An tÚdarás Inniúil um Thorann Aerárthaí

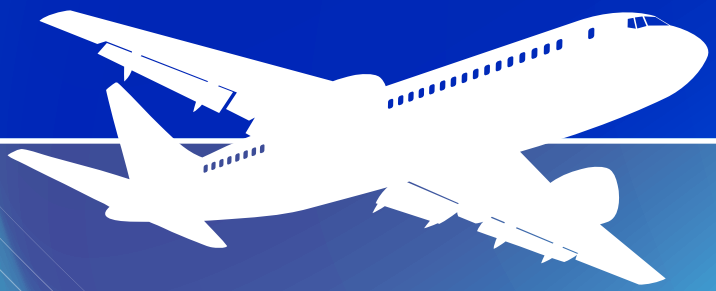
Aircraft Noise Competent Authority

ANCA

Noise Abatement Objective and Draft Regulatory Decision relating to Aircraft Noise Management at Dublin Airport:

Appropriate Assessment - Natura Impact Statement

November 11th 2021



ACKNOWLEDGEMENTS

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Aircraft Noise Competent Authority

The services of Noise Consultants Ltd were retained by ANCA to support the work of the authority by undertaking technical assessments and providing expert advice in the areas of acoustics, aviation, and environmental assessments.

Noise CONSULTANTS

This report was prepared with the assistance of Noise Consultants Ltd., working with:

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1 Introduction

Background

Aircraft Noise Regulation

1.1 *Regulation (EU) 598/2014 (hereinafter referred to as 'Regulation 598') requires Ireland and other EU Member States to appoint a Competent Authority to regulate the noise situation at certain airports. Regulation 598 applies to airports with more than 50,000 civil aircraft movements per calendar year. Dublin Airport is the only airport in Ireland meeting this threshold. Fingal County Council (FCC) have been designated as the Competent Authority for the purposes of aircraft noise regulation at Dublin Airport. FCC have, to fulfil their function with regard noise management, created an independent division, the Aircraft Noise Competent Authority (ANCA), which discharges FCC's functions under Regulation 598 and the Aircraft Noise (Dublin Airport) Regulation Act 2019 (hereinafter referred to as the '2019 Act').*

1.2 *Under Regulation 598, ANCA must ensure that the noise situation at Dublin Airport is assessed in accordance with the Environmental Noise Directive (Directive 2002/49/EC) and by the adoption of the Balanced Approach. Regulation 598 requires the application of the Balanced Approach at airports where a noise problem has been identified. The Balanced Approach is a policy of the International Civil Aviation Organization (ICAO), which has provided detailed guidance in ICAO Doc 9829, Guidance on the Balanced Approach to Aircraft Noise Management. Under Regulation 598, the Balanced Approach is applied where a noise problem at an airport has been identified. According to the ICAO guidance, it involves analysing various measures available to reduce noise which can be classified into four principal elements as follows:*

- *Noise at Source;*
- *Land-use Planning Management;*
- *Noise Abatement Operational Procedures;*
- *Operating Restrictions.*

1.3 *In addition to those elements specified in ICAO, Regulation 598 also requires ANCA, in the context of the Balanced Approach, to define a Noise Abatement Objective (NAO) for the airport, identify the measures available to reduce the noise impact, and evaluate thoroughly the cost-effectiveness of the noise mitigation measures. ANCA must then select the applicable noise mitigation measures without detriment to public safety and taking into account environmental sustainability (including interdependencies between noise and emissions), public interest in the development prospects of the airport, and consultation with stakeholders*

in a transparent way. At the end of this process, ANCA must specify the noise mitigation measures and ensure they are implemented.

1.4 *The 2019 Act gives further effect to Regulation 598 in Ireland. It provides for ANCA to discharge its functions under Regulation 598 on its own initiative or in response to any planning application by Dublin Airport Authority (daa) relating to (1) "any noise problem that would arise from the carrying out of the development as proposed" (Section 34B) or (2) "any noise problem that would arise from taking [a] relevant action as proposed" (Section 34C), whereby the 'relevant action' consists exclusively of the revocation, amendment or replacement of an operating restriction, with or without the introduction of new noise mitigation measures. ANCA discharges its functions under Regulation 598 and the 2019 Act by, among other things, making a 'regulatory decision' (hereinafter referred to as 'the RD').*

How Regulation 598 will apply to the daa planning application

1.5 *daa have made, on 18/12/20, a planning application (F20A/0668) (hereinafter referred to as the 'planning application') to FCC which proposes to amend Condition 3(d) and replace Condition 5 of Planning Permission Reg. Ref. No. F04A/1755 (ABP Ref. No. PL06F.217429) as amended by Fingal County Council F19A/0023 (ABP Ref. No. ABP-305289-19) (hereinafter referred to as the 'Dublin Airport North Runway Planning Permission') that was granted in 2007 to provide for new operating procedures. Specifically, these Conditions restrict the way the Airport can be operated during the night-time (2300-0700) after the construction of the new North Runway, including particularly by not allowing use of the North Runway, and by restricting the number of air traffic movements (ATMs), that are allowed during this period.*

1.6 *Section 34C of the Planning and Development Act 2000, which was introduced by the 2019 Act, deals with planning applications that seek only to modify noise-related operating restrictions. Such operating restrictions are regulated by EU legislation on aircraft noise (i.e. Regulation 598). In seeking to modify such operating restrictions, daa can seek to have noise mitigation measures imposed in place of, or in addition to, operating restrictions. Section 34C requires the planning authority to refer such applications to ANCA, which must apply the Balanced Approach to the data and proposals made by daa.*

1.7 *Pursuant to Section 34C, the planning authority has referred the planning application to ANCA and has consulted with ANCA in relation to any noise problem that could arise from the planning application. ANCA has explored this through its report 'Ascertaining a Noise Problem at Dublin Airport', concluding that "the proposed development may significantly influence the evolving noise climate at Dublin Airport to the extent that presents a noise problem that requires detailed assessment." The following reasons were given:*

- *"The Application proposes an increase in aircraft activity at night, when referenced against the situation that would otherwise pertain, which may result in higher levels of human exposure to aircraft noise."*
- *"The Application proposes a situation where some people will experience elevated levels of night-time noise exposure for the first time which may be considered harmful to human health."*
- *"The EIAR accompanying the Application indicates that the proposed Relevant Action will give rise to significant adverse night-time noise effects. This indicates that the noise effects of the Proposed Development are a material consideration. Mitigation in the form of a night-time noise insulation scheme is proposed by the Application. The provision of such mitigation is an indicator that the Proposed Development may give rise to a Noise Problem."*

1.8 *A noise problem arising from the planning application has consequently been declared by ANCA, through delegated authority from the Chief Executive of FCC (CE Order: ANCA/002/2021).*

1.9 *ANCA can require daa to carry out such assessments and give to it such information or plans arising from such assessments, or to give to it such other information or plans as it may reasonably require for the purposes of making the RD. ANCA must also give notice to the planning authority and daa of the noise mitigation measures and operating restrictions it intends to provide for in the draft RD. The planning authority and daa may then make comments and observations and make counterproposals. ANCA must take those into account and apply the Balanced Approach to the counterproposals.*

1.10 *ANCA must then publish a draft RD and an underlying report for public consultation. The underlying report must include a summary of the data examined, the NAO, the noise mitigation measures considered, an evaluation of their cost-effectiveness, a summary of how ANCA applied the Balanced Approach, the alternative measures that have been considered, the noise mitigation measures and operating restrictions actually proposed, the reasons for those measures, any relevant technical information in that regard, and a non-technical summary of the foregoing. ANCA must take account of all submissions and observations made in that public consultation and revise the draft RD and underlying report if necessary, before making the RD.*

1.11 *The RD can impose the operating restrictions and noise mitigations measures sought by daa, or it can impose other operating restrictions and noise mitigation measures. There is no requirement for the RD to mirror exactly the proposals made in the planning application. If ANCA believe that the RD needs to, for example, consider alternative options or cover a wider breadth of operating procedures to that proposed within the planning application they have the*

ability to do so. Equally, if ANCA believe it to be appropriate, they can extend the RD to consider more than simply the proposals made in the planning application, for example to be extended so that a wider range of noise related measures and/or forecasts are considered.

1.12 *When ANCA makes the RD post-consultation, the planning authority will then consider the planning merits of the planning application, including Environmental Impact Assessment (EIA) and Appropriate Assessment if required. The planning authority must then incorporate the RD into the planning authority's decision (regardless of whether the planning authority's decision is to refuse or grant the planning application) and, if necessary, revoke, replace or amend the conditions of any previous planning permission to make it consistent with the RD.*

1.13 *In this way, Section 34C gives effect to the provisions of Regulation 598 which applies to operating restrictions, such as Conditions 3(d) and 5 of the Dublin Airport Northern Runway Planning Permission, that were pre-existing when the Regulation was introduced. Article 14 of Regulation 598 provides that those operating restrictions shall remain in force until a CA, like ANCA, decides to revise them in accordance with the Regulation.*

1.14 *The decision of the planning authority incorporating the RD may be appealed to An Bord Pleanála by the parties normally entitled to make such appeals, as well as by any party who made a submission or observation in the public consultation on the draft RD.*

1.15 *If the RD introduces a new operating restriction, it must be notified to the European Commission and other Member States. The European Commission may review whether the Balanced Approach was properly applied in imposing the operating restriction.*

Need for Appropriate Assessment

1.16 *Article 6 (3) and Article 6(4) of the EU Habitats Directive (92/43/EEC) states that:*

Article 6(3) – 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.

Article 6(4) - 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 overriding public interest, including those of a 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. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

1.17 *Statutory Instrument (S.I.) No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations (2011), which transposes the EU Habitats Directive (92/43/EEC) into Irish law, requires that 'Appropriate Assessment' (AA) be carried out where a plan or project is likely to have a significant impact on a European site. European sites are commonly referred to as Natura 2000 sites and include Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). Each of these sites is designated because of their specific biodiversity value: for SPAs this is because of their value for wild birds; for SACs, it is because of the important habitats and species that they support.*

1.18 *The RD that will be made in response to the planning application may impose operating restrictions and mitigation measures that will determine whether or not future planning applications for development consent at the airport potentially give rise to the potential for a noise problem. It thereby guides the decisions that ANCA and the planning authority will make on those future applications. It also results from an assessment against an NAO; it cannot be more restrictive than necessary to achieve the NAO. Accordingly, the NAO and RD may set the framework for future development consent of projects. The 'plan' addressed through this Natura Impact Statement (NIS) therefore comprises the NAO and the RD, as two interlinked components, the NAO setting a framework for the RD, which in turn sets the framework for future applications for planning permission at the airport. Together, the NAO and RD set a framework for sustainable growth at Dublin Airport.*

1.19 *AA is required if it cannot be excluded, on the basis of objective scientific information following screening, that the plan (in this case the NAO and RD), individually or in combination with other plans or projects, will have a significant effect on a European site. In determining this, a Screening exercise was undertaken to establish whether the potential for such exists. ANCA, in its role as CA, was required to make a Screening Decision on whether AA applies. On 18th August 2021, having regard for the information provided in the AA Screening Report, ANCA determined that there was the potential for impacts on European sites to occur as a result of implementing the NAO and RD.*

Purpose of this Report

1.20 *AA is a focused and detailed impact assessment of the implications of the plan or project, alone and in combination with other plans and projects, on the integrity of a Natura 2000 site(s) in view of its conservation objectives. Accordingly, data and information on the project and on*

the site and an analysis of potential effects on the site must be obtained and presented in a NIS.

1.21 *In line with the requirements of the Birds and Natural Habitats Regulations (2011) and the AA Guidance (NPWS, 2010), this NIS includes the following information:*

- *a description of the Plan in sufficient detail to make clear its size, scale and objectives (Chapter 2);*
- *the baseline conditions, conservation objectives, and relevant ecological and environmental issues in relation to the relevant Natura 2000 sites (Chapter 4);*
- *a prediction of the potential adverse impacts of the Plan on the Natura 2000 sites, and, where possible, mitigation measures to minimise or avoid these effects (Chapter 5);*
- *a conclusion as to the residual effects of the Plan on the Natura 2000 sites (Chapter 6).*

Related Environmental Assessments

1.22 *Directive 2001/42/EC (hereinafter referred to as the SEA Directive) requires Member States to ensure that certain plans and programmes are subject to a requirement for Strategic Environmental Assessment ('SEA'). Statutory Instrument (S.I.) No. 435/2004 - European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations (2004) (hereinafter referred to as the SEA Regulations) transpose this Directive into Irish legislation.*

1.23 *SEA Screening was therefore undertaken broadly concurrently, but separately, to AA Screening. ANCA, in its role as CA, was required to make a Screening Determination on whether SEA applies. On 15 April 2021, having regard of the information provided in the SEA Screening Report, and submissions and observations provided by the prescribed Environmental Authorities, ANCA determined that there is potential for likely significant environmental effects to occur as a result of implementing the NAO and RD.*

1.24 *With ANCA having determined that the NAO and Regulatory Decision requires SEA, an SEA Scoping Report was subsequently produced to set out the proposed scope of the detailed environmental assessment and to facilitate consultation with the prescribed Environmental Authorities in that regard. This was followed by production of a Draft Environmental Report which presents the results of an assessment of the NAO and Regulatory Decision against the SEA objectives to determine its likely significant effects on the environment.*

1.25 *ANCA will publish the NAO, the draft RD, a report underlying the Draft RD, the SEA Draft Environmental Report and this AA Natura Impact Statement together for public consultation.*

1.26 The process of aircraft noise regulation through the 2019 Act is summarised alongside the SEA and AA processes in Figure 1.1 below.

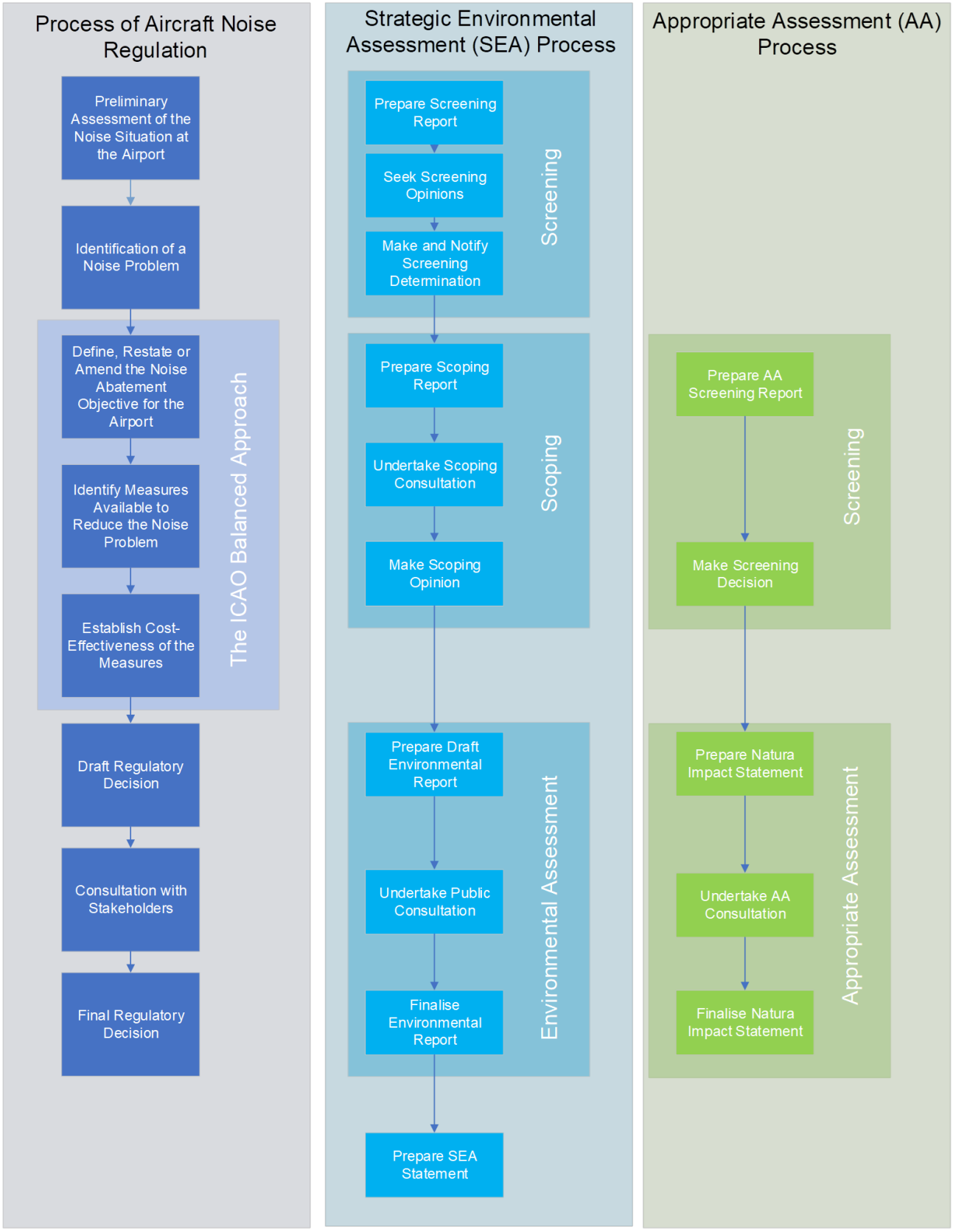

Figure 1.1: The concurrent processes of Aircraft Noise Regulation, SEA and AA

1.27 *Separately to the SEA and AA carried out for the NAO and RD, the planning application submitted by daa has also undergone both EIA and AA Screening. The planning authority must have regard to the EIA Report and AA Screening Report submitted by daa when deciding whether permission should be granted for the development. ANCA may take account of the EIA Report and AA Screening Report submitted by daa in the drafting of the NAO and RD, however, must also be mindful that these were prepared for the purposes of the planning application, rather than the processes undertaken by ANCA in setting the NAO or making the RD.*

Consultant Team

1.28 *This Report has been prepared by Logika Consultants Ltd. ('Logika'), part of the Noise Consultants Ltd. consultant team engaged to provide expert support to ANCA in setting the NAO and making the RD. Specifically Logika are responsible for providing SEA and AA input to the NAO and RD process.*

1.29 *The individuals involved in the production of this Report are Toby Gibbs, Declan Murphy and Helen Davies. Their relevant qualifications and experience are set out below.*

Toby Gibbs, BSc (Hons) CEnv MCIEEM

1.30 *Toby is a Chartered Environmentalist and a Full Member of the Chartered Institute of Ecology and Environmental Management. He has more than 22 years' experience in the environmental sector and is a specialist in the environmental impacts of aviation activities having worked on many aviation projects, and with experience in the UK, Europe, Africa and the Middle East. Project highlights include being engaged to provide environmental support to the development of Heathrow Airport's expansion proposals including contributing significantly to the evidence provided to the Airports Commission and leading the team engaged to produce the environmental assessments required to support the consenting application for a third runway. He was also the Project Director for the EIA associated with the ending of the Cranford Agreement at the Airport and provided written evidence to the Public Inquiry. He was also the Director responsible for the EIA that formed part of the consenting application for the reopening of Manston Airport in Kent. All these projects required AA with an emphasis on consideration of the effects of aviation activities on birds.*

1.31 *Outside of the UK he performed the role of Environmental Director for the expansion works at Jomo Kenyatta International Airport in Kenya and completed a special advisory role for the New Lisbon Airport EIA. He also provided expert advice to countries in Eastern Europe and West Asia as they sought to bring in environmental legislation to regulate the impacts of aviation activities. Toby is the British Aviation Group's Sustainability Working Group Chair, recognition of his knowledge of the environmental and ecological issues that are associated with aviation activities.*

Declan Murphy, BSc (Hons) MRes ACIEEM

1.32 *Declan is a Consultant Ecologist and an Associate Member of the Chartered Institute of Ecology and Environmental Management. He has over six years of experience in ecology, conservation, and land management, with a strong background of input into Ecological Impact Assessments, ecology chapters for EIA Reports, and AAs. During this time he has worked on numerous large scale projects involving both residential and infrastructure developments. Of most relevance was his role in the assessment of impacts on wintering and breeding birds from the creation of a new coastal wind and solar farm within the Wentlooge and Caldicot Levels in south Wales. This involved mapping and assessing flight lines of thousands of bird records over a two year period. In addition, his novel research and reporting carried out during his Masters degree has given him a solid foundation and ability to undertake literature reviews, read and understand scientific papers, and draw considered and sensible conclusions from them.*

Helen Davies, BSc (Hons) MSc PhD CEnv MIEMA ACIEEM

1.33 *Helen is a Chartered Environmentalist and an Associate Member of the Chartered Institute of Ecology and Environmental Management, with a PhD that investigated the enhancement of urban forests. She has over 13 years' experience in environmental consultancy, specialising in conducting SEA and AA of local, regional, national and multi-national plans throughout the UK and Ireland. This includes AA of Ireland's Forestry Programme, which identified potential detrimental impacts on Natura 2000 sites and protected species (including Hen Harrier and ground-nesting bird species) related to afforestation and felling, which required specific mitigation measures as well as project level AA. Helen also undertook AA of the Mid Sussex Core Strategy which required data collection in the form of a 4-week visitor survey of the Ashdown Forest SAC/SPA to determine the likely recreational impacts of new housing developments on the heathland and its ground nesting birds. The findings of the AA led to the incorporation of a Natural England-approved policy within the Submission Plan requiring all new development within 7km of the SAC/SPA to contribute to suitable alternative natural greenspace.*

2 Description of the Plan

Site Location

2.1 As stated in the National Aviation Policy (2015 albeit which has been the subject of progress reviews in both 2016 and 2019), Dublin Airport has the potential to become an established secondary hub of European significance, with routes to over 200 different destinations, served by nearly 50 airlines. In 2019 a total of 32.9 million passengers used the Airport and its 241,000 ATMs. Dublin Airport is currently served by one main runway and a further cross runway which is used less frequently. It has two terminals, operates 24 hours a day, and for 364 days a year. As with all major airports, it relies on considerable additional infrastructure including an extensive bus network and car parking facilities.

2.2 Dublin Airport is located on the east coast of Ireland, see Figure 2.1, in Collinstown, in County Dublin in the administrative area of FCC. It lies approximately 7km north of Dublin City Centre, and between the City and the Airport lies mostly development. The area north of the Airport is also mainly developed all the way to the conurbation of Swords which lies approximately 3km to the north. In an easterly direction from the Airport is found a mixture of farmland and other open space, with scattered development all the way to the coast and the settlement of Portmarnock which lies approximately 5km from the Airport itself. West of the Airport is characterised by being mainly undeveloped and comprising mostly farmland and other forms of open space.

2.3 The Airport is accessed by the M1 motorway, which provides access from Dublin itself and from areas to the north as far as Belfast in Northern Ireland. The M50 Dublin ring road connects with the M1, and from this there are road connections to the rest of Ireland.

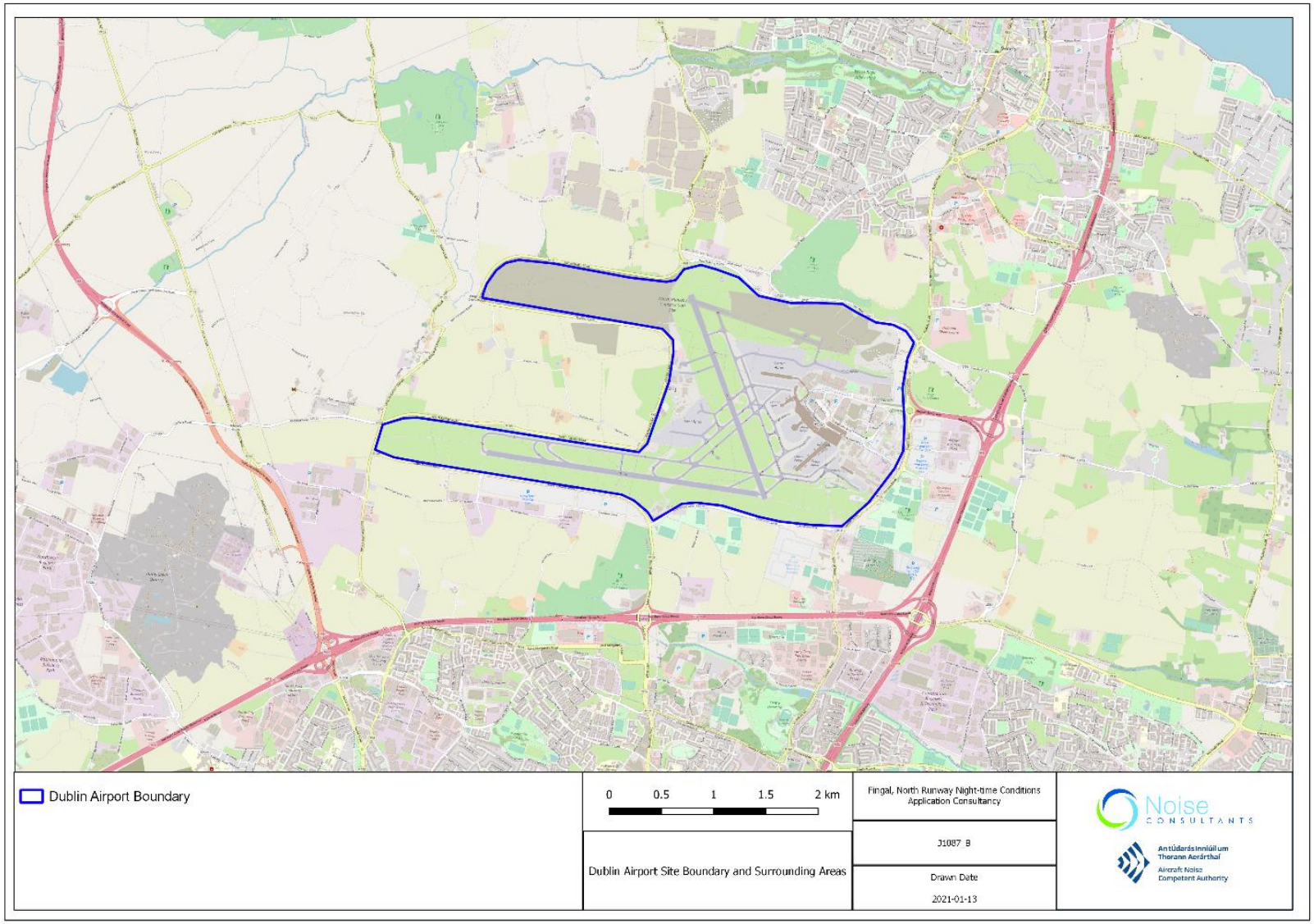

Figure 2.1: Dublin Airport site location

Contents and Main Objectives of the Plan

2.4 *As stated in the previous chapter, where ANCA identifies a noise problem at Dublin Airport, an NAO must be defined in order to apply the Balanced Approach, including identification of the measures available to reduce the noise impact, and the cost-effectiveness of these measures. The noise problem that will be triggered by the development proposed in the planning application must then be assessed in the context of the NAO, culminating in ANCA making an RD. The 'Plan' addressed through this NIS therefore has two components: the NAO (focused on noise outcomes) and the RD (focused on noise mitigation measures and if necessary, operating restrictions which seek to secure the noise outcomes set by the NAO). ANCA is preparing the NAO and RD as two separate outputs of an interlinked process. These are described separately below.*

The Noise Abatement Objective

2.5 *As set out in the NAO Report (2021), the purpose of an NAO is to set the level of ambition for a noise management regime that secures both environmental improvement and a sustainable transport network. An NAO should also aim to address multiple stakeholder interests, ideally around a common purpose. Different interest groups are however likely to have their own principal expectations for the NAO. These are that it should:*

- *Provide opportunities for sustainable growth whilst protecting the health of those affected;*
- *Provide a level of certainty by setting realistic outcomes and expectations of change;*
- *Ensure the desired outcomes are measurable, and the metrics used are evidence based and credible with stakeholders;*
- *Recognise the balance between the needs of different stakeholder groups;*
- *Use clear accessible language.*

2.6 *In order to meet these expectations, ANCA has sought to develop a NAO in manner which:*

- *Aligns with wider regional and national noise, sustainability and economic policies;*
- *Provides flexibility in how the desired outcomes are to be achieved and does not seek to prescribe the approach;*
- *Is consistent with the requirements of the in Regulation 598/2014 and the 2019 Act;*
- *Includes measurable and achievable outcomes, having regard for human and environmental health, against which progress can be assessed, and provides expectations and opportunities for all stakeholders. The NAO therefore needs to be*

'data-driven' and informed not just by the noise situation today but how the noise climate may evolve into the future;

- *Incentivises the development and uptake of new technology at Dublin Airport;*
- *Allows for consistency in undertaking the requirements of the Regulation 598/2014 and Noise Action Planning processes, particularly where there are multiple authorities involved;*
- *Allows for measurable criteria to be used to assess progress.*

2.7 *It will be necessary for Dublin Airport to demonstrate its compliance with the NAO. This will need to be informed and presented in a manner that allows ANCA and any other interested stakeholder to understand whether Dublin Airport is complying with the NAO. The noise situation at Dublin Airport must be subject to review against the NAO.*

2.8 *ANCA's powers and obligations to define an NAO arise from Regulation 598 and, while they are exercised in parallel with the planning process in this instance, the NAO is not constrained by the terms of the planning application. Having regard for the above expectations, the NAO can usefully be a plan for the decisions that are needed to manage the aircraft noise aspects of future aircraft operations at Dublin Airport beyond the scope of the current planning application. ANCA consider that the NAO should describe an outlook or set of noise outcomes over a period of time having regard for wider European, national and regional plans relating to Dublin Airport and aircraft noise. The NAO will therefore sit above both the present planning application and future planning applications, and is designed to complement other published policies which present scenarios for the sustainable development of Dublin Airport to a 40 million passengers per annum (mppa) operation in 2030 and a c.55 mppa operation from 2050.*

2.9 *In this context, the NAO can guide noise management and the measures needed as part of meeting these policies in compliance with the Balanced Approach, Regulation 598/2014 and the 2019 Act. The NAO will therefore seek to define noise outcomes that would govern the implementation of activities associated with planning applications made for the future growth provided for in existing policies, be that an increase in ATMs/passenger numbers and/or any associated infrastructure works. ANCA would therefore set a long-term NAO that anticipates that growth and does not need to be revised incrementally as Dublin Airport grows in accordance with existing policies..*

2.10 *Any such growth could however, only occur if these outcomes are met and would require planning permission and, where applicable, formal EIA and AA processes. In that case the NAO will set a noise management framework for future decisions on applications for planning permission, but the planning authority could grant or refuse permission within that framework*

if found to be unacceptable to the planning authority for other reasons. Consequently, only impacts, direct and indirect, resulting from the management of aircraft noise will be assessed in this NIS, as ANCA cannot influence any other aspect of Dublin Airport's growth and operation. Other impacts will be addressed through the AA of other plans and projects.

2.11 *In terms of structuring the NAO, a policy objective is necessary to encapsulate the level of ambition being set by the NAO, supported by measurable criteria and expected outcomes. ANCA therefore proposes that there will be five key components to the NAO. These components are likely to be as described in Table 2.2 below.*

Table 2.1: Key components of the NAO

Element	
Part 1: Policy Objective	*Limit and reduce the long-term adverse effects of aircraft noise on health and quality of life, particularly at night, as part of the sustainable development of Dublin Airport.*
Part 2: Explaining the Objective	*Noise from Dublin Airport should be limited and reduced in line with principles of sustainable development. As Dublin Airport grows, the long-term adverse effects on human health and quality of life should progressively reduce over the lifetime of this NAO. The Balanced Approach will be used to ensure that cost-effective, practicable and sustainable measures are implemented to achieve this objective.*
Part 3: Measurable Criteria	*The NAO will be primarily measured through the number of people 'highly sleep disturbed' and 'highly annoyed' in accordance with the approach recommended by the World Health Organisation's Environmental Noise Guidelines (WHO, 2018) as endorsed by the European Commission through Directive 2020/367, taking into account noise exposure from 45 dB L_{den} and 40 dB L_{night}. These metrics describe those chronically disturbed by aircraft noise.* *These metrics help articulate the effect of aircraft noise on health and quality of life. The following will also be used to help identify where noise exposure results in the populations experiencing the harmful effects. These are the number of people exposed to aircraft noise above:* • *55 dB L_{night} (a level of night-time noise exposure described by the WHO as representing a clear risk to health)* • *65 dB L_{den} (where a large proportion of those living around Dublin Airport can be considered 'highly annoyed')* *In order to measure performance, these metrics shall be completed using a noise model prepared in accordance with the methodology described in Directive 2015/996 (European Civil Aviation Conference (ECAC) Doc.29 4th Edition or as*

	amended). The noise model shall be validated using local noise and track keeping performance data from Dublin Airport's systems. *The calculation of the number of people exposed to aircraft noise shall have regard for the most recent population data available and assessed against the population exposed to aircraft noise in 2019.*
Part 4: Expected Outcomes	*In the context of its recovery from the global pandemic, noise exposure from Dublin Airport is expected to increase up to 2025. Whilst the resultant health effects are expected to be lower than those which occurred prior to the pandemic and in the years 2018 and 2019, these effects should then reduce over the medium to long-term, to improve the noise situation at Dublin Airport whilst allowing for the sustainable growth. ANCA therefore expects the following outcomes to be achieved through this NAO as set against the measures described below.* *The number of people highly sleep disturbed and highly annoyed shall reduce so that:* • *The number of people highly sleep disturbed and highly annoyed in 2030 shall reduce by 30% compared to 2019;* • *The number of people highly sleep disturbed and highly annoyed in 2035 shall reduce by 40% compared to 2019;* • *The number of people highly sleep disturbed and highly annoyed in 2040 shall reduce by 50% compared to 2019; and* • *The number of people exposed to aircraft noise above 55 dB L_{night} and 65 dB L_{den} shall be reduced compared to 2019.*
Part 5: Monitoring	*Monitoring of the NAO will be informed by annual reports which will be reviewed by ANCA as part of its obligations under the Act of 2019.*

2.12 *Importantly the NAO will not set the level of passengers or ATMs that could use or operate from Dublin Airport. What it does do is set the noise outcomes that need to be achieved.*

The (Draft) Regulatory Decision

2.13 *The Dublin Airport North Runway Planning Permission is a ten-year permission to allow development of a new North Runway at Dublin Airport by daa. Extension of the duration of the permission was granted in 2017 (F04A/1755 E1). This project is currently under construction with, according to the daa application, a scheduled opening date of 2022.*

2.14 *The planning permission associated with the second runway was subject to 31 planning Conditions. The planning application made by daa proposes to have two of these replaced by different operating procedures. The two Conditions in question are:*

- *Condition 3(d) which prohibits the use of North Runway for landings and take-offs between the hours of 23.00 and 07.00.*
- *Condition 5 which states that, on completion of construction of the new runway, the average number of night-time aircraft movements at the airport shall not exceed 65 per night (between 23.00 and 07.00) when measured over the 92 day modelling period.*

2.15 *daa seek, through a Section 34C application, to take a 'Relevant Action[1]' to revoke and replace these operating restrictions. The proposals would allow for scheduled North Runway operations between the hours of 0600-0659 and 2300-2330 to occur, and for the restriction to an average of 65 night-aircraft movements at the airport to be lifted[2]. In its place, daa has proposed a set of noise-related operating restrictions, specifically in the form of a noise quota count[3] and mitigation measures, namely a noise insulation retrofit scheme for affected dwellings.*

2.16 *ANCA has exclusive competence to impose, revoke, replace, or amend the terms of, an operating restriction.*

2.17 *Having applied the Balanced Approach to the noise problem identified on 10th February 2021, ANCA proposes to, in the context of Section 34C(10) of the Act of 2000, make an RD. ANCA proposes to direct the planning authority to include the following conditions in their decision (if any) to grant application F20A/0668. These have regard to the objectives and outcomes of the NAO as defined by ANCA and ANCA considers that they are not more restrictive than is necessary to achieve the NAO.*

[1] Under Section 34C a relevant action refers to: the revoking of an operating restriction; the amendment of an operating restriction; or the replacement of an operating restriction with another

[2] Pre-COVID-19 levels of demand for night flights (23:00-07:00) was over 100/night, with 113/night associated with regularly scheduled services on a typical busy day in Summer 2019.

[3] The noise quota count works like a 'noise budget' that Dublin Airport would have to operate within. Aircraft are allocated a number of points at production relating to the amount of noise they make. These points are called their quota count. The noisier the plane, the higher the quota count. As planes take off and land at the airport at night-time, their quota count contributes to the total that is permitted for Dublin Airport.

Table 2.2: Proposed content of the RD

Condition	*Proposed RD wording*
1	*The existing operating restriction, Condition 5, of the North Runway Planning Permission (FCC Reg. Ref: F04A/1755; ABP Ref: PL06F.217429) reading as:* *'On completion of construction of the runway hereby permitted, the average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period as set out in the reply to the further information request received by An Bord Pleanála on the 5th day of March, 2007.'* *shall be revoked and replaced with an annual noise quota scheme operating restriction as follows:* *'The airport shall be subject to a Noise Quota Scheme (NQS) with an annual limit of 16,260 between the night-time hours of 2300hrs and 0700hrs (local time) with noise-related limits on the aircraft permitted to operate at night. The annual noise scheme shall be applied as detailed in Schedule A.'*
2	*The existing operating restriction imposed by Condition 3(d) and the exceptions at the end of Condition 3 of the North Parallel Runway Planning Permission (FCC Reg. Ref: F04A/1755; ABP Ref: PL06F.217429) reading:* *'3(d). Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours. except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports.'* *shall be amended as follows:* *'Runway 10L/28R shall not be used for take-off or landing between 0000 hours and 0600 hours (local time) except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10L/28R length is required for a specific aircraft type.'*
3	*A voluntary residential sound insulation grant scheme (RSIGS) for residential dwellings shall be provided for all homes forecast in 2025 to be exposed to aircraft noise at or above 55dB L_{night} contour and experience a 'very significant' effect. Dwellings exposed to levels at or above 55 dB L_{night} shall be reviewed every two years commencing in 2027 and if applicable be made eligible for the scheme. This scheme shall not apply to properties where works were undertaken under the existing Residential Noise Insulation Scheme (RNIS) or Home Sound Insulation Programme (HSIP) or to properties where a planning application was lodged after 09th December 2019, the date being the adoption of Variation No. 1 to the Fingal Development Plan 2017 – 2023 incorporating policies relating to development within Aircraft Noise Zones.*

Relationship with other Plans and Environmental Protection Objectives

2.18 A review of relevant policy has been undertaken in relation to Dublin Airport to identify those that may in combination with the NAO and RD have an adverse effect on the integrity of any European site. The following plans have been reviewed from which the key themes identified from these are discussed below.

- *Zero Pollution Action Plan (European Commission, 2021)*
- *National Aviation Policy for Ireland (Department of Transport, Tourism and Sport (DTTAS), 2015)*
- *Ireland's Action Plan for Aviation Emissions Reduction (DTTAS, 2019)*
- *Review of Future Capacity Needs at Ireland's State airports (DTTAS, 2018)*
- *National Policy Statement on Airport Charges Regulation (DTTAS, 2017)*
- *National Planning Framework – Project Ireland 2040 (Government of Ireland, 2018)*
- *National Development Plan 2018-2027 (Government of Ireland, 2018)*
- *Regional Spatial and Economic Strategy for the Eastern and Midland Region 2019-2031 (Eastern & Midland Regional Assembly, 2019)*
- *Transport Strategy for the Greater Dublin Area 2016-2035 (National Transport Authority, 2016)*
- *South Fingal Transport Study (FCC, 2019)*
- *Fingal Development Plan 2017-2023 (FCC, 2017, varied 2019)*
- *Meath County Development Plan 2013-2019 (Meath County Council, 2013)*
- *Dublin Airport Local Area Plan (FCC, 2020)*
- *Dublin Airport Central Masterplan (FCC, 2016)*
- *Dublin Airport Noise Action Plan 2019-2023 (FCC, 2018)*

Growth

2.19 The majority of the policies reviewed discuss the sustainable growth of Dublin Airport, supporting its:

- *Growth as a vibrant secondary hub airport (by means of the second runway);*
- *the build out of the second runway and the development of Dublin as a secondary hub airport;*

- *Continued development of the airport in the national interest; and*
- *Releasing the potential from the significant investment on the new runway.*

2.20 Local and national policy discusses this in the context of:

- *reviewing capacity constraints every 5 years;*
- *incremental terminal expansion to 40mppa (by 2030) and a third terminal beyond that;*
- *capacity constraints being expected beyond 400,000 ATMs;*
- *growth of the airport to 55mppa by 2040 as part of the Airport's masterplan through third terminal (from 2031 target);*
- *a baseline scenario of the Airport reaching 54mppa alongside 365,000 ATMs in 2050;*
- *the Airport operating at its maximum sustainable potential through the required facilities and infrastructure.*

2.21 In particular, the strategic aims set out in the Dublin Airport Local Area Plan (LAP) include supporting the continued sustainable growth of Dublin Airport, as well as timely delivery of required infrastructure to facilitate airport growth. Achieving the 40 mppa threshold (by 2030) is dependent on the following key infrastructure:

- *Improved surface access;*
- *Expanded terminal capacity by way of reconfiguration and augmentation of existing facilities (at T1 and T2);*
- *Completion of the North Runway; and*
- *Additional aircraft parking stands supported by accompanying boarding gate and aircraft piers, particularly in the context of growing the hub function of the Airport.*

2.22 A summary of the growth aspirations cited in the above-mentioned plans is presented in Table 2.3 below.

Table 2.3: Growth aspirations for Dublin Airport as set out in other plans

Year	*Passenger numbers*	*ATMs*	*Related infrastructure*	*Plans where cited*
2030	*36 mppa (downside)* *40 mppa (baseline)* *42 mppa (upside)*	*250,000 (downside)* *265,000 (baseline)* *280,000 (upside)*	*T1 and T2 augmentation*	*Dublin Airport LAP (FCC, 2020)*
2040	*55 mppa*	*-*	*Above + Third Terminal*	*Dublin Airport Central Masterplan (FCC, 2016)* *South Fingal Transport Study (FCC, 2019)*
2050	*49 mppa (downside)* *54 mppa (baseline)* *61 mppa (upside)*	*329,000 (downside)* *365,000 (baseline)* *409,000 (upside)*	*Above + Third Terminal*	*Review of Future Capacity Needs at Ireland's State airports (DTTAS, 2018)* *Dublin Airport LAP (FCC, 2020)*

2.23 The future levels of passenger throughput and air traffic described by these plans exceed the peak levels of activity reported by Dublin Airport in 2019, which saw 238,000 ATMs and 32.9 million passengers.

Environmental objectives

2.24 Whilst the above-mentioned plans support growth at Dublin Airport, they also highlight the need for environmental performance to be considered. In the context of noise, the plans highlight the:

- *application of Regulation 598/2014 regarding the imposition of noise-related operating restrictions;*
- *need for effective land-use planning;*
- *promotion of new technology in aircraft and engine design to address noise and emissions;*
- *consideration of impacts on local residential areas;*
- *use of measures such as Continuous Descent Approaches to reduce noise.*

2.25 The above-mentioned plans also have regard for other environmental considerations in relation to the airport. For example, the plans stipulate:

- *the need for technology improvements in aircraft and engine design to help combat aviation emissions and improve energy efficiency;*
- *protection of natural landscape features, such as rivers, and the climate from impacts associated with airport expansion.*

2.26 *Plans including the NPF, RSES and climate related plans also have more general environmental protection objectives beyond those related to airport development or air noise management. These are set out in the policy sub-sections for each of the environmental aspects within Chapter 4. For example, the NPF states:*

"National Policy Objective 52: The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital."

"National Policy Objective 59: Enhance the conservation status and improve the management of protected areas and protected species by: Implementing relevant EU Directives to protect Ireland's environment and wildlife …"

3 NIS Scope and Methodology

3.1 *This chapter provides more detail on the NIS process, including the outcomes of the Screening stage, and the methodology for undertaking the impact assessment that will determine whether the NAO and RD will have an adverse effect on the integrity of any Natura 2000 site.*

3.2 *The Dublin Airport LAP identifies a number of infrastructural constraints to growth, including limitations in the road network for passengers travelling to and from the airport. At a certain point, those infrastructural constraints will have to be addressed with appropriate road and/or rail development if the Airport is to grow. While the NAO and RD will provide for a noise management regime that will allow the airport to grow, they only provide for a noise management framework and are neutral on whether that growth actually occurs. Therefore, they do not constrain the planning authority or An Bord Pleanála in any way in making whatever decision they consider appropriate on any application for that further development necessary to deliver growth. Therefore, any such development (e.g. relating to a new terminal or road/rail development) will have to be subject to EIA and AA (or screening for EIA and AA) and planning scrutiny on its own terms and its impacts will be fully assessed and considered at that stage.*

3.3 *Given the above, and that ANCA's remit is confined to aircraft noise (as revealed in Chapters 1 and 2), this AA deals only with the direct and indirect impacts relating to the management of aircraft noise.*

AA Screening

3.4 *An AA Screening Report was published on 18th August 2021 and included the following information:*

- *An outline description of the Plan and the geographical area involved (including the Zone of Influence);*
- *Identification of relevant Natura 2000 sites, and compilation of information on their qualifying interests and conservation objectives;*
- *A high level assessment of likely effects, undertaken on the basis of available information;*
- *A screening statement with conclusions.*

3.5 *ANCA then, in their role as CA, made screening determination pursuant to Article 42 of the EC (Birds and Natural Habitats) Regulations 2011 that the NAO and RD would be likely to have a significant effect on Natura 2000 sites. This direction was given on the basis that, as there was uncertainty around what exactly the NAO and RD would contain, it could not be determined at*

the screening stage that there would not be, as a result of implementation of the NAO and RD, no significant effects on any Natura 2000 sites.

3.6 *The AA Screening Report considered whether there was any potential for the NAO and RD to have effect on Natura 2000 sites in combination with other Plans (listed in this Report in para 2.16) that outline policies that promote growth or changes in operations at the Airport. It concluded that the proposals within the NAO and RD will be complementary to and in accordance with those other Plans, and so therefore not in any way additional.*

3.7 *It also stated that there are no known projects occurring or in development that are contrary to or additional, to the Plans set out, and this remains the case.*

3.8 *For these reasons, the Screening Report concluded that there was therefore no further need to consider the potential for increased effects as a result of the NAO and RD acting in combination with the effects of other projects or plans, within a detailed Appropriate Assessment. In combination effects of the implementation of the NAO and RD with other Plans are therefore not considered further.*

Future Baseline

3.9 *As set out in the various plans listed in para 2.18, the national, regional and local policy direction for the future of Dublin Airport is to increase passenger numbers to c.40 mppa in 2030, and c.54 mppa from 2050, through further terminal development and infrastructure. Though development required as part of that expansion will require planning permission, for the purpose of this AA it is considered that the daa will seek to grow beyond the 32 mppa passenger cap that is being introduced from 2022 onwards[4] (regardless of the terms of the NAO or any RD), and so the future baseline has to take this into account.*

3.10 *daa has provided updated annual passenger forecasts under four different operating scenarios over the period 2019-2040, as shown below in Table 3.1. Under Scenario B, the existing conditions 3(d) and 5 remain in place, but the likely increasing of passenger numbers beyond the 32 mppa cap, as part of policy directed growth, is allowed to occur. That growth would require a new planning application to lift the 32mppa cap, which is supported by existing plans and policy. This therefore reflects the future baseline' (i.e. without implementation of the NAO and RD).*

[4] The 32 mppa passenger cap is required by Condition 3 of daa's 'Terminal 2' planning application F06A/1248 and An Bord Pleanála 06F.220670, and Condition 2 of daa's 'Extension to Terminal 1' planning application F06A/1843 and An Bord Pleanála 06F.223469. As matters stand, it will become effective in 2022, when the new runway becomes operational.

3.11 *Note that daa's forecast under this Scenario of 36.3 mppa in 2030 falls shy of the policy ambition of c.40 mppa, and would also be unlikely to reach c.54 mppa from 2050 (the latter unconfirmed as daa forecasts reach only to 2040). daa states that this is due to being unable to sufficiently increase passenger growth, particularly during the early morning 'rush hour', without planning conditions 3(d) and 5 being amended. Scenario E reflects a 'constrained future baseline', i.e. without the NAO and RD, or any wider growth being implemented – however, this is considered to be unlikely because all policy points to there being growth at the Airport .*

Table 3.1: Annual passengers (mppa) for 2019-2040 under different scenarios

Year	*Scenario A/C - amend 3(d) and 5 - no 32 mppa cap 'Assessment case'*	*Scenario B - with 3(d) and 5 - no 32 mppa cap => future baseline'*	*Scenario D - amend 3(d) and 5 - with 32 mppa cap*	*Scenario E - with 3(d) and 5 - with 32 mppa cap=> Constrained future baseline*
2019	*32.9*	*32.9*	*32.9*	*32.9*
2020	*7.4*	*7.4*	*7.4*	*7.4*
2021	*7.9*	*7.9*	*7.9*	*7.9*
2022	*21.0*	*19.6*	*21.0*	*19.6*
2023	*26.7*	*24.9*	*26.7*	*24.9*
2024	*31.2*	*29.3*	*30.8*	*29.3*
2025	*32.3*	*30.4*	*32.0*	*30.4*
2026	*34.0*	*31.6*	*32.0*	*31.2*
2027	*35.6*	*32.8*	*32.0*	*32.0*
2028	*37.0*	*33.9*	*32.0*	*32.0*
2029	*38.4*	*35.1*	*32.0*	*32.0*
2030	*39.6*	*36.3*	*32.0*	*32.0*
2031	*40.5*	*37.0*	*32.0*	*32.0*
2032	*41.3*	*37.6*	*32.0*	*32.0*
2033	*42.1*	*38.2*	*32.0*	*32.0*
2034	*42.7*	*38.9*	*32.0*	*32.0*
2035	*43.4*	*39.5*	*32.0*	*32.0*

2036	44.0	40.0	32.0	32.0
2037	44.7	40.5	32.0	32.0
2038	45.3	41.0	32.0	32.0
2039	46.0	41.5	32.0	32.0
2040	46.6	42.0	32.0	32.0

3.12 *Implementation of the NAO and RD will set a framework for sustainable growth of the airport that limits and reduces the impact of noise. As noted earlier, however, they do not stipulate the level of passenger numbers or ATMs that could use or operate from Dublin Airport. Instead they set the noise outcomes that need to be achieved, whether or not growth occurs, e.g. reducing the number of people highly annoyed and highly sleep disturbed by 30% (compared to 2019 levels) by 2030.*

In order to undertake the AA, the assessment case (i.e. the case whereby the NAO and RD are implemented) must be identified in terms comparable with the future baseline. The assessment case used is Scenario A/C from Table 3.1. It can be seen from the this assessment case that an indirect impact of the NAO and RD will be an increase in mppa of 4.6m over the future baseline (albeit one in which the noise impacts are limited and reducing). That indirect impact is therefore considered in this NIS.

Methodology

Scope of NIS

3.13 *The assessment undertaken compares the likely future baseline with the assessment case as shown in Table 3.2 below.*

Table 3.2: Increase in passenger numbers for 2019-2040 between the future baseline and the assessment case

	Scenario A/C - amend 3(d) and 5 - no 32 mppa cap => Assessment case	Scenario B - with 3(d) and 5 - no 32 mppa cap => Likely future baseline	Increase in passenger numbers between the likely future baseline and the assessment case (Scenario A/C – Scenario B)	
Year	mppa	mppa	mppa	%
2019	32.9	32.9	0.0	-
2020	7.4	7.4	0.0	-

2021	7.9	7.9	0.0	-
2022	21.0	19.6	1.4	7.1%
2023	26.7	24.9	1.8	7.2%
2024	31.2	29.3	1.9	6.5%
2025	32.3	30.4	1.9	6.3%
2026	34.0	31.6	2.4	7.6%
2027	35.6	32.8	2.8	8.5%
2028	37.0	33.9	3.1	9.1%
2029	38.4	35.1	3.3	9.4%
2030	39.6	36.3	3.3	9.1%
2031	40.5	37.0	3.5	9.5%
2032	41.3	37.6	3.7	9.8%
2033	42.1	38.2	3.9	10.2%
2034	42.7	38.9	3.8	9.8%
2035	43.4	39.5	3.9	9.9%
2036	44.0	40.0	4.0	10.0%
2037	44.7	40.5	4.2	10.4%
2038	45.3	41.0	4.3	10.5%
2039	46.0	41.5	4.5	10.8%
2040	46.6	42.0	4.6	11.0%

3.14 *The NIS also addresses the period to 2027 with the 32mppa cap still in place to assess the impacts if there is no growth until 2027 notwithstanding the adoption of the NAO and RD t. This is in effect the difference between Scenario D (the 'with 32mppa' assessment case) on Table 3.3 and Scenario E (the 'with 32mppa' likely future baseline). As can be seen, the major changes here are that growth occurs more quickly to 2027 after which in both scenarios passenger numbers are capped at 32mppa. The faster growth in the assessment case is due to the daa being able to meet night-time demand as the night-time noise restrictions will have been lifted.*

Table 3.3: Increase in passenger numbers for 2019-2027 between the future baseline and the assessment case in the scenario that the 32mppa cap remains in place for this period

Year	*Scenario D - amend 3(d) and 5 This is the with 32 mppa cap assessment case*	*Scenario E - with 3(d) and 5 This is the with 32 mppa cap likely future baseline*	*Increase in passenger numbers between the likely future baseline and the assessment case in the 'with 32mppa' cap scenario (Scenario D – Scenario E)*	
	mppa	*mppa*	*mppa*	*%*
2019	*32.9*	*32.9*	*0*	*0%*
2020	*7.4*	*7.4*	*0*	*0%*
2021	*7.9*	*7.9*	*0*	*0%*
2022	*21.0*	*19.6*	*1.4*	*7.1%*
2023	*26.7*	*24.9*	*1.8*	*7.2%*
2024	*30.8*	*29.3*	*1.5*	*5.1%*
2025	*32.0*	*30.4*	*1.6*	*5.2%*
2026	*32.0*	*31.2*	*0.8*	*2.6%*
2027	*32.0*	*32.0*	*0*	*0%*

3.15 In making the assessment, consideration is paid to the indirect impacts of the NAO and RD, including operations and measures that are precluded by Condition 3(d) and 5 but that would not be precluded by the NAO and RD . Implementation of many of these measures will therefore be the responsibility of the daa and would likely be subject to further planning consent and associated EIA and AA (except with regard additional night-flights which is the subject of the current planning application – see para 1.4) This NIS takes account of the legal requirement for the competent authorities considering those proposals to ensure that they are permitted only where they will not adversely affect the integrity of any Natura 2000 site.

3.16 Specifically these include the following:

- *Additional night-flights in particular as a result of lifting the night-time restrictions.*

3.17 And in particular to support the meeting of the requirements of the NAO and RD:

- *Changes in aircraft operating procedures;*
- *Changes in the aircraft fleet mix operating from the Airport, for example to include more larger aircraft; and*

- *Changes in the flight paths used, or at least changes in the frequency of use of flightpaths that already exist.*

3.18 *Given this, the future baseline and the assessment case (both in the with and without 32mppa cap scenarios) show two key changes in activities that need consideration in the detailed assessment: more overflying of Natura 2000 sites as a result of increased numbers of flights operating to and from the airport; and changes to the operating procedures, fleet mix, flight paths and frequency of aircraft movements specifically as a result of more night-time flights occurring.*

3.19 *In particular as a result of these changed activities, and as reported in the AA Screening Report, the following effects will be subject to assessment:*

- *The effects of increases in the level and frequency of noise, and visual disturbance events caused by increases in aircraft overflying of Natura 2000 sites and potentially, also by this overflying occurring at differing times of the day and night.*
- *The effects of changes to air quality, particularly increases in the concentrations of NOx and levels of nitrogen deposition, caused by increased numbers of aircraft overflying Natura 2000 sites.*
- *The effect of emergency fuel dumping from overflying aircraft affecting Natura 2000 sites directly, or indirectly through surface water pathways.*

3.20 *Reaching a conclusion on the likelihood for a change arising from the implementation of the NAO and RD having an effect on a Natura 2000 site has been informed by a detailed review of relevant existing literature and also through the professional judgement of those preparing this NIS. No detailed assessment work, for example including noise modelling, has, or could have been, undertaken. This is because the proposals of the NAO and RD are necessarily high level and their implementation will require further planning applications which will be the subject of EIA and AA .*

Establishing the Zone of Influence

3.21 *All Natura 2000 sites within the likely Zone of Influence (ZoI) of the Plan should be subject to assessment. As set out in the AA Guidance (2010), a distance of 15km is currently recommended as the ZoI for plans. For projects it notes that this could be much less than 15km, but will need to be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in-combination effects. Natura 2000 sites that are more than 15km away could also be relevant, for example plans or projects affecting water quality or quantity upstream or downstream of sites with water dependent habitats or species.*

3.22 *In defining precisely the ZoI for this AA consideration is paid to the source, these being, whether for noise or other emissions, the aircraft in this assessment, the pathways that exist and the receptors that could be affected.*

3.23 *The likely impacts of noise on the key receptors of water birds has been considered, these being the most abundant important features of Natura 2000 sites local to the Airport. Particularly useful in informing this is research produced for the Humber Industry Nature Conservation Association (INCA) by the University of Hull (Cutts et al, 2009). Although not specifically relating to aircraft, this research recommended that (with respect to waterbirds on mudflats), construction noise levels should be restricted to below 70 dB(A) (although not stated within the research this is considered, when reading it in context with the rest of the paper, to be an average noise metric) because birds would habituate to regular noise below that level, and that also sudden and irregular noise above 50 dB(A) should be avoided. The University of Hull subsequently produced refined guidance in the Waterbird Disturbance Mitigation Toolkit (Cutts et al, 2013). It concluded that:*

- *high level disturbance effects are likely with continuous noise above 72 dB or sudden noise above 60 dB;*
- *moderate level disturbance effects are likely with regular noise of 60 – 72 dB or sudden noise of 55 – 60 dB; and,*
- *there is unlikely to be any response by waterbirds to any noises below 55 dB.*

3.24 *Aircraft noise from airports of the scale of Dublin Airport can be considered to generate near continuous and certainly regular noise. Even though an airport will have a number of different flightpaths that can be used, when a flightpath is in operation, aircraft will use a route nearly continuously and also very frequently. Even during the quieter night period, aircraft noise does not appear suddenly, but tapers in and out as the aircraft approaches and then moves away from the receptor. Also night-time movements occur frequently, even if not continuously with the Airport operating 24 hours a day and for 364 days a year. For this reason, it is considered that the only thresholds listed above for bird disturbance that are relevant are those associated with continuous noise.*

3.25 *The most common commercial passenger planes (Boeing 737 and Airbus A320) that operate from Dublin Airport may result in noise events on the ground of approximately between 68 and 72 dB LA_{max} (this being a metric that measures continuous noise) after reaching a height of 3000 ft on departure. During arrivals, and as the aircraft descends through 3,000ft these commercial planes would be expected to produce noise levels less than 65 dB LA_{max}. At the fastest climb rate an altitude of 3000 ft will be reached in 5.54 km. At the slowest climb rate an altitude of 3000 ft will be reached in 13.1 km. Therefore, noise emissions from aircraft will reach 71dB LA_{max} between 5.54km and 13.1km from the end of the Airport runways. It can therefore*

be assumed that the maximum noise on the ground anywhere between these two distances will be 71dB LA_{max}, and that would be a precautionary assumption.

3.26 *This has been reinforced by a review of aircraft operations at Dublin Airport. The flight tracking software 'WebTrak', which is used by daa and is available to the general public via their website, shows that aircraft arriving at the Airport, reach an altitude of 3000 ft at no more than 14-15km from the Airport.*

3.27 *Much of the noise data above is measured in L_{max}, that is the peak noise level recorded from an individual noise event. However, as stated earlier air traffic operations at Dublin Airport will not be made up of sudden, irregular noise events but instead will be experienced by wildlife as fairly continuous (albeit with less frequent flights at night) and having a gradual build up and then decline in noise levels, and occurring regularly. Birds are therefore unlikely to experience the noise as individual events but rather as continuous noise that increases and decreases in volume before starting again immediately or even before the noise from the previous aircraft has faded completely.*

3.28 *It is customary for studies on air quality around airports to include the whole aircraft landing and take-off cycle, including operations on the ground and in the air up to 3,000 feet (~1,000 metres (m)) above ground level. However, it is generally understood that emissions from aircraft become negligible, in terms of their effect on ground-level air quality, once aircraft are more than approximately 350-650 ft (100-200m) above the ground on departure, and when greater than approximately 160-350 ft (50-100m) on arrival.*

3.29 *This height is reached by approximately 2km or less after take-off which is comfortably outside of the airspace of any Natura 2000 site.*

3.30 *The UK's Air Quality Expert Review Group (2004) go further stating that 'Around a third of all NOx emissions from the aircraft (including ground-level emissions from auxiliary power units, engine testing etc, as well as take-off and landing) occur below 100 m in height. The remaining two-thirds occur between 100 and 1000 m and contribute little to ground-level concentrations'.*

3.31 *Certain habitats and species are however, more sensitive to even lower levels of airborne pollution and so a prudent approach to undertaking the work to inform the Appropriate Assessment will be taken with a 15km ZoI enforced for consideration of the effects of airborne pollution also applied.*

3.32 *Given all this, a precautionary 15km ZoI is therefore proposed for departing aircraft from the Airport. This should ensure that both the potential for high level and moderate level noise and air quality effects (occurring continuously) will be undertaken. In addition, a 15km ZoI is also considered appropriate for arrivals.*

3.33 It is felt that this prescribed ZoI will cover noise effects to birds which are the interest features of the SPAs, those habitats which are interest features of the SACs, and other interest features such as mammals which might also occur.

4 Relevant Natura 2000 Sites

4.1 This chapter identifies relevant Natura 2000 sites within the 15km ZoI, along with information on their qualifying interests and conservation objectives, as obtained from the NPWS website.

4.2 Within the 15km ZoI there are 18 sites designated for their internationally important biodiversity value. These include eight SPAs designated for their wild birds, and ten SACs designated for their habitats. The nearest European Sites are Malahide Estuary SAC and SPA located c. 3km to the north-east, and Baldoyle Bay SAC and SPA located c. 5km to the east, both downstream of the Plan area. These are shown in Figure 4.1.

4.3 In addition, in Figure 4.2 the airspace design proposals for Dublin Airport[5], after the opening of the second runway, are shown. This indicates that it is likely that all SPAs and SACs that occur within the ZoI will be overflown, or at least will be in the general proximity of flightpaths, to a lesser or greater extent once the second runway is operational, this being, of course, the likely future baseline situation. None can therefore be ruled out from assessment.

4.4 Details on each of the Natura 2000 sites are provided in the following tables.

[5] Obtained from 'Bickerdike Allen Partners LLP, Dublin Airport North Runway Noise Information for the Regulation 598/2014 (Aircraft Noise Regulation) Assessment, November 2020.'

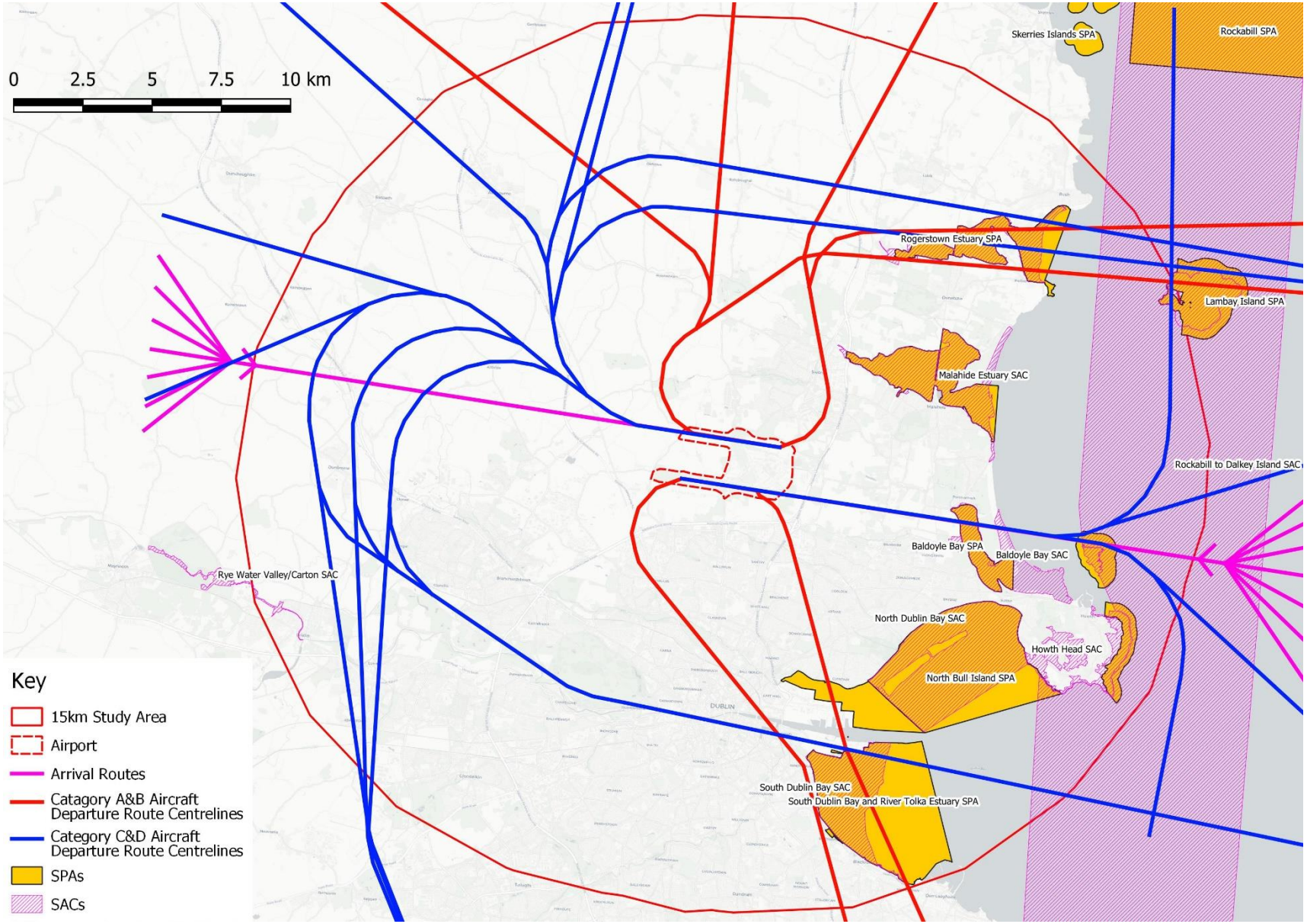

Figure 4.2: Future Airspace design overlayed with Natura 2000 sites within the 15km ZOI

Current Baseline	*Baldoyle Bay*	
	SAC	*SPA*
Interest Features	*Intertidal flats (sands/muds) exposed at low tide. Common Cord-grass in the inner estuary. Narrow-leaved Eelgrass and Dwarf Eelgrass also present. During summer, sandflats in sheltered areas are covered by green algae.* *Lugworm dominate the sandy flats. Tubeworm Lanice conchilega is present in high densities at the low tide mark, and the small gastropod Hydrobia ulvae occurs in the muddy areas, along with crustaceans.* *Glassworts, Sea-purslane, Sea Plantain and Sea Rush are present in the existing saltmarsh. Dune hills are dominated by Marram, though Lymegrass is also found.* *Brackish marsh present along the Mayne River. Knotted Hedgeparsley has been recorded, along with Brackish Water-crowfoot.*	*An important site for wintering waterfowl, providing good quality feeding areas and roost sites. An internationally important population of Light-bellied Brent Goose, also supporting Shelduck, Ringed Plover, Golden Plover, Grey Plover; and Bar-tailed Godwit.* *Other species include Great Crested Grebe, Pintail, Teal, Mallard, Common Scoter, Oystercatcher, Lapwing, Knot, Dunlin, Black-tailed Godwit, Curlew, Redshank, Greenshank and Turnstone.* *Migrant birds of Curlew Sandpiper, Spotted Redshank and Green Sandpiper are regular in small numbers. Little Egret colonisation occurs.* *The inner part of the site is a Statutory Nature Reserve and designated as a wetland of international importance under the Ramsar Convention.*
Conservation Objectives	*To maintain the conservation condition of mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonizing mud and sand, Atlantic salt meadows, and Mediterranean salt meadows.*	*To maintain the favourable conservation condition of Light-bellied Brent Goose, Shelduck, Ringed Plover, Golden Plover, Grey Plover, Bar-tailed Godwit, and the wetland habitat.*

Condition	*Good diversity in sediment types, quality variable but generally good. Salt marshes are of moderate quality. The following quantum of habitat and conservation status is present:* • *Mudflats and sandflats not covered by seawater at low tide (409.24ha, good)* • *Salicornia and other annuals colonizing mud and sand (0.38ha, average or reduced conservation)* • *Spartina swards (10.78ha, not noted)* • *Atlantic salt meadows (12.51ha, average or reduced conservation)* • *Mediterranean salt meadows (2.64ha, average or reduced conservation)*	*The quality of habitats present is variable but generally good. The following conservation status is noted:* • *Excellent (Brent Goose and Grey Plover)* • *Good (Northern Pintail, Teal, Mallard, Turnstone, Sanderling, Dunlin, Knot, Ringed Plover, Oystercatcher, Bar-tailed Godwit, Black-tailed Godwit, Red-breasted Merganser, Curlew, Golden Plover, Great Crested Grebe, Shelduck, Greenshank, Redshank and Lapwing)*
Vulnerabilities	*The surrounding area is densely populated. The main threats to the site include visitor pressure, disturbance to wildfowl and dumping. In particular, the dumping of spoil onto the foreshore presents a threat to the value of the site. The high threat categories comprise:* • *Outdoor sports and leisure activities, recreational activities* • *Sport and leisure structures*	*The high threat categories comprise:* • *Urban pressure and human habitation* • *Human induced changes in hydraulic conditions* • *Sport and leisure structures* • *Invasive non-native species* • *Fertilisation*

	• *Urbanised areas, human habitation* • *invasive non-native species*	

Current Baseline	*Howth Head*	
	SAC	*SPA (Howth Head Coast)*
Interest Features	*Heathland vegetation comprises Western Gorse, Heather, Bell Heather and localised patches of Bracken. In more open areas species such as English Stonecrop, Wood Sage and Navelwort occur. The heath merges into dry grassland in places, with Bent Grasses, Red Fescue, Cock's-foot, Yorkshire-fog, Sweet Vernal-grass, Lady's, Ribwort Plantain and Yellow-wort. In the summit area there are a few wet flushes and small bogs, with Bog Asphodel and Sundews. Patches of scrub, mostly Hawthorn, Blackthorn, Willow and Downy Birch occur in places.* *Golden-samphire, Sea Wormwood, Grass-leaved Orache, Frosted Orache, Sea Spleenwort, Bloody Crane's-bill, Spring Squill, Sea Stork's-bill and three uncommon clover species (Knotted Clover, Bird's-foot Clover and Western Clover) are present.* *The Earlscliffe area is of national importance for lichens and supports black, yellow and grey lichen zonation. Green-winged Orchid, Bird's-foot, Hairy Violet, Rough Poppy, Pennyroyal, Heath Cudweed and Betony (Red Data Book species) are present.*	*The site is of special conservation interest for Kittiwake.* *A range of seabird species also breed including Fulmar, Shag, Herring Gull, Great Black-backed Gull, Guillemot and Razorbill, and Peregrine Falcon. Black Guillemot are also present.* *The site has important amenity and educational value due to its proximity to Dublin City.*

	Curved Hard-grass (not previously recognised as occurring in Ireland), was found in 1979. *A number of rare invertebrates have been recorded. The fly Phaonia exoleta occurs in the woods and has not been seen anywhere else in Ireland, while the ground beetle Trechus rubens is found on storm beaches on the eastern cliffs. A hoverfly, known from only a few Irish locations, Sphaerophoria batava, is present in the heathland habitat.*	
Conservation Objectives	*To maintain the favourable conservation condition of the Vegetated sea cliffs of the Atlantic and Baltic coasts, and European dry heaths.*	*To maintain or restore the favourable conservation condition of Kittiwake.*
Condition	*The flora is very diverse with several Red Data Book species and species of very restricted Irish distribution. The dry heath and sea cliff vegetation is extensive and well developed. The following quantum of habitat and conservation status is noted:* • *Vegetated sea cliffs of the Atlantic and Baltic coasts (74.97ha, excellent)* • *European dry heaths (131.20ha, excellent)*	*The following conservation status is noted:* • *Excellent (Kittiwake)* • *Good (Peregrine Falcon, Fulmar, Guillemot, Razorbill)*
Vulnerabilities	*The main land use within the area is recreation, mostly walking and horse-riding, and this has led to some erosion within the site. Fires pose a danger to the site. There may*	*The high threat categories comprise:*

	also be a threat in some areas from further housing development. The high threat categories comprise: • *Outdoor sports and leisure activities, recreational activities* • *Mining and quarrying* • *Invasive non-native species* • *Fire and fire suppression*	• *Outdoor sports and leisure activities, recreational activities*

Current Baseline	*Ireland's Eye*	
	SAC	*SPA*
Interest Features	*Drift soils support Bracken and various grasses, especially Red Fescue, along with Bluebells, Common Dog-violet and Navelwort. The thinner soils support Spring Squill, Knotted Clover and Field Mouse-ear. Bloody Cranesbill has also been recorded. The cliff maritime flora includes Rock Sea-spurrey, Sea Stork's-bill, Rock Samphire, Golden Samphire, Rock Sea-lavender, Meadow Rue, Portland Spurge and Tree-mallow.* *A small area of shingle vegetation occurs above the sandy beach at Carrigeen Bay. Species such as Curled Dock, Silverweed and Spear-leaved Orache occur. The rare Sea-kale, and Henbane (Irish Red Data Book species) are also present.* *Owing to its easy access and proximity to Dublin it has great educational and amenity value.*	*Important populations of breeding seabirds. Species recorded include Fulmar, Gannet, Cormorant, Shag, Lesser Black-backed Gull, Great Black-backed Gull, Herring Gull, Kittiwake, Guillemot, Razorbill, Puffin Shelduck, Oystercatcher and Ringed Plover. Black Guillemot may also breed.* *The Gannet colony is one of six in the country and one of only two sites on the east coast. Several pairs each of breed.* *The island is also a traditional site for Peregrine Falcon. In winter small numbers of Greylag Goose and Pale-bellied Brent Goose graze on the island and it is used as a roost site by gulls and some waders.*
Conservation Objectives	*To maintain the favourable conservation condition of Perennial vegetation of stony banks, and Vegetated sea cliffs of the Atlantic and Baltic coasts.*	*To maintain or restore the favourable conservation condition of Cormorant, Herring Gull, Kittiwake, Guillemot and Razorbill.*

Condition	*This uninhabited marine island has a well-developed maritime flora, with two habitats (sea cliffs and shingle). The following quantum of habitat and conservation status is noted:* • *Perennial vegetation of stony banks (0.13ha, excellent)* • *Vegetated sea cliffs of the Atlantic and Baltic coasts (8.37ha, excellent)*	*The following conservation status is noted:* • *Excellent (Razorbill, Cormorant, Kittiwake, Guillemot)* • *Good (Peregrine Falcon, Fulmar)* • *Average or reduced (Puffin, Gannet)*
Vulnerabilities	*The high threat categories comprise:* • *Fire and fire suppression* • *Outdoor sports and leisure activities, recreational activities* • *Sport and leisure structures* • *Other human intrusions and disturbances* • *Grazing*	*Owing to its proximity to the mainland, the island is popular with day-trippers and has educational value. As a result, the high threat categories comprise:* • *Outdoor sports and leisure activities, and recreational activities*

Current Baseline	*Lambay Island*	
	SAC	*SPA*
Interest Features	*Extensive heath formerly existed but this has been eliminated at the expense of improved pasture. Vegetated cliff is the most notable habitat – these are quite representative of eastern cliffs with diversity in height, slope and aspect.* *The cliffs hold internationally important populations of seabirds. This site provides year-round haul-out habitat for the Annex II species Grey Seal and Common (Harbour) Seal, (both species for which the site is designated), and includes regionally significant breeding and moulting sites.* *The foreshore surrounding the island holds examples of Reef habitat with typical biodiversity for the east coast. Qualifying features of the site additionally include Reefs and Vegetated Sea Cliffs.*	*The site is of special conservation interest for the following species: Fulmar, Cormorant, Shag, Greylag Goose, Lesser Black-backed Gull, Herring Gull, Kittiwake, Guillemot, Razorbill and Puffin.* *The site is also of special conservation interest for holding and assemblage of over 20,000 breeding seabirds, and is one of the top seabird sites in Ireland.* *The presence of Peregrine, a species that is listed on Annex I of the E.U. Birds Directive, is also of note.*
Conservation Objectives	*To maintain the favourable conservation condition of Reefs, Vegetated sea cliffs of the Atlantic and Baltic coasts, Grey Seal, and Common (Harbour) Seal.*	*To maintain or restore the favourable conservation condition of Fulmar, Cormorant, Shag, Greylag Goose, Lesser Black-backed Gull, Herring Gull, Kittiwake, Guillemot, Razorbill and Puffin.*

Condition	*The following quantum of habitat and conservation status is noted:* • *Reefs (58.0ha, good)* • *Vegetated sea cliffs (20.3ha, good)* *For species, the following conservation status is noted:* • *Excellent (Grey Seal)*	*The following conservation status is noted:* • *Excellent (Razorbill, Greylag Goose, Fulmar, Lesser Black-backed Gull, Kittiwake, Guillemot)* • *Good (Puffin, Cormorant)*
Vulnerabilities	*The high threat categories comprise:* • *Grazing*	*There are no high threat categories of impacts on the site.*

Current Baseline	*Malahide Estuary*	
	SAC	*SPA*
Interest Features	*This site is a fine example of an estuarine system with all the main habitats represented. The outer part of the estuary is mostly cut off from the sea by a large sand spit, known as 'the island'. The outer estuary drains almost completely at low tide, exposing sand and mud flats, for which the site is designated.* *The inner estuary does not drain at low tide apart from the extreme inner part. Here, patches of saltmarsh and salt meadows occur (also qualifying features of the site). The site includes a fine area of rocky shore south-east of Malahide and extending towards Portmarnock.*	*This site is of high importance for wintering waterfowl and supports a particularly good diversity of species. The lagoonal nature of the inner estuary is of particular value as it increases the diversity of birds which occur.* *The site is of special conservation interest for the following species: Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank.*
Conservation Objectives	*To maintain the favourable conservation condition of Tidal Mudflats and Sandflats, Salicornia Mud, Atlantic Salt Meadows, Mediterranean Salt Meadows, Marram (White) Dunes, and Fixed (Grey) Dunes*	*To maintain the favourable conservation condition of Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank.*

		There is an additional objective to maintain the favourable conservation condition of the wetland habitat in Malahide *Estuary SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.*
Condition	*The following quantum of habitat and conservation status is noted:* • *Tidal Mudflats and Sandflats (310.7ha, good)* • *Salicornia Mud (1.92ha, good)* • *Atlantic Salt Meadows (25.1ha, good)* • *Mediterranean Salt Meadows (0.63ha, average or reduced)* • *Marram (White) Dunes (1.80ha, average or reduced)* • *Fixed (Grey) Dunes (21.4ha, good)*	*The following conservation status is noted:* • *Excellent (Black-tailed Godwit, Dunlin, Knot, Grey Plover, Oystercatcher, Red-breasted Merganser, Goldeneye, Pintail, Shelduck, Brent Goose)* • *Good (Redshank, Bar-tailed Godwit, Golden Plover, Great Crested Grebe)*
Vulnerabilities	*The inner part of the estuary is heavily used for water sports. A section of the outer estuary has recently been infilled for a marina and housing development. The high threat categories comprise:*	*The high threat categories comprise:* • *Roads, paths and railroads* • *Urbanised areas, human habitation* • *Human induced changes in hydraulic conditions*

	• *Outdoor sports and leisure activities, recreational activities* • *Roads, paths and railroads* • *Human induced changes in hydraulic conditions*	• *Outdoor sports and leisure activities, recreational activities*

Current Baseline	*North Dublin Bay and North Bull Island*	
	SAC (North Dublin Bay)	*SPA (North Bull Island)*
Interest Features	*Fixed dune grassland to pioneer communities on foredunes occur, which support Marram Grass, Lyme-grass and Sand Couch. Behind the first dune, Wild Pansy, Kidney Vetch, Common Bird's-foot-trefoil, Common Restharrow, Yellow-rattle, Pyramidal Orchid and Bee Orchid are present.* *About 1km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees. The water table is very near the surface and only slightly brackish. Saltmarsh Rush, Meadowsweet and Devil's-bit Scabious are present. Orchids include Marsh Helleborine, Twayblade, Autumn Lady's-tresses and Marsh Orchids.* *Saltmarsh is present on the landward side. On the lower marsh, Glasswort, Common Saltmarsh-grass, Annual Sea-blite and Greater Sea-spurrey are the main species. In the middle marsh Sea Plantain, Sea Aster, Sea Arrowgrass and Thrift appear. Above the normal high tide, species such as Common Scurvygrass and Sea Milkwort are found, while on*	*The site is of special conservation interest for Light-bellied Brent Goose (being one of the most important sites for this species), Shelduck, Teal, Pintail (14% of Ireland's population), Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot (10% of Ireland's population), Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull.* *The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds.* *Grey Heron, Little Egret, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser, Ringed Plover and Greenshank are also present.* *Gulls are present during winter (Black-headed Gull, Common Gull and Herring Gull). While some of the birds also frequent South Dublin Bay and the River Tolka*

	the upper marsh, the rushes Juncus maritimus and J. gerardi are dominant. *The habitat 'annual vegetation of drift lines' is found in places, with Sea Rocket, Oraches and Prickly Saltwort located.* *Two intertidal lagoons are present. The north lagoon is dominated by Salicornia dolichostachya. Beaked Tasselweed and Narrow-leaved Eelgrass occur. Dwarf Eelgrass also occurs in Sutton Creek. Common Cordgrass occurs but is controlled by management. Green algal mats cover large areas during summer. Sediments have a rich macrofauna, with high densities of Lugworms. Mussels occur, along with bivalves such as Cerastoderma edule, Macoma balthica and Scrobicularia plana. The small gastropod Hydrobia ulvae occurs in high densities, and crustaceans Corophium volutator and Carcinus maenas are common.* *On the seaward side Lesser Centaury, Red Hemp-nettle and Meadow Saxifrage (rare species) are present, alongside Wild Clary/Sage and Spring Vetch (Red Data Book listed). A rare liverwort, Petalophyllum ralfsii is present.*	*Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter.* *There are regular passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. The island is a regular wintering site for Short-eared Owl.* *The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Breeding birds include Skylark, Meadow Pipit, Stonechat, Mallard and Reed Bunting, Ringed Plover breed, and sometimes Shelduck.*

	Irish Hare are resident. At least seven important invertebrate species are present (from the Orders Diptera, Hymenoptera and Hemiptera).	
Conservation Objectives	*To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows, Mediterranean salt meadows, and Petalwort.* *To restore the favourable conservation condition of Salicornia and other annuals colonizing mud and sand, Annual vegetation of drift lines, Embryonic shifting dunes, Shifting dunes along the shoreline with Ammophila arenaria ('white dunes'), Fixed coastal dunes with herbaceous vegetation ('grey dunes'), and Humid dune slacks.*	*To maintain the favourable conservation condition of Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull, and the wetland habitat.*
Condition	*This site is an excellent example of a coastal site with all the main habitats represented. The following quantum of habitat and conservation status is present:* • *Mudflats and sandflats not covered by seawater at low tide (577.73ha, good)* • *Annual vegetation of drift lines (0.11ha, good)* • *Salicornia and other annuals colonizing mud and sand (29.10, excellent)*	*One of the top sites in Ireland for wintering waterfowl, and a Ramsar Convention site. The following conservation status is noted:* • *Excellent (Pintail, Shoveler, Teal, Turnstone, Light-Bellied Brent Goose, Sanderling, Dunlin, Knot, Oystercatcher, Black-headed Gull, Bar-tailed Godwit, Black-tailed Godwit, Curlew, Grey Plover, Shelduck, Redshank, Wigeon, Mallard, Ringed Plover, Common Gull, Red-breasted Merganser, Greenshank)*

	• *Spartina swards (73.75ha, not stated)* • *Atlantic salt meadows (82.27ha, good)* • *Mediterranean salt meadows (7.98ha, good)* • *Embryonic shifting dunes (6.07ha, excellent)* • *Shifting white dunes along the shoreline (3.18ha, good)* • *Fixed grey coastal dunes (104.8ha, excellent)* • *Humid dune slacks (12.11ha, excellent)*	• *Good (Golden Plover, Short-eared Owl, Curlew Sandpiper, Little Stint, Ruff, Spotted Redshank)*
Vulnerabilities	*The North Bull Island is the main recreational beach in Co. Dublin and is used throughout the year. Two golf courses are present. The site is used regularly for educational purposes. The high threat categories comprise:* • *Industrial or commercial areas* • *Urbanised areas, human habitation* • *Interspecific faunal relations* • *Outdoor sports and leisure activities, recreational activities* • *Discharges*	*The high threat categories comprise:* • *Outdoor sports and leisure activities and recreational activities* • *Roads, paths and railroads*

Current Baseline	*Rockabill to Dalkey Island*
	SAC
Interest Features	*Reef habitat is uncommon along the eastern seaboard of Ireland. Species recorded in the intertidal include Fucus spiralis, Fucus serratus, Pelvetia canaliculata, Ascophyllum nodosum, Semibalanus balanoides and Necora puber. Subtidally, Laminaria hyperborea, Flustra folicacea, Alaria esculenta, Halidrys siliquosa, Pomatocereos triqueter, Alcyonium digitatum, Metridium senile, Caryophyllia smithii, Tubularia indivisa, Mytilus edulis, Gibbula umbilcalis, Asterias rubens, and Echinus esculentus were present.* *These reefs are subject to strong tidal currents with an abundant supply of suspended matter resulting in good representation of filter feeding fauna such as sponges, anemones and echinoderms.* *Harbour Porpoise occur year-round. The site also supports Common Seal and Grey Seal. Bottlenosed Dolphins have also occasionally been recorded. Minke, Fin, and Killer Whales, and Risso's and Common Dolphins are present.*
Conservation Objectives	*To maintain the favourable conservation condition of Reefs and Harbour Porpoise.*
Condition	*The following quantum of habitat and conservation status is present:* • *Reefs (181.84ha, good)*
Vulnerabilities	*The high threat categories comprise:* • *Shipping lanes, ports, marine constructions* • *Excess energy*

	• *Discharges* • *Fishing and harvesting aquatic resources*

Current Baseline	*Rogerstown Estuary*	
	SAC	*SPA*
Interest Features	*The site is a typical eastern estuary with fairly extensive intertidal sand and mud flats. The intertidal flats of the outer estuary are mainly of sands, with soft muds in the north-west sector and along the southern shore. The salt marshes which fringe the estuary are of moderate importance and quality and include both Atlantic and Mediterranean salt meadows, as well as Salicornia flats. The sand dune element at site is limited in its distribution and quality.* *Two plant species which are legally protected under the Flora (Protection) Order, 1999, occur within the site: Hairy Violet Viola hirta occurs on the sand spit and Meadow Barley Hordeum secalinum occurs in the saline fields of the inner estuary. Another rare species, Green-winged Orchid Orchis morio, occurs in the sandy areas of the outer estuary.*	*Rogerstown Estuary SPA is an important winter waterfowl site, a regular site for a range of autumn passage migrants, and an important link in the chain of estuaries on the east coast. The site is of special conservation interest for the following species: Greylag Goose, Light-bellied Brent Goose, Shelduck, Shoveler, Oystercatcher, Ringed Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit and Redshank.*
Conservation Objectives	*To maintain the favourable conservation condition of Estuaries; Mudflats and sandflats not covered by seawater at low tide; Salicornia and other annuals colonising mud and sand; Atlantic salt meadows Glauco-Puccinellietalia*	*To maintain the favourable conservation condition of Greylag Goose, Light-bellied Brent Goose, Shelduck,*

	maritimae; Mediterranean salt meadows Juncetalia maritime; Shifting dunes along the shoreline with Ammophila arenaria (white dunes); Fixed coastal dunes with herbaceous vegetation (grey dunes)	*Shoveler, Oystercatcher, Ringed Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit and Redshank.*
Condition	*The following quantum of habitat and conservation status is noted:* • *1130 Estuaries (268.3ha, average or reduced)* • *1140 Mudflats and sandflats not covered by seawater at low tide (370.5ha, average or reduced)* • *1310 Salicornia and other annuals colonising mud and sand (0.90ha, average or reduced)* • *1330 Atlantic salt meadows (37.2ha, average or reduced)* • *1410 Mediterranean salt meadows (2.18ha, average or reduced)* • *2120 Shifting (white) dunes (2.56ha, average or reduced)* • *2130 Fixed (grey) coastal dunes (8.30ha, average or reduced)*	*The following conservation status is noted:* • *Excellent (Light-bellied Brent Goose, Shelduck, Shoveler, Oystercatcher, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Redshank)* • *Good (Greylag Goose, Ringed Plover)*

Vulnerabilities	*The quality of the site is variable owing to pollution from a number of sources, especially a large landfill site which was built on the mudflats. The high threat categories comprise:* • *Human induced changes in hydraulic conditions* • *Invasive non-native species* • *Use of biocides, hormones and chemicals* • *Abiotic (slow) natural processes*	*The high threat categories comprise:* • *Discharges* • *Invasive non-native species* • *Fertilisation* • *Human induced changes in hydraulic conditions*

Current Baseline	*Rye Water Valley/Carton*
	SAC
Interest Features	*Around a series of lakes Reed Sweet-grass, Yellow Iris, Reed Canary-grass, Bulrush, Water Forget-me-not, Marsh-marigold and starworts are present. The river has been dredged, removing much of the reed fringe.* *A small clump of willows, with Dogwood, Alder, Ash and Elder exists. The ground flora includes Golden Saxifrage, Meadowsweet, Common Valerian, Wavy Bitter-cress and Bittersweet.* *The woods on Carton Estate are both deciduous and coniferous. Conifers, including some Yew are dominant, with Beech, Oak, Sycamore, Ash and Hazel also occurring. The ground flora is dominated by Ivy, with Hedge Woundwort, Wood Speedwell, Woodruff, Wood Avens, Common Dog-violet, Wild Angelica, Ramsons, Ground-ivy and Ivy Broomrape also found.* *Hairy St. John's-wort and Green Figwort are present, and there is an old record for Hairy Violet (Red Data Book listed, the latter not recoded recently).* *The marsh, mineral spring (considered rare) and seepage area found at Louisa Bridge support Stoneworts, Marsh Arrowgrass, Purple Moor-grass, Sedges, Common Butterwort, Marsh Lousewort, Grass-of-Parnassus and Cuckooflower. Blue Fleabane (Red Data Book listed) is found growing on a wall at Louisa Bridge.* *The Rye Water is a spawning ground for Trout and Salmon, and the rare Whiteclawed Crayfish has been recorded. The rare Narrowmouthed Whorl Snail and Desmoulin's Whorl Snail occur in marsh vegetation. The scarce dragonfly, Orthetrum coerulescens, has also been recorded. Within the woods, Blackcap, Woodcock and Long-eared Owl have been recorded. Little Grebe, Coot, Moorhen, Tufted Duck, Teal and Kingfisher occur on and around the lake.*

Conservation Objectives	*To maintain or restore the favourable conservation condition the Petrifying springs with tufa formation, Narrow-mouthed Whorl Snail and Desmoulin's Whorl Snail.*
Condition	*The following quantum of habitat and conservation status is present:* • *Petrifying springs with tufa formation (0.72ha, good)* • *Kingfisher (excellent)* • *Narrow-mouthed Whorl Snail (excellent)* • *Desmoulin's Whorl Snail (good)*
Vulnerabilities	*There are no high threat categories relating to the site. The medium threat categories comprise:* • *Urbanised areas, human habitation* • *Human induced changes in hydraulic conditions* • *Forest related activities*

Current Baseline	*South Dublin Bay and River Tolka Estuary*	
	SAC (South Dublin Bay)	*SPA*
Interest Features	*The bed of Dwarf Eelgrass is the largest on the east coast. Green algae are in low density. Fucoid algae occur on the rocky shore.* *Small, sandy beaches with incipient dune formation are present. Drift line vegetation occurs. Species present are Sea Rocket, Frosted Orache, Spear-leaved Orache, Prickly Saltwort and Fat Hen. Also occurring is Sea Sandwort, Sea Beet and Annual Sea-blite. A small area of pioneer saltmarsh now occurs in the lee of an embryonic sand dune. Pioneer stands of glassworts also occur.* *Lugworm, Cockles and Annelids, and other Bivalves are frequent. The small gastropod Hydrobia ulvae occurs.*	*Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern are present.* *Other species occurring in smaller numbers include Great Crested Grebe, Curlew, Little Egret and Turnstone.* *An important site for wintering waterfowl. Birds regularly commute between the south bay and north bay, however recent studies have shown that certain populations which occur in the south bay spend most of their time there.* *A significant site for wintering gulls, including Black-headed Gull, Common Gull, Herring Gull and Mediterranean Gull.* *Common Tern (being one of their most important sites) and Arctic Tern breed in Dublin Docks, on a man-made*

		mooring structure. South Dublin Bay is an important staging/passage site in autumn for Tern species.
Conservation Objectives	*To maintain the favourable conservation condition of Mudflats and Sandflats not covered by seawater at low tide.*	*To maintain the favourable conservation condition of Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern, Arctic Tern and the wetland habitat.*
Condition	*The following quantum of habitat and conservation status is present:* • *Mudflats and Sandflats not covered by seawater at low tide (719.95ha, good)* • *Annual vegetation of drift lines (0.01ha, good)* • *Salicornia and other annuals colonizing mud and sand (0.01ha, good)* • *Embryonic shifting dunes (0.03ha, good)*	*The following conservation status is noted:* • *Excellent (Brent Goose, Sanderling, Mediterranean Gull, Roseate Tern, Common Tern, Arctic Tern)* • *Good (Turnstone, Dunlin, Knot, Ringed Plover, Oystercatcher, Common Gull, Black-headed Gull, Bar-tailed Godwit, Red-breasted Merganser, Curlew, Cormorant, Grey Plover, Great Crested Grebe, Redshank)*
Vulnerabilities	*At low tide, the inner parts of the south bay are used for amenity purposes. Bait digging is a regular activity on the sandy flats. At high tide, some areas have windsurfing and jet-skiing.* *The high threat categories comprise:*	*The high threat categories comprise:* • *Industrial or commercial areas* • *Outdoor sports and leisure activities, recreational activities*

	• *Industrial or commercial areas* • *Human induced changes in hydraulic conditions* • *Outdoor sports and leisure activities, recreational activities* • *Biocenotic evolution, succession* • *Urbanised areas, human habitation*	• *Urbanised areas, human habitation* • *Human induced changes in hydraulic conditions* • *Discharges*

5 Assessment of Impacts

5.1 *As stated in paras 3.2 to 3.7 of this Report, although there is currently a 32 mppa passenger cap in place at Dublin Airport, the future baseline for the purposes of the AA must take into account national and local policy ambitions to increase passenger numbers to c.40 mppa in 2030, and c.55 mppa from 2050. The assessment of the NAO and RD in this chapter is therefore against the 'future baseline', which includes the permitted restrictions via conditions 3(d) and 5, but allows for policy-directed passenger growth beyond the 32 mppa cap, i.e. daa's Scenario B, albeit understanding that this does not fully meet policy ambitions (peaking at 42 mppa in 2040).*

5.2 *An assessment has also been undertaken of the period up to 2027 but with the 32mppa cap remaining in place. This mirrors the situation of the current planning application being granted, but no further growth occurring within the period to 2027 and takes account of the detailed information that is available for these short term impacts.*

5.3 *For both the 'with the 32mppa cap in place' and the 'without the 32mppa cap in place' scenarios the future baseline and the assessment case shows only three key change characteristics that have the potential to have an adverse impact on the integrity of any Natura 2000 sites:*

- *The effects of increases in the level and frequency of noise, and visual disturbance events caused by increases in aircraft overflying of Natura 2000 sites and potentially, also by this overflying occurring at differing times of the day and night.*
- *The effects of changes to air quality, particularly increases in the concentrations of NOx and levels of nitrogen deposition, caused by increased numbers of aircraft overflying Natura 2000 sites.*
- *The effects of emergency fuel dumping from overflying aircraft affecting Natura 2000 sites directly, or indirectly through surface water pathways.*

The effects of increases in the level and frequency of noise, and visual disturbance events caused by increases in aircraft overflying of Natura 2000 sites and potentially, also by this overflying occurring at differing times of the day and night.

With the 32mppa cap in place

5.4 *With the 32mppa cap in place, according to future forecasts provided by daa, up to 2027, there will be a small number of additional passengers and therefore almost certainly a small number of additional aircraft movements, that will occur if the planning application is granted*

and the night-time noise restrictions lifted when compared to the situation if these restrictions remained in place. These differences are shown earlier in this Report, in Table 3.3.

5.5 *However, it is considered that the differences are small when compared to overall numbers of passengers and associated flights, for example this being an approximately 7% difference in 2022 (1.4mppa) and 2023 (1.8mppa), reducing to a 5% difference in 2024 (1.5mppa) and 2025 (1.6mppa). Furthermore, they occur only for a very short period of a few years with in 2027, passenger numbers in both the future baseline and assessment case having reached the 32mppa cap. Also the total number of passengers never exceeds that which has already been achieved in the recent past (for example 2018 and 2019 where numbers exceeded 32mppa). For these reasons it is considered highly unlikely that effects on the Natura 2000 sites, and in particular those interest features noted within their conservation objectives and including important habitats, would occur as a result of increased overflying with the 32mppa cap in place.*

5.6 *Figure 5.1 demonstrates that during the defined night-time period, there will be increased noise to the Natura 2000 sites because of increased overflying at these times. According to forecasts provided by daa the majority of these additional flights occur though during the late evening, particularly in the period 2300 – 2330, and in the early morning, 0600 to 0700.*

5.7 *These increases are, in noise terms, and in 2025 which is considered to be the worst case year for noise[6], in the region of 7dB with increases over Malahide Estuary SPA (and SAC) most pronounced. However, as stated before this increase occurs only in this night-time period. During the day, with the northern runway fully operational, as is the case in the future baseline scenario, these Natura 2000 sites are already overflown and will be subject to even higher levels of overflying than during the night.*

[6] 2025 is the worst year with respect to noise based on the Applicants forecasts. This is due to the fleet mix assumed as part of the Airport's forecasts which contains a higher number of G0 aircraft types. In the forecasts for 2030 and beyond, there is a great proportion of the latest generation of aircraft.

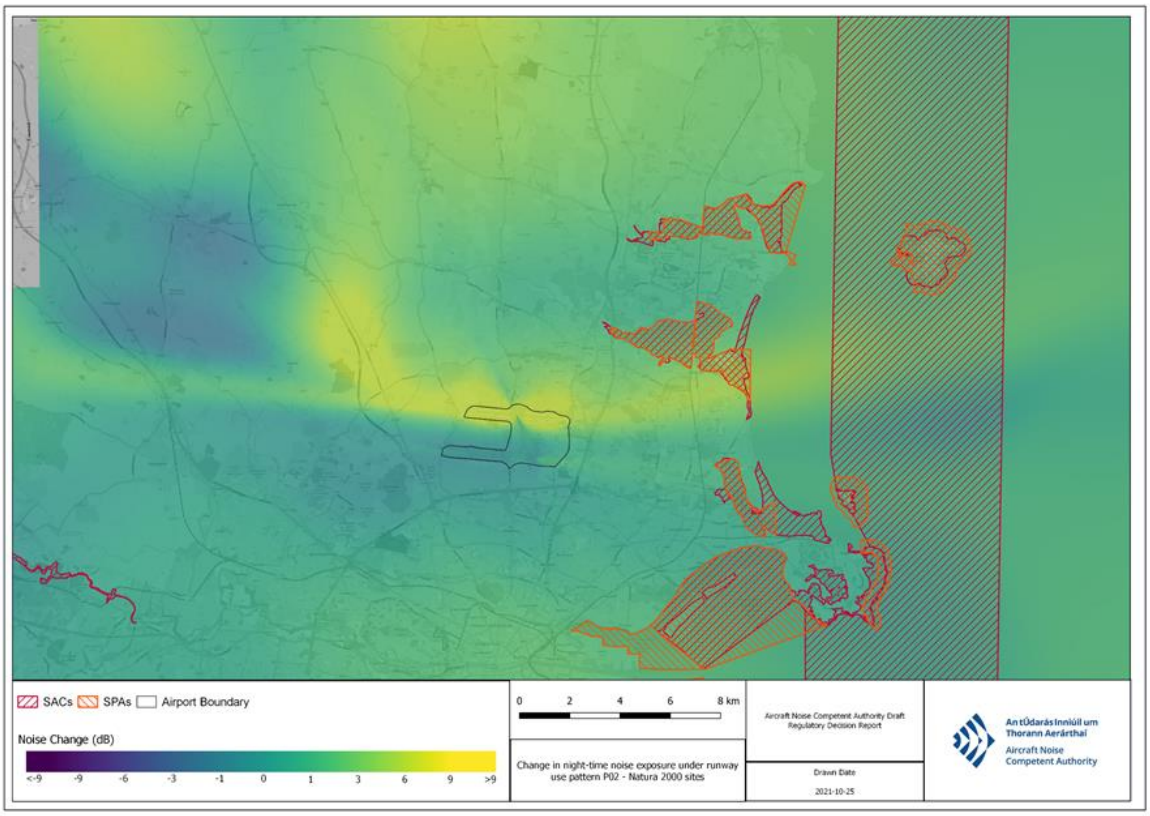

Figure 5.1 – Change in night-time noise exposure at Natura 2000 sites in 2025

5.8 *What this means is that when then considering the effect of the NAO and RD whilst the 32mppa cap remains in place, compared to the likely future baseline, there will be more night-time flights albeit once the level of the cap is reached (in 2027), this will be offset by their being fewer daytime flights. As a result, on average, noise levels will therefore be, across the entire day / night period, the same.*

5.9 *The question therefore is whether specifically, increased night-time flights are more likely to compromise the conservation objectives of the Natura 2000 sites, these being, in particular, important birds.*

5.10 *According to daa forecasts, for 2025, actual numbers of night-time flights to occur within the night-time period will be, annually, just below 32,000 compared to the future baseline of just under 20,000 flights. This is an increase of just over 60%.*

5.11 *It is considered that birds are unlikely to be any more disturbed by aircraft at night when compared with the day. In fact arguably, because the aircraft themselves will be, except for its lighting, much less visible, birds would become less likely to be disturbed.*

5.12 *This lack of visual stimuli is backed up by research from Cutts et al (2009), who detailed that habituation by waterfowl flocks on the Humber Estuary, England, to regular commercial aircraft flights that operate to and from Humberside Airport, appears to occur (more is said on*

habituation later in this Report). The research states that birds showed no response to regular daily flights, except on two occasions, when they appeared "spooked" by the shadow of an aircraft that passed close to where they were congregated, though no comment is given as to the total flights observed. For these reasons it is believed that visual stimuli increases the potential for disturbance from overflying.

5.13 *Additionally the timings of these increased number of night-flights, being mostly late (0600-0700) and early (2300-2330) in the night-time period are so close to the timings of flights that would occur outside of the night-time period (just after 0700 and just before 2300) that it is considered highly unlikely that they would lead to new effects. The behaviour of birds during these times might change somewhat during a year reflecting seasonal differences including the timing of sunrise and sunset, and the reasons the birds are using the sites i.e. roosting, breeding, foraging etc., but it is not considered likely that these additional night-flights given the timing they occur, would affect compromise the conservation objectives of any Natura 2000 site that occurs within the ZoI.*

5.14 *For similar reasons the non-bird conservation objectives of other Natura 2000 sites are also unlikely to be compromised including in particular those related to: Lambay Island SAC – grey seal and common seal; Rockabill to Dalkey Island SAC – grey seal and common seal, and several cetaceans.*

5.15 *It is also understood, from the daa forecasts that have been provided, that growth in the number of night-flights will stabilise post 2027, if the 32mppa cap is to remain in place. Although, night-time growth could occur as long as it accorded with the requirements of the NAO and demand existed, it would mean that the number of daytime flights would need to reduce in proportion.*

Without the 32mppa cap in place

5.16 *The assessment case without the 32mppa cap in place indicates a circa 11% increase in passenger numbers (4.6mppa) when compared to the future baseline. This will undoubtedly allow the Airport to operate more inbound and outbound flights to service this increase albeit this might not be directly proportional as it may also lead to part of this increase in passenger numbers being as a result of the Airport being served by larger aircraft.*

5.17 *The consequence of the NAO (and RD) is to drive the Airport to operate in a manner which means any growth occurs in the most sustainable way possible with particular regard to noise management. The NAO is primarily driven at reducing noise for human receptors but some of the consequences of these measures will also benefit other environmental aspects including those that are ecological such as Natura 2000 sites.*

5.18 *The NAO and RD will incentivise the Airport to require more efficient aircraft fleet so that noise levels directly from aircraft flying overhead are reduced. This will have the obvious benefit that on average the aircraft will be less noisy and therefore noise generated from aircraft activities is not likely to be significant in light of the conversation objectives of the Natura 2000 sites.*

5.19 *With this said, and taking a precautionary approach, the assessment needs to consider a small increase in aircraft numbers associated with proposed passenger growth of circa 15%, but understanding that some of this increase will be mitigated by the likely introduction of a quieter aircraft fleet mix continue to grow without breaching the NAO and RD requirements. Operating with a quieter fleet has therefore been an assumption used in undertaking this assessment.*

5.20 *Importantly though, based on information provided by daa and used to define both the likely future baseline and assessment case, it is considered that the additional 4.6mppa will use the Airport within the defined night-time period (2300 – 0700) only. The increase occurs as a result of the demand for night-time flights only being met if the planning application to remove the existing night-time movement restrictions is granted.*

5.21 *The NAO (or RD) does not dictate specifically the number of additional night flights that will occur when compared to the future baseline which is, of course, capped by the noise restrictions that are in place. Rather the NAO establishes noise metrics within which the Airport must operate and the RD establishes the operating restrictions and noise mitigation measures necessary to achieve those metrics. These thresholds ensure that noise is managed so that it is never worse at night, than was the situation in 2019 whether this be during day-evening-night or at night only.*

5.22 *Being better than 2019 is however, based on the overall noise situation and doesn't consider that there may still be increased noise at particular receptors which could include for example, Natura 2000 sites. It is also focussed on human receptors rather than those that are ecological and in fact, the drive to overfly fewer people could result in a focus on overflying areas that are unpopulated more frequently and this could include Natura 2000 sites.*

5.23 *Understanding this means that this assessment focuses on both considering the effect of the increased numbers in passengers and air traffic movements in totality but also when considering that this will occur only during the night-time period.*

5.24 *As said before the interest features that are also listed in the conservation objectives of the SPAs that fall within the ZoI are birds and in particular waterbirds including wintering wildfowl and waders. Consideration is therefore paid to the potential for impacts on birds that inhabit these SPAs. It is important to note however, that the research available to support the assessment made, except for that which has been produced to support the daa planning application, is generally not specific to the species that occur within the SPAs in the ZoI. The research does however, cover a wide range of birds including wildfowl and waders. It*

demonstrates that bird species generally have similar responses to these stimuli and as such is considered appropriate to inform this assessment. Because the research is not specific to a particular species (or to more than one species) that might occur at one or more of the SPAs being considered, this analysis applies to all.

5.25 *For context, as part of the AA Screening undertaken for the planning application that seeks to have the night-time noise restrictions removed, a total of 228 hours of vantage point survey were carried out within Baldoyle Bay and Rogerstown Estuary between June 2016 and December 2018. The AA Screening Report submitted with the planning application (AECOM, 2020) reveals that, during this period, despite an almost continuous stream of air traffic overhead, at no time was a reaction by any wetland bird(s) to passing aircraft recorded. It could therefore be assumed that birds that occupy the closest SPAs to the Airport have already habitually gotten used to the noise.*

5.26 *Further evidence as detailed below based on a variety of research backs up that birds can become habitually used to aircraft overflying and the noise associated with it. Relevant research quoted has been used previously to support the conclusions of other Appropriate Assessments undertaken including, for example, with regard operational changes at London Heathrow Airport in England.*

5.27 *The Federal Highway Association review (FHWA, 2004) is an important review of studies on the effect, in terms of behavioural and physiological responses, of aircraft noise on wildlife including, of particular relevance, migratory wildfowl and dabbling ducks. The review identifies a number of potentially negative effects caused by noise from aircraft. In particular alert reactions to physiological indicators of stress (e.g. changes in hormonal levels, organ function, etc.) occurred in both domestic and wild species ranging with, in particular, migratory waterfowl often making brief flights in response to aircraft overflights. However, noise in these studies was generally intermittent and occurred at levels greater than will be encountered at the SPAs in question even after growth has occurred i.e. > 100 dB,. As described in para 3.23, precautionary noise levels on the ground are on average 71 dB, which is significantly less than the levels reported in this research. In addition, noise at Dublin Airport is characterised as being continuous, rather than intermittent as was the case in this research. Intermittent noise, as is shown by research described in para 3.21, disturbs birds at much lower levels than does continuous noise.*

5.28 *In contrast, at a mean sound level of 85dB(A) and when exposed to low-flying aircraft (L_{eq} 24 hr. = 63 dB(A)), a field study by Conomy et al. (1998) of black ducks, American wigeon Anas americana, gadwall and green-winged teal A. crecea carolinensis, and other dabbling ducks, found no change to the time-activity budgets of the birds studied (i.e. the time they spend doing normal tasks). This study concluded that across all species observed, ≤1.4% of their time was spent reacting to aircraft, and that only 2% of the birds surveyed were disturbed at all.*

Conclusions were that waterfowl are therefore tolerant to these levels of noise, and that habituation to this level of noise, at least in black ducks, occurs rapidly. .

5.29 *Cutts et al (2009), notes in their literature review that birds within the Humber Estuary habituate to construction noise as long as it is continuous and below 70 dB(A). Continuous noise is an average over time (and measured in L_{eq}) and , as such, the L_{max} for this time period will always be higher than L_{eq}. Therefore, despite the fact noise events from air traffic are likely to occur at levels up to 71dB LA_{max} the average noise from air traffic will be much lower, and therefore below the threshold Cutts et al has identified.*

5.30 *Burger (1981) found that reactions from herring gulls Larus argentatus (i.e. taking flight) to noise only occurred significantly when Concorde was overflying, and where noise occurred at levels exceeding 101 dB(A). The normal colony noise itself was 77 dB(A) and hence birds had become habituated to non-Concorde jet aircraft noise events below that noise level.*

5.31 *Perhaps most relevant to this assessment is a study by Harms et al. (1997). Harms measured the heart rate of black ducks for 4 days and subjected them to simulated aircraft noise for 48 episodes per day with peak volume of 110 dB. On the first day acute responses occurred but these diminished significantly after that thus indicating the ability of the species to habituate to the noise for low flying aircraft.*

5.32 *Also relevant is a study by Kempf & Hüppop (1998) that determined that the frequency and regularity with which an aeroplane flies past can have a significant influence on the reactions of birds. They found that waterfowl on those Wadden Sea islands that have an airfield, developed a certain tolerance to air traffic, when compared to similar flyovers undertaken on an adjacent island, Mellum, where there is no airfield and where, as a result, the same species of birds showed considerable flight reactions.*

5.33 *Consideration also needs to be paid to the effect of noise generated from overflying on other important species as are noted in the Conservation Objectives for the SACs, including in particular:*

- *Lambay Island SAC – grey seal and common seal;*
- *Rockabill to Dalkey Island SAC – grey seal and common seal, and several cetaceans.*

5.34 *The United States Airforce Research Laboratory funded research on the effects of both sub-sonic and super-sonic jet aircraft on marine wildlife. Both papers were published in 2000, the combined objectives of which were as follows:*

- *"Predicting properties of sound waves in air and under water as generated by both subsonic and supersonic aircraft flights;*
- *Estimating the effects of sound on marine life, both in air and under water;*

- *Determining populations of marine life at risk, as functions of aircraft, flight path, and time of year."*

5.35 *The research on the effects of sub-sonic jets, carried out by Eller, A. I., & Cavanagh, R. C. (2000) concluded that "it is difficult to construct cases (for any aircraft at any altitude in any propagation environment) for which the underwater noise is sufficiently intense and long lasting to cause harassment or injury to any form of marine life". Reaching this conclusion was informed by an examination of the way in which sound waves propagate across the water-air interface, and how this is effected by the angle of impacts, and the scattering properties of waves. Even when assessing super-sonic aircraft and the sonic-boom events associated with their travel (which goes far beyond the noise impacts of current commercial aircraft), the dissipation of pressure waves during the cross between the air and water medium means that the conclusion drawn was that there is no risk of injury or harassment to underwater marine wildlife as a result of noise from overflying (Laney, H., & Cavanagh, R. C., 2000).*

5.36 *Research conducted by Blackwell et al. (2000) on the impacts of impact pipe-driving and construction sounds on ringed seals at North Star Island, Alaska, found that seals presented little or no reaction to the industrial work being undertaken, with seals swimming as close as within 46 m of construction activities, where under water sound pressure levels reached 112 dB (~20 mPa). This same paper reports incidental observations of seal reaction to being overflown by a Bell 212 helicopter, where despite the low level of the craft an individual seal reacted only very mildly, and these reactions were not long lasting.*

5.37 *Consideration does need to be paid to the fact though, that as a result of implementation of the NAO and in particular the RD, the additional growth when compared to the future baseline will occur at night only. In pare 5.6 of this Report, and according to daa forecasts, it is stated that the likely future baseline with the night-time restrictions in place allow just under 20,000 flights to occur in 2025. However, without the night-time restrictions in place daa forecast that in 2025 numbers of flights will increase to just below 32,000. Furthermore, with growth allowed i.e. the 32mppa cap being lifted, daa forecast night-flights in 2040 will reach just under 43,500, an increase of more than double when compared with the likely future baseline.*

5.38 *However, rather like the effect of additional night-time flights that will occur with the 32mppa cap in place, it is considered that any increase in night-time flights, even given that it is a large increase, is unlikely to disturb birds which are already, and will become ever more, habituated to overflights and the noise associated with it. This is because it is considered no more likely that they are going to be any more sensitive to night-time rather than daytime overflying.*

5.39 *Similarly it is expected that neither common or grey seal will be affected by their being additional night-flights given that their will already be overflying at night and the two species will be habituated to it. Cetaceans, given that they live underwater and therefore less affected by whether it is daytime or night-time, will be unaffected too.*

The effects of changes to air quality, particularly increases in the concentrations of NOx and levels of nitrogen deposition, caused by increased numbers of aircraft overflying Natura 2000 sites.

With the 32mppa cap in place

5.40 *Although, as shown in Table 5.1, in the assessment case the cap of 32mppa is reached slightly earlier than is the case for the future baseline, the differences are really very small (approximately 5% in 2024), occur over a period of only five years, and from 2027, in both situations, the Airport is shown to be operating at 32mppa. Given the history of overflying of the Natura 2000 sites, including in 2018 and 2019 at levels to accommodate more than 32mppa, that overflying will continue in perpetuity, and as explained, increased overflying levels are very small and occur for a period of only five years, no effects on Natura 2000 sites as a result of the very small changes in air quality are therefore considered likely to occur. In fact, without the Covid-19 pandemic, it is very likely that numbers of flights operating from the Airport would have continued at levels to serve 32mppa and therefore, in comparison with this situation the air quality situation, will in fact be improved (albeit only very slightly).*

Without the 32mppa cap in place

5.41 *The SACs are protected because they support a range of different habitats that include those associated with coastal locations such as saltmarsh and shingle, and terrestrial habitats such as heath. Some, as are shown on Table 5.1 below, are more affected by a deterioration in air quality than others. Of course, importantly the interest features of the SPAs that are also noted as being conservation objectives, i.e. the birds, and a range of important invertebrates, cetaceans and molluscs (including Narrow-mouthed Whorl Snail and Desmoulin's Whorl Snail which are also listed within the Conservation Objectives for Rye Water Valley / Carton SAC) as are noted in the citations for the SACs, rely on these habitats for a range of their lifecycle needs.*

Table 5.1: Habitat sensitivity to pollution

Habitat	*Sites where Present*	*Sensitivities to Pollution*
Tidal Mudflats and Sandflats (sands/muds)	*Badoyle Bay, Malahide Estuary, North Dublin Bay and North Bull Island, Rogerstown Estuary, South Dublin Bay and River Tolka Estuary*	*NOx –* • *Increased graminoid (grasses) biomass, with potentially adverse effects on forbs.*
Mediterranean salt meadows	*Badoyle Bay, Malahide Estuary, North Dublin Bay and North Bull Island, Rogerstown Estuary*	

Atlantic salt meadows	*Badoyle Bay, Malahide Estuary, North Dublin Bay and North Bull Island, Rogerstown Estuary*	
Salicornia Mud	*Malahide Estuary, North Dublin Bay and North Bull Island, Rogerstown Estuary, South Dublin Bay and River Tolka Estuary*	
Spartina swards	*North Dublin Bay and North Bull Island*	
Brackish marsh	*Badoyle Bay*	
Marram (White) Dunes	*Badoyle Bay, Malahide Estuary, North Dublin Bay and North Bull Island*	*NOx –* • *These systems are adapted to low levels of mineral N availability: increasing the availability of Nitrogen will threaten the competitive balance between species leading to changes in composition and loss of habitat species constants.* • *Speeds up succession through the chronosequence, movement between the dune stages.* • *Lichens and mosses are particularly sensitive both from direct effects associated with Nitrogen accumulation and from shading as a consequence of increase growth of overstorey vegetation in response to Nitrogen deposition* • *Species sensitivity to other stresses e.g. grazing pressure, desiccation and pathogens may be enhanced.* • *Potentially damaging interaction between Nitrogen deposition and grazing, but grazing may offset eutrophication effects on graminoids (grasses).*
Shifting (white) dunes	*Rogerstown Estuary*	
Fixed (Grey) Dunes	*Malahide Estuary, North Dublin Bay and North Bull Island, Rogerstown Estuary*	
Embryonic shifting dunes	*North Dublin Bay and North Bull Island, South Dublin Bay and River Tolka Estuary*	
Humid dune slacks	*North Dublin Bay and North Bull Island*	
Perennial vegetation of stony banks	*Ireland's Eye*	
Annual vegetation of drift lines	*North Dublin Bay and North Bull Island, South Dublin Bay and River Tolka Estuary*	
European dry heaths	*Howth Head*	*NOx –* • *Changes in species composition with a marked decline in heather Calluna vulgaris and ericoids, and an increased dominance of grasses (e.g. Bobbink and Roeloffs 1995b, Pitcairn and Fowler 1991).* • *Loss of mosses, liverworts and lichens which receive their nutrients from the*

		atmosphere directly (Fangemeier et al. 1994). • *Increased risk of heather beetle attacks on heather, encouraged by higher Nitrogen levels in foliage* • *Initial Nitrogen stimulated growth for heather, increased litter, Nitrogen return and mineralization.* • *Negative effects on ericoid mycorrhiza and increase in drought sensitivity.* • *Impacts linked to increased attractiveness to insects pests, and opening up of the canopy due to frost.* *SO_2–* • *Relatively little information is available on exposure effects. Key concerns are:* o *Visible decline symptoms for example, leaf discoloration.* o *Stimulated growth at low concentrations of Sulpher potentially changing community composition.* o *The vulnerability to direct damage of mosses, liverworts and lichens which are sensitive to lower concentrations than those causing injury to higher plants.* o *Grass spp. have been shown to evolve tolerance to SO_2 in a short period of time at polluted sites. This however has led to reduced growth in clean air compared with sensitive genotypes (UKCLAG 1996).*
Reefs	*Lambay Island, Rockabill to Dalkey Island*	• *Marine habitats do not tend to be sensitive to air pollution impacts.*

5.42 Although it is clear from Table 5.1 that a deterioration in air quality could lead to damage of the habitats that occur on at least some of the SACs, such is not expected to occur as a result of daa operating in accordance with the NAO or RD. The level of increase in air passenger numbers when comparing the assessment case with the future baseline is, as already stated, likely to result in very modest increases in air traffic. In addition, that implementation of the NAO and RD is likely to drive an acceleration in the modernisation of the aircraft fleet that operates from the Airport when compared to the future baseline, will also likely mean that this increase is, at least in part, mitigated by the fact that aircraft will likely produce a reduced level of emissions.

5.43 *It is, however, important to note that more detailed changes in overflying will be assessed in future planning applications and by the competent authority responsible for planning airspace design that will be necessary to achieve the growth anticipated in existing policy, including importantly whether as a result of airspace re-design that might occur to help meet the requirements of the NAO and RD, routes over an SPA or SAC become more used than others. The assessment of those impacts is a matter for assessment when the relevant plans are adopted or planning is sought for relevant proposed developments and as such they are not constrained at this stage by the NAO or RD.*

The effect of emergency fuel dumping from overflying aircraft affecting Natura 2000 sites directly or indirectly through surface water pathways

With / without the 32mppa cap in place

5.44 *Emergency fuel dumping could also theoretically cause an impact via surface water pathways to Baldoyle Bay and Malahide Estuary, or directly to a Natura 2000 site itself. In particular the risk is that additional overflying of Natura 2000 sites, or areas where there are surface water pathways to Natura 2000 sites, could increase the number of fuel dumping events that occur. However, as stated in the EIA Report (AECOM, 2020), incidents in the UK and Ireland are rare and have involved relatively minor leakages with no more than minor impacts in terms of oil deposits. Indeed, very few aircraft can jettison fuel – single aisle aircraft cannot and the vast majority of the aircraft currently operating at Dublin Airport cannot do so – as modern aircraft design and manufacturing allows aircraft to land at maximum take-off weight. Furthermore, any fuel dumping from visiting wide-bodied jets which might be able to jettison fuel would typically be undertaken in a controlled manner by the flight crew and in an appropriately selected area away from watercourses and Natura 2000 sites, and/or at a sufficient altitude to allow for vaporisation and dispersion before reaching ground level. The jettisoning of fuel invariably takes place over open water at altitude of at least 10,000 feet; academic studies by the United States Air Force have shown that, in general, fuel jettisoned above 5,000 to 6,000 feet will completely vaporise before reaching the ground.*

5.45 *The potential for this to impact Natura 2000 sites will be assessed in future planning applications and by the competent authority responsible for planning airspace design and, if necessary, include planning conditions that control the manner in which it occurs to as to ensure that it does not have an adverse effect on the integrity of any Natura 2000 site. The consideration of those planning applications and airspace plans are not constrained by the NAO or RD.*

6 Conclusion

6.1 This NIS considers whether the NAO and RD will have an adverse effect on the integrity of any Natura 2000 sites in light of their conservation objectives. The following impact pathways were identified:

- *The effects of increases in the level and frequency of noise, and visual disturbance events caused by increases in aircraft overflying of Natura 2000 sites and potentially, also by this overflying occurring at differing times of the day and night:*
- *The effects of changes to air quality, particularly increases in the concentrations of NOx and levels of nitrogen deposition, caused by increased numbers of aircraft overflying Natura 2000 sites.*
- *The effects of emergency fuel dumping from overflying aircraft affecting Natura 2000 sites directly, or indirectly through surface water pathways.*

6.2 The assessment undertaken has enabled us to determine, on the basis of best scientific knowledge, that the implementation of the NAO and RD will not have a significant adverse effect on the ecological integrity of any European site, either individually or in combination with any other plan or project. This is due to a number of reasons including that:

- *Increases in overflying when compared with the likely future baseline are generally quite small;*
- *The interest features of the Natura 2000 sites have already become habituated to noise and overflying more generally, and any increase as a result of the NAO and RD is unlikely to have further effects;*
- *That although increases in night-time flights will occur, this will lead to no significant effect to the conservation objectives of the Natura 2000 sites within the ZoI;*
- *That increased numbers of flights are low enough that changes in air quality will also be small and will not affect the habitats within the SACs (and SPAs) such that there is deterioration;*
- *That fuel dumping will be infrequent and subject to control measures by the Airport which will reduce the likelihood for effects albeit the potential for such will be assessed in future planning applications or similar related for, for example, growth or airspace redesign.*

6.3 The assessment has regard to the fact that the NAO and RD, as a plan setting the framework for sustainable growth at Dublin Airport, are not sufficient of themselves to unlock growth up to the limits of existing policy, and that future application for planning permission will be needed

in that regard, including screening for AA and detailed AA where necessary. Much is unknown about the future operations of the Airport at this point, and will have to be particularised and assessed in those planning applications, particularly should the daa choose to make an application to remove the 32mppa cap. Furthermore, there is the potential, as implementation of the NAO and RD seeks to establish to overfly fewer people, that the daa and the airport users engage with the competent authorities for airspace design to seek to change the way the airspace is operated, with a focus on overflying less densely populated areas than are currently overflown not at all, or overflying these same areas more frequently than is currently the case (or at least is proposed with the airspace design that will be utilised when the new northern runway is operational). Should such be proposed it would likely form part of wider proposals for growth that would be subject to a requirement for gaining a planning permission. Any application for planning permission would almost certainly need to be accompanied by documentation to support an EIA process and also AA, as the LAP indicates. During this, the effect of airspace re-design would need to be considered if it meant changes to the number of flights proportionally that use routes that overfly Natura 2000 sites.

6.4 *Table below summaries the results of the assessment with specific regard to each site, their specific conservation features and the predicted impact.*

Table 6.1: Summary of the assessment undertaken

Site	*Conservation Objective*	*Assessment outcome*
Baldoyle Bay SAC	*To maintain the conservation condition of mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonizing mud and sand, Atlantic salt meadows, and Mediterranean salt meadows.*	*Increased overflights will not result in an increase in air pollutants that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Baldoyle Bay SPA	*To maintain the favourable conservation condition of light-bellied brent goose, shelduck, ringed plover, golden plover, grey plover, bar-tailed godwit, and the wetland habitat.*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Howth Head SAC	*To maintain the favourable conservation condition of the vegetated sea cliffs of the Atlantic and Baltic coasts, and European dry heaths.*	*Increased overflights will not result in an increase in air pollutants that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*

Howth Head Coast SPA	*To maintain or restore the favourable conservation condition of kittiwake.*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Ireland's Eye SAC	*To maintain the favourable conservation condition of perennial vegetation of stony banks, and vegetated sea cliffs of the Atlantic and Baltic coasts.*	*Increased overflights will not result in a decrease in air quality that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Ireland's Eye SPA	*To maintain or restore the favourable conservation condition of cormorant, herring gull, kittiwake, guillemot and razorbill.*	*Average noise levels from aircraft over flying the Site will be below that at which negative impacts are likely. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Lambay Island SAC	*To maintain the favourable conservation condition of reefs, vegetated sea cliffs of the Atlantic and Baltic coasts, grey seal, and common (harbour) seal.*	*Increased overflights will not result in an increase in air pollutants that would negatively impacts these habitats,* *Seals are highly resilient to high levels of noise both in and out of water, at levels much higher than those from over flying commercial aircraft. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Lambay Island SPA	*To maintain or restore the favourable conservation condition of fulmar, cormorant, shag, greylag goose, lesser black-backed gull, herring gull, kittiwake, guillemot, razorbill and puffin.*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Malahide Estuary SAC	*To maintain the favourable conservation condition of tidal mudflats and sandflats, salicornia mud, Atlantic salt meadows, Mediterranean salt meadows, marram (white) dunes, and fixed (grey) dunes*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Malahide Estuary SPA	*To maintain the favourable conservation condition of great crested grebe, light-bellied brent goose, shelduck, pintail, goldeneye, red-breasted*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are*

	merganser, oystercatcher, golden plover, grey plover, knot, dunlin, black-tailed godwit, bar-tailed godwit and redshank.	*no other impacts with the potential to have an adverse effect on the integrity of this site.*
North Dublin Bay SAC	*To maintain the favourable conservation condition of mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows, Mediterranean salt meadows, and petalwort.* *To restore the favourable conservation condition of Salicornia and other annuals colonizing mud and sand, annual vegetation of drift lines, embryonic shifting dunes, Shifting dunes along the shoreline with Ammophila arenaria ('white dunes'), fixed coastal dunes with herbaceous vegetation ('grey dunes'), and humid dune slacks.*	*Increased overflights will not result in a decrease in air quality that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
North Bull Island SPA	*To maintain the favourable conservation condition of light-bellied brent goose, shelduck, teal, pintail, shoveler, oystercatcher, golden plover, grey plover, knot, sanderling, dunlin, black-tailed godwit, bar-tailed godwit, curlew, redshank, turnstone, black-headed gull, and the wetland habitat.*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Rockabill to Dalkey Island SAC	*To maintain the favourable conservation condition of reefs and harbour porpoise.*	*Increased overflights will not result in a decrease in air quality that would adversely and significantly impact reefs,* *The dissipation of pressure waves as they travel between air and water is such that noise from increased numbers of overflying presents no potential to cause a significant effect to cetaceans. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*

Rogerstown Estuary SAC	*To maintain the favourable conservation condition of Estuaries; Mudflats and sandflats not covered by seawater at low tide; Salicornia and other annuals colonising mud and sand; Atlantic salt meadows Glauco-Puccinellietalia maritimae; Mediterranean salt meadows Juncetalia maritime; Shifting dunes along the shoreline with Ammophila arenaria (white dunes); Fixed coastal dunes with herbaceous vegetation (grey dunes)*	*Increased overflights will not result in a decrease in air quality that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Rogerstown Estuary SPA	*To maintain the favourable conservation condition of Greylag Goose, Light-bellied Brent Goose, Shelduck, Shoveler, Oystercatcher, Ringed Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit and Redshank.*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
Rye Water Valley/Carton SAC	*To maintain or restore the favourable conservation condition the Petrifying springs with tufa formation, Narrow-mouthed Whorl Snail and Desmoulin's Whorl Snail.*	*Increased overflights will not result in a decrease in air quality that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
South Dublin Bay and River Tolka Estuary SAC	*To maintain the favourable conservation condition of Mudflats and Sandflats not covered by seawater at low tide.*	*Increased overflights will not result in a decrease in air quality that would adversely and significantly impact these habitats. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*
South Dublin Bay and River Tolka Estuary SPA	*To maintain the favourable conservation condition of Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern,*	*Average noise levels from aircraft overflying the site will be below that at which adverse impacts are likely for a variety of reasons but including that habituation from the species concerned to overflying will already have occurred. There are no other impacts with the potential to have an adverse effect on the integrity of this site.*

	Common Tern, Arctic Tern and the wetland habitat.	

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