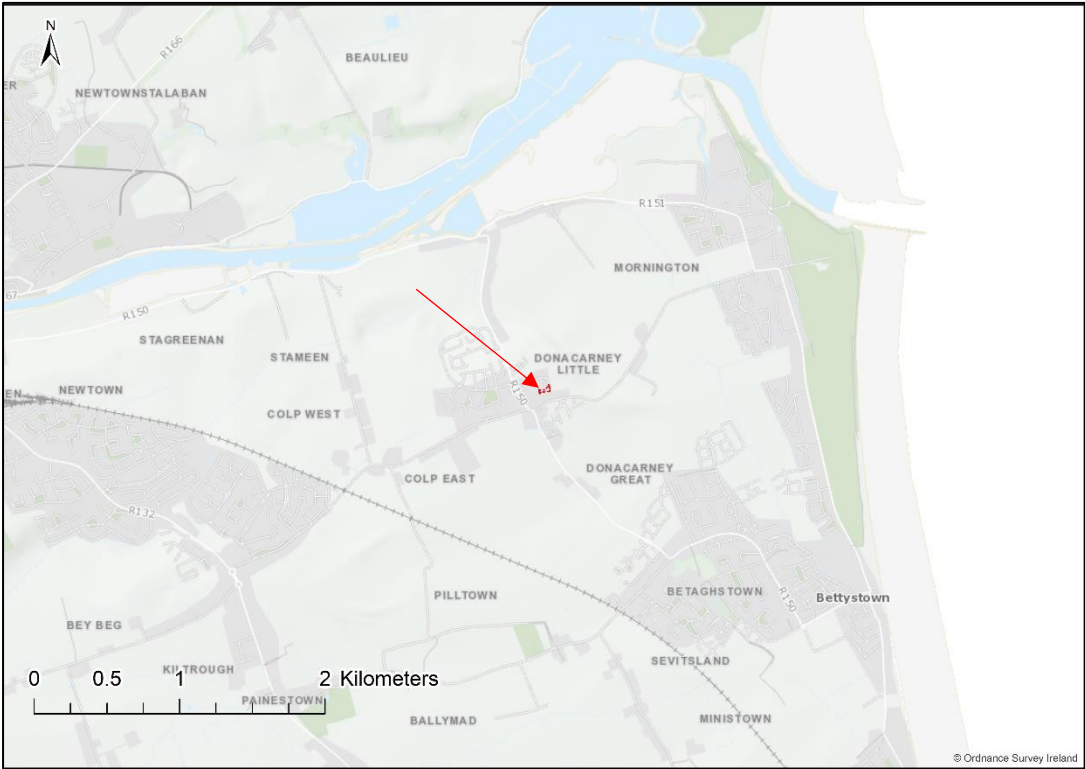


Figure 3: Approximate location of proposed development (1:25,000)

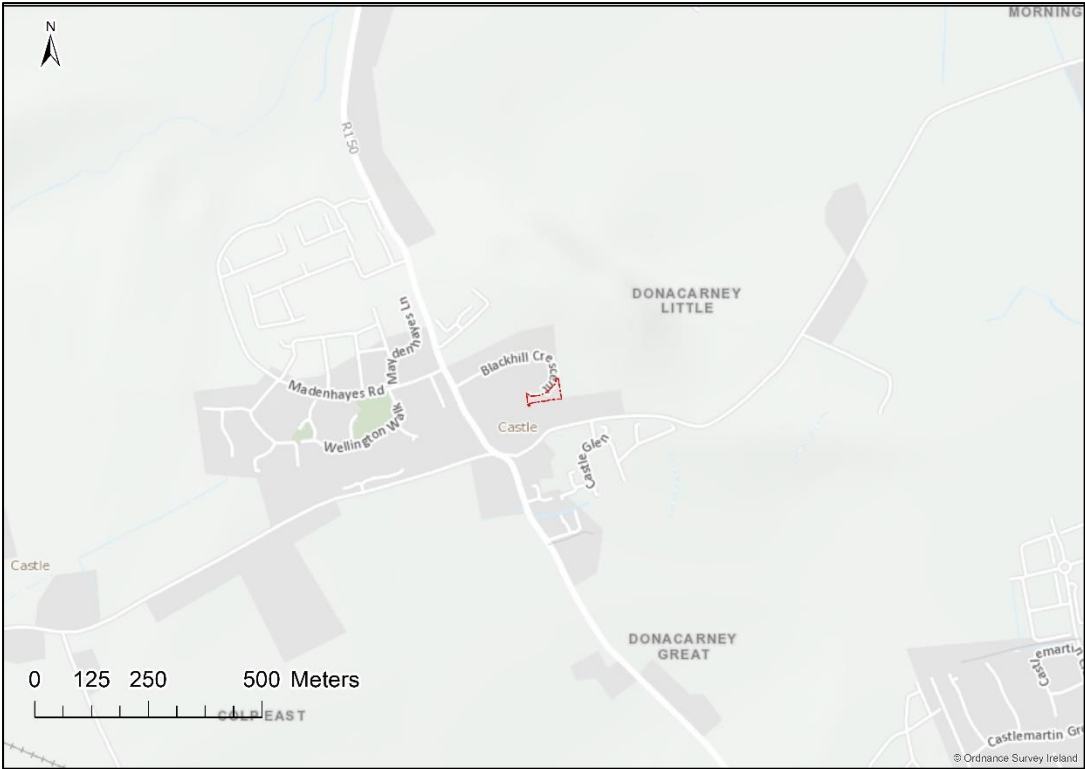


Figure 4: Approximate location of proposed development (1:8,000)



Figure 5: Approximate location of proposed development overlain on satellite imagery (1:2,500)

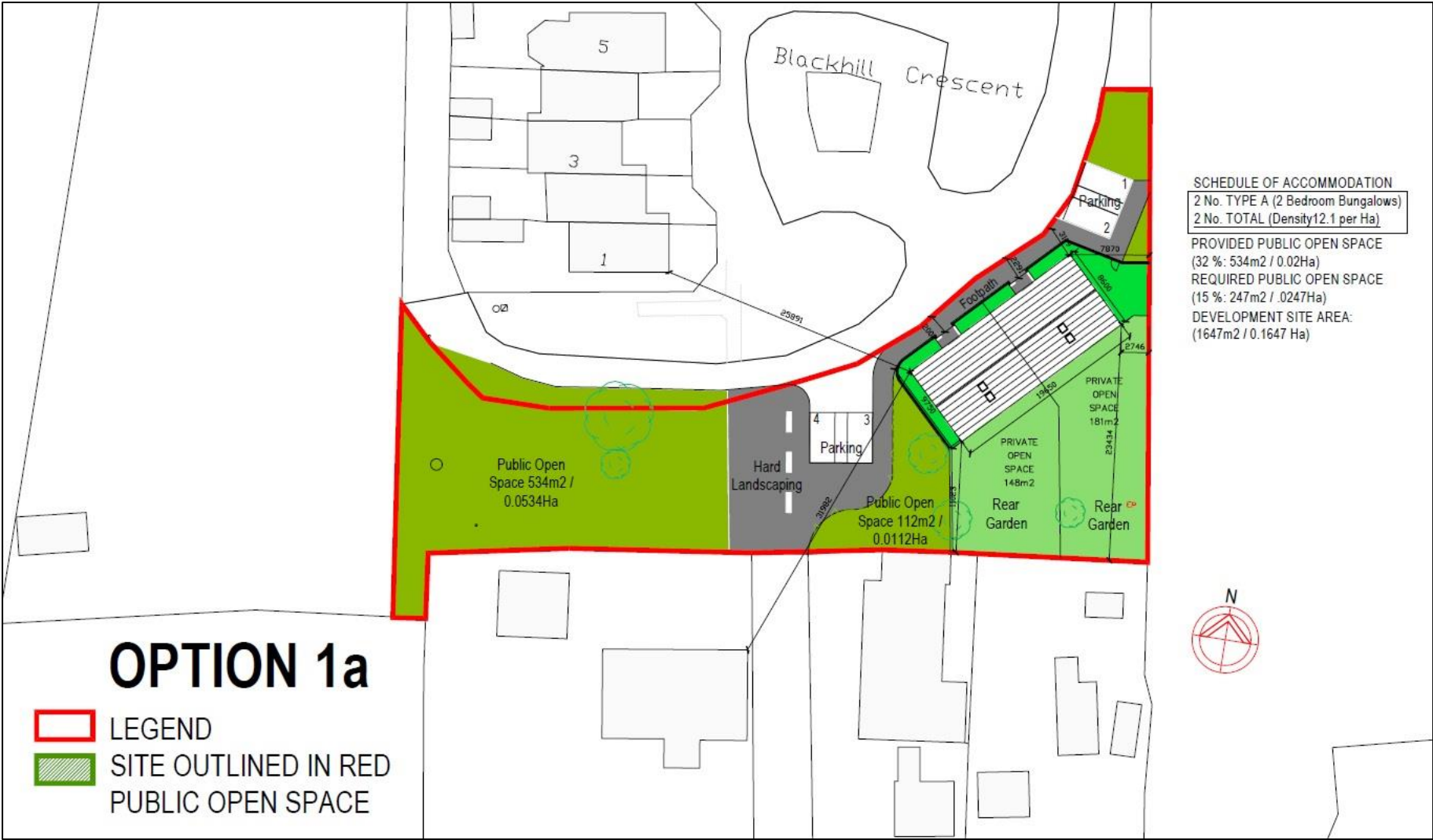


Figure 6: Excerpt from Architect's drawings indicating proposed layout

2.2 Description of existing conditions on site

A site visit was carried out on the morning of February 24th, 2022, by Dr Patrick Moran. This is outside of the optimal window for undertaking ecological assessments. Given the nature of the development, and the habitats present (predominantly GA2 – Amenity Grassland associated with an existing housing development and a small area of rank grassland), however, a site assessment at within this period was deemed sufficient to determine any potential impact on Annex Habitats/Species. Aerial Images and photographs of the site *environs* are provided in Figure 7, Figure 8, Figure 9, Figure 10 and Figure 11. Given the nature and location of the habitats present, no Annex I habitat or Annex II species would be likely to occur now or in the future. There is potential for the habitat to be utilised by foraging bats, all Irish species of which are listed in Annex IV of the EU Habitats Directive. The habitats within the site footprint are not suitable as *ex-situ* feeding habitat for any Qualifying Interests of proximate SPAs owing to the size and degree of disturbance of the proposed location.



Figure 7: Aerial image of the proposed development location



Figure 8: Aerial image illustrating location of playing pitch adjacent to proposed development site



Figure 9: Primary habitat present



Figure 10: Amenity grassland with scattered immature trees



Figure 11: Associated hedgerow

2.3 Description of scope

The geographical scope of the assessment is to determine if the proposed works/development has the potential to have any significant negative impact on the Natura 2000 sites occurring within 15 km of the proposed development.

The NBDC database was accessed on 15/02/22 to query records occurring within the vicinity of the proposed development (2 km square, O17H see Figure 12). The species of conservation concern as recorded within this 2 km square are illustrated in Table 1. As indicated by the proximity to numerous Natura 2000 sites, the numbers of species of conservation concern present is significant. None of the species of conservation concern for which the proximate SACs or SPAs are likely to occur within the footprint of the proposed development.

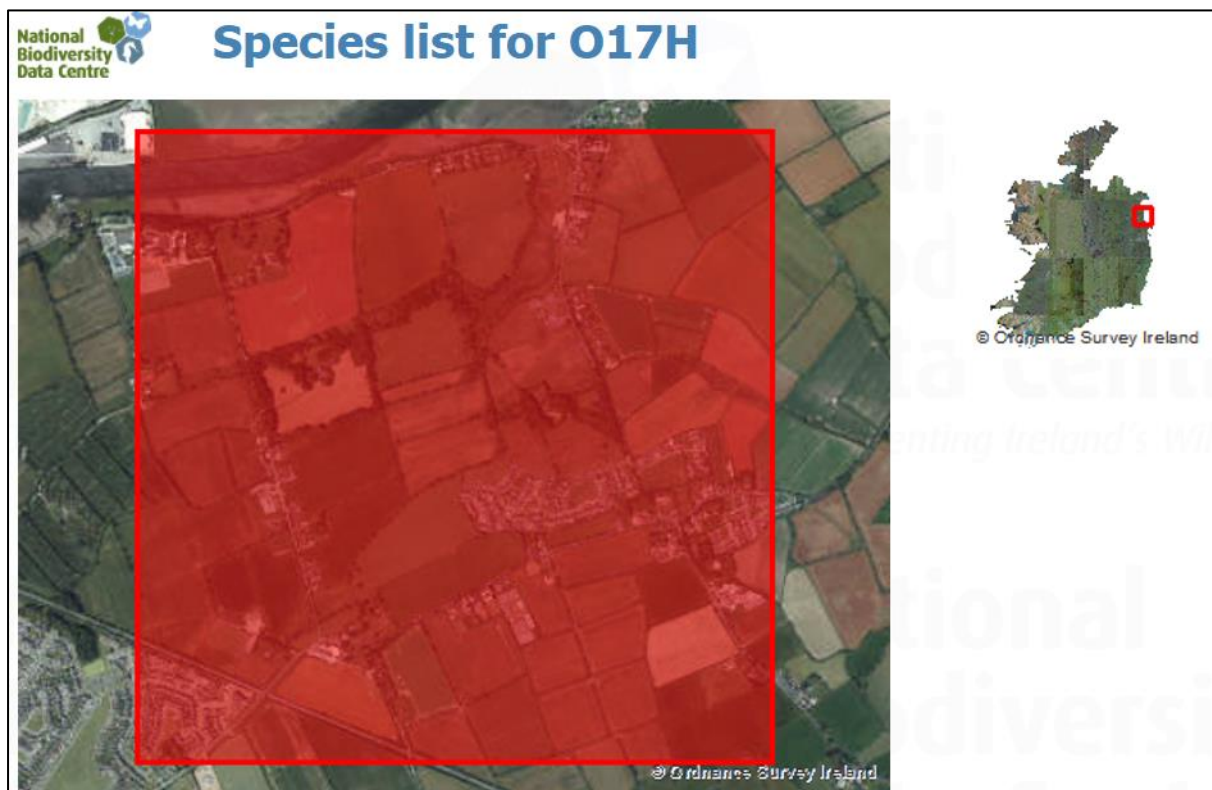


Figure 12: Location of 10km square queried (National Biodiversity Data Centre)

Table 1: Species of conservation concern recorded in the vicinity of the proposed development site

Scientific Name	Common Name	Date of last record
<i>Branta bernicla</i>	Brent Goose	31/12/2011
<i>Erinaceus europaeus</i>	West European Hedgehog	18/09/2020
<i>Hirundo rustica</i>	Barn Swallow	12/06/2017
<i>Larus marinus</i>	Great Black-backed Gull	11/07/2016
<i>Larus ridibundus</i>	Black-headed Gull	12/06/2017

Scientific Name	Common Name	Date of last record
<i>Limosa limosa</i>	Black-tailed Godwit	26/12/2020
<i>Meles</i>	Eurasian Badger	31/12/2007
<i>Numenius arquata</i>	Eurasian Curlew	26/12/2020
<i>Phalacrocorax aristotelis</i>	European Shag	11/07/2016
<i>Phalacrocorax carbo</i>	Great Cormorant	11/07/2016
<i>Phoca vitulina</i>	Common Seal	11/07/2016
<i>Rana temporaria</i>	Common Frog	19/08/2018
<i>Sciurus carolinensis</i>	Eastern Grey Squirrel	18/12/2012
<i>Sterna sandvicensis</i>	Sandwich Tern	11/07/2016
<i>Sternula albifrons</i>	Little Tern	31/12/2011
<i>Tadorna tadorna</i>	Common Shelduck	26/12/2020
<i>Vanellus</i>	Northern Lapwing	26/12/2020

2.4 Identification of Natura 2000 sites potentially impacted upon by the development

It is general practice, when screening a plan or project for compliance with the Habitats Directive, to identify all Natura 2000 sites within the functional area of the plan/project itself and within 15 km of the boundaries of the area the plan/project applies to (with an appropriate “Zone of Influence” identified from any Source-Pathway-Receptor linkages). This approach is currently recommended in the Department of the Environmental, Heritage and Local Government’s document *Guidance for Planning Authorities* and as a precautionary measure, to ensure that all potentially affected Natura 2000 sites are included in the screening process. The maintenance of habitats and species within individual Natura 2000 sites at favourable conservation condition contributes to the overall maintenance of favourable conservation status of those habitats and species at a national level. It is therefore necessary to identify any potential impacts of the proposed development on the conservation status of Natura 2000 sites. The National Parks and Wildlife Service deem that the favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing.
- The ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable.

The National Parks and Wildlife Service deem that the favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself.
- The natural range of the species is neither being reduced, or likely to be reduced in the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

There are three areas designated as a special area of conservation (SAC) and three areas designated as a Special Protection Area within 15 km of the proposed development site (see Table 2, Figure 13 and Figure 14).

Table 2: Natura 2000 sites within 15km of the proposed development

SITE CODE	DESIGNATION	SITE NAME
001459	SAC	CLOGHERHEAD
001957	SAC	BOYNE COAST AND ESTUARY
002299	SAC	RIVER BOYNE AND RIVER BLACKWATER
004080	SPA	BOYNE ESTUARY
004158	SPA	RIVER NANNY ESTUARY AND SHORE
004232	SPA	RIVER BOYNE AND RIVER BLACKWATER

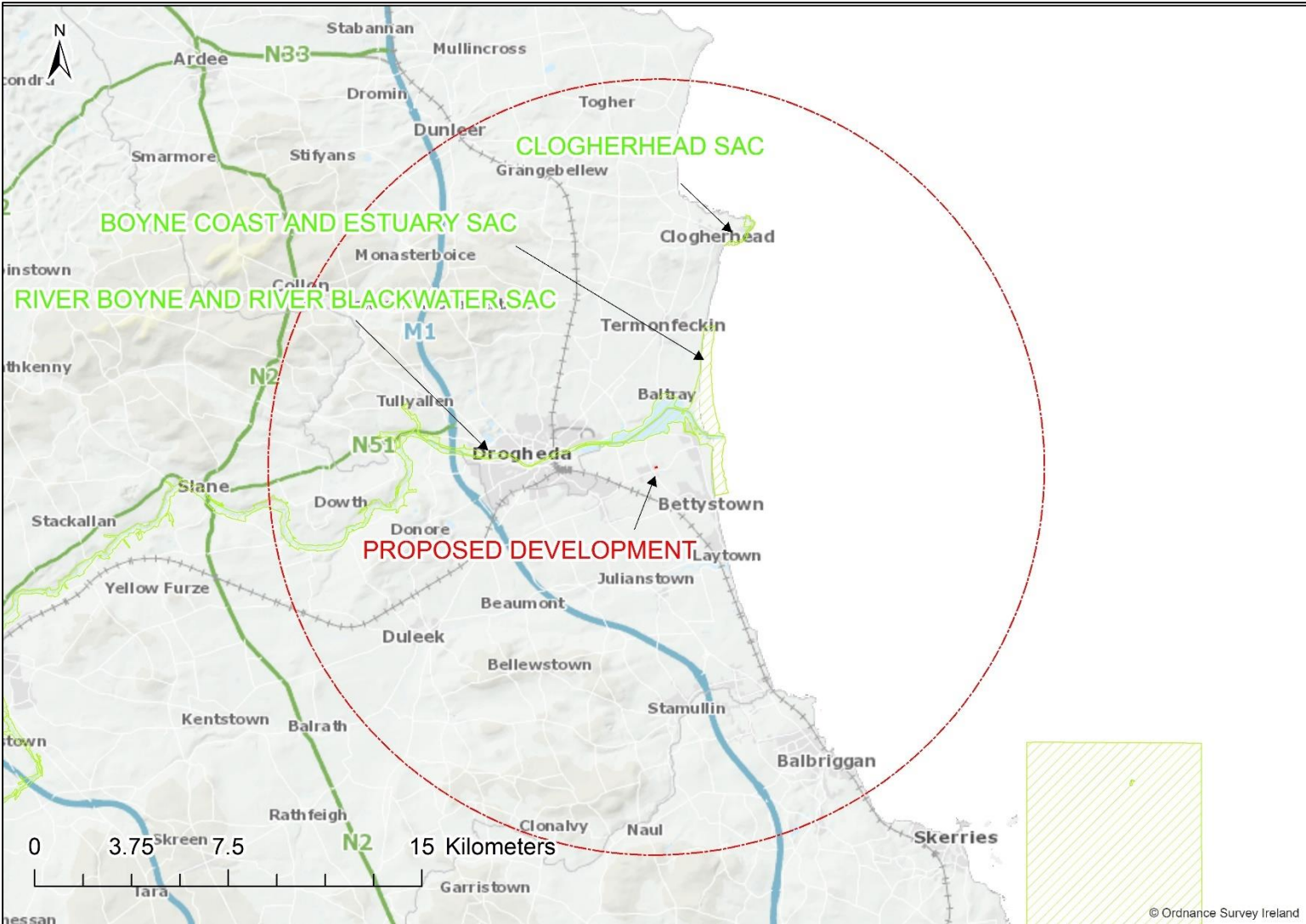


Figure 13: Location of SACs within 15 km of proposed development

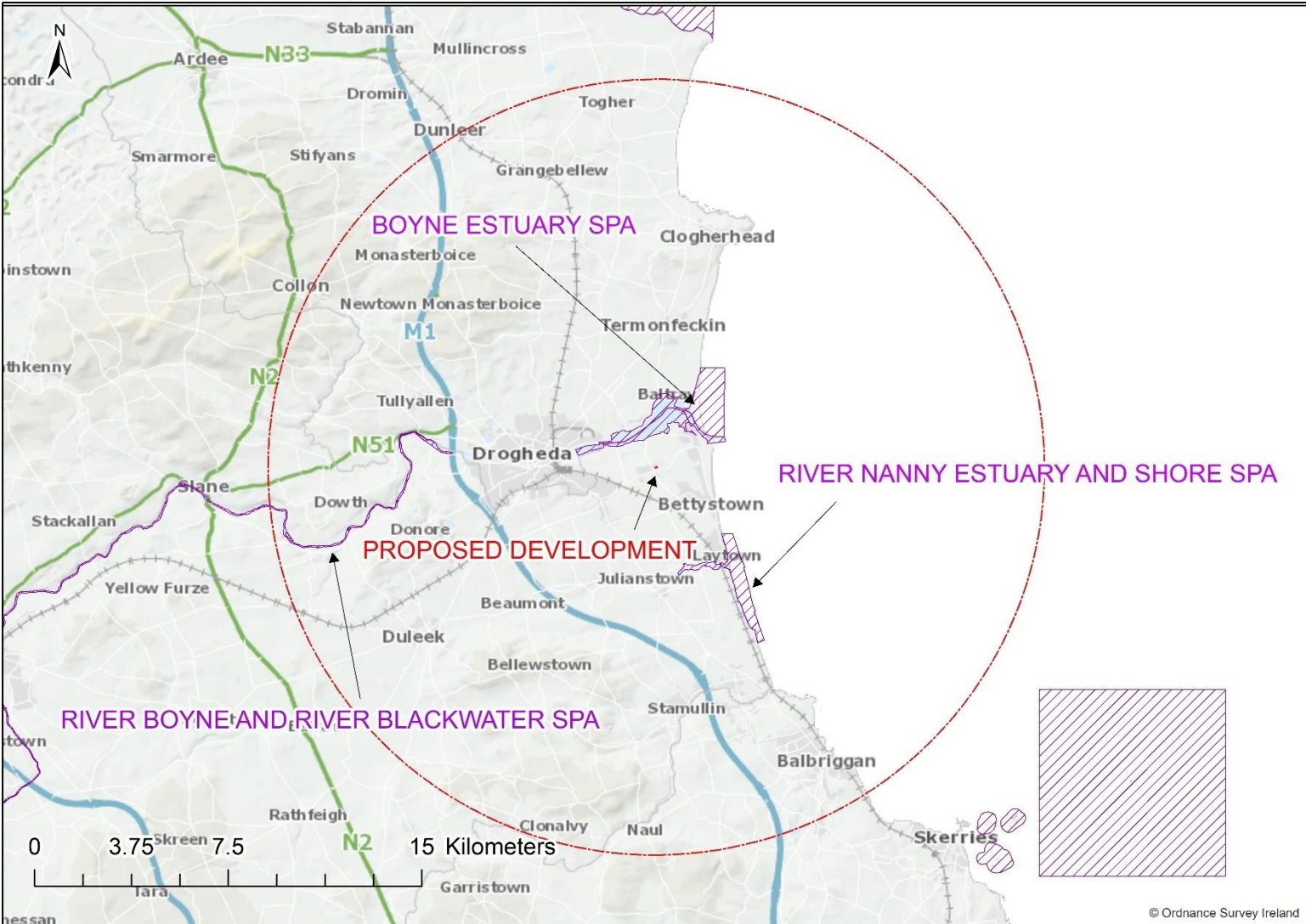


Figure 14: Location of SPAs within 15 km

2.5 Summary of Natura 2000 sites potentially impacted upon by the proposed development

There are six Natura 2000 sites within 15 km of the proposed development. The proposed development is more than 1 km from the nearest Natura 2000 site. It should be noted that given the nature and scale of the proposed development, any potential impacts are likely to be limited to the immediate vicinity, within a distance of no more than 500m.

It is the goal of NPWS to draw up conservation plans for all areas designated for nature conservation, and that these plans will, among other things, set clear objectives for the conservation of the features of interest within a site. Where a detailed Conservation Objectives Document is not available, NPWS have provided a site synopsis, generic Conservation Objectives and a Natura 2000 data form from which information is sourced.

In this section, the Natura 2000 sites potentially impacted upon by the proposed development are described according to:

- 1) General description of the site;
- 2) Qualifying Interests (QI) of the site;
- 3) Threats, pressures and activities with negative impacts on the site;
- 4) Conservation Objectives of the site; and
- 5) Conservation status of the site.

The codes utilized within the Natura 2000 forms are available from

http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

2.5.1 Clogherhead SAC (Site synopsis version date 11/10/13, Natura 2000 form update 10/20, Conservation Objectives Version 1.0)

2.5.1.1 General Description

Clogher Head is a low, rocky headland composed of Silurian rocks, set in a low-lying coastline of sands, clays and mud, overlooking the Irish Sea. It comprises an area of dry heath vegetation, flanked by low, rocky vegetated sea cliffs. The area surrounding the site is intensively farmed. The site includes examples of two Annex I habitats, dry heath and vegetated sea cliffs. A number of scarce vascular plant species, *Inula crithmoides*, *Scilla verna*, *Trifolium striatum* and *Trifolium ornithopodioides* (the last-named not recorded recently), have been reported from the site.

2.5.1.2 Qualifying Interests

The qualifying interests of this site are indicated in Table 8.

Table 3

Qualifying Interests	
<i>* indicates a priority habitat under the Habitats Directive</i>	
001459	Clogher Head SAC
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts
4030	European dry heaths

2.5.1.3 Threats, pressures, and activities with negative impacts on the site

Details as to the threats, pressures, and activities with negative impacts on the site are identified from the Natura 2000 data form for the sites and are illustrated in Table 9.

Table 4: Threats, pressures, and activities with impacts on the site

Negative Impacts				Positive Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]	Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
M	D03.01.02		b	L	X		i
M	E06.02		o				
H	I01		i				
M	E03.01		b				
M	D01.01		i				
M	D03.01.03		b				
H	A04.02		i				
H	A04.03		i				
H	J03.01		i				
H	J02.12.01		b				
M	D03.01		o				
M	F02.01		b				
M	G02		i				
M	E05		o				

Rank: H = high, M = medium, L = low
 Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
 i = inside, o = outside, b = both

2.5.1.4 Conservation Objectives of the site

A detailed Conservation Objectives Document has been prepared for this site and is available to download from:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001459.pdf

Details from this document are reproduced here. The Conservation Objectives of the site are outlined in Table 10 and Table 11.

Table 5

Conservation Objectives for : Clogher Head SAC [001459]			
1230 Vegetated sea cliffs of the Atlantic and Baltic coasts			
To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Clogher Head SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat length	Kilometres	Area stable, subject to natural processes, including erosion. For the sub-site (Clogher Head) mapped, total length of cliff sections: 1.63km. See map 2	Based on data from the Irish Sea Cliff Survey (ISCS) (Barron et al., 2011). Cliffs are linear features and are therefore measured in kilometres. The sub-site Clogher Head (ISCS site ID: 07001) was identified using a combination of aerial photos and the DCENR helicopter viewer. The length of cliff was measured (in sections) to give a total estimated area of 1.63km within Clogher Head SAC. The length of cliff is likely to be underestimated. See the Clogher Head SAC conservation objectives supporting document for coastal habitats for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 2	Sea cliffs occur along the coastline around Clogher Head from the beach in the south, to the pier at Port Oriel in the north. Both hard and soft cliffs have been noted at Clogher Head and it is estimated that the majority of the cliffs are of the hard type (Browne, 2005; Barron et al., 2011). See the coastal habitats supporting document for further details
Physical structure: functionality and hydrological regime	Occurrence of artificial barriers	No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures	Based on data from Barron et al. (2011). Maintaining natural geomorphological processes, including natural erosion, is important for the health of vegetated sea cliffs. Hydrological processes maintain flushes, and in some cases tufa formations, that can be associated with sea cliffs. No hydrological features such as gullies, streams or cascades were identified by the ISCS as occurring at Clogher Head. See the coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of sea cliff habitat zonation including transitional zones, subject to natural processes including erosion and succession	Based on data from Barron et al. (2011). Dry heath occurs adjacent to sea cliff vegetation in Clogher Head SAC. See the coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from Barron et al. (2011). The ISCS noted ungrazed grassland on the cliff tops with a vegetation height of 30cm. See the coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011)	Cliff top vegetation includes thrift (<i>Armeria maritima</i>), sea campion (<i>Silene uniflora</i>), wild carrot (<i>Daucus carota</i>), buck's-horn plantain (<i>Plantago coronopus</i>), English stonecrop (<i>Sedum anglicum</i>), rock sea-spurrey (<i>Spergularia rupicola</i>), red fescue (<i>Festuca rubra</i>) and kidney vetch (<i>Anthyllis vulneraria</i>). These are indicative of maritime grassland on hard cliffs. Coastal heath species such as western gorse (<i>Ulex gallii</i>) and sheep's-bit (<i>Jasione montana</i>) have been recorded, along with the grassland species cock's-foot (<i>Dactylis glomerata</i>), cat's-ear (<i>Hypochaeris radicata</i>), lady's bedstraw (<i>Galium verum</i>), ribwort plantain (<i>Plantago lanceolata</i>) and the lichens <i>Cladonia</i> spp., <i>Xanthoria</i> spp., <i>Caloplaca</i> spp. and <i>Verrucaria</i> spp. See the coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage	Negative indicator species (including non-native species) to represent less than 5% cover	Based on data from Barron et al. (2011). No negative species were recorded by the ISCS in this SAC. See the coastal habitats supporting document for further details

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Vegetation composition: bracken and woody species	Percentage	Cover of bracken (<i>Pteridium aquilinum</i>) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%	Based on data from Barron et al. (2011). Apart from western gorse (<i>Ulex gallii</i>), which is an integral part of the dry heath vegetation, no bracken or woody species were recorded within this SAC by the ISCS. See the coastal habitats supporting document for further details
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Table 6

Conservation Objectives for : Clogher Head SAC [001459]			
4030 European dry heaths			
To maintain the favourable conservation condition of European dry heaths in Clogher Head SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	European dry heaths has not been mapped in detail for Clogher Head SAC and thus the total area of the qualifying habitat is unknown. Dry heath is known to occur on thin soils covering rocks. Vegetated sea cliffs (1230), bedrock shore and dry grassland also occur within the SAC (NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See note on area above
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013)
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The diversity of dry heath communities within this SAC is unknown. Information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: lichens and bryophytes	Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding <i>Campylopus</i> and <i>Polytrichum</i> mosses	Attribute and target based on Perrin et al. (2014). Dry heath is not necessarily rich in lichen and bryophyte species, but a minimum amount should still be present
Vegetation composition: number of positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least two	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. Western gorse (<i>Ulex gallii</i>), bell heather (<i>Erica cinerea</i>) and ling (<i>Calluna vulgaris</i>) are listed as present in the dry heath in this SAC (NPWS internal files)
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented
Vegetation composition: dwarf shrub composition	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of dwarf shrub cover composed collectively of bog-myrtle (<i>Myrica gale</i>), creeping willow (<i>Salix repens</i>) and western gorse (<i>Ulex gallii</i>) is less than 50%	Attribute and target based on Perrin et al. (2014). Bog-myrtle is indicative of flushed conditions and is more characteristic of wet heaths and blanket bogs. Creeping willow is more characteristic of dune heaths. Western gorse is a component of dry heath, but high proportions of it may indicate a history of undesirable levels of grazing
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014). High cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community

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Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of soft rush would suggest undesirable hydrological conditions. Note however, that poor flushes dominated by soft rush can naturally occur in mosaic with this habitat. Discrete areas of this separate habitat should not be considered here
Vegetation structure: senescent ling	Percentage cover at a representative number of 2m x 2m monitoring stops	Senescent proportion of ling (<i>Calluna vulgaris</i>) cover less than 50%	Attribute and target based on Perrin et al. (2014). Senescence is part of the natural cycle of ling, but a dominance of ling in the senescent phase would indicate a lack of management (appropriate grazing or burning) to promote ling regeneration
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. Fires can be part of the natural cycle of dry heaths and may also be used as a valuable management tool to promote a diversity of growth phases in ling (<i>Calluna vulgaris</i>). However, currently most hill fires in Ireland are intentionally started to encourage grass growth for livestock. Fires which are too intense, too frequent, too extensive or which occur in sensitive areas are damaging to the habitat
Vegetation structure: growth phases of ling	Percentage cover in local vicinity of a representative number of monitoring stops	Outside sensitive areas, all growth phases of ling (<i>Calluna vulgaris</i>) should occur throughout, with at least 10% of cover in the mature phase	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. The growth phases of ling are pioneer (<10cm high), building (10-30cm high) and mature (>30cm high). As burning is undesirable in sensitive areas, it is not reasonable to require the stated diversity of growth phases within these areas
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human foot prints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

2.5.1.5 Baseline Conservation Status of the site

A synopsis of the conservation status of this site is provided in Table 18.

Table 7: Habitat types present on site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A B C D	A B C		
						Representativity	Relative Surface	Conservation	Global
1230			7.12		M	C	C	B	C
4030			7.12		M	C	C	B	C

2.5.2 Boyne Coast and Estuary SAC (Site synopsis version date 09/02/16, Natura 2000 form update 09/18, Conservation Objectives Version 1.0)

2.5.2.1 General Description

This moderately sized coastal site, which is situated below the town of Drogheda, comprises most of the estuary of the Boyne River, a substantial river which drains a large catchment. On the seaward side the site extends north and south for several kilometres to include the remaining intact areas of dune systems at Baltray and Mornington, as well as the adjacent beaches and intertidal sand flats. The main channel of the Boyne is contained by training walls for navigable purposes. As well as intertidal sand and mud flats, the inner part of the site has salt marshes and *Spartina* swards. While the site has a good diversity of coastal habitats, including fixed dunes, most have been modified in some way. The containment of the main tidal channel has altered the tidal pattern which affects the functioning of the various estuarine habitats. Both dune systems were formerly far more extensive but much of the stable areas have now been converted to golf courses. Site is important for wintering waterfowl, supporting nine species in nationally important numbers, including *Pluvialis apricaria*, an Annex I EU Birds Directive species. *Sterna albifrons* breeds or attempts to breed in most years.

2.5.2.2 Qualifying Interests

The qualifying interests of this site are indicated in Table 8.

Table 8

Qualifying Interests	
* indicates a priority habitat under the Habitats Directive	
001957	Boyne Coast and Estuary SAC
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1310	Salicornia and other annuals colonizing mud and sand
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')
2130	*Fixed coastal dunes with herbaceous vegetation ('grey dunes')

2.5.2.3 Threats, pressures, and activities with negative impacts on the site

Details as to the threats, pressures, and activities with negative impacts on the site are identified from the Natura 2000 data form for the sites and are illustrated in Table 9.

Table 9: Threats, pressures, and activities with impacts on the site

Negative Impacts				Positive Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]	Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
M	D01.05		i	M	D01.01		i
M	J02.01.03		i	M	J03.03		i
H	K02		i	M	G03		i
H	L07		b	M	J02		o
M	J02.12		i				
M	J02.02		i				
H	H01		i				
L	J02.12.01		i				
M	G01.03.02		i				
L	E03.03		i				
L	G05		i				
M	G01.02		o				
H	I01		i				
M	J02.12		i				
M	E01		i				
L	G05.04		i				
M	E05		b				
H	E03.01		b				

Rank: H = high, M = medium, L = low
 Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
 T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
 i = inside, o = outside, b = both

2.5.2.4 Conservation Objectives of the site

A detailed Conservation Objectives Document has been prepared for this site and is available to download from:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001957.pdf

Details from this document are reproduced here. The Conservation Objectives of the site are outlined in Table 10, Table 11, Table 12, Table 13, Table 14, Table 15, Table 16, Table 17.

Table 10

1130 Estuaries			
To maintain the favourable conservation condition of Estuaries in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated as 403ha using OSi data and the defined Transitional Water Body area under the Water Framework Directive
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with <i>Hediste diversicolor</i> and <i>Corophium volutator</i> community; and Subtidal fine sand dominated by polychaetes community. See map 5	Habitat structure was elucidated from intertidal and subtidal surveys undertaken in 2010 (ASU, 2011; EcoServe, 2011)

Table 11

1140 Mudflats and sandflats not covered by seawater at low tide			
To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 4	Habitat area was estimated using OSi data as 403ha
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with <i>Hediste diversicolor</i> and <i>Corophium volutator</i> community; and Fine sand dominated by bivalves community complex. See map 5	Habitat structure was elucidated from an intertidal survey undertaken in 2010 (ASU, 2011). See marine supporting document for further details

Table 12

1310 Salicornia and other annuals colonizing mud and sand			
To restore the favourable conservation condition of <i>Salicornia</i> and other annuals colonizing mud and sand in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Baltray- 2.91ha, Mornington- 1.14ha. See map 6	Based on data from Saltmarsh Monitoring Project (McCorry and Ryle, 2009). Habitat mapped at two sub-sites surveyed, giving a total estimated area of 4.05ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from McCorry and Ryle (2009). <i>Salicornia</i> is an annual species, so its distribution can vary significantly from year to year. At Baltray, saltmarsh is expanding in infilled intertidal zone. Large area of Mornington saltmarsh was reclaimed in the past. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). Sediment supply is particularly important for this pioneer saltmarsh community, as the distribution of this habitat depends on accretion rates. Sediment supply to saltmarshes at Baltray and Mornington is likely to be affected by the construction of navigation walls and dredging of the main channel. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). Creeks deliver sediment throughout saltmarsh system. At Baltray and Mornington the structure is modified by drainage channels. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	This pioneer saltmarsh community requires regular tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). At Baltray and Mornington there are zonations within the saltmarsh habitats as well as transitions to adjacent sand dune systems. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Baltray and Mornington grazing is absent and sward height is variable. See coastal habitats supporting document for further details

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1310 Salicornia and other annuals colonizing mud and sand

To restore the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry & Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species- <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	Based on data from McCorry & Ryle (2009). <i>Spartina</i> is well established at this site. Swards of <i>Spartina</i> are widespread at Baltray and there has been significant expansion of <i>Spartina</i> at Mornington since 2000. See coastal habitats supporting document for further details

Table 13

1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)			
To maintain the favourable conservation condition of Atlantic salt meadows (<i>Glauco-Puccinellietalia</i>) in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Baltray- 17.67ha, Mornington- 8.76ha. See map 6	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). Habitat mapped at two sub-sites surveyed, giving a total estimated area of 26.43ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from McCorry and Ryle (2009). At Baltray there has been some extensive recent development of ASM. At Mornington the saltmarsh may have been more extensive in the past. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Baltray and Mornington saltmarsh development likely to be affected by the construction of navigation walls in the past and dredging of the main channel. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). Creek and pan structures are well-developed in some parts of Baltray and Mornington but modified in other areas by drainage channels. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). At Baltray and Mornington there are zonations within the saltmarsh habitats as well as transitions to adjacent sand dune systems. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). The saltmarshes at Baltray and Mornington are ungrazed by livestock and the sward height is quite variable. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	See coastal habitats supporting document for further details

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1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To maintain the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia*) in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). <i>Spartina</i> is well established at this site. Swards of <i>Spartina</i> are widespread at Baltray and there has been significant expansion of <i>Spartina</i> at Mornington since 2000. See coastal habitats supporting document for further details

Table 14

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

The status of Mediterranean salt meadows (*Juncetalia maritimi*) as a qualifying Annex I habitat for Boyne Coast and Estuary SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat.

Attribute	Measure	Target	Notes

Table 15

2110 Embryonic shifting dunes			
To restore the favourable conservation condition of Embryonic shifting dunes in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Baltray- 2.52ha, Mornington- 0.67ha. See map 7	Based on data from the Coastal Monitoring Project (Ryle et al., 2009). Habitat is very difficult to measure in view of its dynamic nature and was recorded at both sub-sites, giving a total estimated area of 3.18ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. The training wall at the mouth of the Boyne Estuary has led to an accumulation of sand at Mornington and enhanced the development of dunes at the northern section. The dunes are accreting at the southern end of Baltray, with wide areas of embryonic dune and strandine fronting mobile and fixed dunes. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009). Both sand dune systems at Baltray and Mornington occur adjacent to extensive estuarine saltmarshes. See coastal habitats supporting document for further details
Vegetation composition: plant health of foredune grasses	Percentage cover	More than 95% of sand couch (<i>Elytrigia juncea</i>) and/or lyme-grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species: sand couch (<i>Elytrigia juncea</i>) and/or lyme-grass (<i>Leymus arenarius</i>)	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details

Continued overleaf...

2110 Embryonic shifting dunes

To restore the favourable conservation condition of Embryonic shifting dunes in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea buckthorn (<i>Hippophae rhamnoides</i>) should be absent or effectively controlled. See coastal habitats supporting document for further details

Table 16

2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')			
To restore the favourable conservation condition of Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Baltray- 2.97ha, Mornington- 1.99ha. See map 7	Habitat was mapped during the Coastal Monitoring Project (Ryle et al. 2009). Habitat was recorded at both sub-sites, giving a total estimated area of 4.97ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009). Shifting dunes were recorded at both Baltray and Mornington sub-sites. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Marram (<i>Ammophila arenaria</i>) reproduces vegetatively and requires constant accretion of fresh sand to maintain active growth encouraging further accretion. The training wall at the mouth of the Boyne Estuary has led to an accumulation of sand at Mornington and enhanced the development of dunes at the northern section. The dunes are accreting at the southern end of Baltray, with wide areas of embryonic dune and strandine fronting mobile and fixed dunes. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Gaynor (2008) and Ryle et al. (2009). Both sand dune systems at Baltray and Mornington occur adjacent to extensive estuarine saltmarshes. See coastal habitats supporting document for further details
Vegetation composition: plant health of dune grasses	Percentage cover	More than 95% of marram (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>)	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details

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2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea buckthorn (<i>Hippophae rhamnoides</i>) should be absent or effectively controlled. Ragwort (<i>Senecio jacobaea</i>) was recorded from Mobile dunes at both Baltray and Mornington. See coastal habitats supporting document for further details

Table 17

2130 *Fixed coastal dunes with herbaceous vegetation ('grey dunes')			
To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Baltray-26.41ha; Mornington-20.46ha. See map 7	Based on data from the Coastal Monitoring Project (Ryle et al., 2009). Habitat was recorded at both sub-sites, giving a total estimated area of 46.87ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from the Coastal Monitoring Project (Ryle et al., 2009). Fixed dunes recorded at both Baltray and Mornington. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers.	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from the Coastal Monitoring Project (Ryle et al., 2009). The training wall at the mouth of the Boyne Estuary has led to an accumulation of sand at Mornington and enhanced the development of dunes at the northern section. The dunes are accreting at the southern end of Baltray, with wide areas of embryonic dune and strandine fronting mobile and fixed dunes. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009). Both sand dune systems at Baltray and Mornington occur adjacent to extensive estuarine saltmarshes. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008) and Ryle et al. (2009). The estimated area of bare sand at Mornington currently accounts for greater than 10% of the fixed dune habitat. See coastal habitats supporting document for further details
Vegetation composition: sward height	Centimeters	Maintain structural variation within sward	Based on data from Gaynor (2008) and Ryle et al. (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Ryle et al. (2009)	Based on data from Gaynor (2008) and Ryle et al. (2009). The locally rare species viper's bugloss (<i>Echium vulgare</i>) was recorded in the fixed dunes at Baltray. Mornington is the most northerly known site in Ireland for wild clary (<i>Salvia verbenaca</i>). See coastal habitats supporting document for further details

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2130 *Fixed coastal dunes with herbaceous vegetation ('grey dunes')			
To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Boyne Coast and Estuary SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea buckthorn (<i>Hippophae rhamnoides</i>) should be absent or effectively controlled. At both Baltray and Mornington, creeping thistle (<i>Cirsium arvense</i>), ragwort (<i>Senecio jacobaea</i>) and common nettle (<i>Urtica dioica</i>) were recorded in fixed dunes. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details

2.5.2.5 Baseline Conservation Status of the site

A synopsis of the conservation status of this site is provided in Table 18 and Table 19.

Table 18: Habitat types present on site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A B C D	A B C		
						Representativity	Relative Surface	Conservation	Global
1130			119.61		M	C	C	C	C
1140			377.71		M	C	B	C	C
1310			6.3		M	C	C	C	C
1320			6.3		M	D			
1330			18.89		M	B	C	C	C
1410			6.3		M	C	C	C	C
2110			6.3		M	B	C	B	B
2120			6.3		M	C	C	B	C
2130			31.48		M	B	C	C	C

Table 19: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site					Site assessment				
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D		A B C	
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A052	Anas crecca			w	185	185	i		G	C	B	C	C
B	A050	Anas penelope			w	485	485	i		G	C	B	C	C
B	A053	Anas platyrhynchos			w	160	160	i		G	C	B	C	C
B	A169	Arenaria interpres			w	104	104	i		G	C	B	C	B
B	A046	Branta bernicla			w	142	142	i		G	C	B	C	B
B	A144	Calidris alba			w	93	93	i		G	B	B	C	B
B	A149	Calidris alpina			w	627	627	i		G	C	B	C	C
B	A143	Calidris canutus			w	1599	1599	i		G	B	B	C	A
B	A137	Charadrius hiaticula			w	103	103	i		G	C	B	C	B
B	A130	Haematopus ostralegus			w	922	922	i		G	C	B	C	C
B	A157	Limosa lapponica			w	77	77	i		G	C	C	C	C
B	A156	Limosa limosa			w	414	414	i		G	B	A	C	A
B	A070	Mergus merganser			w	18	18	i		G	C	B	C	C
B	A160	Numenius arquata			w	352	352	i		G	C	B	C	C
B	A017	Phalacrocorax carbo			w	75	75	i		G	C	B	C	C
B	A140	Pluvialis apricaria			w	5338	5338	i		G	B	B	C	B
B	A141	Pluvialis squatarola			w	112	112	i		G	B	B	C	B
		Sterna												
B	A195	albifrons			r		20	p		G	B	B	C	B
B	A048	Tadorna tadorna			w	176	176	i		G	C	B	C	B
B	A162	Tringa totanus			w	539	539	i		G	B	B	C	B
B	A142	Vanellus vanellus			w	4755	4755	i		G	B	B	C	B

2.5.3 River Boyne and River Blackwater SAC (Site synopsis version date 06/01/2014, Natura 2000 form update 09/19, Conservation Objectives Version 1)

2.5.3.1 General Description

This site comprises most of the freshwater element of the River Boyne from upriver of the Boyne Aqueduct at Drogheda, the Blackwater River as far as Lough Ramor and the principal Boyne tributaries, notably the Deel, Stoneyford and Tremblestown Rivers. This system drains a considerable area of Cos. Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. The rivers flow through a landscape dominated by intensive agriculture, mostly of improved grassland but also cereals. Much of the river channels were subject to arterial drainage schemes in the past. Natural floodplains now exist along only limited stretches of river, though often there is a fringe of reed swamp, freshwater marsh, wet grassland or deciduous wet woodland. Along some parts, notably between Drogheda and Slane, are stands of tall, mature mixed woodland. Substantial areas of improved grassland and arable land are included in site for water quality reasons. There are many medium to large sized towns adjacent to but not within the site.

The main channel of the Boyne contains a good example of alluvial woodland of the *Salicetum albo-fragilis* type which has developed on three alluvium islands. Alkaline fen vegetation is well represented at Lough Shesk, where there is a very fine example of habitat succession from open water to raised bog. The Boyne and its tributaries is one of Ireland's premier game fisheries and offers a wide range of angling, from fishing for spring salmon and grilse to sea trout fishing and extensive brown trout fishing. The site is one of the most important in eastern Ireland for *Salmo salar* and has very extensive spawning grounds. The site also has an important population of *Lampetra fluviatilis*, though the distribution or abundance of this species is not well known. *Lutra lutra* is widespread throughout the site. Some of the grassland areas along the Boyne and Blackwater are used by a nationally important winter flock of *Cygnus cygnus*. Several Red Data Book plants occur within the site, with *Pyrola rotundifolia*, *Poa palustris* and *Juncus compressus*. Also occurring are a number of Red Data Book animals, notably *Meles meles*, *Martes martes* and *Rana temporaria*. The River Boyne is a designated Salmonid Water under the EU Freshwater Fish Directive.

2.5.3.2 Qualifying Interests

The qualifying interests for this site are indicated in Table 20.

Table 20

Qualifying Interests	
<i>* indicates a priority habitat under the Habitats Directive</i>	
002299	River Boyne and River Blackwater SAC
1099	River Lamprey <i>Lampetra fluviatilis</i>
1106	Salmon <i>Salmo salar</i>
1355	Otter <i>Lutra lutra</i>
7230	Alkaline fens
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)*

2.5.3.3 Threats, pressures and activities with negative impacts on the site

Details as to the threats, pressures and activities with negative impacts on the site are identified from the Natura 2000 data form for the sites and are illustrated in Table 21.

Table 21: Threats, pressures and activities with impacts on the site

Negative Impacts				Positive Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]	Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
M	G02.10		i	M	A03		i
H	H01		i	H	J02.05.02		i
L	D01.05		i				
M	A07		i				
M	A08		i				
M	A05.02		o				
L	G01		i				
H	J02.15		i				
M	A01		i				
M	A10.01		i				
M	C01.01		i				
L	G05.06		i				
L	G05		i				
M	A10.01		i				
M	E05		i				
M	E01.04		i				
M	J02.11		i				
M	J02.10		i				
M	D01.02		i				
M	E03.02		i				
H	E03.04		i				
M	J02		i				
H	E02		i				
H	I01		i				
M	B01.02		i				

Rank: H = high, M = medium, L = low
 Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
 T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
 i = inside, o = outside, b = both

2.5.3.4 Conservation Objectives of the site

A detailed Conservation Objectives document for this site has been prepared and is available at:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002299.pdf

The Conservation Objectives for this site are outlined in Table 22, Table 23, Table 24, Table 25 and Table 26.

Table 22

Conservation Objectives for : River Boyne and River Blackwater SAC [002299]			
7230 Alkaline fens			
To maintain the favourable conservation condition of Alkaline fens in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Alkaline fen has not been mapped in detail for River Boyne and River Blackwater SAC and thus the exact total current area of the qualifying habitat in the SAC is currently unknown. The main areas of alkaline fen in the SAC are documented to occur in the vicinity of Lough Shesk, Freekan Lough, Newtown Lough in the upper reaches of the Stonyford River. At Lough Shesk, the habitat is particularly well-represented and there is a good example of succession from open water to fen-type habitat (NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See the notes for habitat area above
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat in NPWS (2013). See also Bobbink and Hettelingh (2011). Increased nutrients can lead to changes in plant and invertebrate species through competition and subsequent structural changes to micro-habitat. These nutrients favour growth of grasses rather than forbs and mosses and leads to a higher and denser sward
Ecosystem function: peat formation	Percentage cover of peat-forming vegetation and water table levels	Maintain active peat formation, where appropriate	In order for peat to form, water levels need to be slightly below or above the soil surface for c.90% of the time
Ecosystem function: hydrology - groundwater levels	Water levels (centimetres); duration of levels; hydraulic gradients; water supply levels	Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat	Fen habitats require high groundwater levels (i.e. water levels at or above the ground surface) for a large proportion of the calendar year (i.e. duration of mean groundwater level). Fen groundwater levels are controlled by regional groundwater levels in the contributing catchment area (which sustain the hydraulic gradients of the fen groundwater table). Regional abstraction of groundwater may affect fen groundwater levels
Ecosystem function: hydrology - surface water flow	Drain density and form	Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions	Drainage, either within or surrounding the fen habitat, can result in the drawdown of the groundwater table. The depth, geometry and density of drainage (hydromorphology) will indicate the scale and impact on fen hydrology. Drainage can result in loss of characteristic species and transition to drier habitats
Ecosystem function: water quality	Various	Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat	Fens receive natural levels of nutrients (e.g. iron, magnesium and calcium) from water sources. However, they are generally poor in nitrogen and phosphorus, with the latter tending to be the limiting nutrient under natural conditions. Water supply should be also relatively calcium-rich
Vegetation composition: community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The entire diversity of alkaline fen vegetation communities present in the SAC is currently unknown. Information on the vegetation communities associated with alkaline fens is provided by O'Neill et al. (in prep.). See also the Irish Vegetation Classification (Perrin, 2018; www.biodiversityireland.ie/projects/ivc-classification-explorer)

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Vegetation composition: typical brown mosses	Percentage cover at a representative number of monitoring stops	Maintain adequate cover of typical brown moss species	For lists of typical bryophyte species, including high quality indicator species, see O'Neill et al. (in prep.). Species recorded at Lough Shek and Newtown Lough include: <i>Calliergon giganteum</i> , <i>Scorpidium scorpioides</i> , <i>Campylium stellatum</i> , <i>Bryum pseudotriquetrum</i> , <i>Fissidens adianthoides</i> , <i>Scorpidium scorpioides</i> , <i>Calliergonella cuspidata</i> and <i>Ctenidium molluscum</i> (NPWS internal files)
Vegetation composition: typical vascular plants	Percentage cover at a representative number of monitoring stops	Maintain adequate cover of typical vascular plant species	For lists of typical vascular plant species for the different vegetation communities, including high quality indicators, see O'Neill et al. (in prep.). Typical species recorded in the habitat in the SAC include black bog-rush (<i>Schoenus nigricans</i>), dioecious sedge (<i>C. dioica</i>) and common butterwort (<i>Pinguicula vulgaris</i>) (NPWS internal files)
Vegetation composition: native negative indicator species	Percentage cover at a representative number of monitoring stops	Cover of native negative indicator species at insignificant levels	Negative indicators include species not characteristic of the habitat and species indicative of undesirable activities such as overgrazing, undergrazing, nutrient enrichment, agricultural improvement or impacts on hydrology. Native negative indicators may include <i>Anthoxanthum odoratum</i> , <i>Epilobium hirsutum</i> , <i>Holcus lanatus</i> , <i>Juncus effusus</i> , <i>Phragmites australis</i> and <i>Ranunculus repens</i> . See O'Neill et al. (in prep.)
Vegetation composition: non-native species	Percentage cover at a representative number of monitoring stops	Cover of non-native species less than 1%	Attribute and target based on O'Neill et al. (in prep.). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on O'Neill et al. (in prep.). Scrub and trees will tend to invade if fen conditions become drier
Vegetation composition: algal cover	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of algae less than 2%	Attribute and target based on O'Neill et al. (in prep.). Algal cover is indicative of nutrient enrichment from multiple sources (McBride et al., 2011)
Vegetation structure: vegetation height	Percentage cover at a representative number of monitoring stops	At least 50% of the live leaves/flowering shoots are more than either 5cm or 15cm above ground surface depending on community type	Attribute and target based on O'Neill et al. (in prep.). While grazing may be appropriate in this habitat, excessive grazing can reduce the ability of plant species to regenerate reproductively and maintain species diversity, especially if flowering shoots are cropped during the growing season
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of disturbed bare ground not more than 10%	Attribute and target based on O'Neill et al. (in prep.). While grazing may be appropriate in this habitat, excessive areas of disturbed bare ground may develop due to unsuitable grazing regimes. Disturbance can include hoof marks, wallows, human footprints, vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for peatlands
Physical structure: tufa formations	Percentage cover in local vicinity of a representative number of monitoring stops	Disturbed proportion of vegetation cover where tufa is present is less than 1%	Attribute and target based on O'Neill et al. (in prep.)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). The Near Threatened species (Wyse Jackson et al., 2016) round-leaved wintergreen (<i>Pyrola rotundifolia</i>) has been recorded in the habitat around Newtown Lough in the SAC (NPWS internal files)
Transitional areas between fen and adjacent habitats	Hectares; distribution	Maintain adequate transitional areas to support/protect the alkaline fen ecosystem and the services it provides	In many cases, fens transition to other wetland habitats. It is important that the transitional areas between fens and other habitats are maintained in as natural condition as possible in order to protect the functioning of the fen

Table 23

Conservation Objectives for : River Boyne and River Blackwater SAC [002299]			
91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)*			
To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes. See map 3 for surveyed woodland areas	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* is present within River Boyne and River Blackwater SAC. As part of the National Survey of Native Woodlands (NSNW), the sub-sites Grove Island (NSNW site code 688) and Yellow Island (752) were surveyed by Perrin et al. (2008). Yellow Island (code 752) was also included in national monitoring surveys (O'Neill and Barron, 2013; Daly et al., in prep.). Map 3 shows the minimum area of alluvial forests within the SAC, which is estimated to be 16.7ha (Perrin et al., 2008; Daly et al., in prep.). It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. The surveyed woodland locations are shown on map 3	Distribution based on Perrin et al. (2008) and Daly et al. (in prep.). It is important to note that further unsurveyed areas may be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). In some cases, topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%	The target aims for a diverse structure with a canopy containing mature trees, shrub layer with semi-mature trees and shrubs, and well-developed field layer (herbs, graminoids and dwarf shrubs) and ground layer (bryophytes). Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	The Boyne River Islands are an example of gallery forests of willows (<i>Salicion albae</i>), which occur alongside river channels and on river islands, where tree roots are almost continuously submerged (Daly et al., in prep.). Grove Island (NSNW site code 688) and Yellow Island (752) were assigned by Perrin et al. (2008) to the <i>Salix triandra – Urtica dioica</i> vegetation type (2h) of the <i>Fraxinus excelsior – Hedera helix</i> group. This corresponds to the <i>Salix fragilis – Calystegia sepium</i> sub-community (WL3Di) of the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/ivc-classification-explorer)
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	The target species for 91E0* are alder (<i>Alnus glutinosa</i>), ash (<i>Fraxinus excelsior</i>) and willows (<i>Salix</i> spp.). Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)

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Hydrological regime: flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river and lake floodplains, but not for woodland around springs/seepage areas. Much of the river channel within the SAC was subject to arterial drainage schemes. Natural flood-plains now exist along only limited stretches of river (NPWS internal files)
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem
Woodland structure: veteran trees	Number per hectare	No decline	Veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local distinctiveness	Occurrence; population size	No decline in distribution and, in the case of red listed and other rare or localised species, population size	Includes ancient or long-established woodlands (see Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species
Woodland structure: indicators of overgrazing	Occurrence	All five indicators of overgrazing absent	There are five indicators of overgrazing within 91E0*: topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, severe recent bark stripping, and trampling (Daly et al., in prep.)
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The target species for 91E0* are alder (<i>Alnus glutinosa</i>), ash (<i>Fraxinus excelsior</i>) and willows (<i>Salix</i> spp.) (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: typical species	Occurrence	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present	A variety of typical native species should be present, depending on woodland type. The target species for 91E0* are alder (<i>Alnus glutinosa</i>), ash (<i>Fraxinus excelsior</i>) and willows (<i>Salix</i> spp.). Positive indicator species for 91E0* are listed in Daly et al. (in prep.) and O'Neill and Barron (2013)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Negative indicator species (i.e. any non-native species, including herbaceous species) should be absent or under control. The canopy at Grove Island (NSNW site code 688) and Yellow Island (752) is dominated by a range of <i>Salix</i> spp. (<i>S. cinerea</i> , <i>S. triandra</i> , <i>S. fragilis</i> , <i>S. viminalis</i>) (Perrin et al., 2008). Although the latter two are not native to Ireland, an exception is made for these species where they occur within gallery woodland (Daly et al., in prep.). Perrin et al. (2008) recorded some sycamore (<i>Acer pseudoplatanus</i>) in the canopy at Grove Island (NSNW site code 688). Daly et al. (in prep.) found that the recent arrival of the invasive non-native herb Himalayan balsam (<i>Impatiens glandulifera</i>) at Yellow Island (752) has caused significant negative impacts to the alluvial forest habitat
Vegetation composition: problematic native species	Percentage	Cover of common nettle (<i>Urtica dioica</i>) less than 75%	Common nettle (<i>Urtica dioica</i>) is a positive indicator species for 91E0* but, in some cases, it may become excessively dominant. Increased light and nutrient enrichment are factors which favour proliferation of common nettle (Daly et al., in prep.)

Table 24

Conservation Objectives for : River Boyne and River Blackwater SAC [002299]			
1099 River Lamprey <i>Lampetra fluviatilis</i>			
To restore the favourable conservation condition of River Lamprey (<i>Lampetra fluviatilis</i>) in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Distribution	Percentage of river accessible	Restore access to all water courses down to first order streams	Artificial barriers can block or impede the passage of upstream migrating lamprey, thereby restricting access to spawning areas (Gargan et al., 2011; Rooney et al., 2015). There are a number of weirs along the lower sections of the Boyne main channel, the most substantial of these are located at Slane and downstream of Navan at Blackcastle. Efforts to trap adult river lamprey were undertaken at four locations throughout the catchment during November 2014 to April 2015. This was augmented in April 2015 by an extensive fyke-netting survey (n=26 sites). No adult river lamprey were encountered, with the only record to date being a dead individual from the River Boyne at Slane in late March 2015 (Gallagher et al., 2016). On the Boyne main channel, there is ideal spawning habitat both upstream and downstream of the weir at Blackcastle but spawning has not been observed at these locations to date.
Distribution of larvae	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	Not less than 50% of sample sites with suitable habitat positive for larval brook/river lamprey	It is not possible to distinguish between larval brook and river lamprey in the field and they are therefore considered together in assessing conservation status. A survey of the Boyne catchment in 2015 recorded n=583 <i>Lampetra</i> spp. larvae from n=102 sites (Gallagher et al., 2016). As stated, the weirs in the lower main stem are a significant impediment to river lamprey passage and, for this reason, these larvae are considered to be mainly, if not all, brook lamprey. To achieve favourable condition <i>Lampetra</i> spp. should, as a minimum, be present in not less than 50% of all sampling sites surveyed with suitable habitat present within the natural range (JNCC, 2015). <i>Lampetra</i> spp. larvae were recorded from 72% of sites indicating a pass for this target. Distribution remained similar to a 2005 survey (O'Connor, 2006) although larvae continued to be absent from the Boycetown and Skane Rivers, as well as the upper reaches of the Kells Blackwater system.
Population structure of larvae	Number of age/size classes	At least three age/size classes of larval brook/river lamprey present	The target of at least three age/size classes is based on guidance from JNCC (2015). Larvae typically range from 10-150mm in length and this corresponds to up to six age classes. A broad range of size classes (12-153mm), including young-of-year larvae, was recorded from the 2015 Boyne catchment-wide survey indicating a pass for this target. However, given the issue of artificial barriers on the River Boyne, it is likely that this value pertains to brook lamprey, as previously stated.
Larval lamprey density in fine sediment	Larval lamprey/m ²	Mean density of brook/river larval lamprey in sites with suitable habitat more than 5/m ²	A target mean density of more than 5/m ² larvae in sites with suitable habitat is required to achieve favourable condition (JNCC, 2015). In the Boyne survey a mean density of 6/m ² <i>Lampetra</i> spp. larvae (n=583) was obtained. A number of tributaries did not achieve a pass for this target, including the Athboy/Tremblestown, Boycetown, Deel, Skane and Stonyford Rivers. Again, the overall mean density value is most likely indicative of the status of brook lamprey in the Boyne catchment.
Extent and distribution of spawning nursery habitat	m ² and occurrence	No decline in extent and distribution of spawning and nursery beds	This target is based on spawning and nursery bed mapping during targeted larval lamprey monitoring surveys. River lamprey spawn in clean gravels in flowing water where they excavate shallow nests. While coarse substrate is required for spawning, the close proximity of nursery areas comprising mainly sand/silt are necessary for the development of larvae. The 2015 Boyne survey recorded adequate spawning and nursery habitat availability within the catchment (Gallagher et al., 2016). However, the sequence of weirs in the lower main channel of the Boyne represents a significant impediment to upstream passage. In addition, this lower section of river is in a degraded hydromorphological state with impounding and, therefore, poor habitat availability for spawning.

Table 25

Conservation Objectives for : River Boyne and River Blackwater SAC [002299]			
1106 Salmon <i>Salmo salar</i>			
To restore the favourable conservation condition of Atlantic Salmon (<i>Salmo salar</i>) in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. There are multiple barriers to fish migration in the Boyne system
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	A conservation limit (CL) is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Technical Expert Group on Salmon's (TEGOS) annual model output of CL attainment levels. See Gargan et al. (2021) for further details. Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The Boyne is significantly below its CL
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL)
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, predation and sea lice (<i>Lepeophtheirus salmonis</i>)
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels. There is restricted habitat for salmon in the Boyne and habitat rehabilitation programmes have been undertaken in sections of the catchment
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)

Table 26:

Conservation Objectives for : River Boyne and River Blackwater SAC [002299]			
1355 Otter <i>Lutra lutra</i>			
To maintain the favourable conservation condition of Otter (<i>Lutra lutra</i>) in River Boyne and River Blackwater SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. Favourable Conservation Status (FCS) target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 447.6ha along river banks/ lake shoreline/around ponds	No field survey. Areas mapped to include 10m terrestrial buffer, identified as critical for otters (NPWS, 2007), along rivers and around water bodies
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 263.3km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 31.6ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk and Moorhouse, 1991; Kruuk, 2006)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m, e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed

2.5.3.5 Baseline Conservation Status of the site

A synopsis of the conservation status of this site is provided in Table 27 and Table 28.

Table 27: Habitat types present on site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A B C D	A B C		
						Representativity	Relative Surface	Conservation	Global
7230			23.21		M	B	C	B	B
91E0			23.21		M	B	B	B	B

Table 28: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species			Population in the site							Site assessment				
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D	A B C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A038	Cygnus cygnus			w	50	200	i		G	C	B	C	B
F	1099	Lampetra fluviatilis			r				P	DD	C	B	C	B
M	1355	Lutra lutra			p				P	DD	C	A	C	A
F	1106	Salmo salar			r				C	DD	C	B	C	B

2.5.4 Boyne Estuary SPA (Site synopsis version date 30/05/15, Natura 2000 form update 09/18, Conservation Objectives version 1.0)

2.5.4.1 General Description

This moderately-sized coastal site, which is situated below the town of Drogheda, comprises most of the estuary of the Boyne River, a substantial river which drains a large catchment. Apart from one section which is over 1 km wide, the width is mostly less than 500 m. The main river channel, which is navigable and dredged, is defined by training walls, the latter being breached in places. Intertidal flats occur on the sides of the channelled river. The sediments vary from fine muds in the innermost areas

to sandy muds or sands towards the mouth. The linear stretches of intertidal flats to the north and south of the river mouth are mainly sands. Intertidal areas are fringed by salt marshes in the inner sheltered areas. *Spartina* is frequent on the flats and salt marshes. The Boyne Estuary is one of the most important sites for wintering waterfowl on the east coast. It has a total of 10 species with populations of national importance - of particular note is that it supports 7.0% of the national total of *Calidris canutus* and 4.0% of the total for *Pluvialis apricaria*. Other species which have populations of national importance include *Tadorna tadorna*, *Haematopus ostralegus*, *Vanellus vanellus*, *Limosa limosa*, *Tringa totanus* and *Arenaria interpres*. The site provides both feeding and roosting areas for the birds. *Sterna albifrons* bred in the past but successful breeding has not occurred since 1996.

2.5.4.2 Qualifying Interests

A detailed Conservation Objectives Document has been prepared for this site. The qualifying interests of the site are identified in Table 29.

Table 29

Qualifying Interests	
* indicates a priority habitat under the Habitats Directive	
004080	Boyne Estuary SPA
A048	Shelduck <i>Tadorna tadorna</i>
A130	Oystercatcher <i>Haematopus ostralegus</i>
A140	Golden Plover <i>Pluvialis apricaria</i>
A141	Grey Plover <i>Pluvialis squatarola</i>
A142	Lapwing <i>Vanellus vanellus</i>
A143	Knot <i>Calidris canutus</i>
A144	Sanderling <i>Calidris alba</i>
A156	Black-tailed Godwit <i>Limosa limosa</i>
A162	Redshank <i>Tringa totanus</i>
A169	Turnstone <i>Arenaria interpres</i>
A195	Little Tern <i>Sterna albifrons</i>
A999	Wetlands

2.5.4.3 Threats, pressures, and activities with negative impacts on the site

Details as to the threats, pressures, and activities with negative impacts on the site are identified from the Natura 2000 data form for the sites and are illustrated in Table 30.

Table 30: Threats, pressures and activities with impacts on the site

Negative Impacts				Positive Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]	Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
M	E01		o	H	G02.01		o
M	F01		i	M	F01		i
M	G02.01		o	L	F02.03		i
H	G01.02		i				
H	I01		i				
H	J02.11		i				
H	J02.01.02		i				
H	J02.05		i				
L	F02.03		i				

Rank: H = high, M = medium, L = low
 Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
 i = inside, o = outside, b = both

2.5.4.4 Conservation Objectives of the site

A detailed Conservation Objectives Document has been prepared for this site and is available to download from:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004080.pdf

Details from this document are reproduced here. The Conservation Objectives of the site are outlined in Table 31, Table 32, Table 33, Table 34, Table 35, Table 36, Table 37, Table 38, Table 39, Table 40, Table 41 and Table 42.

Table 31

Conservation Objectives for : Boyne Estuary SPA [004080]			
A048		Shelduck <i>Tadorna tadorna</i>	
To maintain the favourable conservation condition of Shelduck in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 32

Conservation Objectives for : Boyne Estuary SPA [004080]			
A130		Oystercatcher <i>Haematopus ostralegus</i>	
To maintain the favourable conservation condition of Oystercatcher in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 33

Conservation Objectives for : Boyne Estuary SPA [004080]			
A140		Golden Plover <i>Pluvialis apricaria</i>	
To maintain the favourable conservation condition of Golden Plover in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 34

Conservation Objectives for : Boyne Estuary SPA [004080]			
A141		Grey Plover <i>Pluvialis squatarola</i>	
To maintain the favourable conservation condition of Grey Plover in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 35

Conservation Objectives for : Boyne Estuary SPA [004080]			
A142		Lapwing <i>Vanellus vanellus</i>	
To maintain the favourable conservation condition of Lapwing in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 36

Conservation Objectives for : Boyne Estuary SPA [004080]			
A143		Knot <i>Calidris canutus</i>	
To maintain the favourable conservation condition of Knot in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 37

Conservation Objectives for : Boyne Estuary SPA [004080]			
A144 Sanderling <i>Calidris alba</i>			
To maintain the favourable conservation condition of Sanderling in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 38

Conservation Objectives for : Boyne Estuary SPA [004080]			
A156 Black-tailed Godwit <i>Limosa limosa</i>			
To maintain the favourable conservation condition of Black-tailed Godwit in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 39

Conservation Objectives for : Boyne Estuary SPA [004080]			
A162 Redshank <i>Tringa totanus</i>			
To maintain the favourable conservation condition of Redshank in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 40

Conservation Objectives for : Boyne Estuary SPA [004080]			
A169 Turnstone <i>Arenaria interpres</i>			
To maintain the favourable conservation condition of Turnstone in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 41

Conservation Objectives for : Boyne Estuary SPA [004080]			
A195 Little Tern <i>Sterna albifrons</i>			
To maintain the favourable conservation condition of Little Tern in Boyne Estuary SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Mitchell et al. (2004) provides summary population information for Louth. The Seabird Monitoring Programme (SMP) also provides background data (JNCC, 2013). In 2010, 43 breeding pairs were recorded at this colony (Reilly, 2010)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). For 2010, an estimated productivity rate of 2.2 fledged birds per breeding pair was reported (Reilly, 2010)
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	Little tern nest in well-camouflaged shallow scrapes on sand and shingle beaches, spits or inshore islets (Mitchell et al., 2004). For a description of the area used by the colony in 2010, see Reilly (2010)
Prey biomass available	Kilogrammes	No significant decline	Key prey items: Mainly small, often juvenile, fish; invertebrates, especially crustaceans and insects. Key habitats: Very shallow water, advancing or receding tidelines, brackish lagoons and saltmarsh creeks, sand-banks close to the coast. Foraging range: Max 11km, mean max 6.94km, mean 4.14km (BirdLife International Seabird Database (Birdlife International, 2013))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of the marine waters adjacent to their breeding colonies. Foraging range: Max 11km, mean max 6.94km, mean 4.14km (BirdLife International Seabird Database (Birdlife International, 2013))
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding little tern population	Little tern nest in well-camouflaged shallow scrapes on sand and shingle beaches, spits or inshore islets (Mitchell et al., 2004)

Table 42

Conservation Objectives for : Boyne Estuary SPA [004080]			
A999		Wetlands	
To maintain the favourable conservation condition of the wetland habitat in Boyne Estuary SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 594ha, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 594ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

2.5.4.5 *Baseline Conservation Status of the site*

A synopsis of the conservation status of this site is provided in Table 43.

Table 43: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species			Population in the site							Site assessment				
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D		A B C	
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A052	Anas crecca			w	230	230	i		G	C	B	C	C
B	A050	Anas penelope			w	454	454	i		G	C	B	C	C
B	A053	Anas platyrhynchos			w	197	197	i		G	C	B	C	C
B	A169	Arenaria interpres			w	175	175	i		G	C	B	C	B
B	A046	Branta bernicla			w	172	172	i		G	C	B	C	C
B	A144	Calidris alba			w	69	69	i		G	C	B	C	B
B	A149	Calidris alpina			w	480	480	i		G	C	B	C	C
B	A143	Calidris canutus			w	1771	1771	i		G	B	B	C	A
B	A137	Charadrius hiaticula			w	80	80	i		G	C	B	C	C
B	A130	Haematopus ostralegus			w	1099	1099	i		G	C	B	C	B
B	A182	Larus canus			w	145	145	i		G	C	B	C	C
B	A179	Larus ridibundus			w	593	593	i		G	C	B	C	C
B	A157	Limosa lapponica			w	76	76	i		G	C	C	C	C
B	A156	Limosa limosa			w	471	471	i		G	B	A	C	A
B	A069	Mergus serrator			w	14	14	i		G	C	B	C	C
B	A160	Numenius arquata			w	395	395	i		G	C	B	C	C
B	A017	Phalacrocorax carbo			w	97	97	i		G	C	B	C	C
B	A140	Pluvialis apricaria			w	6070	6070	i		G	B	B	C	B
B	A141	Pluvialis squatarola			w	98	98	i		G	C	B	C	B
B	A195	Sterna albifrons			r				P	M	C	C	C	C
B	A048	Tadorna tadorna			w	218	218	i		G	C	B	C	B
B	A164	Tringa nebularia			w	6	6	i		G	C	B	C	C
B	A162	Tringa totanus			w	583	583	i		G	C	A	C	B
B	A142	Vanellus vanellus			w	4657	4657	i		G	B	B	C	B

2.5.5 River Nanny Estuary and Shore SPA (Site synopsis version date 20/01/15, Natura 2000 form update 09/18, Conservation Objectives version 1.0)

There is a conservation objectives document for this site (www.npws.ie) from which the following is sourced, in addition to site synopses and Natura 2000 data form.

2.5.5.1 General Description

The site comprises the estuary of the River Nanny and sections of the shoreline to the north and south of the estuary (c.3 km in length). The estuarine channel, which extends inland for almost 2 km, is narrow and well sheltered. Sediments are muddy in character and edged by saltmarsh and freshwater marsh/wet grassland. The shoreline, which is approximately 500 m in width to the low tide mark, comprises beach and intertidal habitats. It is a well-exposed shore, with coarse sand sediments. The well-developed beaches, which are backed in places by clay cliffs, provide high tide roosts for the birds. The village of Laytown occurs on the northern side of the River Nanny estuary. This is an important east coast site, with nationally important populations of *Pluvialis apricaria*, *Haematopus ostralegus*, *Charadrius hiaticula*, *Calidris cantus*, *Calidris alba* and *Larus argentatus*. The population of *Calidris canutus* and *Calidris alba* are of particular note as they represent 4% and 3.8% of the respective all-Ireland totals. A range of other waterfowl species also occur, including *Branta bernicla hrota*, as well as *Larus* gulls.

2.5.5.2 Qualifying Interests

A detailed Conservation Objectives Document has been prepared for this site. The qualifying interests of the site are identified in Table 44.

Table 44

Qualifying Interests		
* indicates a priority habitat under the Habitats Directive		
004158	River Nanny Estuary and Shore SPA	
A130	Oystercatcher <i>Haematopus ostralegus</i>	wintering
A137	Ringed Plover <i>Charadrius hiaticula</i>	wintering
A140	Golden Plover <i>Pluvialis apricaria</i>	wintering
A143	Knot <i>Calidris canutus</i>	wintering
A144	Sanderling <i>Calidris alba</i>	wintering
A184	Herring Gull <i>Larus argentatus</i>	wintering
A999	Wetlands	

2.5.5.3 Threats, pressures and activities with negative impacts on the site

Details as to the threats, pressures, and activities with negative impacts on the site are identified from the Natura 2000 data form for the sites and are illustrated in Table 45.

Table 45: Threats, pressures and activities impacting on the site

Negative Impacts				Positive Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]	Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
M	G01.02		i	M	G01.02		i
M	E01.01		o				

Rank: H = high, M = medium, L = low
 Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
 i = inside, o = outside, b = both

2.5.5.4 Conservation Objectives

A detailed Conservation Objectives Document has been prepared for this site (www.npws.ie). The Conservation Objectives of the site are outlined in Table 46, Table 47, Table 48, Table 49, Table 50, Table 51 and Table 52.

Table 46

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A130 Oystercatcher <i>Haematopus ostralegus</i>			
To maintain the favourable conservation condition of Oystercatcher in River Nanny Estuary and Shore SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by oystercatcher other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 47

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A137 Ringed Plover <i>Charadrius hiaticula</i>			
To maintain the favourable conservation condition of Ringed Plover in River Nanny Estuary and Shore SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by ringed plover other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 48

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A140 Golden Plover <i>Pluvialis apricaria</i>			
To maintain the favourable conservation condition of Golden Plover in River Nanny Estuary and Shore SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by golden plover other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 49

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A143 Knot <i>Calidris canutus</i>			
To maintain the favourable conservation condition of Knot in River Nanny Estuary and Shore SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by knot other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 50

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A144 Sanderling <i>Calidris alba</i>			
To maintain the favourable conservation condition of Sanderling in River Nanny Estuary and Shore SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by sanderling other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 51

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A184 Herring Gull <i>Larus argentatus</i>			
To maintain the favourable conservation condition of Herring Gull in River Nanny Estuary and Shore SPA, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by herring gull other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Table 52

Conservation objectives for: River Nanny Estuary and Shore SPA [004158]			
A999 Wetlands			
To maintain the favourable conservation condition of the wetland habitat in River Nanny Estuary and Shore SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:			
Attribute	Measure	Target	Notes
Wetland habitat	Area (ha)	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 230ha, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 230ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

2.5.5.5 Baseline Conservation Status of site

A synopsis of the conservation status of the site is provided in Table 53.

Table 53: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species			Population in the site							Site assessment				
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D		A B C	
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A053	Anas platyrhynchos			w	76	76	i		G	C	B	C	C
B	A169	Arenaria interpres			w	59	59	i		G	C	B	C	C
B	A046	Branta bernicla			w	145	145	i		G	C	B	C	C
B	A144	Calidris alba			w	240	240	i		G	B	A	C	A
B	A149	Calidris alpina			w	721	721	i		G	C	B	C	C
B	A143	Calidris canutus			w	1190	1190	i		G	B	A	C	B
B	A137	Charadrius hiaticula			w	185	185	i		G	C	B	C	B
B	A130	Haematopus ostralegus			w	1014	1014	i		G	C	B	C	B
B	A184	Larus argentatus			w	609	609	i		G	C	B	C	C
B	A182	Larus canus			w	66	66	i		G	C	B	C	C
B	A179	Larus ridibundus			w	926	926	i		G	C	B	C	C
B	A157	Limosa lapponica			w	63	63	i		G	C	B	C	C
B	A160	Numenius arquata			w	107	107	i		G	C	B	C	C
B	A017	Phalacrocorax carbo			w	35	35	i		G	C	B	C	C
B	A140	Pluvialis apricaria			w	1759	1759	i		G	C	B	C	C
B	A141	Pluvialis squatarola			w	55	55	i		G	C	B	C	C
B	A162	Tringa totanus			w	150	150	i		G	C	B	C	C
B	A142	Vanellus vanellus			w	1112	1112	i		G	C	B	C	C

2.5.6 The River Boyne and River Blackwater SPA (Site synopsis version date 25/11/10, Natura 2000 form update 10/2020, Conservation Objectives (generic) Version 8.0.

2.5.6.1 General Description

The River Boyne and River Blackwater SPA is a long linear site that comprises stretches of the River Boyne and several of its tributaries: most of the site is in Co Meath but it extends also into Counties Cavan, Louth and Westmeath. It includes the following river sections: The River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co Cavan; the Tremblestown River (and Athboy River) from the junction with the River Boyne at Kilnagross Bridge to the bridge in Athboy, Co Meath; the Stoneyford River from its junction with the River Boyne to Stonestone Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cumber Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation. The River Boyne and River Blackwater SPA supports nationally important numbers of *Alcedo atthis*. Other species which occur within the site include *Cygnus olor*, *Anas crecca*, *Anas platyrhynchos*, *Phalacrocorax carbo*, *Ardea cinerea*, *Gallinula chloropus*, *Gallinago gallinago* and *Riparia riparia*.

2.5.6.2 Qualifying Interests

The Qualifying Interest (QI) of the River Boyne and River Blackwater SPA is

- Kingfisher, *Alcedo atthis*

2.5.6.3 Threats, pressures and activities with negative impacts on the site

Details as to the threats, pressures and activities with negative impacts on the site are identified from the Natura 2000 data form for the sites and are illustrated in Table 54.

Table 54: Threats, pressures and activities with impacts on the site

Negative Impacts				Positive Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]	Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
M	J02		i	L	X		i
H	E01		o				
H	D01.02		i				
H	D01.02		o				
H	E01.03		o				

Rank: H = high, M = medium, L = low
 Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
 i = inside, o = outside, b = both

2.5.6.4 Conservation Objectives

The primary conservation objective (generic) of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- Kingfisher (*Alcedo atthis*)

There is currently no detailed conservation objectives document prepared referring specifically to Kingfisher as a Qualifying Interest. It is, therefore, not possible to infer Conservation Objectives for this Qualifying Interest.

2.5.6.5 Baseline Conservation Status

A synopsis of the conservation status of this site is provided in Table 55.

Table 55: Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species			Population in the site							Site assessment				
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D			
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A229	Alcedo atthis			r	19	19	p		G	C	B	C	B
B	A052	Anas crecca			w	166	166	i		G	C	B	C	C
B	A053	Anas platyrhynchos			w	219	219	i		G	C	B	C	C
B	A028	Ardea cinerea			w	44	44	i		G	C	B	C	C
B	A017	Phalacrocorax carbo			w	36	36	i		G	C	B	C	C

2.6 Identification and evaluation of likely significant effects

2.6.1 Description of source-pathway-receptor linkages and identification of “Zone of Influence”

The basis for identifying potential impacts/significance thereof and defining the zone of influence is the “Source-Pathway-Receptor” (S-P-R) model. This model underpins all water-protection schemes in Ireland, as well as the EU Water Framework Directive on which both surface water and groundwater regulations are based. This model is applied to all possible impacts (i.e., not just water-based impacts). When examining S-P-R relationships in regard to impacts on Natura 2000 sites, the main questions to be considered are:

- 1) Source characterisation – Identification of potential source(s) of the impact(s);
- 2) Pathways analysis – Identification of means through which potential impacts could take place, for example is there a hydrogeological or hydrological link that can deliver a pollutant source to a nearby receptor; and
- 3) Receptor identification – identification of Natura 2000 sites/qualifying interests potentially affected.

Therefore, the key questions to be considered are:

- 1) Is there any source(s) of impact(s) on water quality associated with the proposed development?
- 2) Is there a pathway present between the source of impact and a Natura 2000 site; and
- 3) What are the Natura 2000 sites/qualifying interests potentially impacted upon?

2.6.1.1 Sources of potential impacts

The proposed development is of a small scale in an urban setting. The Conservation Objectives of the Qualifying Interests of the Natura 2000 sites in question are either directly or indirectly dependant in water quality. Any impacts of the proposed development on water quality of the relevant Natura 2000 sites is, therefore, could therefore, have a potential negative impact on the ecological integrity of the Natura 2000 network. The proposed development site is more than 1 km from any of the proximate SPAs but could be a source of disturbance if the habitat occurring is an *ex-situ* feeding site. A site visit, however, indicated that the habitat was not suitable as an *ex-situ* feeding site.

Connections will be made using the existing foul connection and will be serviced by the Drogheda Agglomeration Waste Water Treatment Plant (WWTP). According to the most recent Annual

Environmental Report¹ available (2020), the final effluent of the Drogheda Agglomeration (D0041-01) was not compliant with the Emission Limit Values, owing to excess Ammonia and Suspended solids. There is Organic capacity (P.E.) remaining at the Drogheda WWTP (2020 figure) and it will not be exceeded in the next 3 years (2020 value). It is for the Relevant Authority to determine if the WWTP can cope with the load of the proposed development. Given the excess capacity, it is assumed here the WWTP is capable of coping with the (relatively insignificant) increased load associated with the proposed development.

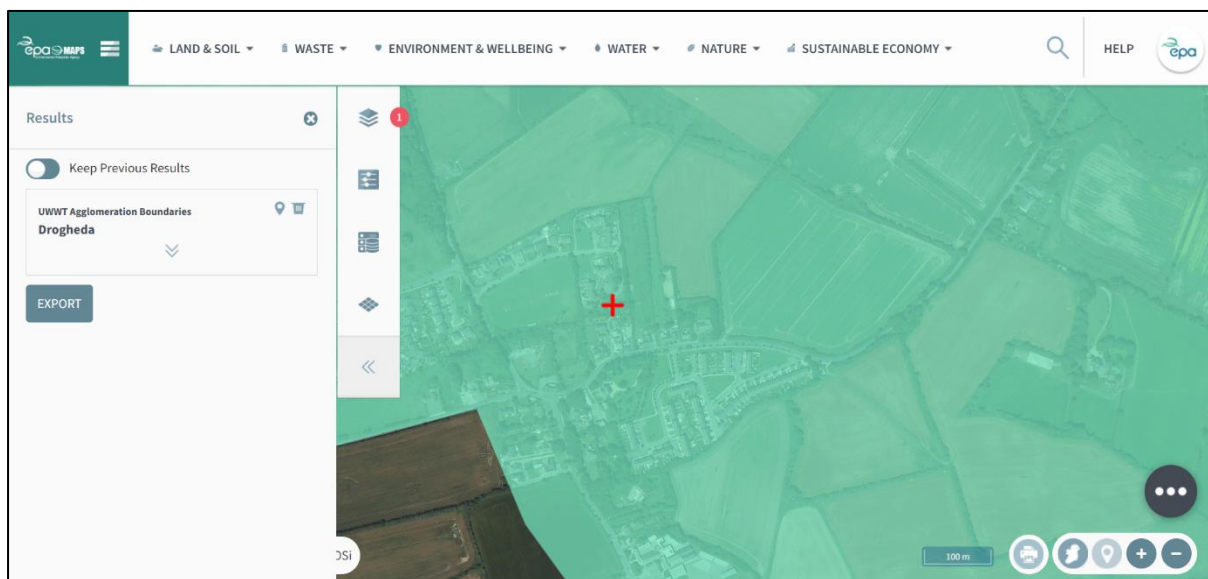


Figure 15: Excerpt from EPA online resource

2.6.1.2 Presence of pathway and receptor

The OSI Geohive mapping resource does not include any significant waterways connecting the proposed development site to any watercourse. A review of historic mapping (Figure 16) would indicate that there have not been any significant watercourses piped underground. There is, therefore, no direct Source-Pathway-Receptor linkage present.

¹ https://www.water.ie/_uuid/d3c10cbc-367b-4cf4-8534-b72724da75f3/d0041-01_2020_aer.pdf

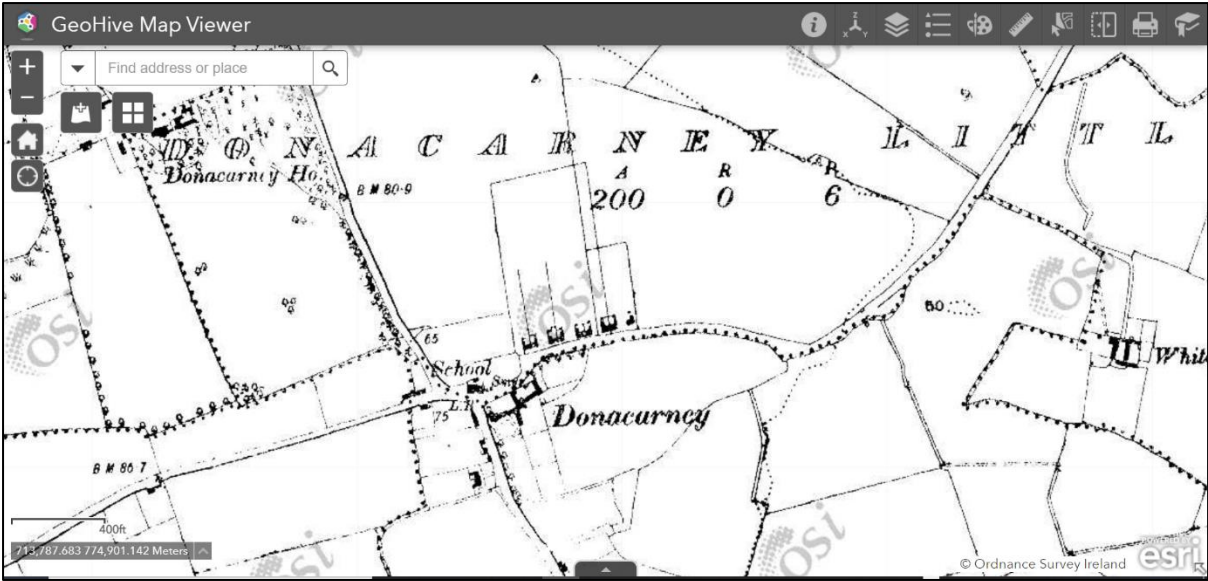


Figure 16: Historic 6" map of the vicinity of the proposed development indicating that there were no significant watercourses present that might have been piped underground

2.6.1.3 Natura 2000 site(s) with potential to be impacted upon and Zone of Influence

Given the absence of any direct pathway between the proposed development and the Natura 2000 network, there is no potential for significant negative impacts on the Conservation Objectives of the Qualifying Interests of the Natura 2000 sites identified as being within 15 km of the proposed development.

2.6.2 Sources of potential Direct, Indirect or Secondary Impacts

2.6.2.1 *Direct Impacts*

There is no habitat for which any relevant Natura 2000 sites are designated that will be lost through land-take, etc. associated with the proposed development. There are no direct impacts foreseen.

2.6.2.2 *Indirect Impacts*

There is no significant potential for indirect impacts associated with either the construction or operation phases of the proposed development.

2.6.2.3 *Secondary and or Residual Impacts*

In the absence of any direct or indirect impacts, there are no significant residual/secondary impacts foreseen.

A summary of the potential for primary impacts upon Natura 2000 sites within the zone of influence of the proposed development is summarized in Table 56 and Table 57. There are no potential significant impacts on the qualifying interests of identified Natura 2000 sites foreseen.

Table 56: Summary of the potential for impacts upon Natura 2000 sites.

Site Name	Direct Impacts	Indirect/ Secondary Impacts	Resource requirements (water abstraction etc.)	Emissions (to land, water or air)	Excavation requirements	Duration of construction, operation and decommissioning
Clogherhead SAC	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
Boyne Coast and Estuary SAC	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
River Boyne and River Blackwater SAC	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
Boyne Estuary SPA	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
River Nanny Estuary and Shore SPA	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
River Boyne and River Blackwater SPA	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen

Table 57: Summary of the potential for changes to Natura 2000 sites.

Site Name	Reduction of habitat area	Disturbance to key species	Habitat/species fragmentation	Reduction in species density	Changes in Key Indicators of Conservation Value	Climate change
Clogherhead SAC	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
Boyne Coast and Estuary SAC	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
River Boyne and River Blackwater SAC	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
Boyne Estuary SPA	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
River Nanny Estuary and Shore SPA	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen
River Boyne and River Blackwater SPA	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen	None foreseen

2.6.3 Potential cumulative/in-combination impacts in association with other plans

Article 6(3) of the Habitats Directive requires an assessment of a plan/project to consider other plans/projects that might, in combination with the proposed plan/project, have the potential to adversely impact upon Natura 2000 sites. Any plan/project with the potential to impact on water quality/hydrology within the zone of influence and any plan/project with the potential to have an impact through disturbance has the potential to have cumulative/in-combination impacts.

Table 58: Potential cumulative impacts.

Plan/Project	Purpose	Cumulative impact
EU Water framework Directive	Maintain and enhance water quality within the EU	None predicted
EU Freshwater Fish Directive	Protect freshwater bodies within the EU suitable for sustaining fish populations	None predicted
EU Groundwater Directive	Maintain and enhance the quality of groundwater within the EU	None predicted
EU Floods Directive	The Floods Directive applies to river basins and coastal areas at risk of flooding	None predicted
Nitrates Directive	Reducing water pollution within the EU	None predicted
Urban Waste-water treatment Directive	Protecting the environment from adverse impacts of waste-water discharge	None predicted
Sewage Sludge Directive	Regulate the use of sewage sludge	None predicted
The IPPC Directive	To achieve a high level of environmental protection	None predicted
National Development Plan	To promote more balanced spatial and economic development	None predicted
National Spatial Strategy	To achieve a better balance of social, economic and physical development across Ireland	None predicted
Eastern CRFAM	Long-term planning for reducing and managing flood risk	None predicted
Local Area Development Plans	Various	None predicted
Meath and Louth County Development Plans	Sustainable development of Counties Louth and Meath	None predicted
Quarrying activities, water abstraction, discharge, etc	Various	None predicted
Current and future planning permissions –	Various	None predicted
Part 8's	Various	None predicted
Land spreading of organic waste by farmers in the locality	Fertilising land, disposing of organic waste	None predicted

As regards any cumulative impacts, **all** future developments must be subject to the Appropriate Assessment process. A review of the National Planning Application Database (NPAD) indicates that there are no planning applications of significant size/nature in the immediate vicinity (see Figure 17). Given the scale and nature of the proposed development, no cumulative impacts are foreseen.

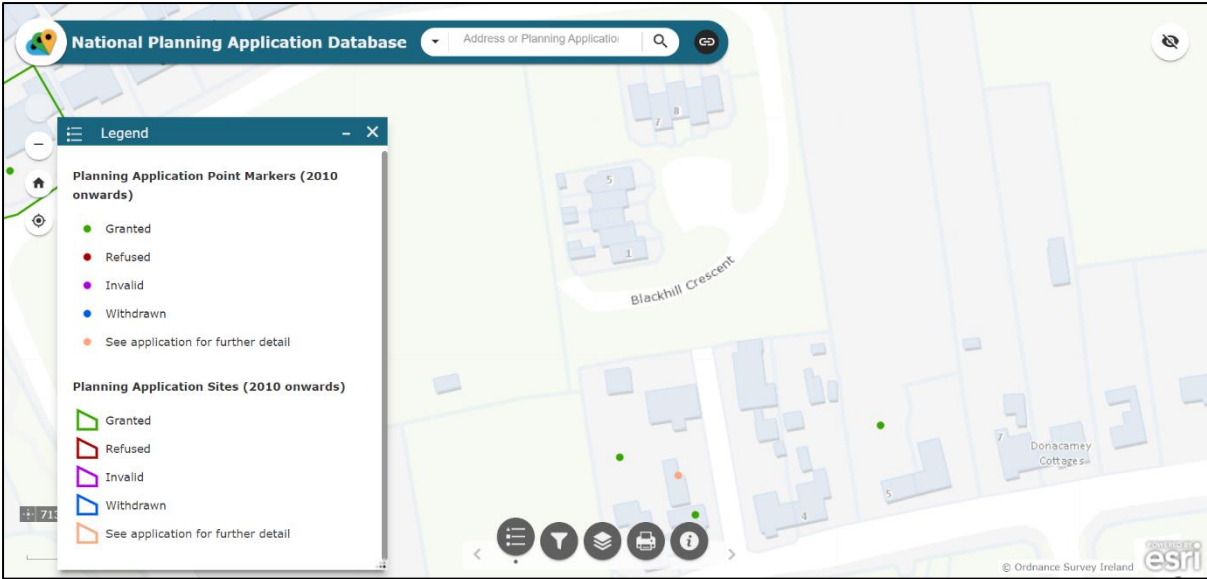


Figure 17: Excerpt from NPAD online resource

2.6.4 “Do nothing” scenario

No significant negative impacts associated with the proposed development have been identified. The impacts of a “Do Nothing” scenario do not differ from the proposed development.

2.6.5 Gauging of Impacts on Natura 2000 sites – Integrity of site checklist

The potential impacts of the proposed development on Natura 2000 sites are gauged using a checklist, which aids in determining the potential of development to have a significant impact on any Natura 2000 site. This checklist consists of a number of pertinent questions as set out in Table 59.

Table 59: Potential of the proposed development to impact on Natura 2000 sites in the absence of suitable mitigation/preventative measures

Does the Plan have the potential to:	Yes/No
Cause delays in progress towards achieving the conservation objectives of the Natura 2000 site?	NO
Interrupt progress toward achieving the conservation objectives of the Natura 2000 site?	NO
Disrupt those factors helping to maintain the favourable conditions at the Natura 2000 site?	NO
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the Natura 2000 site?	NO
Cause changes to the vital defining aspects (e.g., nutrient balance) that determine how the Natura 2000 site functions as a habitat or ecosystem?	NO
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the Natura 2000 site?	NO
Interfere with predicted or expected natural changes to the Natura 2000 site (such as water dynamics or chemical composition)?	NO
Reduce the area of key habitats within the Natura 2000 site?	NO
Reduce the population of key species of the Natura 2000 site?	NO
Alter the balance between key species of the Natura 2000 site?	NO
Reduce the biodiversity of the Natura 2000 site?	NO
Result in disturbance that could affect population size or density or the balance between key species within the Natura 2000 site?	NO
Result in fragmentation?	NO
Result in the loss or reduction of key features of Natura 2000 sites?	NO

2.7 Conclusions of screening

According to the guidance published by the NPWS (DoEHLG, 2009), Screening for Appropriate Assessment can either identify that a Natura Impact Statement (NIS) is not required where:

- (1) A project/proposal is directly related to the management of the site; or
- (2) There is no potential for significant impacts affecting the Natura 2000 network

Where the screening process identifies that significant impacts are certain, likely or uncertain the project must either proceed to Stage II Appropriate Assessment or be rejected.

The potential impacts that will arise from the proposed development have been examined in the context of a number of factors that could potentially impact upon the integrity of the Natura 2000 network. On the basis of the findings of this Screening for Appropriate Assessment, it is concluded that the proposed plan:

- (1) Is not directly connected with or necessary to the management of a Natura 2000 site and
- (2) Will not have any significant negative impacts on the Natura 2000 network.

Following an examination, analysis and evaluation of the relevant information and the potential for significant effects on the conservation objectives of Natura 2000 sites, and applying the Precautionary Principle, it is, in the professional opinion of the author of this report, possible to exclude (on the basis of objective information and in the absence of specific prescribed precautionary/mitigation measures) that the proposed development individually or in combination with other plans or projects, will have any significant potential to have negative impacts on the Natura 2000 network.

Having identified no potential impacts of the proposed development upon the Natura 2000 network, and in accordance with Article 6(3) of the Habitats Directive, a Stage 2 Appropriate Assessment is not required in this instance.

3 References and Bibliography

Environmental Protection Agency (1995) Advice notes on current practice in the preparation of Environmental Impact Statements. EPA, Wexford, Ireland.

Environmental Protection Agency (1997) Draft Guidelines to be contained in the information to be contained in Environmental Impact Statements. EPA, Wexford, Ireland.

European Commission (2000) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive. Luxembourg: Office for Official Publications of the European Communities

Fossitt, J. (2001) A Guideline to Habitats in Ireland. The Heritage Council, Kilkenny, Ireland.

European Commission (2002) Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Luxembourg: Office for Official Publications of the European Communities

European Commission (2007) European Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC; Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission.

DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. DEHLG

DEHLG (2011) European Communities (Birds and Natural Habitats) Regulations 2011. DEHLG.

Environmental Protection Agency. (2017) Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR). EPA, Wexford, Ireland.

Commission notice "Managing Natura 2000 sites The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC", Brussels, 21.11.2018 C (2018) 7621 final.

DCHG (2019). The Status of EU Protected Habitats and Species in Ireland 2013. DAHG.

www.meath.ie – official website of Meath County Council.

www.npws.ie – website of the National Parks and Wildlife Service, source of information for data regarding Natura 2000 sites and Article 17 Conservation Assessments.

www.europa.eu – official website of the European Union, source of information on EU Directives.