

Appropriate Assessment Screening & Natura Impact Statement – Information for a Stage 1 (AA Screening) and Stage 2 (Natura Impact Statement) AA for a proposed Strategic Housing Development at Mooretown, Swords, Co. Dublin



11th April 2022

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Document Control Sheet				
Project	Proposed development for a Strategic Housing Development at Mooretown,			
	Swords, Co. Dublin			
Report	Appropriate Assessment Screening and Natura Impact Statement			
Date	11 th April 2022			
Version	Author	Reviewed	Date	
Draft 01	Bryan Deegan	Jack Doyle	6 th April 2022	
Planning	Bryan Deegan		11 th April 2022	

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Introduction

The following Appropriate Assessment (AA) (Screening Stage) and Natura Impact Statement has been prepared by **Altemar Ltd.** at the request of Gerard Gannon Properties for a proposed Strategic Housing Development on lands to the south of Rathbeale Road, to the north and south of Main Street and to the east and southeast of Mooretown Distributor Road (Western Distributor Link Road), Mooretown, Swords, Co. Dublin, with associated engineering works on lands locally known as the Celestica/Motorola site, junction of Glen Ellan Road and Balheary Road, and at/on Balheary Road, Swords, Co. Dublin.

An Appropriate Assessment is an assessment of the potential effects of a proposed project or plan, on its own, or in combination with other plans or projects, on one or more Natura 2000 sites. Natura 2000 sites are those sites designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA).

The AA Screening stage examines the likely significant effects of a plan or project, either on its own, or in combination with other plans and projects, upon a Natura 2000 site and considers whether, on the basis of objective scientific evidence, it can be concluded that there are not likely to be significant effects on any European site, in view of best scientific knowledge and the conservation objectives of the relevant European sites.

The Natura Impact Statement examines whether the plan or project, either alone, or in combination with other plans and projects, in the view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European sites.

Altemar Ltd.

Since its inception in 2001, Altemar has been delivering ecological and environmental services to a broad range of clients. Operational areas include: residential; infrastructural; renewable; oil & gas; private industry; Local Authorities; EC projects; and, State/semi-State Departments. Bryan Deegan, the managing director of Altemar, is an Environmental Scientist and Marine Biologist with 27 years' experience working in Irish terrestrial and aquatic environments, providing services to the State, Semi-State and industry. He is currently contracted to Inland Fisheries Ireland as the sole "External Expert" to environmentally assess internal and external projects. He is also chair of an internal IFI working group on environmental assessment. Bryan Deegan (MCIEEM) holds a MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture). Bryan Deegan carried out all elements of this Appropriate Assessment Screening.

Background to the Appropriate Assessment

The Habitats Directive 92/43/EEC (together with the Birds Directive (2009/1477/EC)) forms the cornerstone of Europe's nature conservation policy. The Habitats Directive protects over 1000 animals and plant species and over 200 "habitat types" which are of European importance. In the Habitats Directive, Articles 3 to 9 provide the legislative means to protect habitats and species of European Community interest through the establishment and conservation of an EU-wide network of conservation sites (NATURA, 2000). These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive, Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

"Any plan or project not directly connected with or necessary to the management of the [NATURA 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the component 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."

As outlined in "Managing European sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC" (European Commission, 21 November 2018) "The purpose of the appropriate assessment is to assess the implications of the plan or project in respect of the site's conservation objectives, either individually or in combination with other plans or projects. The conclusions should enable the competent authorities to ascertain whether the plan or project will adversely affect the integrity of the site concerned. The focus of the appropriate assessment is therefore specifically on the species and/or the habitats for which the European site is designated."

As outlined in the EC guidance document on Article 6(4) (January 2007)¹:

"Appropriate assessments of the implications of the plan or project for the site concerned must precede its approval and take into account the cumulative effects which result from the combination of that plan or project with other plans or projects in view of the site's conservation objectives. This implies that all aspects of the plan or project which can, either individually or in combination with other plans or projects, affect those objectives must be identified in the light of the best scientific knowledge in the field.

Assessment procedures of plans or projects likely to affect European sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity. Regardless of whether the provisions of Article 6(3) are delivered following existing environmental impact assessment procedures or other specific methods, it must be ensured that:

- Article 6(3) assessment results allow full traceability of the decisions eventually made, including the selection of alternatives and any imperative reasons of overriding public interest.
- The assessment should include all elements contributing to the site's integrity and to the overall coherence of the network as defined in the site's conservation objectives and Standard Data Form, and be based on best available scientific knowledge in the field. The information required should be updated and could include the following issues:
 - Structure and function, and the respective role of the site's ecological assets;
 - Area, representativity and conservation status of the priority and nonpriority habitats in the site;
 - Population size, degree of isolation, ecotype, genetic pool, age class structure, and conservation status of species under Annex II of the Habitats Directive or Annex I of the Birds Directive present in the site;

¹ European Commission. (2007).Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission;

- Role of the site within the biographical region and in the coherence of the European network; and,
- Any other ecological assets and functions identified in the site.
- It should include a comprehensive identification of all the potential impacts of the plan or project likely to be significant on the site, taking into account cumulative impacts and other impacts likely to arise as a result of the combined action of the plan or project under assessment and other plans or projects.
- The assessment under Article 6(3) applies the best available techniques and methods, to estimate the extent of the effects of the plan or project on the biological integrity of the site(s) likely to be damaged.
- The assessment provides for the incorporation of the most effective mitigation measures into the plan or project concerned, in order to avoid, reduce or even cancel the negative impacts on the site.
- The characterisation of the biological integrity and the impact assessment should be based on the best possible indicators specific to the European assets which must also be useful to monitor the plan or project implementation."

Stages of the Appropriate Assessment

This Appropriate Assessment screening and Natura Impact Statement was undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC, 2001), Part XAB of the Planning and Development Act 2000, as amended, in addition to the December 2009 publication from the Department of Environment, Heritage and Local Government; 'Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities' and the European Communities (Birds and Natural Habitats) Regulations 2011. In order to comply with the above Guidelines and legislation, the Appropriate Assessment process has been structured as follows:

- 1) Screening stage:
 - Description of plan or project, and local site or plan area characteristics;
 - Identification of relevant European sites, and compilation of information on their qualifying interests and conservation objectives
 - Identification and description of individual in combination effects likely to result from the proposed project;
 - Assessment of the likely significance of the effects identified above. Exclusion of sites where it can be objectively concluded that there will be no likely significant effects; and, Conclusions
- 2) Appropriate Assessment (Natura Impact Statement):
 - Description of the European sites that will be considered further;
 - Identification and description of potential adverse impacts on the conservation objectives of these sites likely to occur from the project or plan; and,
 - Mitigation Measures that will be implemented to avoid, reduce or remedy any such potential adverse impacts
 - Assessment as to whether, following the implementation of the proposed mitigation measures, it can be concluded, beyond all reasonable scientific doubt, that there will be no adverse impact on the integrity of the relevant European Site in light of its conservation objectives"
 - Conclusions.

If it can be demonstrated during the AA screening phase (Stage 1), that the proposed project will not have a significant effect, whether alone or in combination with other plans or projects, on the conservation objectives of a Natura 2000 site, then no further AA (Stage 2) will be required. It is important to note that there is a requirement to apply a precautionary approach to AA screening. Therefore, where effects are possible, certain or unknown at the screening stage, AA will be required.

In addition, it should be noted that Article 6(3) of the Habitats Directive must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an AA of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

Stage 1 Screening Assessment

Management of the Site

The plan or project is not directly connected with, or necessary to the management of European sites.

Description of the Proposed Project

The proposed development consists of a mixed-use residential neighbourhood of some 650 no. units; comprising of 265 no. houses, 113 no. duplex units, 6 no. triplex units, 266 apartments, a 512 sqm. creche and 946 sqm. of retail/café uses clustered in a small village centre. The development includes all associated site works and infrastructure, including landscaped open space, internal road, paths, cycle paths, public lighting and drainage. The development also includes off site drainage works for a stormwater storage tank and overflow outfall gravity sewer to the Broadmeadow River on lands at the junction of the Glen Ellan and Balheary roads.

The proposed site outline, location, site layout plan, and elevations for the development are seen in Figures 1-6.

Landscape

A Landscape Design Report was prepared by Doyle & O'Troithigh Landscape Architecture. The report states that:

'The layout and design of the streetscape, characterful landscape amenity areas, landscape mitigation and celebration of the cultural heritage is central to ensure the long-term successful establishment of this Strategic Housing Development (SHD) at Mooretown Phase 3, Swords, Co. Dublin.

The site landscape design development has, where possible, been guided and influenced by the ecological, arboricultural and archaeological appraisal of the site lands, contouring, constraints and surrounding environment.'

The Overall Landscape Plan is seen in Figure 7.



Figure 1. Site outline and location on satellite imagery (ESRI)



Project: Mooretown Location: Mooretown, Co. Dublin Date: 06th April 2022 Drawn By: Bryan Deegan (Altemar) ALTEMAR Marine & Environmental Consultancy

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Figure 2. Outline of proposed site.





Figure 4. Site layout plan



Figure 5. Site Sections Composite Elevations (Sheet 5)



Figure 6. Site Sections Composite Elevations (Sheet 6)



Figure 7. Overall Landscape Plan

Drainage

An Engineering Assessment Report has been prepared by Waterman Moylan to accompany this planning application. The report outlines the following drainage strategy for the proposed development site.

Surface Water Drainage

In relation to the existing surface water network, the report states that:

'The site is drained by surface ditches as shown in the figure below, which in turn flow to the Mooretown Mill Stream, on the eastern border of the Mooretown LAP lands. This Mill Stream flows north to the Rathbeale Road where it is culverted by 1200mmØ pipes which traverses the eastern boundary of the oldtown lands before ultimately discharging to the Broadmeadow River.

Neither the Oldtown/Mooretown Lands nor the adjacent Broadmeadow River are part of the SPA or SAC site, however, any development immediately upstream is required to maintain, or improve the quality of surface water to status objectives, as set out in the Water Framework Directive (WFD). These requirements are in place in order to protect and enhance the status of the aquatic ecosystems of the SAC or SPA site. This will require the implementation of SuDS, which are intended to be utilised as part of the development.'



Figure 3 | Existing Surface Water Drainage Network

Furthermore, the report states that: 'An inspection of the existing ditch system was undertaken on 26/02/2021 after rainfall and noted the following:

- 1. This ditch had a light steady flow south to north.
- 2. This ditch had a small amount of standing water but no evidence of any flow.
- 3. This ditch had no water present aside from a small build up at the northern end. No flow noted.

4. The rear of the adjacent units in Abbeyvale is heavily overgrown, there is no evidence of a ditch running west-east.

5. Artificial grip ditch created to cater for ditches connecting from the north, with light flow from west to east.

6. This ditch had extremely light flow, south to north.

7. No flow in this ditch however the invert was found to be damp, ditch ends at an infilled crossing point to adjacent field and resumes on the other side of the crossing.

In general, the existing ditch systems appear to be static ditches and do not convey surface water from upstream lands or upstream development. Only ditch 1 conveys water from upstream lands as all other ditch systems have been severed by the adjacent development to the south.'

In relation to the proposed surface water drainage system, the report states that:

'Mooretown Phase 1's parent planning permission (F15A/0183) and the adjacent Mooretown Road Extension (F14A/0012) were designed to accommodate the attenuation volumes for the entire Mooretown LAP lands including the subject application site: Mooretown Phase 3, within the Watermill Park and Mooretown Road detention basins and ponds, before discharging at restricted greenfield rates to the Mill Stream. The Mill Stream traverses the Mooretown site, west to east. In this regard, we refer you to the catchment drawing submitted and permitted as part of the Mooretown 1 parent planning permission, an extract of which is included as Figure 4 overleaf, marked-up to show the Mooretown 3 lands. We also refer you to the proposed Mooretown 3 drainage layout and overall Mooretown drainage strategy layout drawings P1200 and P1210 respectively, identifying drainage routing within Phase 3 and the greater Mooretown area, in accordance with the overall drainage strategies outlined above.'

'the western portion of Mooretown Phase 3 forms part of Mooretown **Catchment A1** and is attenuated within the attenuation pond in the north-western corner of Mooretown Lands, before discharging through Mooretown 1 at greenfield rates ultimately outfalling at the Mill Stream. The eastern portion of Mooretown Phase 3 forms part of **Catchment C** is attenuated in attenuation pond/basin C at the eastern end of the Mill Stream. It is not proposed to deviate from this permitted strategy. It is noted that the pond for **Catchment A1** has been constructed as part of the Mooretown Road and School Access Road works (F14A/0012) and the construction of pond/basin for **Catchment C**, will be constructed under Mooretown Phase 1, which has recently commenced.

The local surface water piped network within Phase 3 will be designed to accommodate flows from the 1 in 5-year storm. As noted above, the 1 in 100 storm events (plus 20% to accommodate climate change) shall be catered for in the permitted Watermill Park and Mooretown Road detention basins and ponds constructed under parent planning permission F15A/0183 and the adjacent Mooretown Road planning permission F14/0012. In this regard, we again refer you to the surface water layout drawing P1200 & P1210 showing the network for surface water within Mooretown 3 and the connecting Mooretown surface drainage strategy to the respective catchment outfall ponds.

Similar to the approved Mooretown Phase 1 Strategy, Phase 3 will also incorporate similar SuDS features as an integral part of the surface water strategy and design process. This strategy is based upon recommendations in the Greater Dublin Strategic Drainage Study (GDSDS) and in the Ciria SuDS Manual. The approved Mooretown Phase 1 design incorporates a storm water management approach across the entire development through the use of various SuDS techniques. Typical proposed Mooretown SuDS details have been provided on accompanying drawing P1230.

- Water Quality Protection in receiving watercourses and groundwater.
- Stream Regime Protection minimisation of ecological/physical impacts on receiving streams.
- Level of Service Protection protection of the site from flooding of the drainage system.
- Stream Flood Protection minimising the risk of downstream flooding.
- Site Flood Protection control of flooding of the site during extreme events.
- Amenity Ponds/wetlands can be visually attractive & add to the character of developments. 2

FCC's SuDS checklist, required to be submitted as part of the planning application package, is included as Appendix D to this report.

Based on three key elements, Water Quantity, Water Quality and Amenity, the targets of the Mooretown SuDS Strategy are:-

A SUDS train concept has been implemented in the design of the storm water systems for the subject development as a whole:

- Source Control Individual house or structure.
- Site Control A site or phase within the subject lands.
- Regional Control An entire catchment, i.e. Oldtown or Mooretown.'

The proposed drainage layout (Sheets 1-4) are demonstrated in Figures 8-11.

Foul Water Drainage

In relation to the existing foul water drainage network, the report states that:

'there are no foul drainage networks located within the site boundary in the greenfield areas. Networks have been constructed/will be constructed/are currently under construction as part of the Mooretown School Campus, Phase 1, Phase 2, Distributor Road & Distributor Road Extension projects.

The Mooretown foul drainage strategy envisages that all the Mooretown phases will drain in a northerly direction to the existing 500mmØ foul sewer that crosses the Rathbeale Road, constructed to facilitate the Mooretown Lands. This public sewer flows northwards through Oldtown, to the Glen Ellan Road, from where it flows in an easterly direction to Swords Wastewater Treatment Plant which has been upgraded in recent years to be able to cater for a P.E. (population equivalent) of 90,000.'

In relation to the proposed foul water network, the report states that:

'It is proposed to drain wastewater in a north-easterly direction through a series of 150mm and 225mm sewers as can be seen on Drainage Layout drawing number: P1200. There are 8 No. connection points, 1 No. to the foul network in the Mooretown distributor road extension (planning permission granted F20A/0095) and 4 no. to the foul network in the Mooretown school access road (construction completed). The remaining 2 No. Connections will be for the Phase 3 lands north of the School Access Road, which will connect to the permitted phase 2 drainage network, designed in anticipation of this future connection. The foul network in the Mooretown Distributor Road Extension will flow north and connect to the foul network in the Mooretown School Access Road which in turn flows easterly and then northerly along the eastern boundary of the School Campus. It then connects to the foul network in Mooretown Phase 1 (currently under construction) before outfalling to the 500mmØ foul sewer crossing the Rathbeale Road as discussed in Section 2.1.

A pre-connection enquiry was submitted to Irish Water. The subsequent confirmation of feasibility letter dated February 3rd, 2022, included as Appendix A, advises of the downstream constraints and the requirement of a storage tank.

The storage tank was subsequently designed in conjunction with Irish Water input on volumetric storage capacity and the proposal has been submitted for planning permission, with Reg Ref: F21A/0476 and is currently live and at Additional Information stage.'

Flood Risk Assessment

A Flood Risk Assessment has been prepared by Waterman Moylan to accompany this planning application. This report concludes with the following:

'The subject lands have been analysed for risks from tidal flooding from the Irish Sea and Broadmeadow River, fluvial flooding from Mill Stream & River Ward, pluvial flooding, ground water and failures of mechanical systems. Table 4, below, presents the various residual flood risks involved.

Source	Pathway	Receptor	Likelihood	Consequence	Risk	Mitigation Measure	Residual Risk
Tidal	Irish Sea (Malahide Estuary)	Proposed development	Extremely low	None	Extremely low	None	Extremely low
Fluvial	The River Ward & Mill Stream	Proposed development	Low	Low	Extremely Low	Setting of floor levels & freeboard, overland flood routing, no localised low points	Extremely Low
Pluvial	Private & Public Drainage Network	Proposed development, downstream properties, and roads	Ranges from high to low	Moderate	Ranges from high to low	Appropriate drainage, SuDS, and attenuation design, setting of floor levels, overland flood routing	Low
Ground Water	Ground	Underground services, ground level of buildings, roads	High	Moderate	High	Appropriate setting of floor levels, flood routing, damp proof membranes	Low
Human/ Mechanical Error	Drainage network	Proposed development	High	Moderate	High	Setting of floor levels, overland flood routing, regular inspection of SW network	Low

Table 4. Flood Risk Assessment Summary

As indicated in the above table, the various sources of flooding have been reviewed, and the risk of flooding from each source has been assessed. Where necessary, mitigation measures have been proposed. As a result of the proposed mitigation measures, the residual risk of flooding from any source is low.'

Preliminary Construction, Demolition and Waste Management Plan

A Preliminary Construction, Demolition and Waste Management Plan has been prepared by Waterman Moylan Consulting Engineers to accompany this planning application. The report outlines the following in relation to ground water during the construction phase of development:

'10. Ground Water

The excavations for the drainage pipes, water supply, utilities and foundations have been designed to be as shallow as possible in order to reduce excavation depths. Careful attention will be required to maintain the excavations clear of ground water.

A discharge licence will be required for all water pumped from the excavations to any public water course or sewer.

All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.'



Figure 8. Drainage layout (Sheet 1 of 4)



Figure 9. Drainage layout (Sheet 2 of 4)



Figure 10. Drainage layout (Sheet 3 of 4)



Figure 11. Drainage layout (Sheet 4 of 4)

Wintering Bird Surveys

In March 2021 four winter bird surveys were conducted at Mooretown and several nearby sites by Hugh Delaney (Appendix I). As outlined in Appendix I the proposed development site area was classified as Mooretown 1. Over the entire survey area "51 bird species were recorded in the areas covered by these 4 winter bird surveys, from these species recorded Snipe and Redwing are red listed as species of conservation concern in the revised Birdwatch Ireland List of birds of conservation concern in Ireland (2020-2026). Five species recorded are amber listed as wintering species in Ireland (Herring Gull, Lesser black-backed Gull, Cormorant, Mute Swan and Teal). Some of the aforementioned species recorded were transitory of nature and in small numbers."

Furthermore, between November 2021 and March 2022 nine more winter bird surveys were conducted at Mooretown, by Hugh Delaney (Appendix II). As outline in Appendix II: '44 bird species were recorded in the survey area covered by these nine winter bird surveys. A great proportion of the species utilizing the mature hedgerow habitat bordering the fields on the site. In the context of wintering bird species that are red listed as species of conservation concern in the revised Birdwatch Ireland List of birds of conservation concern in Ireland (2020-2026) Redwing was recorded. Declining passerine species Yellowhammer was also noteworthy with the site being a consistent foraging site during the winter. Four gull species listed in the amber wintering species category were recorded (Herring, Lesser black-backed, Common and Blackheaded), however these species pass through the site only. Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).'

Identification of Relevant European sites

The proposed development site is not within a European site. As outlined in Office of the Planning Regulator (2021) "The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km)."

A key factor in the consideration as to whether or not a particular European site is likely to be affected by the proposed development is its distance from the development location. It is generally, but not necessarily, the case that the greater the distance from the plan or project the smaller the likelihood of impacts. In this case, the nearest European site to the proposed development is 2.5 km away (Malahide Estuary SAC).

As demonstrated in Figure 15, there are a number of drainage ditches within, and immediately proximate to, the proposed development site. The drainage ditches on site outfall to the Mooretown Mill Stream, located on the eastern boundary of the subject site. It is worth noting that the EPA WFD River Waterbodies mapping demonstrates a waterbody flowing through the constructed school located to the north of the site. This waterbody, appears however, to have been diverted to a man-made drainage ditch also ultimately outfalls to the Mooretown Mill Stream.

There is a direct hydrological pathway to Malahide Estuary SAC and Malahide Estuary SPA via the proposed surface water drainage strategy. Surface water drainage from Mooretown Phase 3 will be directed to surface water attenuation basins and ponds, which are constructed / to be constructed under previously granted planning applications F15A/0183 and F14/0012. After attenuation, surface water will then outfall to the Mooretown Mill Stream, which in turn outfalls to Broadmeadow River. As this watercourse ultimately discharges to Malahide Estuary (containing Malahide Estuary SAC & SPA), located 2.5km downstream from the subject site, there is a direct hydrological pathway between the proposed development and Malahide Estuary SAC & SPA.

In the interest of carrying out a thorough assessment in line with both the Habitats Directive and the precautionary principle, the area of assessment was expanded beyond the Zol to include designated sites within 15km of the proposed development site, and sites beyond 15km with the potential for a hydrological connection. This was done in the interest of ensuring that any pathways, however indirect or remote, were taken into account.

All Natura 2000 sites within 15km, and beyond 15km with the potential for a hydrological pathway are listed in Table 1. The qualifying interests, and the potential impact of the development on each European site and qualifying interest, are screened in/out in Table 2. SPA's and SAC's within 15km are seen in Figures 12 & 13. Waterbodies, drainage ditches, SACs, and SPAs proximate to the subject site are demonstrated in Figures 14 - 17. Due to the significant dilution effects within the marine environment, it is considered that no Natura 2000 sites with a direct or indirect pathway are noted beyond 15km and no impacts are foreseen on Natura 2000 sites beyond 15km.

European	European Site	Distance	Screened In for NIS
Site Code			
Special Areas	of Conservation		
IE000205	Malahide Estuary SAC	2.5 km	Yes
IE000208	Rogerstown Estuary SAC	5.0 km	No
IE000199	Baldoyle Bay SAC	8.6 km	No
IE000206	North Dublin Bay SAC	11.1 km	No
IE003000	Rockabill to Dalkey Island SAC	11.7 km	No
IE002193	Ireland's Eye SAC	13.3 km	No
IE000202	Howth Head SAC	14 km	No
IE000210	South Dublin Bay SAC	14.2 km	No
IE000204	Lambay Island SAC	14.2 km	No
Special Protect	ted Areas		
IE004025	Malahide Estuary SPA	2.8 km	Yes
IE004015	Rogerstown Estuary SPA	5.7 km	No
IE004016	Baldoyle Bay SPA	8.6 km	No
IE004006	North Bull Island SPA	11.1 km	No
IE004024	South Dublin Bay and River Tolka Estuary SPA	11.3 km	No
IE004117	Ireland's Eye SPA	13.0 km	No

Table 1. Proximity to designated sites of conservation importance

Table 2. Initial screening of European sites within 15km and European sites within 15km with potential ofhydrological connection to the proposed development

European	Name	Screened	Details/Reason
site		IN/OUT	
Special Area	As of Conservat	Scrooned	Concornation Objectives
12000203	Estuary SAC	IN	The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
			Potential Impact The proposed development site is located 2.5 km from Malahide Estuary SAC (Figure 12).
			There is a direct hydrological pathway from the subject site to this SAC via the proposed surface water drainage network. After attenuation within Watermill Park and Mooretown Park detention basins and ponds, surface water drainage will be directed to the Mooretown Mill Stream, which in turn outfalls to Broadmeadow River. This watercourse ultimately outfalls to Malahide Estuary. Given the close proximity of the subject site to this SAC (2.5km) and the direct hydrological pathway to this SAC, there is the potential for silt or pollutants to travel downstream and impact upon the qualifying interests of this SAC. Mitigation measures are required to prevent contaminated surface water reaching this SAC.
			In the absence of mitigation, there is also a risk of contaminated surface water entering the hedgerow and man-made drainage ditch located to the north of the subject site (Figure 15). Mitigation measures are required to ensure that surface water entering the drainage ditch is clean and uncontaminated.
			There is an indirect hydrological pathway to this SAC via the proposed foul wastewater drainage network. Foul wastewater will be directed to the existing foul sewer, which in turn outfalls to Swords WwTP. Foul wastewater produced by the proposed development will then be treated along this network. No significant effects are foreseen in relation to the Foul water network.
			Mitigation measures will need to be in place to prevent silt, dust, contamination and petrochemicals from entering proximate drainage ditches and the Mooretown Mill Stream, which has a direct pathway to this SAC. For these reasons (mitigation measures are required for the prevention of significant effects on a Natura 2000 site), it is necessary to proceed to a NIS on the effects of the project on this site in view of its conservation objectives.
			Potential for significant impacts on the qualifying interests of this site – Natura Impact Statement is required.

European site	Name	Screened IN/OUT	Details/Reason
IE000208	Rogerstown	Screened	Conservation Objectives
12000205	Estuary SAC	OUT	The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
			Potential Impact The proposed development site is located 5km from this SAC (Figure 12). There is no direct hydrological connection to this SAC.
			There is an indirect hydrological pathway to this SAC via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SAC via this indirect pathway (5 km), any pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within Malahide Estuary and the marine environment prior to reaching the SAC. The indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE000199	Baldoyle Bay SAC	Screened OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]
			Potential Impact The proposed development site is located 8.6km from this SAC (Figure 12). There is no direct hydrological connection to this SAC.
			There is an indirect hydrological pathway to this SAC via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.

European	Name	Screened	Details/Reason
site		IN/OUT	
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SAC via this indirect pathway (8.6 km), pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SAC. The indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE000206	North Dublin Bay SAC	Screened OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with white dunes (<i>Ammophila arenaria</i>) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] Petalwort (<i>Petalophyllum ralfsii</i>) [1395]
			Potential Impact The proposed development site is located 11.1km from this SAC (Figure 12). There is no direct hydrological connection to this SAC.
			There is an indirect hydrological pathway to this SAC via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SAC via this indirect pathway (11.1 km), any pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SAC. The indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.

European site	Name	Screened IN/OUT	Details/Reason
IE003000	Rockahill to	Screened	Conservation Objectives
12003000		OUT	The maintenance of behitete and energies within European sites at
	Dalkey	001	The maintenance of nabitals and species within European sites at
	Island SAC		favourable conservation condition will contribute to the overall
			maintenance of favourable conservation status of those habitats and
			species at a national level.
			Qualifying Interests
			Reefs [1170] Harbour Porpoise (<i>Phocoena phocoena</i>) [1351]
			Detential Imment
			Potential Impact
			The proposed development site is located 11.7km from this SAC (Figure 12).
			There is no direct hydrological connection to this SAC.
			There is an indirect hydrological nathway to this SAC via the proposed foul
			There is an indirect hydrological pathway to this SAC via the proposed rout
			and surface water drainage networks. Four wastewater will be directed to
			an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords
			WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after
			attonuation within Watermill Bark and Megretown Bark detention basins
			attenuation within waternin Fark and Mooretown Fark detention basins
			and ponds. This watercourse outrails to Broadmeadow River, which in turn
			outrails to Malanide Estuary. Given the distance to the SAC via this indirect
			pathway (11.7 km), pollutants or silt produced by the proposed
			development will, in the absence of mitigation, settle, be dispersed, or
			diluted within the marine environment prior to reaching the SAC. The
			indirect pathway of surface water will not result in a significant effect on the
			European site.
			No potential impact is foreseen. There is no direct pathway from this site to
			the SAC. The construction and operation of the proposed development will
			not impact on the conservation interests of the site.
			No significant effects are likely.
IF002193	Ireland's Eve	Screened	Conservation Objectives
12002100	SAC		The maintenance of habitats and species within European sites at
	JAC	001	for a subscription condition will contribute to the overall
			ravourable conservation condition will contribute to the overall
			maintenance of favourable conservation status of those habitats and
			species at a national level.
			Qualifying Interests
			Perennial vegetation of stony banks [1220]
			Verential vegetation of story ballis [1220]
			vegetated sea clins of the Atlantic and Baltic coasts [1230]
			Potential Impact
			The proposed development site is located 13.3km from this SAC (Figure 12).
			There is no direct hydrological connection to this SAC
			There is an indirect hydrological pathway to this SAC via the proposed foul
			and surface water drainage networks. Foul wastewater will be directed to
			an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords
			WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after
			attenuation within Watermill Park and Mooretown Park detention basins
			and ponds. This watercourse outfalls to Broadmeadow River, which in turn
			outfalls to Malahide Estuary. Given the distance to the SAC via this indirect
			nother set water the set of the s
			pathway (13.3 km), pollutants or slit produced by the proposed
			development will, in the absence of mitigation, settle, be dispersed, or
			diluted within the marine environment prior to reaching the SAC. The

European site	Name	Screened IN/OUT	Details/Reason
			indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE000202	Howth Head SAC	OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030]
			Potential Impact The proposed development site is located 14 km from this SAC (Figure 12). There is no direct hydrological connection to this SAC.
			There is an indirect hydrological pathway to this SAC via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SAC via this indirect pathway (14 km), pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SAC. The indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE000210	South Dublin Bay SAC	Screened OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Embryonic shifting dunes [2110]
			Potential Impact The proposed development site is located 14.2 km from this SAC (Figure 12). There is no direct hydrological connection to this SAC.
			There is an indirect hydrological pathway to this SAC via the proposed foul and surface water drainage networks. Foul wastewater will be directed to

European	Name	Screened	Details/Reason
site		IN/OUT	
			an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SAC via this indirect pathway (14.2 km), pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SAC. The indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE000204	Lambay Island SAC	Screened OUT	Conservation Objective The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Grey Seal (<i>Halichoerus grypus</i>) [1364] Harbour Seal (<i>Phoca vitulina</i>) [1365]
			Potential Impact The proposed development site is located 14.2 km from this SAC (Figure 12). There is no direct hydrological connection to this SAC.
			There is an indirect hydrological pathway to this SAC via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SAC via this indirect pathway (14.2 km), pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SAC. The indirect pathway of surface water will not result in a significant effect on the European site.
			No potential impact is foreseen. There is no direct pathway from this site to the SAC. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.

European	Name	Screened	Details/Reason	
site		IN/OUT		
Special Protection Areas				
IE004025	Malahide Estuary SPA	Screened IN	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.	
			Qualifying Interests Great Crested Grebe (Podiceps cristatus) [A005] Light-bellied Brent Goose (Branta bernicla hrota) [A046] Shelduck (Tadorna tadorna) [A048] Pintail (Anas acuta) [A054] Goldeneye (Bucephala clangula) [A067] Red-breasted Merganser (Mergus serrator) [A069] Oystercatcher (Haematopus ostralegus) [A130] Golden Plover (Pluvialis apricaria) [A140] Grey Plover (Pluvialis squatarola) [A141] Knot (Calidris canutus) [A143] Dunlin (Calidris alpina) [A149] Black-tailed Godwit (Limosa limosa) [A156] Bar-tailed Godwit (Limosa lapponica) [A157] Redshank (Tringa totanus) [A162] Wetland and Waterbirds [A999]	
			Potential Impact The proposed development site is located 2.8 km from Malahide Estuary SPA (Figure 13).	
			There is a direct hydrological pathway from the subject site to this SPA via the proposed surface water drainage network. After attenuation within Watermill Park and Mooretown Park detention basins and ponds, surface water drainage will be directed to the Mooretown Mill Stream, which in turn outfalls to Broadmeadow River. This watercourse ultimately outfalls to Malahide Estuary. Given the close proximity of the subject site to this SPA (2.8km) and the direct hydrological pathway to this SPA, there is the potential for silt or pollutants to travel downstream and impact upon the qualifying interests of this SPA. Mitigation measures are required to prevent contaminated surface water reaching this SPA.	
			In the absence of mitigation, there is also a risk of contaminated surface water entering the hedgerow and man-made drainage ditch located to the north of the subject site (Figure 15). Mitigation measures are required to ensure that surface water entering the drainage ditch is clean and uncontaminated.	
			There is an indirect hydrological pathway to this SPA via the proposed foul wastewater drainage network. Foul wastewater will be directed to the existing foul sewer, which in turn outfalls to Swords WwTP. Foul wastewater produced by the proposed development will then be treated along this network.	
			Given the minimum distance to this SPA (2.8 km), in the absence of mitigation, no significant noise or vibration effects on the bird species protected as Qualifying Interests of this SPA are likely. Further, given that no bird species protected as Qualifying Interests of this SPA were noted on site, the results of the surveys suggest that the proposed development site is not an important ex-situ habitat for the Qualifying Interests of this SPA. As outlined in the Wintering Bird Survey 2021-2022 (Appendix II): <i>'Results from</i>	

European	Name	Screened	Details/Reason
site		IN/OUT	
			the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).' In the absence of mitigation measures, no significant effects on the conservation objectives of the Qualifying Interests of this SPA are likely.
			Potential for significant impacts on the qualifying interests of this site via surface water network – Natura Impact Statement is required.
IE004015	Rogerstown Estuary SPA	Screened OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Greylag Goose (<i>Anser anser</i>) [A043] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Shoveler (<i>Anas clypeata</i>) [A056] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Knot (<i>Calidris canutus</i>) [A143] Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Redshank (<i>Tringa totanus</i>) [A162] Wetland and Waterbirds [A999]
			Potential Impact The proposed development site is located 5.7km from this SPA (Figure 13). There is no direct hydrological connection to this SPA.
			There is an indirect hydrological pathway to this SPA via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. The qualifying interests of this SPA were not noted on site. Given the distance to the SPA via this indirect pathway (5.7 km), any pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SPA. The indirect pathway of surface water will not result in a significant effect on the European site. The qualifying interests of this SPA were not noted on site.
			Given the minimum distance to this SPA (5.7 km), in the absence of mitigation, no significant noise or vibration effects on the bird species protected as Qualifying Interests of this SPA are likely. Further, given that no bird species protected as Qualifying Interests of this SPA were noted on site, the results of the surveys suggest that the proposed development site is not an important ex-situ habitat for the Qualifying Interests of this SPA. As outlined in the Wintering Bird Survey 2021-2022 (Appendix II): ' <i>Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).</i> ' In the absence of mitigation measures, no significant effects on the conservation objectives of the Qualifying Interests of this SPA are likely.

European site	Name	Screened IN/OUT	Details/Reason
			No potential impact is foreseen. There is no direct pathway from this site to the SPA. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE004016	Baldoyle Bay SPA	Screened OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Wetland and Waterbirds [A999]
			Potential Impact The proposed development site is located 8.6km from this SPA (Figure 13). There is no direct hydrological connection to this SPA.
			There is an indirect hydrological pathway to this SPA via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SPA via this indirect pathway (8.6 km), pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SPA. The indirect pathway of surface water will not result in a significant effect on the European site. The qualifying interests of this SPA were not noted on site.
			Given the minimum distance to this SPA (8.6 km), in the absence of mitigation, no significant noise or vibration effects on the bird species protected as Qualifying Interests of this SPA are likely. However, given that no bird species protected as Qualifying Interests of this SPA were noted on site, the results of the surveys suggest that the proposed development site is not an important ex-situ habitat for the Qualifying Interests of this SPA. As outlined in the Wintering Bird Survey 2021-2022 (Appendix II): 'Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).' In the absence of mitigation measures, no significant effects on the conservation objectives of the Qualifying Interests of this SPA are likely.
			No potential impact is foreseen. There is no direct pathway from this site to the SPA. The construction and operation of the proposed development will not impact on the conservation interests of the site.
15004000	Neutle D. II	Constant	No significant effects are likely.
1E004006	NORTH BUIL	Screened	Conservation Objectives: The maintenance of habitats and species within Furonean sites at
		501	favourable conservation condition will contribute to the overall

European	Name	Screened	Details/Reason
site		IN/OUT	
			maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Knot (<i>Calidris canutus</i>) [A143] Sanderling (<i>Calidris alba</i>) [A144] Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156]
			Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Turnstone (<i>Arenaria interpres</i>) [A169]
			Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Wetland and Waterbirds [A999]
			Potential Impact The proposed development site is located 11.1 km from this SPA (Figure 13). There is no direct hydrological connection to this SPA.
			There is an indirect hydrological pathway to this SPA via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. The qualifying interests of this SPA were not noted on site. Given the distance to the SPA via this indirect pathway (11.1 km), any pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SPA. The indirect pathway of surface water will not result in a significant effect on the European site.
			Given the minimum distance to this SPA (11.1 km), in the absence of mitigation, no significant noise or vibration effects on the bird species protected as Qualifying Interests of this SPA are likely. A pair of Teal were recorded onsite on 31 st March 2021 (Appendix I). Given the low number of Teal onsite over the length of the survey period, no significant effects on this Qualifying Interest are likely. Black-headed Gull were recorded on site (Appendix II). Based on Cummins <i>et al.</i> (2019) there is a breeding population of 7,810 pairs in Ireland and the numbers seen on site were well below 1% of the National population. As outlined in the Wintering Bird Survey 2021-2022 (Appendix II): ' <i>Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).</i> ' In the absence of mitigation measures, no
			2022 (Appendix II): 'Results from the surveys suggest that the site is not ex-situ foraging or roosting site for species of qualifying interest from ne Special protection areas (SPA's).' In the absence of mitigation measures significant effects on the conservation objectives of the Qualifying Interest of this SPA are likely.

European	Name	Screened	Details/Reason
site		IN/OUT	
			No potential impact is foreseen. There is no direct pathway from this site to the SPA. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE004024	South Dublin Bay and River Tolka Estuary SPA	Screened OUT	Conservation Objectives The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.
			Qualifying Interests Light-bellied Brent Goose (Branta bernicla hrota) [A046] Oystercatcher (Haematopus ostralegus) [A130] Ringed Plover (Charadrius hiaticula) [A137] Grey Plover (Pluvialis squatarola) [A141] Knot (Calidris canutus) [A143] Sanderling (Calidris alba) [A144] Dunlin (Calidris alpina) [A149] Bar-tailed Godwit (Limosa lapponica) [A157] Redshank (Tringa totanus) [A162] Black-headed Gull (Chroicocephalus ridibundus) [A179] Roseate Tern (Sterna dougallii) [A192] Common Tern (Sterna hirundo) [A193] Arctic Tern (Sterna paradisaea) [A194] Wetland and Waterbirds [A999]
			Potential Impact The proposed development site is located 11.3 km from this SPA (Figure 13). There is no direct hydrological connection to this SPA.
			There is an indirect hydrological pathway to this SPA via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. The qualifying interests of this SPA were not noted on site. Given the distance to the SPA via this indirect pathway (11.3 km), any pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SPA. The indirect pathway of surface water will not result in a significant effect on the European site.
			Given the minimum distance to this SPA (11.3 km), in the absence of mitigation, no significant noise or vibration effects on the bird species protected as Qualifying Interests of this SPA are likely. Black-headed Gull were recorded on site (Appendix II). Based on Cummins et al. (2019) there is a breeding population of 7,810 pairs in Ireland and the numbers seen on site were well below 1% of the National population. However, as outlined in the Wintering Bird Survey 2021-2022 (Appendix II): ' <i>Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).</i> ' In the absence of mitigation measures, no significant effects on the conservation objectives of the Qualifying Interests of this SPA are likely.

European	Name	Screened	Details/Reason
Site			No potential impact is foreseen. There is no direct pathway from this site to the SPA. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.
IE004117	Ireland's Eye SPA	Screened OUT	Conservation Objectives To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.
			Qualifying Interests Cormorant (<i>Phalacrocorax carbo</i>) [A017] Herring Gull (<i>Larus argentatus</i>) [A184] Kittiwake (<i>Rissa tridactyla</i>) [A188] Guillemot (<i>Uria aalge</i>) [A199] Razorbill (<i>Alca torda</i>) [A200]
			Potential Impact The proposed development site is located 13 km from this SPA (Figure 21). There is no direct hydrological connection to this SPA.
			There is an indirect hydrological pathway to this SPA via the proposed foul and surface water drainage networks. Foul wastewater will be directed to an existing foul sewer on Rathbeale Road, which in turn outfalls to Swords WwTP for treatment.
			Surface water drainage will be directed to the Mooretown Mill Stream after attenuation within Watermill Park and Mooretown Park detention basins and ponds. This watercourse outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary. Given the distance to the SPA via this indirect pathway (13 km), any pollutants or silt produced by the proposed development will, in the absence of mitigation, settle, be dispersed, or diluted within the marine environment prior to reaching the SPA. The indirect pathway of surface water will not result in a significant effect on the European site.
			Cormorant was recorded flying over the subject site. Herring gull (<i>Larus argentatus</i>) were noted on site but in low numbers and were transitory in nature. Given that the fields are a significant distance 13km from the Irelands Eye SPA and the transitory nature of the sightings, these fields would not form ex-situ sites for cormorant or herring gull. Based on Cummins <i>et al.</i> (2019) there is a breeding population of 10,333 pairs in Ireland and the numbers seen on site were well below 1% of the National population. As outlined in the Wintering Bird Survey 2021-2022 (Appendix II): ' <i>Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).</i> ' In the absence of mitigation measures, no significant effects on the conservation objectives of the Qualifying Interests of this SPA are likely.
			No potential impact is foreseen. There is no direct pathway from this site to the SPA. The construction and operation of the proposed development will not impact on the conservation interests of the site.
			No significant effects are likely.


Figure 12. Special Areas of Conservation (SACs) located within 15 km of the proposed development



Figure 13. Special Protection Areas (SPAs) located within 15 km of the proposed development

Figure 14. Watercourses proximate to the proposed development

Figure 15. Watercourses and drainage ditches located within close proximity to the proposed development

Figure 16. Watercourses and SACs proximate to the proposed development

Figure 17. Watercourses and SPAs proximate to the proposed development

In-Combination Effects

There are several proposed developments that were granted planning permission on the lands of, and in the immediate area surrounding, the proposed development site. The following is a list of planning applications as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Map' portal:

Planning Ref.	Address	Proposal
F20A/0096	Lands at Mooretown, Swords, Co. Dublin	A c. 400m long southerly extension to the newly constructed Mooretown Distributor Road including verges, cycle paths, footpaths, water supply, foul and surface water drainage, surface water attenuation, utilities and ancillary works. The Mooretown Distributor Road is part of the Swords Western Distributor Road which connects the Rathbeale Road to the Mooretown Local Area Plan lands. Add Info received 16th February 2021. Add Info deemed Significant 17th February 2021. Revised Notices received 2nd March 2021.
F20A/0095	Lands at Mooretown and Abbeyvale Court, Swords, Co. Dublin.	A c. 185m long pedestrian and cycle path with ancillary works to provide a new east-west connection from Abbeyvale Court to the proposed Mooretown Distributor Road extension and a new school campus. The Mooretown Distributor Road is part of the Swords Western Distributor Road, which connects the Rathbeale Road to the Mooretown Local Area Plan lands. Add Info received 16th February 2021. Add Info deemed Significant 17th February 2021. Public Notices received 2nd March 2021.
F19A/0029	Lands south of the Rathbeale Road, And east of the Swords Western Distributor Link Road, And north of Watermill Park, Mooretown, Swords, Co. Dublin	Revisions to part of previously permitted development Reg. Ref. F15A/0183 to omit a crèche and 69 no. houses comprising 23 no. 4- bedroom 2-storey houses and 46 no. 3-bedroom 2-storey houses and two 3-storey with penthouse level blocks of 15 apartments comprising 8 no. 1-bedroom apartments and 22 no. 2-bedroom apartments (99 units in total) and to now provide 81 no. 3-bedroom 2-storey houses and 13 no. 4-bedroom 2-storey houses (94 units in total). The development includes 188 car parking spaces and all associated and ancillary site works. This application is referred to as 'Phase 1C and is the third of 3 planning applications to revise the house types, apartments and crèche permitted in the parent permission F15A/0183. Add Info received 6th September 2019. Revised Public Notices received 25th September 2019.
F18A/0701	Lands south of the Rathbeale Road, And east of the Swords Western Distributor Link Road, And north of the Watermill Park, Mooretown, Swords, Co. Dublin.	Permission to omit 43 no. houses comprising 18 no 4-bedroom 2- storey houses, 23 no. 3-bedroom 2-storey houses, 2 no. 3-bedroom 3-storey houses and a single 3 storey with penthouse level block of 15 apartments comprising 4 no. 1-bedroom apartments and 11 no. 2- bedroom apartments (58 units in total) and to now provide 2 no. 2- bedroom 2-storey houses, 33 no. 3-bedroom 2-storey houses and 4 no. 4-bedroom 2-storey houses. It also proposes 2 no. 3-storey with penthouse level apartment blocks comprising 40 no. 2-bedroom apartments and 20 no. 1-bedroom apartments (99 units in total) and a 352m ² crèche. The development includes 153 car parking spaces

Table 3. Planning applications granted planning permission	on the lands of, and in the immediate area
of, the proposed development site.	

and all associated and ancillary site works. The application is referred

Planning Ref.	Address	Proposal	
F184/0163	Lands at	to as 'Phase 1A' and is the first of 3 planning applications to revise the house types and apartments permitted in the parent permission F15A/0183. Add Info received 7th March 2019. Clarification of Add Info received 21st May 2019. Clarification of Add Info deemed Significant 24th May 2019. Revised Public Notices received 6th June 2019. 2 new school buildings with a total floor area of 15,913 sq.m.	
	Mooretown, Off Rathbeale Road, Swords, Fingal, Co. Dublin.	incorporating: (A) Swords Community College (RN76475D), consisting of a new, part 3-storey, part 2-storey, 11,397 sq.m. post primary school, including a 2-classroom Special Needs unit and Sports Hall with all ancillary pupil and staff facilities; and (B) new Primary School consisting of a new 2-storey, 24-classroom, 4,516 sq.m. primary school with a 2-classroom Special Needs unit, including all ancillary pupil and staff facilities; GP hall; and (C) all associated site works, including a substation, with a total of 104 number car parking spaces (40 spaces for primary and 64 spaces for post primary) including all landscaping, ball courts and soft play areas.	
F16A/0505	Three parcels of land adjacent to the approved Watermill Park, at lands south of Rathbeale Road, Mooretown, Swords, Co. Dublin.	The construction of 188 houses and 50 apartments. The proposed houses comprise 72 no. four-bedroom two storey houses, 19 no. three-bedroom three storey houses and 97 no. three-bedroom two storey houses. The proposed apartments are in two blocks (A & B). Core A1 comprises 3 no. one-bedroom apartments, 17 no. two-bedroom apartments and 1 no. three bedroom apartment in four storeys plus penthouse. Adjoining Core A2 comprises 3 no. one-bedroom apartments and 1 no. three-bedroom apartments, 14 no. two-bedroom apartments and 1 no. three-bedroom apartments, 14 no. two-bedroom apartments and 1 no. three-bedroom apartments and 1 no. three-bedroom apartments in three storeys plus penthouse. Block B comprises 2 no. one-bedroom apartments and 9 no. two-bedroom apartments in three storeys plus penthouse. The site area includes minor amendments to the site area of adjacent permission Reg. Ref. F15A/0183. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle-paths, public lighting, utilities, a reserved site for future ESB mast, drainage and surface water attenuation. This site is accessed from previously approved Swords Western Distributor Link Road (approved under Reg. Ref. F12A/0270, PL 06F.241634) and roads permitted under previously approved residential development Reg. Ref. F15A/0183. The application is accompanied by an Environmental Impact Statement (EIS) which will be available for inspection or purchase for a fee not exceeding the reasonable costs of making a copy at the offices of Fingal County Council during its public opening hours. Additional Information lodged 15/06/2017 Deemed Significant. Revised Public Notices lodged 28/06/2017 - Irish Independent 26/06/2017	
F15A/0183	Lands South of the Rathbeale Road, Mooretown, Swords, Co. Dublin.	The construction of 190 houses and 60 apartments. The proposed houses comprise 72 no. four bedroom two storey houses, 15 no. three bedroom three storey houses and 103 no. three bedroom two storey houses. The proposed apartments are within four blocks of 15 apartments each comprising 4 no. one bedroom apartments and 11 no. two bedroom apartments in three storey plus penthouse. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cyclepaths, public lighting, utilities, drainage and surface water	

Planning Ref.	Address	Proposal
		attenuation. This application is accompanied by an Environmental Impact Statement (EIS), which will be available for inspection or purchase for a fee not exceeding the reasonable costs of making a copy at the offices of Fingal County Council during its public opening hours.
F14A/0012	LAP Lands at Mooretown, Swords, Co. Dublin.	Access road and services enabling works to serve the future school campus. The access road shall form the main street of the future local centre at Mooretown and includes a civic plaza area, street parking, cycle paths and footpaths. The new access road shall connect the future schools campus to the approved section of the Swords Western Distributor link road within Mooretown that connects to the Rathbeale Road (approved under Reg. Ref. F12A/0270; PL 06F.241634). The application includes water supply, foul water drainage connecting to the existing sewer on the Rathbeale Road, surface water attenuation and ancillary works.
F11A/0436	Glen Ellan Road, Oldtown, Swords, Co. Dublin	Construction of 245 dwellings and a 316m ² two-storey creche. The residential development comprises 104 four-bedroom houses, 113 three-bedroom houses, 12 two-bedroom houses, 8 three-bedroom maisonettes and 8 one-bedroom apartments in two and three storeys. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle paths, public lighting, utilities, drainage, surface water attenuation and a temporary emergency access road.

In relation to Planning Ref. **F18A/0163**, a Report for the purposes of Appropriate Assessment Screening has been prepared by Moore Group – Environmental Services to accompany this application. This report concludes with the following:

'Potential source vector pathways were addressed in considering the hydrological connectivity between the site and the Broadmeadow River leading to Malahide Estuary. There would be no direct impact on the Estuary and so potential indirect impacts are then considered. The potential for a large-scale pollution event is unlikely and by employing construction management included in the Construction Management Plan for the overall Mooretown development there would be no significant indirect impacts on the Malahide Estuary European sites.

It has been objectively concluded by Moore Group Environmental Services that:

- 1. The project is not directly connected with, or necessary to the conservation management of the *European sites considered in this assessment*.
- 2. The proposed development is unlikely to indirectly, significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
- 3. The project, alone or in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment in view of their conservation objectives.
- 4. It has been determined by Moore Group Environmental Services that it is possible to rule out likely significant impacts on any European sites considered in this assessment.
- 5. It is possible to conclude that there would be no adverse effects on site integrity resulting from the project and that there would be no significant effects, no potentially significant effects and no uncertain effects if the projects were to proceed.

It is the view of Moore Group Environmental Services that it is not necessary to undertake any further stage of the Appropriate Assessment process.'

In relation to Planning Ref. **F16A/0505**, an Appropriate Assessment Screening Report has been prepared by OPENFIELD Ecological Services to accompany this application. This report concludes with the following:

'This proposed development is not located within or directly adjacent to any SAC or SPA but pathways do exist to a number of these areas. An assessment of the aspects of this project has shown that significant negative effects are not likely to occur to these areas with regard to their conservation objectives, either alone or in combination with other plans or projects.'

Furthermore, there are several development proposals located within close proximity to the proposed site. The following is a planning history as identified in the Department of Housing, Local Government and Heritage's 'National Planning Application Map' portal²:

Planning Ref.	Address	Proposal
F11A/0436/E1	Glen Ellan Road, Oldtown, Swords, Co. Dublin.	Construction of 245 dwellings and a 316m ² two-storey crèche. The residential development comprises 104 four- bedroom houses, 113 three-bedroom houses, 12 two- bedroom houses, 8 three-bedroom maisonettes and 8 one-bedroom apartments in two and three storeys. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle paths, public lighting, utilities, drainage, surface water attenuation and a temporary emergency access road.
F16A/0091	Lands at Glen Ellan Road, Oldtown, Swords, Co. Dublin.	Revisions to approved development (Reg. Ref. F11A/0436), to omit 7 two bedroom apartments in a 3-storey plus penthouse block, 5 three bedroom triplex units and 2 two bedroom duplex units and now provide 2 four bedroom 3-storey houses, 4 one-bedroom apartments and 10 two bedroom apartments in a 3-storey plus penthouse block and a 253 sq.m. crèche. The development includes 28 no. car parking spaces, and all associated ancillary and site works.

Table 4. Development proposals	located in close p	proximity to the p	proposed develop	oment site
1 1 1	,	/ /	, , ,	

No significant projects are proposed or currently under construction that could potentially cause in combination effects on European sites.

Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. It is concluded that no significant effects on European sites will be seen as a result of the proposed development alone or combination with other projects.

No significant cumulative impacts are likely in relation to the proposed development.

2

https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de

Conclusions

An initial screening of the proposed works, using the precautionary principle (without the use of any standard control phase controls or mitigation measures) and the Source/Pathway/Receptor links between the proposed works and European sites with the potential to result in significant effects on the conservation objectives and qualifying interests of the European sites was carried out in Table 2. Based on best scientific knowledge and objective information and assessment, the possibility of significant effects caused by the proposed project was excluded for the following European sites within 15km in addition to sites beyond 15km with a direct/indirect pathway:

Special Areas of Conservation

(000208)	Rogerstown Estuary SAC
(000199)	Baldoyle Bay SAC
(000206)	North Dublin Bay SAC
(003000)	Rockabill to Dalkey Island SAC
(002193)	Ireland's Eye SAC
(000202)	Howth Head SAC
(000210)	South Dublin Bay SAC
(000204)	Lambay Island SAC

Special Protection Areas

(004015)	Rogerstown Estuary SPA
(004016)	Baldoyle Bay SPA
(004006)	North Bull Island SPA
(004024)	South Dublin Bay and River Tolka Estuary SPA
(004117)	Ireland's Eye SPA

In the absence of mitigation measures, there is potential for silt laden material and pollution to enter the Malahide Estuary SAC and Malahide Estuary SPA via surface water drainage and proximate drainage ditches.

Acting on a strictly precautionary basis, NIS is required in respect of the effects of the project on the Malahide Estuary SAC and Malahide Estuary SPA, because it cannot be excluded on the basis of best objective scientific information following screening, in the absence of control or mitigation measures, that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the named European Site/s.

An NIS or Stage 2 Appropriate Assessment is not required for the effects of the project on all other listed Natura sites above because it can be excluded on the basis of the best objective scientific information following screening that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the European Sites.

A Natura Impact Statement is required for the proposed development.

Stage 2: Natura Impact Statement

A Natura Impact Statement (NIS) is Stage 2 of the Appropriate Assessment process. In the case of the proposed Strategic Housing Development on lands south of the Rathbeale Road, Mooretown, Swords, Co. Dublin, acting on a strictly precautionary basis an NIS is required in respect of the effects of the project on Malahide Estuary SAC (000205) and Malahide Estuary SPA (004025) (due to the potential for downstream impacts during construction and operation), because it cannot be excluded on the basis of best objective scientific information, in the absence of control or mitigation measures, following screening that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the named European Site/s.

A Stage 2 Appropriate Assessment or NIS is not required for the effects of the project on all other listed Natura sites within, and sites beyond, 15km because, it can be excluded, on the basis of the best objective scientific information following screening, that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the European Site/s.

The NIS evaluates the potential for direct, indirect effects, alone or in combination with other plans and projects having taken into account the use of mitigation measures. The NIS is informed by site visits, including the wintering bird surveys (Appendix I & II), breeding bird survey (Appendix III), and Preliminary Construction, Demolition and Waste Management Plan, including the proposed mitigation measures that are outlined to reduce the potential effects of the proposed project.

A further review of the Conservation Objectives and qualifying interests is necessary to determine if significant effects are likely to impact on Malahide Estuary (SAC & SPA).

Malahide Estuary SAC (Site code: 000205)

As outlined in the Malahide Estuary SAC Site Synopsis³ (NPWS, Version date 26.05.2017)

'Malahide Estuary is situated immediately north of Malahide and east of Swords in Co. Dublin. It is the estuary of the River Broadmeadow. The site is divided by a railway viaduct which was built in the 1800s.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats
[1310] Salicornia Mud
[1330] Atlantic Salt Meadows
[1410] Mediterranean Salt Meadows
[2120] Marram Dunes (White Dunes)
[2130] Fixed Dunes (Grey Dunes)*

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. There is a large bed of Eelgrass (Dwarf Eelgrass, Zostera noltii, and Narrow-leaved Eelgrass, Z. angustifolia) in the north section of the outer estuary, along with Beaked Tasselweed (Ruppia maritima) and extensive mats of green algae (Enteromorpha spp., Ulva lactuca). Common Cord-grass (Spartina anglica) is also widespread in this sheltered part of the estuary.

The dune spit has a well developed outer dune ridge dominated by Marram Grass (Ammophila arenaria). The dry areas of the stabilised dunes have a dense covering of Burnet Rose (Rosa pimpinellifolia), Red Fescue (Festuca rubra) and species such as Yellow-wort (Blackstonia perfoliata), Autumn Gentian (Gentianella amarella), Hound'stongue (Cynoglossum officinale), Carline Thistle (Carlina vulgaris) and Pyramidal Orchid (Anacamptis pyramidalis). Much of the interior of the spit is taken up by a golf course. The inner stony shore has frequent Sea-holly (Eryngium maritimum). Welldeveloped saltmarshes occur at the tip of the spit. Atlantic salt meadow is the principle type and is characterised by species such as Seapurslane (Halimoine portulacoides), Sea Aster (Aster tripolium), Thrift (Armeria maritima), Sea Arrowgrass (Triglochin maritima) and Common Saltmarsh-grass (Puccinellia maritima). Elsewhere in the outer

³ <u>https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000205.pdf</u>

estuary, a small area of Mediterranean salt meadow occurs which is characterised by the presence of Sea Rush (Juncus maritimus). Below the salt marshes there are good examples of pioneering glasswort (Salicornia spp.) swards and other annual species, typified by S. dolichostachya and Annual Sea-blite (Suaeda maritima).

The inner estuary does not drain at low tide apart from the extreme inner part. Here, patches of saltmarsh and salt meadows occur, with Sea Aster, Sea Plantain (Plantago maritima) and Sea Club-rush (Scirpus maritimus). Beaked Tasselweed occurs in one of the channels.

The site includes a fine area of rocky shore south-east of Malahide and extending towards Portmarnock. This represents the only continuous section through the fossiliferous Lower Carboniferous rocks in the Dublin Basin, and is the type locality for several species of fossil coral.

The estuary is an important wintering bird site and holds an internationally important population of Brent Goose and nationally important populations of a further 15 species. Average maximum counts during the 1995/96-1997/98 period were: Brent Goose 1217; Great Crested Grebe 52; Mute Swan 106; Shelduck 471; Pochard 200; Goldeneye 333; Red-breasted Merganser 116; Oystercatcher 1228; Golden Plover 2123; Grey Plover 190; Redshank 454; Wigeon 50; Teal 78; Ringed Plover 106; Knot 858; Dunlin 1474; Greenshank 38; Pintail 53; Black-tailed Godwit 345; Bar-tailed Godwit 99. The high numbers of diving birds reflects the lagoon-type nature of the inner estuary.

The estuary also attracts migrant species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of the island and the habitat remains suitable for these birds.

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.

This site is a fine example of an estuarine system with all the main habitats represented. The site is important ornithologically, with a population of Brent Goose of international significance.'

The Natura 2000 Standard Data Form⁴ (2020) states that:

'The site is situated in north Co. Dublin, between the towns of Malahide and Swords. It comprises the estuary of the River Broadmeadow. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well sheltered from the sea by a large sand spit, known as ?the island?. This spit is now mostly converted to golf-course though some sand dunes and salt marshes remain. A section of bedrock shore extending towards Portmarnock is included as it represents the only continuous section through the fossiliferous Lower Carboniferous rocks in the Dublin Basin, and is the type locality for several species of fossil coral.

The site has an important example of intertidal sand and mud flats, with Zostera spp. Their quality is variable but generally good. Salt marshes are well represented, particularly Atlantic salt meadows and Salicornia flats. Most of the sand dune system is managed for a golf course but significant areas of fixed dunes and shifting white dunes remain. The site has Viola hirta, a Red Data Book plant species. It is of high importance for wintering waterfowl, with an internationally important population of Branta bernicla horta and nationally important populations of a further 14 species, including Pluvialis apricaria. It also supports a regionally important population of Limosa lapponica. this site has educational value and has been the subject of a number of research projects.'

As outlined in the Conservation objectives supporting document – marine habitats⁵ (NPWS, 2013):

'Section 1

Principal Benthic Communities

⁴ <u>https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000205.pdf</u>

⁵https://www.npws.ie/sites/default/files/publications/pdf/000205_Malahide%20Estuary%20SAC%20Marine%20S_upporting%20Doc_V1.pdf

Within Malahide Estuary SAC five community types were recorded in the Annex I habitat and the overlapping SPA. These are presented in table 1 and a description of each community type is given below.

	SAC Annex I Habitat	
	Mudflats and	
Community Type	sandflats not covered	SPA
	by seawater at low	
	tide (1140)	
Fine sand with oligochaetes, amphipods,		
bivalves and polychaetes community	✓	✓
complex		
Estuarine sandy mud with Chironomidae		
and Hediste diversicolor community	×	~
complex		
Sand to muddy sand with Peringia ulvae,		
Tubificoides benedii and Cerastoderma	✓	✓
edule community complex		
Zostera-dominated community	~	~
Mytilus-dominated community complex	×	~

Table 1. The community types recorded in Malahide Estuary SAC and the overlapping SPA.

Estimated areas of each community type in the Annex I habitat, based on interpolation, are given in the objective targets in Section 2.

The development of a community complex target arises when an area possesses similar abiotic features but records a number of biological communities that are not regarded as being sufficiently stable and/or distinct temporally or spatially to become the focus of conservation efforts. In this case, examination of the available data from Malahide Estuary SAC identified a number of biological communities whose species composition overlapped significantly. Such biological communities are grouped together into what experts consider are sufficiently stable units (i.e. a complex) for conservation targets.

FINE SAND WITH OLIGOCHAETES, AMPHIPODS, BIVALVES AND POLYCHAETES COMMUNITY COMPLEX

This community complex occurs along the eastern boundary of the site from the Martello Tower at Balcarrick in the north to Portmarnock in the south (Figure 2).

The sediment of this community complex is largely that of fine sand (ranging from 74% to 88.9%) with negligible amounts of coarse material (

The complex is distinguished by the oligochaete Tubificoides benedii, the crustacean Bathyporeia guilliamsoniana, the bivalve Angulus tenuis and the polychaetes Nephtys cirrosa, Hediste diversicolor, Scoloplos armiger and Scolelepis squamata, all of which occur in moderate abundances here (Table 2).

Distinguishing species of the Fine sand with oligochaetes, amphipods, bivalves and polychaetes community complex		
Tubificoides benedii Hediste diversicolor		
Bathyporeia guilliamsoniana Scoloplos armiger		
Angulus tenuis Scolelepis squamata		
Nephtys cirrosa		

Table 2. Distinguishing species of the Fine sand with oligochaetes, amphipods, bivalves and polychaetes community complex

This complex is recorded at Swords where the Ward River and Broad Meadow River enter the Malahide estuary (Figure 2).

The sediment is largely that of sandy mud with silt-clay and very fine sand accounting for between 19.6% to 59.7% and 12.4% to 28.4% of the sediment fractions respectively. The remaining fractions range from

0.8% to 12.5% coarse sand, very coarse sand from 0.4% to 5.1%, medium sand from 1.6% to 27.7% and the fine sand fraction from 8.7% to 21.9%. The proportion of gravel recorded is negligible (<1%).

The fauna is distinguished by unidentified Chironomidae species and the polychaete Hediste diversicolor which occur in high to moderate abundances here. The oligochaetes Heterochaeta costata and Paranais litoralis are also recorded here (Table 3).

Distinguishing species of the Estuarine sandy mud with Chironomidae and <i>Hediste diversicolor</i> community complex		
Chironomidae Heterochaeta costata		
Hediste diversicolor Paranais litoralis		

Table 3 Distinguishing species of the Estuarine sandy mud with Chironomidae and Hediste diversicolor community complex.

SAND TO MUDDY SAND WITH PERINGIA ULVAE, TUBIFICOIDES BENEDII AND CERASTODERMA EDULE COMMUNITY COMPLEX

This community complex is recorded extensively within the estuary from Donabate to Malahide (Figure 2).

The substrate here is composed largely of fine material with silt-clay ranging from 2.2% to 59.7%, very fine sand from 3.2% to 32.9% and fine sand from 6.1% to 80%. Coarse material accounts for less than 7% of the sediment fractions.

The fauna is distinguished by the gastropod Peringia ulvae, the oligochaete Tubificoides benedii and the bivalve Cerastoderma edule which all occur in moderate abundances within this complex. The polychaete Hediste diversicolor and the bivalve Scrobicularia plana are not uniformly distributed, having their highest abundances near Malahide Point. The polychaetes Scoloplos armiger, Pygospio elegans and Nephtys hombergii are also recorded here (Table 4).

Distinguishing species of the Sand to muddy sand with Peringia ulvae, Tubificoides benedii and Cerastoderma edule community complex		
Peringia ulvae Scrobicularia plana		
Tubificoides benedii Scoloplos armiger		
Cerastoderma edule Pygospio elegans		
Hediste diversicolor Nephtys hombergii		

Table 4 Distinguishing species of the Sand to muddy sand with Peringia ulvae, Tubificoides benedii and

 Cerastoderma edule community complex.

ZOSTERA-DOMINATED COMMUNITY

The intertidal seagrass Zostera noltii is recorded in two discrete areas to the north of the site, on Burrow Strand at Corballis and along the shore to the east of Kilcrea (Figure 2).

The sediment here is largely that of fine sand which accounts for 80% of the sediment fractions. Coarse material and fines fractions are negligible.

The coverage of Zostera noltii at this site ranges from 60% in the more westerly bed to 82% in the beds on Burrow Strand. The fauna is dominated by the gastropod Peringia ulvae which is recorded in very high abundances; the polychaetes Pygospio elegans and Scoloplos armiger occur in high abundance here. The infauna is similar to that recorded for the "Sand to muddy sand with Peringia ulvae, Tubificoides benedii and Cerastoderma edule community complex" (See Table 4).

MYTILUS-DOMINATED COMMUNITY COMPLEX

This community occurs on the intertidal expanse between the railway line and the spit at Malahide Point (Figure 2).

The bivalve Mytilus edulis, with algal epibionts such as Ectocarpus sp. are abundant here. Between the clumps of mussel patches of sandy mud occur in which the polychaete Arenicola marina is recorded in densities of between 3-4m². The bivalve Scrobicularia plana, barnacles and encrusting polychaetes also occur within this complex (Table 5).

Distinguishing species of the <i>Mytilus</i> -dominated community complex		
Mytilus edulis	Fucus vesiculosus	
Ectocarpus sp.	Enteromorpha sp.	
Arenicola marina	Ulva intestinalis	
Littorina littorea	Scrobicularia plana	

Table 5 Distinguishing species of the Mytilus-dominated community complex.

Section 2

Appropriate Assessment Notes

Many operations/activities of a particular nature and/or size require the preparation of an environmental impact statement of the likely effects of their planned development. While smaller operations/activities (i.e. sub threshold developments) are not required to prepare such statements, an appropriate assessment and Natura Impact Statement is required to inform the decision-making process in or adjacent to European sites. The purpose of such an assessment is to record in a transparent and reasoned manner the likely effects on a European site of a proposed development. General guidance on the completion of such assessments has been prepared and is available at www.npws.ie.

Annex I Habitats

It is worth considering at the outset that in relation to Annex I habitat structure and function, the extent and quality of all habitats varies considerably in space and time and marine habitats are particularly prone to such variation. Habitats which are varying naturally, i.e. biotic and/or abiotic variables are changing within an envelope of natural variation, must be considered to have favourable conservation condition. Anthropogenic disturbance may be considered significant when it causes a change in biotic and/or abiotic variables in excess of what could reasonably be envisaged under natural processes. The capacity of the habitat to recover from this change is obviously an important consideration (i.e. habitat resilience) thereafter.

This Department has adopted a prioritized approach to conservation of structure and function in marine Annex I habitats.

- 1. Those communities that are key contributors to overall biodiversity at a site by virtue of their structure and/or function (keystone communities) and their low resilience should be afforded the highest degree of protection and any significant anthropogenic disturbance should be avoided.
- 2. In relation to the remaining constituent communities that are structurally important (e.g. broad sedimentary communities) within an Annex I marine habitat, there are two considerations.
 - 2.1 Significant anthropogenic disturbance may occur with such intensity and/or frequency as to effectively represent a continuous or ongoing source of disturbance over time and space (e.g. effluent discharge within a given area). Drawing from the principle outlined in the European Commission's Article 17 reporting framework that disturbance of greater than 25% of the area of an Annex I habitat represents unfavourable conservation status, this Department takes the view that licensing of activities likely to cause continuous disturbance of each community type should not exceed an approximate area of 15%. Thereafter, an increasingly cautious approach is advocated. Prior to any further licensing of this category of activities, an interDepartmental management review (considering inter alia robustness of available scientific knowledge, future site requirements, etc) of the site is recommended.
 - 2.2 Some activities may cause significant disturbance but may not necessarily represent a continuous or ongoing source of disturbance over time and space. This may arise for intermittent or episodic activities for which the receiving environment would have some

resilience and may be expected to recover within a reasonable timeframe relative to the six-year reporting cycle (as required under Article 17 of the Directive). This Department is satisfied that such activities could be assessed in a contextspecific manner giving due consideration to the proposed nature and scale of activities during the reporting cycle and the particular resilience of the receiving habitat in combination with other activities within the designated site.

The following technical clarification is provided in relation to specific conservation objectives and targets for Annex I habitats to facilitate the appropriate assessment process:

Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Malahide Estuary SAC, which is defined by the following list of attributes and targets.

Target 1 - The permanent habitat area is stable or increasing, subject to natural processes.

- This target refers to activities or operations that propose to permanently remove habitat from a site, thereby reducing the permanent amount of habitat area. It does not refer to long or short term disturbance of the biology of a site.
- Early consultation or scoping with the Department in advance of formal application is advisable for such proposals.

Target 2 - Maintain the extent of the Zostera-dominated community and Mytilusdominated community complex, subject to natural processes.

- The Zostera-dominated community and Mytilus-dominated community complex are considered to be keystone communities that are of considerable importance to the overall ecology and biodiversity of a habitat by virtue of its physical complexity, e.g. the former community serves as important nursery grounds for commercial and noncommercial species while both provide important food sources for a number of bird species.
- Any significant anthropogenic disturbance to the extent of this community should be avoided.
- An interpolation of the likely distribution of these community types are provided in figure 2. The areas given below are based on spatial interpolation and therefore should be considered indicative:
 - Zostera-dominated community 5ha
 - Mytilus-dominated community complex- 4ha

Target 3 - Conserve the high quality of the Zostera-dominated community, subject to natural processes.

• It is important to ensure the quality as well as the extent of Zostera-dominated communities is conserved. For example, percent coverage can provide an indication of the habitat quality as well as giving information on the habitat complexity and refuge capability; all important components in maintaining the structural and functional integrity of the habitat.

Target 4 - Conserve the high quality of the Mytilus edulis-dominated community complex, subject to natural processes.

- Every effort should be made to avoid any death to living Mytilus edulis.
- Any significant anthropogenic disturbance to the quality (e.g. living individual/m2) of the community should be avoided.

Target 5 - Conserve the following community types in a natural condition: Fine sand with oligochaetes, amphipods, bivalves and polychaetes community complex; Estuarine sandy mud with Chironomidae and Hediste diversicolor community complex; and Sand to muddy sand with Peringia ulvae, Tubificoides benedii and Cerastoderma edule community complex.

- A semi-quantitative description of the communities has been provided in Section 1.
- An interpolation of their likely distribution is provided in figure 2.

- The estimated areas of the communities within the Mudflats and sandflats not covered by seawater at low tide habitat given below are based on spatial interpolation and therefore should be considered indicative:
 - Fine sand with oligochaetes, amphipods, bivalves and polychaetes community complex 126ha
 - Estuarine sandy mud with Chironomidae and Hediste diversicolor community complex 7ha
 - Sand to muddy sand with Peringia ulvae, Tubificoides benedii and Cerastoderma edule community complex 169ha
- Significant continuous or ongoing disturbance of communities should not exceed an approximate area of 15% of the interpolated area of each community type, at which point an inter-Departmental management review is recommended prior to further licensing of such activities.
- Proposed activities or operations that cause significant disturbance to communities but may not necessarily represent a continuous or ongoing source of disturbance over time and space may be assessed in a context-specific manner giving due consideration to the proposed nature and scale of activities during the reporting cycle and the particular resilience of the receiving habitat in combination with other activities within the designated site.'

Legend SAC 000205 SAC 000205 OSi Discovery Series Co	fats not covered by sea water at low tide burty Boundaries	M		
An Home	MALAHIDE ESTUARY SAC	SITE CODE: SAC 000205 CO DUBLIN; version 1.02	The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance	N
Bepartment of Arts, Heritage and the Gaellacht	TIDAL MUDFLATS AND SANDFLATS Map to be tead in conjunction with the NPWS Conservation Objectives Marrie Exporting Document.	0 0.25 0.5 0.75 1 km	Níl una seorannaícha ar na Noncálkeana ach neó ganthuionteach ginearáita. Fáadtarathonténntée a céanamh ar theorainneacha na gceantar comhanthaithe. Macasamhail d'ábhar na Suitbhéanachta Ordonáis le chead ón Rialtan (Ceadunas Uinh. EN 8059206)	Map Version 1 Date: October 2012

Figure 18. Extent of Mudflats and sandflats not covered by seawater at low tide in Malahide Estuary SAC

Figure 19. Distribution of community types in Malahide Estuary SAC

As outlined in the Conservation objectives supporting document – coastal habitats⁶ (NPWS, 2013):

'2 Conservation Objectives

The conservation objective aims to define the favourable conservation condition of a habitat or species at a particular site. Implementation of these objectives will help to ensure that the habitat or species achieves favourable conservation status at a national level.

3 Saltmarsh habitats

Saltmarshes are stands of vegetation that occur along sheltered coasts, mainly on mud or sand, and are flooded periodically by the sea. They are restricted to the area between mid neap tide level and high water spring tide level. In Ireland, there are four saltmarsh habitats listed under Annex I of the EU Habitats Directive (92/43/EEC):

- Salicornia and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (ASM) (1330)
- Mediterranean salt meadows (Juncetalia maritimi) (MSM) (1410)
- Mediterranean and thermo-Atlantic halophilous scrub (1420)

Three of the above habitats (in bold) are listed as Qualifying Interests for Malahide Estuary SAC. The last habitat is restricted in its distribution to sites in the southeast of the country.

The distribution of saltmarsh habitats within Malahide Estuary SAC is presented in Appendix I. The SMP surveyed, mapped and assessed one sub-site within Malahide Estuary SAC (McCorry, 2007) - Malahide Estuary (Appendix II).

Within Malahide Estuary SAC, ASM and Salicornia flats are particularly well represented. MSM is present only in small amounts at the two small strips of marsh in the northern part of the outer estuary. Detailed descriptions of each habitat in the sub-site recorded by McCorry (2007) in Malahide Estuary can be found in Appendix II.

3.1 Overall Objectives

The overall objective for 'Salicornia and other annuals colonising mud and sand' in Malahide Estuary SAC is to 'maintain the favourable conservation condition'.

The overall objective for 'Atlantic salt meadows' in Malahide Estuary SAC is to 'restore the favourable conservation condition'.

The overall objective for 'Mediterranean salt meadows' in Malahide Estuary SAC is to 'maintain the favourable conservation condition'.

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area (b) Range and (c) Structure and Functions.

3.2 Area

3.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target is no decrease in extent from the baseline which was established by McCorry (2007). Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is assessed subject to natural processes, including erosion and succession.

A baseline habitat map was produced for the saltmarsh in Malahide Estuary during the SMP. This map is included with the individual site report in the Appendices at the end of this document (Appendix II).

The total areas of each saltmarsh habitat within each sub-site as mapped by the SMP and the total area of the habitat within the SAC are presented in the following tables.

There are a number of differences in the figures below. Most of the differences can be explained by the fact that the SMP mapped the total saltmarsh resource at Malahide Estuary and not all of the

⁶https://www.npws.ie/sites/default/files/publications/pdf/000205_Malahide%20Estuary%20SAC%20Coastal% 20Supporting%20Doc_V1.pdf

saltmarsh mapped is contained within the SAC boundary. In addition, the total area within the SAC can be greater than given in the SMP as the SMP did not include any mosaics when calculating their total areas. The following rules were applied when calculating the areas for the site's conservation objectives:

- 1. Where a polygon was identified as a mosaic of an Annex I habitat and a non-Annex I habitat, then the entire area was counted as the Annex I habitat.
- 2. Where a polygon was identified as a mosaic of two Annex I habitats, the area was divided 50:50 for each habitat.

Sub-site	Total area (ha) of <i>Salicornia</i> mudflats from SMP	Total area (ha) of <i>Salicornia</i> mudflats within SAC boundary (including mosaics)
Malahide Estuary	1.95	1.925
Total	1.95	1.925

The target for Salicornia flats is that the area should be stable or increasing, subject to natural processes, including erosion and succession.

Sub-site	Total area (ha) of ASM (excluding mosaics) from SMP	Total area (ha) of ASM within SAC boundary (including mosaics)
Malahide Estuary	26.21	25.33
Total	26.21	25.33

The target for ASM is that the area should be increasing, subject to natural processes, including erosion and succession.

Sub-site	Total area (ha) of MSM (excluding mosaics) from SMP	Total area (ha) of MSM within SAC boundary (including mosaics)
Malahide Estuary	0.64	0.636
Total	0.64	0.636

The target for MSM is that the area should be stable or increasing, subject to natural processes, including erosion and succession.

3.3 Range

3.3.1 Habitat distribution

The SMP sub-divided the Malahide Estuary into three sub-sites:

- i. Malahide Island
- ii. Outer estuary
- iii. Inner Estuary
- i. Malahide Island

This saltmarsh is located on the eastern side of the outer estuary on the sand spit and ASM dominates. The site has an unusual topography and there are long narrow bands of saltmarsh situated between sand dune ridges. Creeks flow into these narrow bands and drain them. Salicornia flats occur on the seaward side of the ASM on sand and mud. Common cord grass (Spartina anglica) is also found here.

ii. Outer Estuary

Saltmarsh is also located along the northern side of the outer estuary and is mainly situated in both of the corners of the estuary. The north-eastern corner of the estuary contains a range of different Annex I habitats that are located in a sheltered area and are typically zoned in an arc around the edge of the shoreline. The most prominent habitat is ASM. There are several patches of MSM located to the landward side of the ASM and this is the only MSM present within Malahide Estuary. Spartina swards also occur in this area.

iii. Inner Estuary

Most of the saltmarsh in the inner estuary is situated at the western end, although there are several other fragments on the north and southern sides further east. The saltmarsh at the western side of the inner estuary is made up of low-lying islands at Lissenhall including Horse Bank and Mill Marsh, which are all dominated by ASM (McCorry, 2007)

The target is that there should be no decline or change in the distribution of these saltmarsh habitats, unless it is the result of natural processes, including erosion, accretion and succession.

3.4 Structure and Functions

The location, character and dynamic behaviour of saltmarshes are governed by sediment supply, tidal regime, wind-wave climate and sea level change. The slope of the saltmarsh allows the development of several ecological gradients such as tidal submergence and salinity, and this influences the development of distinctive zones of halophytic and salt tolerant plant communities. Maintaining the favourable conservation condition of the saltmarsh habitats in Malahide Estuary in terms of its structure and functions depends on a range of attributes for which targets have been set as outlined below.

3.4.1 Physical structure: sediment supply

Accretion and erosion are natural elements of saltmarsh systems. Maintaining the sediment supply is vital for the continued development and natural functioning of a saltmarsh system. Interruption to the sediment circulation through physical structures can starve the system and lead to accelerated erosion rates.

The saltmarsh habitats at this site have been disturbed in the past by the construction of the railway viaduct across the estuary. This has led to the development of more brackish or lagoonal-type conditions in the inner estuary and a reduced tidal range (McCorry, 2007).

The M1 Broadmeadow Motorway Bridge was constructed to cross the estuary at Lissenhall in 2001-2003. Care was taken during the construction phase not to damage the structure or surface of the saltmarsh and by and large the structure of the saltmarsh has remained intact (McCorry, 2007).

A comparison of the 1920's OSI 2nd edition six inch map to the current extent of saltmarsh shows there has been some minor gains and losses of saltmarsh around the estuary. The southern edge of Malahide Island indicates some erosion and realignment of saltmarsh since the 1920s. There has also been some accretion in portions of this site which is actively occurring albeit at a slow rate. There has also been some transition of saltmarsh to sand dune and vice versa. Active accretion at this location may also affect the extent of Salicornia flats as this habitat transitions to ASM (McCorry, 2007).

A substantial area of the estuary at the north-western corner was reclaimed between the drawing of the 1st and 2nd edition 6inch maps. This probably occurred in the 19th Century and was facilitated by the construction of the viaduct across the estuary. The area reclaimed was behind the viaduct in Mullan Intake. There has been some loss of saltmarsh around this old shoreline due to this reclamation (McCorry, 2007).

Within the ASM there is some erosion albeit at a slow rate at the seaward side of the northern tip as seen from comparisons of the 2nd ed OS map with 2000 aerial photos. The erosion is countered by accretion along the north side of the causeway (McCorry, 2007). The MSM is mainly situated along the boundary of St Anne's Golf Course and the extent of this habitat is likely to have been greater in the past prior to the development of the golf courses (McCorry, 2007).

The target is to maintain the natural circulation of sediment and organic matter, without any physical obstructions.

3.4.2 Physical structure: creeks and pans

Saltmarshes can contain a distinctive topography with an intricate network of creeks and pans occurring on medium to large-sized sites. Creek density is influenced by vegetation cover, sediment supply and tidal influence. Creeks absorb tidal energy and assist with delivery of sediment into the saltmarsh. The efficiency of this process depends on creek pattern. Creeks allow pioneer vegetation to become established along their banks higher up into the saltmarsh system. Major erosion of saltmarsh

is indicated by internal dissection and enlargement of the drainage network, ultimately leading to the creation of mud basins.

At Malahide Island the saltmarsh is in good condition, though there are fewer saltpans than expected for a saltmarsh associated with a sandier substrate. The ASM at Lissenhall is also in relatively good condition despite any disturbance resulting from construction of the M1 motorway bridge. There are few signs of disturbance to the physical structure of the saltmarsh and old pans are still present in some of the brackish communities.

The target is to maintain creek and pan networks where they exist and to restore areas that have been altered.

3.4.3 Physical structure: flooding regime

The regular ebb and flow of the tide brings salinity, but also nutrients, organic matter and sediment, which are central to the development, growth and indeed survival of saltmarshes. Saltmarsh vegetation consists of a limited number of halophytic (salt-tolerant) species that are adapted to regular immersion by the tides. Species in the lowest part of the saltmarsh require regular inundation, while those higher up on the marsh can only tolerate occasional inundation.

The viaduct that was built over the estuary in the 1800s has modified the tidal regime of the estuary over time, which prevents the inner estuary from emptying completely at low tide, therby creating a lagoon (McCorry, 2007).

The target is to maintain a flooding regime whereby the lowest levels of the saltmarsh are flooded daily, while the upper levels are flooded occasionally (e.g. highest spring tides).

3.4.4 Vegetation structure: zonation

Saltmarshes are naturally dynamic coastal systems. As is the case on the majority of Irish saltmarshes, ASM is the dominant saltmarsh habitat at Malahide Estuary where it occurs in a mosaic with other saltmarsh habitats, including 'Salicornia and other annuals colonising mud and sand' and 'Mediterranean salt meadows'.

At Malahide Island there is some natural transition between ASM and Salicornia flats in an actively accreting area. This is a feature of particular significance and indicates active accretion is occurring and the saltmarsh is in transition. There are also some natural transitions between the ASM and the sand dune habitats, as well as transitions between ASM and Spartina swards at the northern end of the outer estuary (McCorry, 2007).

The target is to maintain the range of coastal habitats, including transitional zones, subject to natural processes including erosion and succession.

3.4.5 Vegetation structure: vegetation height

A varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. Grazing is often used as a tool for maintaining structural diversity in the sward but stocking levels need to be appropriate. Overgrazing can lead to loss of species and destruction of the vegetation cover, while undergrazing can lead to a loss of plant diversity due to competitive exclusion.

Grazing by livestock is absent from Malahide Estuary resulting in a high vegetation cover and a wide range of sward heights (McCorry, 2007). The saltmarsh is grazed by wildfowl as the estuary is an important wintering bird site.

The target is to maintain structural variation within the sward. A general guideline is that there should be a sward ratio of 30% tall:70% short across the entire saltmarsh.

3.4.6 Vegetation structure: vegetation cover

Vegetation cover can have a major effect on saltmarsh development by reducing the velocity of the tide and thereby enhancing the deposition of sediment. Excessive bare mud, however, is often a sign of overuse by livestock or humans and can lead to destabilisation and accelerated erosion of the system.

There is some amenity use of the saltmarsh at Malahide Island, such as by walkers and probably offroad vehicles and motor bikes. This use has created eroded tracks in the saltmarsh. There are also wheel ruts present in the ASM at the north-eastern corner of the outer estuary. O'Reilly & Pantin (1957) recorded cart tracks across the saltmarsh which may have been related to the collection of gravel from the foreshore (McCorry, 2007).

The target is to maintain 90% of the area outside of the creeks vegetated.

3.4.7 Vegetation composition: typical species & sub-communities

Saltmarshes contain several distinct zones that are related to elevation and frequency of flooding. The lowest part along the tidal zone is generally dominated by the most halophytic (salt-tolerant) species including common saltmarsh-grass (Puccinellia maritima) and species more usually associated with Salicornia muds. The mid-marsh zone is generally characterised by sea thrift (Armeria maritima), sea plantain (Plantago maritima) and sea aster (Aster tripolium). This mid-zone vegetation generally grades into an herbaceous community in the upper marsh, dominated by red fescue (Festuca rubra), sea milkwort (Glaux maritima) and saltmarsh rush (Juncus gerardii). Below are lists of typical species for the different saltmarsh zones, although some of these species have a restricted distribution nationally and may not occur in the Malahide Estuary area.

Typical species			
Lower marsh	Low-mid marsh	Mid-upper marsh	
Salicornia spp.	Puccinellia maritima	Festuca rubra	
Suaeda maritima	Triglochin maritima	Juncus gerardii	
Puccinellia maritima	Plantago maritima	Armeria maritima	
Aster tripolium	Atriplex portulacoides	Agrostis stolonifera	
	Aster tripolium	Limonium humile	
	Spergularia sp.	Glaux maritima	
	Suaeda maritima	Seriphidium maritimum	
	Salicornia spp.	Plantago maritima	
	Glaux maritima	Aster tripolium	
		Juncus maritimus	
		Triglochin maritima	
		Blysmus rufus	
		Eleocharis uniglumis	
		Leontodon autumnalis	
		Carex flacca	
		Carex extensa	

The target for this attribute is to ensure that a typical flora of saltmarshes is maintained, as are the range of sub-communities within the different zones.

3.4.8 Vegetation structure: negative indicator species

The only invasive and non-native species recorded on saltmarshes during the SMP was common cordgrass (Spartina anglica), which was recorded throughout the SAC by the SMP (McCorry, 2007).

The largest area of Spartina sward is situated in the north-western corner of the outer estuary. This is quite a dense stand and there are frequent creeks draining the sward that link to the main channel. There are some small open patches within the sward with exposed mud and less aggregated clumps of common cordgrass (McCorry, 2007).

Spartina sward is also located in the north-east corner of the outer estuary. There is natural transition seaward from ASM to dense Spartina swards to a mosaic of frequent clumps of Common cord grass and exposed mud flats to isolated clumps of cord grass (McCorry, 2007).

Some small patches of Spartina sward are located in the inner estuary on the saltmarsh at Lissenhall, where Spartina has colonised the edge of established saltmarsh and along the adjacent mudflats. There is also a small area of Spartina sward located at the Southern end of Malahide Island (McCorry, 2007).

The aim is that negative indicators such as Spartina should be absent or under control. The current target for this particular site is no significant expansion and an annual spread of less than 1%.

4 Sand dune habitats

Sand dunes are hills of wind blown sand that have become progressively more stabilised by a cover of vegetation. In general, most sites display a progression through strandline, foredunes, mobile dunes and fixed dunes. Where the sandy substrate is decalcified, fixed dunes may give way to dune heath. Wet hollows, or dune slacks, occur where the dunes have been eroded down to the level of the water-table. Machair is a specialised form of dune system that is only found on the northwest coasts of Ireland and Scotland. Transitional communities can occur between dune habitats and they may also form mosaics with each other. Dune systems are in a constant state of change and maintaining this natural dynamism is essential to ensure that all of the habitats present at a site achieve favourable conservation condition.

In Ireland, there are 9 sand dune habitats (including annual vegetation of drift lines) listed under Annex I of the EU Habitats Directive (92/43/EEC) (* denotes a priority habitat):

- Annual vegetation of drift lines (1210)
- Embryonic shifting dunes (2110)
- Shifting dunes along the shoreline with Ammophila arenaria (2120)
- Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130) *
- Decalcified dunes with Empetrum nigrum (2140) *
- Decalcified dune heath (2150) *
- Dunes with Salix repens (2170)
- Humid dune slacks (2190)
- Machair (21AO) *

Three dune habitats were recorded by Ryle et al. (2009) and two are listed as Qualifying Interests (indicated in bold above) for Malahide Estuary SAC. Embryonic shifting dunes were also recorded by the CMP. These habitats include mobile areas at the front, as well as more stabilised parts of dune systems.

Annual vegetation of drift lines is found on beaches along the high tide mark, where tidal litter accumulates. It is dominated by a small number of annual species (i.e. plants that complete their lifecycle within a single season). Tidal litter contains the remains of marine algal and faunal material, as well as a quantity of seeds. Decaying detritus in the tidal litter releases nutrients into what would otherwise be a nutrient-poor environment. The habitat is often represented as patchy, fragmented stands of vegetation that are short-lived and subject to frequent re-working of the sediment. The vegetation is limited to a small number of highly specialised species that are capable of coping with salinity, wind exposure, an unstable substrate and lack of soil moisture. Typical species include spear-leaved orache (Atriplex prostrata), frosted orache (A. laciniata), sea rocket (Cakile maritima), sea sandwort (Honckenya peploides) and prickly saltwort (Salsola kali).

Embryonic dunes are low accumulations of sand that form above the strandline. They are sometimes referred to as foredunes, pioneer dunes or embryo dunes, as they can represent the primary stage of dune formation. They are characterised by the presence of the salttolerant dune grasses sand couch (Elytrigia juncea) and lyme grass (Leymus arenarius), which act as an impediment to airborne sand. Strandline species can remain a persistent element of the vegetation.

Where sand accumulation is more rapid, marram grass (Ammophila arenaria) invades, initiating the transition to mobile dunes (Shifting dunes along the shoreline with Ammophila arenaria). Marram growth is actively stimulated by sand accumulation. These unstable and mobile areas are sometimes referred to as 'yellow dunes' (or white dunes in some European countries), owing to the areas of bare sand visible between the tussocks of marram.

Fixed dunes refers to the more stabilised area of dune systems, generally located in the shelter of the mobile dune ridges, where the wind speed is reduced and the vegetation is removed from the influence of tidal inundation and salt spray. This leads to the development of a more or less closed or 'fixed' carpet of vegetation dominated by a range of sand-binding species (Gaynor, 2008).

All the dune habitats indicated above occur as a complex mosaic of constantly changing and evolving vegetation communities. They are inextricably linked in terms of their ecological functioning and should be regarded as single geomorphological units. As such, no dune habitat should be considered in isolation from the other dune habitats present at a site, or the adjoining semi-natural habitats with which they often form important transitional communities. Detailed descriptions from the Coastal

Monitoring Project (CMP) (Ryle et al., 2009) of each sand dune habitat found at Malahide Estuary are presented in Appendix IV.

The CMP surveyed a single sub-site within Malahide Estuary SAC. See Appendix III for map:

• Malahide Island (Appendix IV for site report)

Malahide Island is a sand spit overlying a gravel ridge and extends 3km southwards in to Malahide estuary from the rocky promontory of Portrane. The Corballis Golf Course and the Island Golf Course occupy most of the sand dune system. These golf courses have been excluded from the SAC.

4.1 Overall objectives

The overall objective for 'Shifting dunes along the shoreline with Ammophila arenaria' in Malahide Estuary SAC is to 'restore the favourable conservation condition'.

The overall objective for 'Fixed coastal dunes with herbaceous vegetation' in Malahide Estuary SAC is to 'restore the favourable conservation condition'.

These objectives are based on an assessment of the current condition of each habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area (b) Range and (c) Structure and Functions.

4.2 Area

4.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. A baseline habitat map was produced for the sand dune habitats at each sub-site in Malahide Estuary SAC during the Coastal Monitoring Project (CMP) (Ryle et al., 2009). The map for Malahide Island is included with the individual site report in Appendix IV.

The total areas of each sand dune habitat within the SAC as estimated by Ryle et al. (2009) are presented in the second column of the following table. These figures were subsequently checked and adjusted to take into account some overlapping polygons and mapping errors. The adjusted figures are presented in the final column

Habitat	Total area (ha) of habitat from CMP	Total area (ha) of habitat within SAC boundary
Shifting dunes along the shoreline with Ammophila arenaria	1.804	1.80
Fixed coastal dunes with herbaceous vegetation	21.430	21.42
Total	23.234	23.22

The general target for this attribute in the case of each habitat is that the area should be stable, or increasing. Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is always assessed subject to natural processes, including erosion and succession

4.3 Range

4.3.1 Habitat distribution

The fixed dune habitat flanks the eastern and southern edge of Malahide Island while the mobile dunes occur as a thin band along the northeastern edge of the spit (Ryle et al., 2009).

The distribution of sand dune habitats as mapped by Ryle et al. (2009) is presented in Appendix II.

There should be no decline or change in the distribution of these sand dune habitats, unless it is the result of natural processes, including erosion, and succession.

4.4 Structure and Functions

The location, character and dynamic behaviour of sand dunes are governed by a combination of geographic, climatic, edaphic and anthropogenic factors. Sand dunes are highly complex, dynamic systems, where the habitats occur in a complex and constantly evolving and changing mosaic. They function as systems in terms of geomorphology and hydrology and maintaining the favourable conservation condition of the habitats present depends on allowing these processes to continue

unhindered. Maintaining the favourable conservation condition of all of the sand dune habitats in Malahide Estuary SAC in terms of structure and functions depends on a range of attributes for which targets have been set as outlined below.

4.4.1 Physical structure: functionality and sediment supply

Coastlines naturally undergo a constant cycle of erosion and accretion. There are two main causes of erosion: (a) those resulting from natural causes and (b) those resulting from human interference. Natural causes include the continual tendency towards a state of equilibrium between coasts and environmental forces, climatic change (particularly an increase in the frequency of storms or a shift in storm tracks), relative sea level rise and natural changes in the sediment supply. Human interference is usually associated with changes in the sediment budget, either directly, through the removal of beach or inshore sediment, or indirectly, by impeding or altering sediment movement. It is important to recognise that the process of coastal erosion is part of a natural tendency towards equilibrium. Natural shorelines attempt to absorb the energy entering the coastal zone by redistributing sediment.

Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Sediment supply is especially important in the embryonic dunes and mobile dunes, as well as the strandline communities where accumulation of organic matter in tidal litter is essential for trapping sand and initiating dune formation. The construction of physical barriers such as sea defences can interrupt longshore drift, leading to beach starvation and increased rates of erosion. Sediment circulation and erosion also has a role to play in the more stabilised dune habitats. Cycles of erosion and stabilisation are part of a naturally functioning dune system, where the creation of new bare areas allows pioneer species and vegetation communities to develop, increasing biodiversity. The construction of physical barriers can interfere with the sediment circulation by cutting the dunes off from the beach resulting in fossilisation or overstabilisation of dunes.

The mobile dunes at Malahide Island are undergoing some erosion along the north and eastern edge of the site as well as some accretion to the south. Erosion due to overuse of the dunes is affecting all areas of the mobile and embryonic dunes at the site. Coastal protection works have been installed on the seaward side of the spit in the form of railway sleepers and chestnut paling. The installation of concrete filled plastic barrels and planting of sea buckthorn (Hippophae rhamnoides) are measures that have been used for coastal protection by the golf course (Ryle et al., 2009).

The target for this attribute is to maintain the natural circulation of sediment and organic matter throughout the entire dune system, without any physical obstructions.

4.4.2 Vegetation structure: zonation

The range of vegetation zones on a dune system should be maintained. Gaynor (2008) highlights the highly transitional nature of much of the vegetation; therefore, it is important that the transitional communities are also conserved, including those to the saltmarsh communities.

As well as transitions between sand dune habitats, the fixed dune habitat at Malahide Island is closely associated with saltmarsh habitat that has recently developed over the gravel material at the southern tip of the spit. This is one of the more intact sand dune-saltmarsh complexes on the northeastern coastline (Ryle et al., 2009).

The target is to maintain the range of coastal habitats, including transitional zones, subject to natural processes, including erosion and succession.

4.4.3 Vegetation structure: bare ground

This target only applies to fixed dunes. It does not apply to the other habitats present where high levels of bare sand are a natural component of the habitat (*e.g. mobile dunes). In the fixed areas some degree of instability is vital. Constant cycles of erosion and stabilisation provide the necessary conditions for the establishment of pioneer species and species that favour open conditions including invertebrates, helping to increase biodiversity.

The target is to achieve up to 10% bare sand. This target is assessed subject to natural processes.

4.4.4 Vegetation structure: vegetation height

This attribute applies to the fixed dunes, where a varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. The ecological

benefits of moderate levels of grazing on dunes have been well documented (Gaynor, 2008). Moderate grazing regimes lead to the development of a species-rich vegetation cover. The animals increase biodiversity by creating micro-habitats through their grazing, dunging and trampling activities. Grazing slows down successional processes and in some cases reverses them, helping to achieve a diverse and dynamic landscape. The effects of trampling assist the internal movement of sand through the development of small-scale blowouts, while dunging can eutrophicate those dune habitats whose nutrient-poor status is crucial for the survival of certain vegetation types. Many species, from plants to invertebrates, benefit immensely from the open and diverse system created by a sustainable grazing regime. Many dune species are small in size and have relatively low competitive ability.

Consequently, the maintenance of high species diversity on a dune system is dependent on the existence of some control to limit the growth of rank coarse vegetation (Gaynor, 2008).

Grazing by livestock is absent from Malahide Island (Ryle et al., 2009). The target for this attribute is to maintain structural variation within the sward.

4.4.5 Vegetation composition: plant health of dune grasses

This attribute applies to mobile dunes, where blown sand is a natural feature. The health of the dune grasses (particularly Ammophila arenaria and Elytrigia juncea) is assessed by the plant parts above the ground (they should be green) and the presence of flowering heads. This gives a clear indication of the status of the supply of blown sand, which is required for these species to thrive.

The target for this attribute is that more than 95% of the dune grasses should be healthy.

4.4.6 Vegetation composition: typical species & sub-communities

Species diversity and plant distribution in dunes is strongly controlled by a range of factors, including mobility of the substrate, grazing intensities, moisture gradients, nutrient gradients and human disturbance. In the younger, more mobile dunes, marram (Ammophila arenaria) is common, while groundsel (Senecio vulgaris), sea rocket (Cakile maritima) and dandelion (Taraxacum sp.) are also present. The fixed, more stable dune vegetation includes lady's bedstraw (Galium verum), common birdsfoot trefoil (Lotus corniculatus), wild thyme (Thymus praecox), kidney vetch (Anthyllis vulneraria), wild pansy (Viola tricolor) and biting stonecrop (Sedum acre).

The typical species of the mobile dunes at Malahide Island include marram (Ammophila arenaria), Lyme-grass (Leymus arenarius) and sea spurge (Euphorbia paralias). Sea holly (Eryngium maritimum) occurs occasionally throughout the mobile dunes (Ryle et al., 2009).

Typical species recorded in the fixed dunes at Malahide Island include red fescue (Festuca rubra), birdsfoot-trefoil (Lotus corniculatus), lady's bedstraw (Galium verum), wild thyme (Thymus polytrichus) and wild pansy (Viola tricolor sub sp. cutisii). Species typical of calcareous dunes such as eyebright (Euphrasia officinalis) and biting stonecrop (Sedum acre) were also recorded at the site by the CMP. The fixed dunes also contain a high cover of marram (Ammophilla arenaria) attributed to the lack of grazing. The Irish Red Data book and Flora Protection Order (1999) species, hairy violet (Viola hirta) occurs at the site (Ryle et al., 2009).

The target for this attribute is to maintain a typical flora for the particular sand dune habitat.

4.4.7 Vegetation composition: negative indicator species

Negative indicators include non-native species (e.g. Hippophae rhamnoides), species indicative of changes in nutrient status (e.g. Urtica dioica) and species not considered characteristic of the habitat. Sea-buckthorn (Hippophae rhamnoides) should be absent or effectively controlled.

The main invasive species identified in Gaynor (2008) were bracken (Pteridium aquilinum) and sea buckthorn (Hippophae rhamnoides). The invasion of non-native species compromises the typical plant community structure. Bracken (Pteridium aquilinum) is becoming increasingly dominant, particularly where sites have been abandoned or where grazing levels have been significantly reduced. The vegetation retains many elements of the original vegetation cover, but there is a reduction in biodiversity. As the canopy becomes taller and ranker, many of the low-growing species disappear. In this case, the vegetation is treated as a sub-community of the original community that was invaded. This is always the case unless the original vegetation cover has been completely destroyed, as can happen with H. rhamnoides, which can form dense impenetrable thickets. Sea buckthorn (Hippophae rhamnoides) has been planted at the western edge of the golf course and is extending into the fixed dune. Other negative indicators recorded by the CMP in the fixed dune include creeping thistle (Cirsium arvense), bracken (Pteridium aquilinum), ragwort (Senecio jacobaea) and bramble (Rubus fruticosus). Creeping thistle (Cirsium arvense) also occurs within the mobile dune habitat at Malahide Island (Ryle et al., 2009).

The target is that negative indicators (including non-native species) should represent less than 5% of the vegetation cover.

4.4.8 Vegetation composition: scrub/trees

This attribute only applies to the fixed dunes. Scrub encroachment leads to reduction in dune biodiversity and needs to be controlled.

Within Malahide Estuary, the fixed dune area has been invaded by dog-rose (Rosa canina), privet (Ligustrum sp.) as well as single trees of turkey oak (Quercus cerris) (Ryle et al., 2009)

The target for this attribute therefore is that the cover of scrub and tree species should be under control or make up less than 5% of the vegetation cover.'

Figure 20. Distribution map of saltmarsh habitats within Malahide Estuary SAC

Figure 21. Distribution map of sand dune habitats within Malahide Estuary SAC

Malahide Estuary SPA (Site code: 004025)

As outlined in the Malahide Estuary SPA Site Synopsis ⁷ (NPWS, Version date 23.08.2013):

'Malahide Estuary is situated in north Co. Dublin, between the towns of Malahide and Swords. The site encompasses the estuary, saltmarsh habitats and shallow subtidal areas at the mouth of the estuary. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "The Island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats exposed. Substantial stands of eelgrass (both Zostera noltii and Z. angustifolia) occur in the sheltered part of the outer estuary, along with Tasselweed (Ruppia maritima). Green algae, mostly Ulva spp., are frequent on the sheltered flats. Common Cord-grass (Spartina anglica) is well established in the outer estuary and also in the innermost part of the site. The intertidal flats support a typical macroinvertebrate fauna, with polychaete worms (Arenicola marina and Hediste diversicolor), bivalves such as Cerastoderma edule, Macoma balthica and Scrobicularia plana, the small gastropod Hydrobia ulvae and the crustacean Corophium volutator. Salt marshes, which provide important roosts during high tide, occur in parts of the outer estuary and in the extreme inner part of the inner estuary. These are characterised by such species as Sea Purslane (Halimione portulacoides), Sea Aster (Aster tripolium), Thrift (Armeria maritima), Sea Arrowgrass (Triglochin maritima) and Common Saltmarsh-grass (Puccinellia maritima).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, 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. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

This site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has internationally important populations of Lightbellied Brent Goose (1,104 individuals or 5% of the all-Ireland total) and Black-tailed Godwit (409 individuals or 2.9% of the all-Ireland total) - figures given here and below are mean peaks for the five winters 1995/96-1999/2000. Furthermore, the site supports nationally important populations of an additional 12 species: Great Crested Grebe (63), Shelduck (439), Pintail (58), Goldeneye (215), Red-breasted Merganser (99), Oystercatcher (1,360), Golden Plover (1,843), Grey Plover (201), Knot (915), Dunlin (1,594), Bar-tailed Godwit (156) and Redshank (581). The high numbers of diving ducks reflects the lagoon-type nature of the inner estuary, and this is one of the few sites in eastern Ireland where substantial numbers of Goldeneye can be found.

A range of other species occurs, including Mute Swan (37), Pochard (36), Ringed Plover (86), Lapwing (1,542), Curlew (548), Greenshank (38) and Turnstone (112).

The estuary also attracts other migrant wader species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. These occur mainly in autumn, though occasionally in spring and winter.

Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of Malahide Island. Grey Herons breed nearby and feed regularly within the site.

Malahide Estuary SPA is a fine example of an estuarine system, providing both feeding and roosting areas for a range of wintering waterfowl. The lagoonal nature of the inner estuary is of particular value as it increases the diversity of birds which occur. The site is of high conservation importance, with internationally important populations of Light-bellied Brent Goose and Black-tailed Godwit, and nationally important populations of a further 12 species. Two of the species which occur regularly (Golden Plover and Bar-tailed Godwit) are listed on Annex I of the E.U. Birds Directive. Malahide Estuary (also known as Broadmeadow Estuary) is a Ramsar Convention site.'

The Natura 2000 Standard Data Form⁸ (2021) states that:

⁷ https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004025.pdf

⁸ <u>https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004025.pdf</u>

The site is situated in north Co. Dublin, between the towns of Malahide and Swords. It comprises the estuary of the River Broadmeadow. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "the island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats. Salt marshes occur in parts of the outer estuary and in the extreme inner part of the inner estuary.

The site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has an internationally important population of Branta bernicla hrota (4.8% of national total), and nationally important populations of a further 12 species. Of particular note are the populations of Tadorna tadorna (3.0% of national total), Anas acuta (2.9% of national total), Mergus serrator (2.8% of national total), Pluvialis squatarola (2.7% of national total) and Calidris canutus (3.7% of national total). The site is one of the few in eastern Ireland where substantial numbers of Bucephala clangula occur. It has a regionally important population of Limosa lapponica. The site is an important and regular site for a range of autumn passage migrants, especially Calidris ferruginea and Philomachus pugnax. It supports a regular flock of nonbreeding Cygnus olor.'

Status of the Qualifying Interests/Features of interest and Conservation Objectives.

The Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites in Malahide Estuary are seen in Table 5 and the Site specific conservation objectives for European sites are seen in Table 6.

Table 5. Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for Malahide Estuary (SAC & SPA).

Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites		
European site Name & Code	Qualifying Interests	Current Conservation Status &
		Trend
Special Areas of Conservation (SAC)		
Malahide Estuary SAC	Mudflats and sandflats not covered by seawater at low tide [1140]	Inadequate
	Salicornia and other annuals colonising mud and sand [1310]	Favourable
	Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	Inadequate
	Mediterranean salt meadows (Juncetalia maritimi) [1410]	Inadequate
	Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]	Inadequate
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Bad
Special Protection Areas (SPA)		
Malahide Estuary SPA	Great Crested Grebe (Podiceps cristatus) [A005]	Amber
	Light-bellied Brent Goose (Branta bernicla hrota) [A046]	Amber
	Shelduck (<i>Tadorna tadorna</i>) [A048]	Amber
	Pintail (<i>Anas acuta</i>) [A054]	Red
	Goldeneye (<i>Bucephala clangula</i>) [A067]	Red
	Red-breasted Merganser (Mergus serrator) [A069]	Green
	Oystercatcher (Haematopus ostralegus) [A130]	Amber
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]	Red
	Grey Plover (<i>Pluvialis squatarola</i>) [A141]	Amber
	Knot (<i>Calidris canutus</i>) [A143]	Amber
	Dunlin (<i>Calidris alpina</i>) [A149]	Red
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156]	Amber
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	Amber
	Redshank (<i>Tringa totanus</i>) [A162]	Red
	Wetland and Waterbirds [A999]	N/A

Malahide Estuary SAC (000205)			
Attribute	Measure	Target	
[1140] Mudflats and sandflats not cover	ed by seawater at low tide (Maintain I	the favourable conservation condition)	
Habitat area	Hectares	Permanent habitat area is stable or increasing, subject to natural processes	
Community extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community and the <i>Mytilus edulis</i> - dominated community complex, subject to natural processes.	
Community structure: <i>Zostera</i> density	Shoots/m²	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes.	
Community structure: <i>Mytilus edulis</i> density	Shoots/m ²	Conserve the high quality of the <i>Mytilus edulis</i> dominated community, subject to natural processes	
Community distribution	Hectares	Conserve the following community types in a natural condition: Fine sand with oligochaetes, amphipods, bivalves and polychaetes community complex; Estuarine sandy mud with Chironomidae and <i>Hediste diversicolor</i> community complex; and Sand to muddy sand with <i>Peringia ulvae</i> , <i>Tubificoides benedii</i> and <i>Cerastoderma edule</i> community complex	
[1310] Salicornia and other annuals cold	nizing mud and sand (Restore the favo	ourable conservation condition)	
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes	
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions	
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)	
Malahide Estuary SAC (000205)			
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Attribute	Measure	Target	
Vegetation structure: negative	Hectares	No significant expansion of common cordgrass (Spartina anglica). No new sites for this	
indicator species – Spartina anglica		species and an annual spread of less than 1% where it is already known to occur	
[1320] Spartina swards (Spartinoin mari	timae) - Spartina swards (Spartinion m	aritimae) was originally listed as a qualifying Annex I habitat for Malahide Estuary SAC due	
to historical records of two rare forms	of cordgrass– small cordgrass (Spartin	a maritima) and Townsend's cordgrass (S . x townsendii.). However, Preston et al. (2002)	
considers both forms to be alien. In add	lition, all stands of cordgrass in Ireland	d are now regarded as common cordgrass (S. anglica) (McCorry et al., 2003; McCorry and	
Ryle, 2009). As a consequence, a conser	vation objective has not been prepare	ed for this habitat. It will therefore not be necessary to assess the likely effects of plans or	
[1330] Atlantic salt meadows (Restore t	he favourable condition)		
Habitat area		Area stable or increasing, subject to natural processor, including procise and	
		succession.	
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	
Physical structure: sediment supply	Presence/absence of physical	Maintain natural circulation of sediments and organic matter, without any physical	
	barriers	obstructions.	
Physical structure: creeks and pans	Occurrence	Allow creek and pan structure to develop, subject to natural processes, including	
		erosion and succession	
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural	
		processes including erosion and succession	
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	
Vegetation structure: vegetation cover	Percentage cover at a	Maintain more than 90% of area outside creeks vegetated	
	representative sample of		
	monitoring stops		
Vegetation composition: typical	Percentage cover at a	Maintain range of subcommunities with typical species listed in SMP (McCorry and	
species and sub-communities	representative sample of	Ryle, 2009)	
	monitoring stops		
Vegetation structure: negative	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual	
Indicator species – Spartina anglica		spread of less than 1% where it is known to occur	
[1410] Mediterranean salt meadows (Ju	<i>ncetalia maritimi</i>) – Maintain the favo	urable conservation condition	
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	
Habitat distribution	Occurrence	No decline, subject to natural processes.	

Malahide Estuary SAC (000205)			
Attribute	Measure	Target	
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitats including transitional zones, subject to natural processes including erosion and succession	
Vegetation structure: vegetation height	Centimeters	Maintain structural variation in the sward	
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with characteristic species listed in SMP (McCorry and Ryle, 2009)	
Vegetation structure: negative indicator species – <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1% where it is already known to occur	
[2120] Shifting dunes along the shorelin	e with Ammophila arenaria (Restore t	he favourable conservation condition)	
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession.	
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
Vegetation composition: plant health of dune grasses	Percentage cover	95% of marram grass (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present)	
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius)	
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	
[2130] Fixed coastal dunes with herbaceous vegetation ('grey dunes') (Restore the favourable conservation condition)			

Malahide Estuary SAC (000205)		
Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes
Vegetation composition: sward height	Centimeters	Maintain structural variation within sward
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with typical species listed in Ryle et al. (2009)
Vegetation composition: negative indicator species (including <i>Hippophae</i> <i>rhamnoides</i>)	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover
Vegetation structure: scrub/trees	Percentage cover	No more than 5% cover or under control

Malahide Estuary SPA (004025)			
Attribute	Measure	Target	
Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]; Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]; Shelduck (<i>Tadorna tadorna</i>) [A048]; Pintail (<i>Anas acuta</i>) [A054]; Goldeneye (<i>Bucephala clangula</i>) [A067]; Red-breasted Merganser (<i>Mergus serrator</i>) [A069]; Oystercatcher (<i>Haematopus ostralegus</i>) [A130]; Golden Plover (<i>Pluvialis apricaria</i>) [A140]; Grey Plover (<i>Pluvialis squatarola</i>) [A141]; Knot (<i>Calidris canutus</i>) [A143]; Dunlin (<i>Calidris alpina</i>) [A149]; Black-tailed Godwit (<i>Limosa limosa</i>) [A156]; Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]; Redshank (<i>Tringa totanus</i>) [A162] (Maintain the favourable conservation condition)			
Population trend	Percentage change	Long term population trend stable or increasing	
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas, other than that occurring from natural patterns of variation	
Wetlands [A999] (Maintain the favourable conservation condition)			
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 765 hectares, other than that occurring from natural patterns of variation	

Analysis of the Potential Impacts on Malahide Estuary (SAC & SPA).

Planning permission is sought by Gerard Gannon Properties for a proposed Strategic Housing Development on lands south of the Rathbeale Road, Mooretown, Swords, Co. Dublin.

The proposed development consists of a mixed-use residential neighbourhood of some 650 no. units; comprising of 265 no. houses, 113no. duplex units, 6no. triplex units, 266 apartments, a 519sq.m. creche and 946 sq.m. of retail/café uses clustered in a small village centre. The development includes all associated site works and infrastructure, including landscaped open space, internal road, paths, cycle paths, public lighting and drainage. The development also includes off site drainage works for a stormwater storage tank and overflow outfall gravity sewer to the Broadmeadow River on lands at the junction of the Glen Ellan and Balheary roads.

Construction Impacts

The proposed development is not within a designated conservation site. A direct pathway exists via surface water to the nearby European sites (Malahide Estuary SAC & SPA). The potential impacts on European sites are seen in Table 7. The construction of the proposed development would potentially impact on the existing ecology of the site and the surrounding area. These potential construction impacts would include impacts that may arise during the site clearance, reprofiling, and excavations of the site, in addition to the building phases of the proposed development. This could lead to the transportation of silt and pollutants to Malahide Estuary SAC & SPA via the surface water network to the Mooretown Mill Stream, which outfalls to Broadmeadow River, which in turn outfalls to Malahide Estuary.

Construction phase mitigation measures are required on site particularly as reprofiling of the site is proposed which will remove existing terrestrial habitats and can lead to silt laden and contaminated runoff. There is potential for silt laden runoff and contamination to enter the surface water network with potential for downstream impacts. In the absence of standard petrochemical interception there is potential for pollution to enter the drainage network.

Operational Impacts

Once constructed all onsite drainage will be connected to separate foul and surface water systems. Surface water runoff will comply with SUDS. The biodiversity value of the site would be expected to improve as the landscaping matures, particularly beside the watercourse.

Mitigation Measures to prevent significant impact on Malahide Estuary (SAC & SPA).

Mitigation measures are outlined in Table 8. In addition to these measures a Project Ecologist will be appointed prior to works commencing on site. The project ecologist will oversee the approach to the implementation of the mitigation measures. This will include taking into account all project phases and will be adjusted according to each phase where necessary to ensure that drainage ditches and watercourses do not get contaminated as a result of the works on site. Standard construction phase methodologies will also be implemented in relation to compliance with Water Pollution Acts and Wildlife Acts.

	Table 7. Potentia	I for adverse effects on the qualifying interests and conservation objectives of European sites
European site & Site Code	Qualifying Interests	Potential for Adverse Effects
Malahide Estuary SPA	Great Crested Grebe (<i>Podiceps</i> <i>cristatus</i>) [A005] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Pintail (<i>Anas acuta</i>) [A054]	The use of plant and machinery, as well as the associated temporary storage of construction materials, oils, fuels and chemicals could lead to pollution on site or in the Mooretown Mill Stream. The storage of topsoil or works in the vicinity of the watercourse on-site could lead to dust, soil or silt laden runoff entering the Mooretown Mill Stream and Broadmeadow River. Surface water runoff on site during construction or operation may lead to silt or contaminated materials from site entering the Mooretown Mill Stream. Concrete, silt or pollution could enter watercourses during dewatering of foundations or drainage trenches, if required during construction. If on-site concrete production is required or cement works are carried out in the vicinity of watercourses there is potential for contamination of watercourses. Localised activity on site and noise may be generated during works.
	Goldeneye (<i>Bucephala clangula</i>) [A067] Red-breasted Merganser (<i>Mergus serrator</i>) [A069]	Given the nature of the works all of these effects would be expected to be localised in nature restricted to the immediate vicinity of the site. However, there is potential for downstream impacts. Without the presence of mitigation measures there is a potential for downstream effects if significant quantities of pollution or silt were introduced into the Mooretown Mill Stream with potential for downstream impacts on Malahide Estuary SPA.
	Oystercatcher (<i>Haematopus</i> <i>ostralegus</i>) [A130]	Given the nature of the potential effects outlined above, the proposed project would be expected impact upon the following:
	Golden Plover (<i>Pluvialis</i> <i>apricaria</i>) [A140]	 Distribution, Number and Range of areas used by: Shelduck (Tadorna tadorna) [A048]; Oystercatcher (Haematopus ostralegus) [A130]; Golden Plover (Pluvialis apricaria) [A140]; Grey Plover (Pluvialis squatarola) [A141]; Lapwing
	Grey Plover (<i>Pluvialis squatarola</i>) [A141] Knot (<i>Calidris canutus</i>) [A143] Dunlin (<i>Calidris alpina</i>) [A149]	 (Vanellus vanellus) [A142]; Knot (Calidris canutus) [A143]; Sanderling (Calidris alba) [A144]; Black-tailed Godwit (Limosa limosa) [A156]; Redshank (Tringa totanus) [A162]; and Turnstone (Arenaria interpres) [A169]. Breeding population abundance: apparently occupied nests (AONs), Productivity rate: fledged young per breeding pair, Distribution: breeding colonies, and Prey biomass available of Little Tern (Sterna albifrons) [A195]. Habitat area of wetlands [A999].
	Black-tailed Godwit (<i>Limosa</i> <i>limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa</i> <i>lapponica</i>) [A157]	Large quantities of silt or pollution could enter the Mooretown Mill Stream and, by extension, the Broadmeadow River and lead to downstream impacts. Mitigation measures are required to remove the potential for impacts on Malahide Estuary SPA from direct pathways via the watercourse proximate to the subject site and proposed surface water drainage network.
	Redshank (<i>Tringa totanus</i>) [A162]	
	wetiand and waterbirds [A999]	

Sensitive	Potential Impacts on	Mitigation Measures to Prevent Impacts on sensitive receptors
Receptors	SPA & SAC	
Malahide Estuary SAC	Habitat degradationDust deposition	A Preliminary Construction, Demolition and Waste Management Plan has been prepared by Waterman Moylan Consulting Engineers to accompany this planning application. The report outlines the following in relation to runoff pollution and sediment control:
Malahide	Pollution	'13. Runoff Pollution and Sediment Control
Estuary SPA	• Slit ingress from site runoff	13.1 Runoff Pollution Control
Mooretown Mill Stream	Downstream impactsNegative impacts on	Significant quantities of waste and potential pollutants can be generated during construction. Controls will be put in place to prevent these pollutants from washing into the local storm water system during storm events.
Broadmeadow River	the aquatic environment, aquatic species and	The Inland Fisheries Ireland document: Guidelines on Protection of Fisheries During Construction Works In and Adjacent to Waters 2006, outlines the following areas to be considered for the protection of adjacent water courses during the construction stage
Malahide Estuary	qualifying interests.	 Damage to the aquatic and associated riparian habitat due to loss of vegetation, damage to banks & changes in watercourse morphology & hydrology.
		Pollution of waters due to construction materials.
		• Introduction of non-native species such as plants, algae, fish & shellfish.
		Interference to the movement of aquatic life.
		• Timing of in-stream works on seasonal salmonid activity.
		• Temporary crossing structures in waters.
		Permanent crossing structures in waters.
		• Construction impacts such as cast in-situ concrete, sediment laden surface water, hydrocarbon leaks & water abstraction. (Also discussed in section 13.2)
		In consideration of the above list the following methods listed, but not limited to, will be implemented on site as appropriate:
		• Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from the watercourse/ditches. Refuelling of machinery, etc., will be carried out in bunded areas.
		• Runoff from machine service and concrete mixing areas will not enter the watercourse.
		• Stockpile areas for sands and gravel will be kept to minimum size, well away from the watercourse.
		• Runoff from the above will only be routed to the watercourse via suitably designed and sited settlement ponds/filter channels.
		• Settlement ponds will be inspected daily and maintained regularly.
		• Temporary crossings will be designed to the criteria laid down for permanent works.

Sensitive Receptors	Potential Impacts on SPA & SAC	Mitigation Measures to Prevent Impacts on sensitive receptors
		• Watercourse banks will be left intact if possible. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourses.'
		'13.2 Sediment Control
		Construction runoff is heavily laden with silt which can block road gullies and reduce the hydraulic capacity in pipes and watercourses, contributing to ponding and flooding. Continued development without appropriate controls will ultimately keep maintenance costs elevated, whether that be in cleaning gullies, jetting pipes or dredging. Sediment control plans can be implemented on-site to mitigate these issues.
		Sediment basins and traps should be installed before any major site grading takes place. Additional sediment traps and silt fences should be installed as grading takes place to keep sediment contained on site at appropriate locations.
		Key runoff-control measures should be located in conjunction with sediment traps to divert water from planned undisturbed areas away from the traps and sediment-laden water into the traps. Diversions should be installed above the areas to be disturbed before any grading operations. Any perimeter drains should be installed with stable outlets before opening major areas for development. Any additional facilities needed for runoff control should be installed as grading takes place.
		During grading operations temporary diversions, slope drains, and inlet and outlet protection installed in a timely manner can be very effective in controlling erosion and sediment build up.'
		The main run-off conveyance system with inlet and outlet protection measures should be installed early and used to convey stormwater run-off through the development site without creating gullies or channels. Install inlet protection for storm drains as soon as the drain is functional to trap sediment on site in shallow pools and to allow the flood flows to enter the storm drainage system safely. Install outlet protection at the same time as the conveyance system to prevent damage to the receiving watercourse.
		During the final stages of construction unstable sediment from sediment basins and traps should be removed and if possible incorporated into the topsoil, not just spread on the surface.
		13.2.1 Sediment Control Measures
		Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run- off leaving a disturbed area should pass through a sediment entrapment facility before it exits the site and flows downstream.
		<u>Straw Bales:</u>
		Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.
		Silt Fencing
		A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area but is not recommended for use in a channel or swale. The material is

Sensitive	Potential Impacts on	Mitigation Measures to Prevent Impacts on sensitive receptors
Receptors	SPA & SAC	durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.
		<u>Silt Barriers</u>
		Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components.
		When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.
		Diversion Drains
		Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded, they can be lined with geotextile fabric or large stones or boulders.'
		Operational Mitigation
		Petrochemical interception will be in place on the surface water network.

Adverse Effects on the conservation objectives of European sites likely to occur from the project (post mitigation)

A robust series of mitigation measures are proposed. These would ensure that water entering the onsite surface water network watercourse is clean and uncontaminated. In addition, all works will be only carried out with an approved methodology (project ecologist). Onsite works will be supervised by a project ecologist. However, given the proximity the drainage ditch and stream to the works which lead to the SPA and SAC, it should be noted that the early implementation of ecological supervision on site will be at the initial mobilisation and enabling works. This is seen as an important element to the project, particularly in relation to the implementation of surface water runoff mitigation strategies.

With the successful implementation of the mitigation measures to limit surface water impacts on the surface water network, including mitigation/supervision and the successful supervised installation of the drainage components, no significant impacts are foreseen from the construction or operation of the proposed project. Residual impacts of the proposed project will be localised to the immediate vicinity of the proposed works and would not impact on the SAC or SPA.

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on the Malahide Estuary SAC and Malahide Estuary SPA, through the application the standard construction and operational phase controls as outlined above. In particular, the mitigation measures to ensure compliance with Water Pollution Acts, Inland Fisheries Ireland guidance and to prevent silt and pollution entering the watercourse will satisfactorily address the potential impacts on downstream biodiversity, Malahide SAC and Malahide SPA. No significant adverse impacts on the conservation objectives of European sites are likely following the implementation of the mitigation measures outlined above.

It is essential that these measures outlined are complied with, to ensure that the proposed development does not have "downstream" environmental impacts. These measures are to protect the groundwater/surface water, which are potentially the primary vectors of impacts from the site, and to ensure that it is not impacted during construction and /or operational phases of the proposed development.

In-combination Effects

There are several proposed developments that were granted planning permission on the lands of, and in the immediate area surrounding, the proposed development site. The following is a list of planning applications as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Map' portal:

Planning Ref.	Address	Proposal
F20A/0096	Lands at Mooretown, Swords, Co. Dublin	A c. 400m long southerly extension to the newly constructed Mooretown Distributor Road including verges, cycle paths, footpaths, water supply, foul and surface water drainage, surface water attenuation, utilities and ancillary works. The Mooretown Distributor Road is part of the Swords Western Distributor Road which connects the Rathbeale Road to the Mooretown Local Area Plan lands. Add Info received 16th February 2021. Add Info deemed Significant 17th February 2021. Revised Notices received 2nd March 2021.
F20A/0095	Lands at Mooretown and	A c. 185m long pedestrian and cycle path with ancillary works to provide a new east-west connection from Abbeyvale Court to the

Table 9. Planning applications granted planning permission on the lands of, and in the immediate area of, the proposed development site.

Planning Ref.	Address	Proposal
	Abbeyvale Court, Swords, Co. Dublin.	proposed Mooretown Distributor Road extension and a new school campus. The Mooretown Distributor Road is part of the Swords Western Distributor Road, which connects the Rathbeale Road to the Mooretown Local Area Plan lands. Add Info received 16th February 2021. Add Info deemed Significant 17th February 2021. Public Notices received 2nd March 2021.
F19A/0029	Lands south of the Rathbeale Road, And east of the Swords Western Distributor Link Road, And north of Watermill Park, Mooretown, Swords, Co. Dublin	Revisions to part of previously permitted development Reg. Ref. F15A/0183 to omit a crèche and 69 no. houses comprising 23 no. 4- bedroom 2-storey houses and 46 no. 3-bedroom 2-storey houses and two 3-storey with penthouse level blocks of 15 apartments comprising 8 no. 1-bedroom apartments and 22 no. 2-bedroom apartments (99 units in total) and to now provide 81 no. 3-bedroom 2-storey houses and 13 no. 4-bedroom 2-storey houses (94 units in total). The development includes 188 car parking spaces and all associated and ancillary site works. This application is referred to as 'Phase 1C and is the third of 3 planning applications to revise the house types, apartments and crèche permitted in the parent permission F15A/0183. Add Info received 6th September 2019. Add Info deemed Significant 12th September 2019. Revised Public Notices received 25th September 2019.
F18A/0701	Lands south of the Rathbeale Road, And east of the Swords Western Distributor Link Road, And north of the Watermill Park, Mooretown, Swords, Co. Dublin.	Permission to omit 43 no. houses comprising 18 no 4-bedroom 2-storey houses, 23 no. 3-bedroom 2-storey houses, 2 no. 3-bedroom 3-storey houses and a single 3 storey with penthouse level block of 15 apartments comprising 4 no. 1-bedroom apartments and 11 no. 2-bedroom apartments (58 units in total) and to now provide 2 no. 2-bedroom 2-storey houses, 33 no. 3-bedroom 2-storey houses and 4 no. 4-bedroom 2-storey houses. It also proposes 2 no. 3-storey with penthouse level apartment blocks comprising 40 no. 2-bedroom apartments and 20 no. 1-bedroom apartments (99 units in total) and a 352m ² crèche. The development includes 153 car parking spaces and all associated and ancillary site works. The application is referred to as 'Phase 1A' and is the first of 3 planning applications to revise the house types and apartments permitted in the parent permission F15A/0183. Add Info received 7th March 2019. Clarification of Add Info deemed Significant 24th May 2019. Revised Public Notices received 6th June 2019.
F18A/0163	Lands at Mooretown, Off Rathbeale Road, Swords, Fingal, Co. Dublin.	2 new school buildings with a total floor area of 15,913 sq.m. incorporating: (A) Swords Community College (RN76475D), consisting of a new, part 3-storey, part 2-storey, 11,397 sq.m. post primary school, including a 2-classroom Special Needs unit and Sports Hall with all ancillary pupil and staff facilities; and (B) new Primary School consisting of a new 2-storey, 24-classroom, 4,516 sq.m. primary school with a 2- classroom Special Needs unit, including all ancillary pupil and staff facilities; GP hall; and (C) all associated site works, including a substation, with a total of 104 number car parking spaces (40 spaces for primary and 64 spaces for post primary) including all landscaping, ball courts and soft play areas.
F16A/0505	Three parcels of land adjacent to the approved Watermill Park, at	The construction of 188 houses and 50 apartments. The proposed houses comprise 72 no. four-bedroom two storey houses, 19 no. three-bedroom three storey houses and 97 no. three-bedroom two storey houses. The proposed apartments are in two blocks (A & B). Core A1

Planning Ref.	Address	Proposal
	lands south of Rathbeale Road, Mooretown, Swords, Co. Dublin.	comprises 3 no. one-bedroom apartments, 17 no. two-bedroom apartments and 1 no. three bedroom apartment in four storeys plus penthouse. Adjoining Core A2 comprises 3 no. one-bedroom apartments, 14 no. two-bedroom apartments and 1 no. three-bedroom apartment in three storeys plus penthouse. Block B comprises 2 no. one-bedroom apartments and 9 no. two-bedroom apartments in three storeys plus penthouse. The site area includes minor amendments to the site area of adjacent permission Reg. Ref. F15A/0183. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle- paths, public lighting, utilities, a reserved site for future ESB mast, drainage and surface water attenuation. This site is accessed from previously approved Swords Western Distributor Link Road (approved under Reg. Ref. F12A/0270, PL 06F.241634) and roads permitted under previously approved residential development Reg. Ref. F15A/0183. The application is accompanied by an Environmental Impact Statement (EIS) which will be available for inspection or purchase for a fee not exceeding the reasonable costs of making a copy at the offices of Fingal County Council during its public opening hours. Additional Information lodged 15/06/2017 Deemed Significant. Revised Public Notices lodged 28/06/2017 - Irish Independent 26/06/2017
F15A/0183	Lands South of the Rathbeale Road, Mooretown, Swords, Co. Dublin.	The construction of 190 houses and 60 apartments. The proposed houses comprise 72 no. four bedroom two storey houses, 15 no. three bedroom three storey houses and 103 no. three bedroom two storey houses. The proposed apartments are within four blocks of 15 apartments each comprising 4 no. one bedroom apartments and 11 no. two bedroom apartments in three storey plus penthouse. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle- paths, public lighting, utilities, drainage and surface water attenuation. This application is accompanied by an Environmental Impact Statement (EIS), which will be available for inspection or purchase for a fee not exceeding the reasonable costs of making a copy at the offices of Fingal County Council during its public opening hours.
F14A/0012	LAP Lands at Mooretown, Swords, Co. Dublin.	Access road and services enabling works to serve the future school campus. The access road shall form the main street of the future local centre at Mooretown and includes a civic plaza area, street parking, cycle paths and footpaths. The new access road shall connect the future schools campus to the approved section of the Swords Western Distributor link road within Mooretown that connects to the Rathbeale Road (approved under Reg. Ref. F12A/0270; PL 06F.241634). The application includes water supply, foul water drainage connecting to the existing sewer on the Rathbeale Road, surface water attenuation and ancillary works.
F11A/0436	Glen Ellan Road, Oldtown, Swords, Co. Dublin	Construction of 245 dwellings and a 316m ² two-storey creche. The residential development comprises 104 four-bedroom houses, 113 three-bedroom houses, 12 two-bedroom houses, 8 three-bedroom maisonettes and 8 one-bedroom apartments in two and three storeys. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle paths, public lighting, utilities, drainage, surface water attenuation and a temporary emergency access road.

In relation to Planning Ref. **F18A/0163**, a Report for the purposes of Appropriate Assessment Screening has been prepared by Moore Group – Environmental Services to accompany this application. This report concludes with the following:

'Potential source vector pathways were addressed in considering the hydrological connectivity between the site and the Broadmeadow River leading to Malahide Estuary. There would be no direct impact on the Estuary and so potential indirect impacts are then considered. The potential for a largescale pollution event is unlikely and by employing construction management included in the Construction Management Plan for the overall Mooretown development there would be no significant indirect impacts on the Malahide Estuary European sites.

It has been objectively concluded by Moore Group Environmental Services that:

- 1. The project is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
- 2. The proposed development is unlikely to indirectly, significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
- 3. The project, alone or in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment in view of their conservation objectives.
- 4. It has been determined by Moore Group Environmental Services that it is possible to rule out likely significant impacts on any European sites considered in this assessment.
- 5. It is possible to conclude that there would be no adverse effects on site integrity resulting from the project and that there would be no significant effects, no potentially significant effects and no uncertain effects if the projects were to proceed.

It is the view of Moore Group Environmental Services that it is not necessary to undertake any further stage of the Appropriate Assessment process.'

In relation to Planning Ref. **F16A/0505**, an Appropriate Assessment Screening Report has been prepared by OPENFIELD Ecological Services to accompany this application. This report concludes with the following:

'This proposed development is not located within or directly adjacent to any SAC or SPA but pathways do exist to a number of these areas. An assessment of the aspects of this project has shown that significant negative effects are not likely to occur to these areas with regard to their conservation objectives, either alone or in combination with other plans or projects.'

Furthermore, there are several development proposals located within close proximity to the proposed site. The following is a planning history as identified in the Department of Housing, Local Government and Heritage's 'National Planning Application Map' portal⁹:

Planning Ref.	Address	Proposal
F11A/0436/E1	Glen Ellan Road, Oldtown, Swords, Co. Dublin.	Construction of 245 dwellings and a 316m ² two-storey crèche. The residential development comprises 104 four- bedroom houses, 113 three-bedroom houses, 12 two- bedroom houses, 8 three-bedroom maisonettes and 8 one-bedroom apartments in two and three storeys. The development includes all associated site works and infrastructure which includes landscaped open space, internal roads, paths, cycle paths, public lighting, utilities, drainage, surface water attenuation and a temporary emergency access road.

Table 10. Development proposals located in close proximity to the proposed development site

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https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a 8de

F16A/0091	Lands at Glen Ellan	Revisions to approved development (Reg. Ref.
	Road, Oldtown,	F11A/0436), to omit 7 two bedroom apartments in a 3-
	Swords, Co. Dublin.	storey plus penthouse block, 5 three bedroom triplex units
		and 2 two bedroom duplex units and now provide 2 four
		bedroom 3-storey houses, 4 one-bedroom apartments and
		10 two bedroom apartments in a 3-storey plus penthouse
		block and a 253 sq.m. crèche. The development includes
		28 no. car parking spaces, and all associated ancillary and
		site works.

No significant projects are proposed or currently under construction that could potentially cause in combination effects on European sites.

Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. It is concluded that there will be no adverse effects on the integrity of European sites.

No adverse effects on the integrity of European sites as a result of in-combination effects.

Conclusion

In a strict application of the precautionary principle, it has been concluded that effects on Malahide Estuary SAC and Malahide Estuary SPA are likely from the proposed works in the absence of mitigation measures, as a result of a direct hydrological connection to the site via the proposed surface water drainage network, with possible downstream impacts from the project during the reprofiling, construction landscaping and drainage works. For this reason, an NIS was carried out to assess whether the proposed project, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European Site. All other European sites were screened out at initial screening.

Construction on this site will create localised light and noise disturbance that will not impact on European sites. Mitigation measures will be in place to ensure that there are no significant impacts on the surface water that leads to Malahide Estuary SAC and Malahide Estuary SPA.

Following the implementation of the mitigation measures outlined, the construction and presence of this development would not be deemed to have a significant impact. No significant impacts are likely on European sites, alone or in combination with other plans and projects based on the implementation of mitigation measures.

This report presents an Appropriate Assessment Screening and NIS for the proposed development. It outlines the information required for the competent authority to screen for appropriate assessment and to determine whether or not the proposed development, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European site.

On the basis of the content of this report, the competent authority is enabled to conduct an Appropriate Assessment and consider whether, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European site.

No significant effects are likely on European sites, their features of interest or conservation objectives. The proposed project will not will adversely affect the integrity of European sites.

Data used for the AA Screening/NIS Assessment

NPWS site synopses and Conservation objectives of sites within 15km were examined. There is no direct pathway to any European sites beyond 15km of the proposed development site. The most recent SAC and SPA boundary shapefiles were downloaded and overlaid on ESRI terrain maps and satellite imagery. Several site visits were carried out, including flora, wintering bird, bat and mammal surveys, to determine if the site contained possible threats to a European site or any NATURA 2000 species or habitats.

References

- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities March 2010.
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009; www.npws.ie/publications/archive/NPWS 2009 AA Guidance.pdf
- Managing European sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, European Commission 2000; ec.europa.eu/environment/nature/Natura2000/management/docs/art6/provision of art6 en.pdf
- Assessment of Plans and Projects Significantly Affecting European sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC; ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura 2000 assess en.pdf
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance art6 4 en.pdf
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging;
 <u>ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf</u>
- 7. The Status of EU Protected Habitats and Species in Ireland. www.npws.ie/publications/euconservationstatus/NPWS 2007 Conservation Status Report.pdf
- 8. NPWS (2012) Conservation Objectives: Baldoyle Bay SAC 000199. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
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- 10. NPWS (2013) Conservation Objectives: Lambay Island SAC 000204. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 11. NPWS (2013) Conservation Objectives: Malahide Estuary SAC 000205. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 12. NPWS (2013) Conservation Objectives: Malahide Estuary SPA 004025. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 13. NPWS (2013) Conservation Objectives: North Dublin Bay SAC 000206. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 14. NPWS (2013) Conservation Objectives: Rockabill to Dalkey Island SAC 003000. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 15. NPWS (2013) Conservation Objectives: Rogerstown Estuary SAC 000208. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 16. NPWS (2013) Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 17. NPWS (2013) Conservation Objectives: South Dublin Bay SAC 000210. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 18. NPWS (2015) Conservation Objectives: North Bull Island SPA 004006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2015) Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version
 National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- 20. NPWS (2016) Conservation Objectives: Howth Head SAC 000202. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
- 21. NPWS (2017) Conservation Objectives: Ireland's Eye SAC 002193. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
- 22. NPWS (2022) Conservation objectives for Ireland's Eye SPA [004117]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

Introduction

In March 2021 four winter bird surveys were conducted at Mooretown and several nearby sites within the same development by Hugh Delaney, a freelance Ecologist (Birds primarily) having completed work on numerous sites with ecological consultancies over 10+ years. Hugh is local to the Dun Laoghaire-Rathdown area in Dublin and is especially familiar with the bird life and its ecology in the environs going back over 30 years.

Winter Bird Survey Methodology

Winter bird surveys are conducted from soon after sunrise until late in the afternoon before sunset, the site is monitored throughout the day and all bird species utilizing the site recorded, including species flying through overhead. Checks are also made on suitable habitat nearby or adjacent the site for comparative purposes and to monitor any interchange of birds between sites. Target species (species of more special interest) utilizing the site will be mapped and estimates of the time these species frequented the site recorded.

Site Locations – 1 (Mooretown)

Three large agricultural fields (most recently of arable usage) south from Swords Community School, bordered and divided with mature hedgerow, along which interspersed with some larger trees.



2 – Area around Barn adjacent Site offices (Phase 5)

Arable agricultural field adjacent the Barn, remaining area rough ground/building site.



3- Area adjacent Broadmeadow River (Phase 10)

Pasture field area bordering Broadmeadow River to the north.



Survey Results -

March 25th, 2021

Winter Bird Survey dedicated for day to Area 1 (Mooretown) Area 2 (Phase 5) and Area 3 (Phase 10)

Sunrise- 06.15hrs/Sunset 18.47hrs. Weather – Wind F3 Southwest, Cloud 5/8, Dry, 10c, Excellent visibility. On-site 08.30hrs – 16.30hrs.

1 (Mooretown)

Species recorded – Yellowhammer, Goldfinch, Chaffinch, Robin, Jackdaw, Rook, Hooded Crow, Mistle Thrush, Song Thrush, Wren, Starling, Blackbird, Great Tit, Long-tailed Tit, Dunnock, Woodpigeon, Blue Tit, Greenfinch, Pheasant, Herring Gull, Meadow Pipit, House Sparrow, Goldcrest, Magpie, Buzzard.

<u>08.30hrs - 14.00hrs.</u>- Three Mooretown fields surveyed, from entrance following all three field edges circuitously from field on west side to field at east side, several times. Species list as above, more notable sightings being 3 single sightings of Yellowhammer, all from west field, 2 calling from Hedgerows and another two foraging with a flock of 20 Chaffinch and 2 Greenfinch at the top of the field throughout survey period. One flock of up to 100 Starling foraging also in this field at intervals during the morning. Two fields to the east quieter for passerine activity, lots of Robin, Blackbird, and Wren holding territory in hedgerows. Occasional sightings of Great and Blue Tit. Small numbers of Woodpigeon foraging in all 3 fields along with Jackdaw, Hooded Crow, Rook and Magpie. Up to 3 Buzzard observed twice passing over the site. A few sightings of Song Thrush, Meadow Pipit, Dunnock, Long-tailed Tit, Pheasant and Goldcrest also noted (less than <5). Frogspawn (two batches in one pool) noted in the ditch separating the westernmost field from middle field at point nearest the road.

2 – Area around Barn adjacent Site offices (Phase 5)

Species recorded – Skylark, Goldfinch, Linnet & Raven.

<u>14.10-15.00</u> – Quiet in terms of range of bird species in this area, however one Skylark noted in field with barn, foraging around barn. Also flock of 4 Goldfinch and 6 Linnet in the area. One Raven recorded passing over area.

3- Area adjacent Broadmeadow River (Phase 10)

Species recorded – Skylark, Rook, Jackdaw, Goldfinch, Robin, Meadow Pipit.

<u>15.20-16.30</u> – Two Skylarks noted foraging in the area, site walked west to east and around border, quiet in terms of range of species, small numbers of Jackdaw and Rook, one Meadow Pipit foraging at the east side.

March 26th, 2021

Sunrise- 06.13hrs/Sunset 18.50hrs. Weather – Wind F4 Southwest, Cloud 4/8, Dry, 8c, Excellent visibility. On-site 08.15hrs – 16.00hrs.

Winter Bird Survey dedicated for day to Area 2 (Phase 5) and Area 3 (Phase 10)

2 – Area around Barn adjacent Site offices (Phase 5)

Species recorded – Skylark, Goldfinch, Linnet, Wren, Dunnock, Buzzard.

<u>08.15hrs - 09.45hrs.</u> – Area traversed twice and observed from South looking to North down incline. Two Skylark foraging in area observed mostly to north of barn, flock of 5 Goldfinch and 1 Linnet foraging in area. Single Wren and Dunnock also observed, one Buzzard flew west across site at 09.10hrs. 3 Hare also observed feeding mostly to north of site.

3- Area adjacent Broadmeadow River (Phase 10)

10.00 hrs – 16.00 hrs. – Site traversed three times during day, following Hedgerow border to south and Broadmeadow River to north, and vantage points selected midway along south of site and at northernmost point of site giving excellent overview of site.

Species recorded – Red Kite, Robin, Song Thrush, Woodpigeon, Starling, Chaffinch, Mallard, Blue Tit, Meadow Pipit, Siskin, Wren, Pied Wagtail, Grey Wagtail, Rook, Jackdaw, Linnet, Dunnock, Blackbird, Goldfinch, Bullfinch, Redwing, Magpie, Hooded Crow, Great Tit, Goldcrest, Snipe, Skylark, Grey Heron.

One Red Kite observed at 10.36hrs passing slowly north over middle of site, two observed at 14.30hrs circling the east end of site. One Snipe flushed from middle of site at 11.05hrs. Singles of Grey Heron and Mallard, Grey Wagtail (2) foraging along north border of site adjacent Broadmeadows river. 3 Skylark observed, most sightings of birds at west side of site, one bird giving some song throughout and likely holding territory in area. Flock of 40 Starling observed feeding on pasture at east side of site in afternoon. 12 Redwing observed foraging at east side of side from 11.30hrs-12.30hrs. Almost all the remainder of passerine species recorded in the hedgerow bordering south of site in small numbers (<10).

March 30th, 2021

Sunrise- 07.03hrs/Sunset 19.57hrs. Weather – Wind F3 Southeast, Sunny 0/8, Dry, 12c, Excellent visibility. On-site 08.15hrs – 16.00hrs.

Winter Bird Survey dedicated for day to Area 1 (Mooretown).

Species recorded – Yellowhammer, Goldfinch, Chaffinch, Robin, Jackdaw, Rook, Hooded Crow, Mistle Thrush, Song Thrush, Wren, Starling, Blackbird, Great Tit, Woodpigeon, Blue Tit, Greenfinch, Pheasant, Herring Gull, Lesser black-backed Gull, Meadow Pipit, House Sparrow, Goldcrest, Dunnock, Skylark, Linnet, Reed Bunting, Lesser Redpoll, Siskin, Magpie, Buzzard, Bullfinch.

<u>08-15hrs – 12.00hrs.</u> – Mooretown fields (Area 1) surveyed for the day, site traversed as before, all three fields and boundaries traversed several times with vantage point observations made from western field and eastern field looking across site. Above species recorded in excellent conditions. Some more notable observations – One Skylark observed in song during morning at the west side of west field. Goldcrest observed in song at 2 locations, one in west field and one in middle field. Flock of 8 Chaffinch foraging in the west field during morning. One sighting of Greenfinch passing over the west field at 11.46hrs. Small parties of Woodpigeon (<10) foraging in all three fields during morning. Good numbers of Robin and Wren in hedgerows with a few single Blackbird and Dunnock.

<u>12-00hrs – 16.00hrs.</u> – Similar activity as in morning with some additional passerine species recorded, Song Thrush, House Sparrow, Great Tit recorded during afternoon in small number (<5) and a single Reed Bunting foraging in the west field at 12.45hrs. Two Yellowhammer observed foraging in west field near road at 14.05hrs. Maximum count of 7 Chaffinch foraging in the west filed area at 14.10hrs with 4 others recorded in song in rest of site. Small numbers of House Sparrow present in east field near the adjacent houses (<5).

March 31st, 2021

Sunrise- 07.01hrs/Sunset 19.59hrs. Weather – Wind F2 Southeast, 6/8, Dry, 12c, Excellent visibility. On-site 08.15hrs – 16.15hrs.

Winter Bird Survey dedicated for day to Area 2 (Phase 5) and Area 3 (Phase 10)

2 – Area around Barn adjacent Site offices (Phase 5)

Species recorded – Skylark, Woodpigeon, Hooded Crow, Linnet, Goldfinch, Magpie, Yellowhammer, Wheatear.

<u>08.15hrs- 09.30hrs.</u> – Area around barn surveyed again as before, site traversed and observed from vantage point next to barn. One Skylark holding territory in area, singing just north or barn and towards east over building site area. One Yellowhammer in song just west of survey area however also observed twice flying over survey area. Male Wheatear observed foraging to north of site adjacent building site area. Small numbers of Linnet and Goldfinch (<5) foraging in the area. Flock of 8 Woodpigeon foraging just west of barn. Single Skylark again observed in song when passing through area at 16.15hrs.

3- Area adjacent Broadmeadow River (Phase 10)

Species recorded – Red Kite, Cormorant, Green Sandpiper, Kingfisher, Mute Swan, Sparrowhawk, Buzzard, Robin, Song Thrush, Woodpigeon, Starling, Chaffinch, Mallard, Teal, Blue Tit, Meadow Pipit, Siskin, Wren, Pied Wagtail, Grey Wagtail, Rook, Jackdaw, Linnet, Dunnock, Blackbird, Goldfinch, Bullfinch, Redwing, Magpie, Hooded Crow, Great Tit, Goldcrest, Snipe, Skylark, Grey Heron, Lesser Redpoll, Yellowhammer, Long-tailed Tit, Sand Martin, Swallow, Willow warbler, Blackcap, Greenfinch, Little Egret.

<u>09.45hrs-16.00hrs.</u> – Site traversed three times during day, following Hedgerow border to south and Broadmeadow River to north, and vantage points selected midway along south of site and at northernmost point of site giving excellent overview of site.

Area surveyed produced an interesting and diverse set of species and included early summer migrant arrivals and some scarcer Irish wintering species. Minimum of two Skylark in song in western half of site observed throughout day, display flighting etc. One Heron observed foraging along river to northwest of site at 11.39hrs and 13.05hrs. One Kingfisher observed foraging along river midway along north side of site at 14.58hrs. One Yellowhammer in song in the southwest corner of site from 10.30hrs to 10.50hrs, two birds observed during afternoon in northwest of site. Two Green Sandpiper were observed foraging along river at northeast of site from 12.45hrs, joined by a 3rd bird at 13.50hrs, birds moving from this area to pond to the east of the site during the remainder of the afternoon. One Sparrowhawk flew west over the site at 13.22hrs. Four Sand Martin and two Swallow were observed foraging over the east of the site at 12.25hrs. Two Willow warbler in song at east of site at 13.15hrs. One pair of Mallard observed foraging along Broadmeadow River several times during afternoon with a pair of Teal also observed at west side of site on Broadmeadow River from 15.00-16.00hrs. Pair of Mute Swan and one Little Egret in same area at 16.05hrs. 3 Snipe flushed in meadow at west side of site at 16.30hrs. One Cormorant flew east over site at 14.56hrs. Minimum of two pairs of Meadow Pipit holding territory in northwest area of the site, observed in song and in display flight. One Red Kite drifted slowly north of the northwest corner of site from 14.52-14.56hrs.

One pair of Grey Wagtail observed along the Broadmeadow River throughout, other passerines mostly recorded in hedgerow bordering site to the south.

Comments and observations on survey results

51 bird species were recorded in the areas covered by these 4 winter bird surveys, from these species recorded Snipe and Redwing are red listed as species of conservation concern in the revised Birdwatch Ireland List of birds of conservation concern in Ireland (2020-2026). Five species recorded are amber listed as wintering species in Ireland (Herring Gull, Lesser black-backed Gull, Cormorant, Mute Swan and Teal). Some of the aforementioned species recorded were transitory of nature and in small numbers.

Appendix II-Mooretown (Swords) Winter Bird Surveys 2021-2022 Introduction

Between November 2021 and March 2022 nine winter bird surveys were conducted at lands at Mooretown in Swords, North County Dublin by Hugh Delaney, a freelance ecologist (Birds primarily) with an experienced background in bird surveying on numerous sites with ecological consultancies over 10+ years. Hugh is local to the Dun Laoghaire-Rathdown area in Dublin and is especially familiar with the bird life and its ecology in the environs going back over 30 years.

Winter Bird Survey Methodology

Winter bird surveys are conducted from soon after sunrise until late in the afternoon before sunset, the site is monitored throughout the day and all bird species utilizing the site recorded, including species flying through overhead. Checks are also made on suitable habitat nearby or adjacent the site for comparative purposes and to monitor any interchange of birds between sites. Target species (species of more special interest) utilizing the site will be mapped and estimates of the time these species frequented the site recorded.



Site Location

Figure 1. Three large agricultural fields (most recently of arable usage) south from Swords Community School, bordered and divided with mature hedgerows, along which are some interspersed larger trees. Fields labelled 1,2 & 3 (from west to east) and will referenced as such in the notes.

Survey results

November 23rd, 2021

Sunrise- 08.04hrs/Sunset 16.17hrs. Weather – Wind F1 West, Cloud 5/8, Dry, 6c, Excellent visibility. On-site 08.30hrs – 15.45hrs. Species recorded – Yellowhammer, Long-tailed Tit, Song Thrush, Chaffinch, Wren, Blackbird, Herring Gull, Black-headed Gull, Goldfinch, Robin, Dunnock, Woodpigeon, Hooded Crow, Jackdaw, Linnet, Blue Tit, Rook, Magpie, Meadow Pipit, Starling, Redpoll, Pied Wagtail, Buzzard, Fieldfare, Skylark, House Sparrow, Mistle Thrush, Goldcrest, Bullfinch, Great Tit.

<u>Site survey methodology (All surveys)</u> – Site surveyed from west to east (field 1 to field 3) following field boundaries circuitously. All three fields traversed minimum 3-4 times per visit. Occasional vantage point observations made from positions giving an excellent overview of the site, all from an elevation to the south of the site.

Observations from 08.30hrs - 12.00hrs -

At field 1 a foraging flock finch at the south end comprised Yellowhammer (<5), Goldfinch (<18), Chaffinch (<9) and Linnet (<30) remained throughout the morning feeding on rank vegetation/setaside in the southwest corner. Two Buzzard were observed soaring over the east side of field 1 at 10.30hrs. A flock of 6 Fieldfare were noted foraging at center of field 1 from 11.10-11.25hrs. Other species noted in field 1 were – Song Thrush (<9), Blackbird (<5), Dunnock (<10), Robin (<4), Woodpigeon (<15), Jackdaw (<20), Rook (<15), Pied Wagtail (<1), Blue Tit (<2), Starling (<40 foraging in center at intervals) and Wren.

At fields 2 and 3 more notable sightings were 4 Yellowhammer foraging at field 3 during the morning, a flock of 45 Linnet also foraging in the same area. 5 Skylark and 7 Meadow Pipit were noted foraging in field 2. Other species noted in fields 2 and 3 were – Song Thrush (<5), Blackbird (<10), Robin (<4), Dunnock (<7), Blue Tit (<6), Long-tailed Tit (<3), Chaffinch (<16), Skylark (<2), Bullfinch (<4), House Sparrow (<10), Goldcrest (<2) and Wren (<6).

Observations from 12.00hrs – 15.45hrs –

At field 1 a foraging finch flock remained at the south end comprising – Yellowhammer (<3), Goldfinch (<20), Chaffinch (<15) and Linnet (<25). 15 Fieldfare were noted foraging at center of field 1 from 14.00-14.30hrs. Also foraging in center of field 1 were Skylark (<8) and Starling (<40) intermittently during the afternoon. Two Buzzard were noted soaring north along the west side of field 1 at 15.10hrs. Also noted in field 1 were – Song Thrush (<3), Blackbird (<7), Robin (<5), Wren (<3), Dunnock (<8), long-tailed Tit (<5), Blue Tit (<4), Great tit (<2), Meadow Pipit (<4), Pied Wagtail (<2), Jackdaw (<12), Rook (<20) & Magpie (<5).

At fields 2 and 3 the following were recorded – Yellowhammer (<3 in field 3), Linnet (<14), Song Thrush (<2), Blackbird (<6), Robin (<4), Wren (<6), Blue Tit (<8), Long-tailed Tit (<10), Starling (<20), House Sparrow (<15 in field 3), Chaffinch (<14), Dunnock (<6), Goldcrest (<4), Hooded Crow (<6), Jackdaw (<15). A minimum of 25 Herring Gull and 6 Black-headed Gull were noted passing over the site, mainly moving south.

December 9th, 2021

Sunrise- 08.28hrs/Sunset 16.07hrs. Weather – Wind F3 South, Cloud 7/8, Dry, 9c, Excellent visibility. On-site 09.00hrs – 15.30hrs.

Species recorded – Yellowhammer, Long-tailed Tit, Song Thrush, Chaffinch, Wren, Blackbird, Herring Gull, Black-headed Gull, Common Gull, Goldfinch, Robin, Dunnock, Woodpigeon, Hooded Crow, Jackdaw, Linnet, Blue Tit, Pheasant, Rook, Magpie, Meadow Pipit, Starling, Redpoll, Redwing, Pied Wagtail, Buzzard, Fieldfare, Skylark, House Sparrow, Mistle Thrush, Goldcrest, Bullfinch, Great Tit.

Observations from 09.00hrs - 12.00hrs -

In field 1 a minimum of 4 Yellowhammer were present at 10.10hrs, foraging on the west side. Chaffinch also recorded in field 1 with a foraging flock of a minimum 26 recorded at 10.40hrs at south end. Minimum of 25 Woodpigeon recorded foraging at west side of field 1 at 10.15hrs. Flock of 40 Fieldfare landed into south end of field 1 at 11.58hrs foraging from 11.40-12.00hrs. Minimum of 9 Song Thrush recorded in field 1 with most foraging at the south end. A foraging flock of 40 Linnet were present throughout at west side of field 1. Also in field 1 were Jackdaw (<2), Robin (<1), Bullfinch (<1), Pheasant (<3), Dunnock (<3), Hooded Crow (<2) and Goldfinch (<2), Herring Gull (<5), Black-headed Gull (<2), Common Gull (<8).

In field 2 minimum counts were - Wren (<2), Robin (<1), Dunnock (<1), Skylark (<1), Starling (<3), House Sparrow (<1), Great Tit (<1), Blue Tit (<3), Hooded Crow (<3), Song Thrush (<1), Chaffinch (<1), Woodpigeon (<5). All foraging mainly in hedgerow boundary.

In field 3 minimum counts were – Blue Tit (<5), Blackbird (<2), Chaffinch (<9), Bullfinch (<6), Goldfinch (<3), Dunnock (<1), Goldcrest (<1), Great Tit (<1), Song Thrush (<1), Woodpigeon (<10).

Observations from 12.00hrs - 15.30hrs -

In field 1 the following were recorded – Woodpigeon (<7), Wren (<3), Dunnock (<2), Chaffinch (<18), Linnet (<20), Buzzard (<1), Song Thrush (<3), Rook (<1), Song Thrush (<1), Robin (<2), Herring Gull (<6) and Pied Wagtail (<1).

In field 2, Song Thrush (<1), Mistle Thrush (<2), Woodpigeon (<3), Chaffinch (<1), Redwing (<1), Redpoll (<2), Robin (<1), House Sparrow (<1), Dunnock (<1), Blackbird (<3) and Linnet (<1).

In field 3, Blue Tit (<1), Great Tit (<1), Chaffinch (<10), Bullfinch (<7), Blackbird (<1), House Sparrow (<1), Goldfinch (<1), Song Thrush (<1), Woodpigeon (<4) and Wren (<2). Almost all passerines recorded in hedgerow/tree line or foraging on ground immediately adjacent.

December 21st, 2021

Sunrise- 08.38hrs/Sunset 16.08hrs. Weather – Wind F2 Southeast, Cloud 6/8, Dry, 5c, Excellent visibility. On-site 08.45hrs – 15.15hrs.

Species recorded – Yellowhammer, Long-tailed Tit, Song Thrush, Chaffinch, Wren, Blackbird, Herring Gull, Black-headed Gull, Goldfinch, Robin, Dunnock, Hooded Crow, Jackdaw, Linnet, Blue Tit, Pheasant, Rook, Magpie, Meadow Pipit, Sparrowhawk, Starling, Redpoll, Redwing, Pied Wagtail, Skylark, House Sparrow, Woodpigeon, Mistle Thrush, Goldcrest, Bullfinch, Coal Tit, Great Tit.

Observations from 08.45hrs - 12.00hrs -

In field 1 a minimum of 5 Yellowhammer were foraging along west and south side, also in same area were Linnet (<22), Goldfinch (<8), Bullfinch (<2), Pheasant (<1), Redpoll (<4), Chaffinch (<15 foraging at south end) and Meadow Pipit (<2). Other species recorded in field 1 were Sparrowhawk (one past west at 11.10hrs), Robin (<2), Skylark (<2), Jackdaw (<25), Starling (<20), Dunnock (<5), Wren (<1), Rook (<5), Magpie (<4), Woodpigeon (<25) and Pied Wagtail (<2).

In fields 2 and 3 the following were recorded Redwing (<5 foraging in middle of field 3), Blackbird (<5), Song Thrush (<8), Chaffinch (<11), Woodpigeon (<15), Mistle Thrush (<3), Blue Tit (<4), Coal Tit (<1), Great Tit (<2), Wren (<3), Goldfinch (<18), Long-tailed Tit (<6), House Sparrow (<10), Starling (<40 foraging in field 3). 16 Herring Gull and 6 Black-headed Gulls were noted passing over site during morning most passing south.

Observations from 12.00hrs – 15.30hrs –

In field 1 a minimum of 2 Yellowhammer continued to frequent the west side. Foraging flock of 25 Linnet, 15 Chaffinch, 9 Goldfinch and 1 Redpoll present on west and south side. Two Skylark foraging in center of field 1 at 12.40hrs. Up to 20 Woodpigeon foraging at west side from 14.00hrs. Robin (<2), Wren (<1), Pheasant (<2), Blackbird (<3), Song Thrush (<4), Pied Wagtail (<1), Dunnock (<6), Meadow Pipit (<2), Jackdaw (<15), Rook (<5) and Blue Tit (<2) also recorded in field 1. Observations from fields 2 and 3 included a Yellowhammer, 8 Chaffinch, 2 Bullfinch, 8 House Sparrow foraging at east side of field 3. Two Mistle Thrush foraging in field 2 at intervals. Other species recorded were Song Thrush (<5), Blue Tit (<6), Wren (<3), Dunnock (<7), Long-tailed Tit (<9), Jackdaw (<30), Rook (<10), Hooded Crow (<3), Magpie (<4), Goldfinch (<14) and Herring Gull (<14) and Black-headed Gull (<2) noted passing through site.

January 13th, 2022

Sunrise- 08.34hrs/Sunset 16.33hrs. Weather – Wind F2 Southwest, Cloud 7/8, Dry, 3c, Excellent visibility. On-site 09.00hrs – 15.45hrs.

Species recorded – Yellowhammer, Reed Bunting, Long-tailed Tit, Song Thrush, Chaffinch, Greenfinch, Wren, Blackbird, Herring Gull, Black-headed Gull, Common Gull, Goldfinch, Robin, Dunnock, Hooded Crow, Jackdaw, Raven, Linnet, Blue Tit, Pheasant, Rook, Magpie, Meadow Pipit, Starling, Redpoll, Redwing, Pied Wagtail, Buzzard, Skylark, House Sparrow, Mistle Thrush, Woodpigeon, Collared Dove, Goldcrest, Bullfinch, Great Tit.

Observations from 09.00hrs - 12.00hrs -

A Buzzard was recorded foraging on ground at south end of field 1 at 09.15hrs. Also in field 1 were 3 Yellowhammer, 1 Reed Bunting, 24 Chaffinch, 15 Linnet, 2 Greenfinch and 1 Redpoll foraging at the south end. Other species recorded in field 1 were Pheasant (<1), Rook (<24), Jackdaw (<12), Skylark (<2 foraging west side), Meadow Pipit (<4), Pied Wagtail (<2), Blue Tit (<4), Woodpigeon (<25 foraging west side), Robin (<2), Dunnock (<5), Starling (<30 foraging in center) and Song Thrush (<3 at south end). 6 Herring Gull, 8 Black-headed Gull and 1 Common Gull passed over the site during the morning.

In fields 2 and 3 two Yellowhammer were recorded foraging in field 3 with 5 Goldfinch, 8 Chaffinch and one Redpoll at 10.35hrs. Two Redwing were recorded foraging in the center of field 2 at 10.54hrs. Two Buzzard were noted soaring over field 3 at 11.15hrs. Other species recorded in field 2 and 3 were Goldcrest (<2), Greenfinch (<3), Wren (<4), Robin (<2), Song Thrush (<5), Blackbird (<8), Collared Dove (<2 in field 3), Hooded Crow (<2), Magpie (<6), House Sparrow (<6), Blue Tit (<6), Skylark (<1).

Observations from 12.00hrs – 15.45hrs –

Two Buzzard were noted soaring over west side of field 1 at 12.35hrs and again at 14.10hrs. A foraging finch comprising 2 Yellowhammer, 20 Linnet, 13 Goldfinch, 18 Chaffinch and 2 Redpoll remained foraging at the southwest corner of field from 12.30hrs. Also at south end were 2 Pheasant and 14 Woodpigeon. 35 Starling and 2 Mistle Thrush were recorded foraging in center of field 1 at intervals throughout the afternoon. Other species recorded in field 1 were Dunnock (<8), Robin (<2), Blue Tit (<3), Pied Wagtail (<2), Skylark (<3 foraging at west side), Hooded Crow (<6), Rook (<35), Jackdaw (<15) and Magpie (<2).

At fields 2 and 3 a foraging flock of 5 Bullfinch, 10 Goldfinch, 1 Yellowhammer and 16 Chaffinch were present in field 3 from 13.00hrs. A Raven passed west over field 2 at 13.22hrs. Starling (<25) and House Sparrow (<14) were noted foraging at south end of field 3 from 13.30hrs. Also recorded in fields 2 and 3 – Dunnock (<4), Robin (<3), Blackbird (<6), Song Thrush (<5), Wren (<2), Long-tailed Tit (<4), and Goldcrest (<2).

January 25th, 2022

Sunrise- 08.20hrs/Sunset 16.54hrs. Weather – Wind F1 North, Cloud 5/8, Dry, 5c, Excellent visibility. On-site 08.45hrs – 16.00hrs. Species recorded – Yellowhammer, Long-tailed Tit, Song Thrush, Chaffinch, Wren, Blackbird, Herring Gull, Black-headed Gull, Goldfinch, Robin, Dunnock, Hooded Crow, Jackdaw, Linnet, Blue Tit, Rook, Magpie, Meadow Pipit, Starling, Redpoll, Siskin, Pied Wagtail, Buzzard, Sparrowhawk, Skylark, House Sparrow, Mistle Thrush, Woodpigeon, Pheasant, Stock Dove, Goldcrest, Bullfinch, Great Tit.

Observations from 08.45hrs - 12.00hrs -

In field 1 along the western side of the field a foraging flock of 32 Chaffinch, 2 Yellowhammer, 15 Goldfinch, 4 Redpoll and 25 Linnet were present throughout feeding on a strip of rank vegetation/set-aside in that area. Two Pheasant flushed at the south end at 10.05hrs. Two Buzzard were perched at the southwest corner from 10.25-10.40hrs. In center of field 1 a foraging flock of 20 Woodpigeon were present at intervals during the morning with 1 Stock Dove noted at 11.20hrs. Other species recorded in field 1 – Siskin (<2), Robin (<3), Blackbird (<5), Song Thrush (<2), Rook (<8), Pied Wagtail (<1), Blue Tit (<5), Jackdaw (<15), Wren (<2), Dunnock (<1) and Skylark (<1).

Observations from fields 2 and 3 included a foraging flock of 15 House Sparrow at the south end of field 3 from 09.40hrs, with Bullfinch (<2) and Goldfinch (<15) and Greenfinch (<2) in the same area. A Sparrowhawk passed east over field 3 at 09.55hrs. A foraging group of up to 10 Woodpigeon were present in the center of field 2 at intervals during the morning. Also recorded in fields 2 and 3 were Linnet (<8), Chaffinch (<5), Blue Tit (<3), Jackdaw (<20), Rook (<6), Hooded Crow (<2), Wren (<4), Starling (<25), Goldcrest (<1) and Robin (<3). Minimum of 15 Herring Gull and 2 Black-headed Gull passed over site during morning with a Herring observed briefly foraging in field 2 at 10.10hrs.

Observations from 12.00hrs – 16.00hrs –

In field 1 a foraging flock of 12 Chaffinch, 10 Goldfinch and 22 Linnet continued at the south end. Three Buzzard were recorded soaring over the west and north end at 12.40-12.45hrs. Four Meadow Pipit were foraging at the west side from 13.20hrs. A Blackcap at the southeast corner at 14.15hrs was a new species for the site. Two Yellowhammer were observed briefly foraging at the northwest corner at 14.45hrs. Other species recorded were Redpoll (<2), Robin (<2), Song Thrush (<6), Blackbird (<2), Wren (<1), Pied Wagtail (<1), Woodpigeon (<20), Starling (<35), Hooded Crow (<4), Blue Tit (<2) and Dunnock (<5).

In fields 2 and 3 foraging group of 4 Mistle Thrush were in field 3 at 14.00hrs, a foraging flock of 10 House Sparrow, 5 Goldfinch and 1 Bullfinch continued at the south end of field 3. A Buzzard was perched midway along the east side of field 2 from 15.15-15.25hrs before moving west. Other species recorded were Song Thrush (<3), Robin (<5), Wren (<2), Dunnock (<4), Blue Tit (<6), Great Tit (<2), Long-tailed Tit (<4), Linnet (<8), Rook (<5) and Jackdaw (<12).

February 3rd, 2022

Sunrise- 08.06hrs/Sunset 17.12hrs. Weather – Wind F3 Southwest, Cloud 6/8, Dry, 8c, Excellent visibility. On-site 08.30hrs – 15.45hrs.

Species recorded – Yellowhammer, Long-tailed Tit, Song Thrush, Chaffinch, Wren, Blackbird, Herring Gull, Goldfinch, Robin, Dunnock, Hooded Crow, Jackdaw, Rook, Raven, Linnet, Blue Tit, Magpie, Meadow Pipit, Starling, Redpoll, Reed Bunting, Pied Wagtail, Buzzard, Red Kite, Skylark, House Sparrow, Mistle Thrush, Redwing, Fieldfare, Woodpigeon, Stock Dove, Stonechat, Goldcrest.

Observations from 08.30hrs - 12.00hrs -

At field 1 a foraging flock of 22 Fieldfare and 8 Redwing were noted at the south end from 09.05hrs-09.30hrs. Four Yellowhammer were noted along the west side from 08.45hrs present at intervals during the morning. A flock of 25 Linnet, 6 Goldfinch and 9 Chaffinch were recorded foraging at the northwest corner of field 1 in rank vegetation/set-aside from 10.30-11.00hrs. Other species recorded in field 1 were Woodpigeon (<5), Dunnock (<8), Robin (<2), Hooded Crow (<3), Starling (<40 feeding in center at intervals), Blackbird (<1), Rook (<10) and Meadow Pipit (<2).

In fields 2 and 3 the following were recorded – Song Thrush (<2), Blackbird (<4), Reed Bunting (<1), Woodpigeon (<12), Robin (<4), Starling (<15), Dunnock (<2), House Sparrow (<8), Rook (<18), Jackdaw (<5), Pied Wagtail (<1), Linnet (<2), Yellowhammer (<1 in field 3), Goldcrest (<3), Blue Tit (<4). A Buzzard was noted soaring over field 3 at 09.54hrs. A Red Kite passed north over field 2 at 11.40hrs was the first sighting at this site. Minimum of 10 Herring Gull noted passing over the site.

Observations from 12.00hrs - 15.45hrs -

Two Buzzards were soaring over the north end of field 1 at 12.20hrs and again at 13.30hrs. Three Yellowhammer were present along the west side of field 1 in association with a foraging flock of 8 Linnet, 25 Goldfinch and 10 Chaffinch from 13.00hrs. Five Redwing were noted foraging in the southeast corner of field 1 at 14.10hrs. Other species recorded in field 1 were Song Thrush (<2), Blackbird (<3), Wren (<6), Robin (<1), Pied Wagtail (<2), Dunnock (<4), Skylark (<2 foraging along west side), Meadow Pipit (<1) and Starling (<50 foraging in center at intervals). Stock Dove (<2 flew west at 15.30hrs.

In fields 2 and 3 a minimum of 4 Yellowhammer were present in field 3 from 14.30hrs. At south end of field 3 a foraging flock of Linnet (<12), Goldfinch (<4), Chaffinch (<8) and Redpoll (<1) were present from 14.45hrs. 15 Woodpigeon were noted foraging in field 2 at intervals from 14.15hrs. Also noted in fields 2 and 3 were Blackbird (<5), Song Thrush (<3), Mistle Thrush (<1), Dunnock (<8), Long-tailed Tit (<2), Blue Tit (<6), Hooded Crow (<4), Rook (<25), Jackdaw (<15), Magpie (<6), Raven (<1 flew west at 14.50hrs).

February 22nd, 2022

Sunrise- 07.28hrs/Sunset 17.49hrs. Weather – Wind F3 West, Cloud 5/8, Dry, 8c, Excellent visibility. On-site 08.00hrs – 16.15hrs.

Species recorded – Yellowhammer, Song Thrush, Chaffinch, Wren, Blackbird, Herring Gull, Lesser black-backed Gull, Black-headed Gull, Goldfinch, Siskin, Robin, Dunnock, Hooded Crow, Jackdaw, Rook, Raven, Linnet, Blue Tit, Great Tit, Magpie, Meadow Pipit, Starling, Buzzard, Skylark, House Sparrow, Mistle Thrush, Redwing, Pheasant, Woodpigeon, Stock Dove, Goldcrest.

Observations from 08.00hrs - 12.00hrs -

Field 1 observations included 5 Yellowhammer, 8 Goldfinch and 20 Chaffinch foraging in the southwest corner from 08.40hrs. A Buzzard soaring over the west end at 09.30hrs and 11.10hrs. Five Siskin foraging on east side at 10.05hrs. Other species recorded in field 1 were Linnet (<10), Song Thrush (<2), Blackbird (<2), Woodpigeon (<14), Pheasant (<1), Blue Tit (<3), Great Tit (<1), Dunnock (<5), Starling (<65), Wren (<1), Rook (<15), Jackdaw (<5), Skylark (<1) and Robin (<3).

In fields 2 and 3 the following were recorded Goldcrest (<3), Skylark (<4), Blue Tit (<8), Dunnock (<10), Linnet (<12), Meadow Pipit (<1), Goldfinch (<25), Hooded Crow (<5), Rook (<15), Jackdaw (<20), House Sparrow (<4) and Robin (<2). Three Redwing were noted foraging at the north end of field 3 at 11. 50hrs.

Observations from 12.00hrs – 16.15hrs –

Three Buzzard were noted soaring over the north end of field 1 at 13.05hrs. 1 Yellowhammer, 12 Chaffinch, 5 Linnet and 8 Goldfinch continued foraging at the south end of field 1 throughout. Three Pheasant were also at the south end at 14.25hrs. Also recorded in field 1 – Redpoll (<1), Dunnock (<5), Robin (<3), Blue Tit (<2), Wren (<1), Song Thrush (<4), Starling (<30), Mistle Thrush (<3), Woodpigeon (<10), Jackdaw (<12), Rook (<3) and Magpie (<2). Three Raven passed north over field 1 at 14.48hrs. In fields 2 and 3, A foraging flock of 20 Linnet, 4 Chaffinch and 5 Goldfinch were present on the east side of field 2 from 14.00hrs. A Buzzard was foraging in center of field 3 at 12.30hrs. Other species noted in fields 2 and 3 were Dunnock (<5), Robin (<4), Wren (<6), Woodpigeon (<14), Stock dove (<1), Song Thrush (<5), Jackdaw (<7), Rook (<24), Magpie (<9), Starling (<40), House Sparrow (<6) and Blue Tit (<3). A minimum of 30 Herring Gull, 4 Black-headed Gull and 2 Lesser black-backed Gull passed over the site during the day.

March 1st, 2022

Sunrise- 07.12hrs/Sunset 18.02hrs. Weather – Wind F1 North, Cloud 3/8, Dry, 5c, Excellent visibility. On-site 08.15hrs – 16.00hrs.

Species recorded – Yellowhammer, Song Thrush, Wren, Blackbird, Herring Gull, Lesser black-backed Gull, Black-headed Gull, Chaffinch, Goldfinch, Bullfinch, Greenfinch, Robin, Dunnock, Hooded Crow, Jackdaw, Rook, Linnet, Blue Tit, Great Tit, Coal Tit, Long-tailed Tit, Magpie, Meadow Pipit, Starling, Buzzard, Skylark, House Sparrow, Mistle Thrush, Woodpigeon, Peregrine Falcon, Collared Dove, Goldcrest.

Observations from 08.15hrs – 12.00hrs –

In field 1 three Yellowhammer, 7 Chaffinch and 2 Bullfinch were noted foraging in the northwest corner at 08.30hrs. 10 Meadow pipit and 4 Skylark were foraging along the west side from 08.45hrs. A Buzzard was noted soaring over the south end at 10.10hrs. Other species noted in field 1 were Woodpigeon (<20 foraging at south end), Song Thrush (<8), Blackbird (<3), Dunnock (<6), Robin (<2), Blue Tit (<2), Linnet (<11), Greenfinch (<1), Rook (<3), Jackdaw (<10), Goldcrest (<1) and Magpie (<4).

At fields 2 and 3 the following were recorded – Goldfinch (<15), House Sparrow (<5), Goldcrest (<1), Robin (<5), Blue Tit (<7), Great Tit (<2), Coal Tit (<1), Long-tailed Tit (<14), Blackbird (<4), Song Thrush (<6), Linnet (<16), Goldfinch (<30), Jackdaw (<6), Rook (<18), Mistle Thrush (<1), Collared Dove (<1). A Buzzard passed north over field 2 at 11.32hrs.

Observations from 12.00hrs - 16.00hrs -

At field 1 two Yellowhammer and 5 Chaffinch remained foraging at the northwest corner throughout. At the south end 16 Chaffinch, 5 Goldfinch and 7 Linnet were noted foraging from 12.15hrs. A Peregrine Falcon was noted passing west over field 1 at 13.12hrs. Other species recorded in field 1 were Dunnock (<4), Robin (<2), Wren (<3), Goldcrest (<2), Blue Tit (<4), Skylark (<1), Song Thrush (<4), Blackbird (<2), Meadow Pipit (<2), Starling (<70 foraging in center), Jackdaw (<13) and Rook (<20).

Fields 2 and 3 recorded the following minimum counts – Blackbird (<3), Song Thrush (<2), Linnet (<15), Goldfinch (<8), Robin (<2), House Sparrow (<14), Dunnock (<6), Wren (<2), Rook (<26), Jackdaw (<18), Bullfinch (<1), Blue Tit (<4) and Great Tit (<2). Two Buzzard were noted soaring over the east side of field 3 at 14.40hrs. 12 Herring Gull, 3 Lesser black-backed Gull and 1 Black-headed Gull were noted passing over the site during the day.

March 21st, 2022

Sunrise- 06.25hrs/Sunset 18.40hrs. Weather – Wind F2 Southeast, Cloud 3/8, Dry, 8c, Excellent visibility. On-site 07.50hrs – 15.30hrs.

Species recorded – Yellowhammer, Song Thrush, Wren, Blackbird, Herring Gull, Lesser black-backed
 Gull, Chaffinch, Goldfinch, Bullfinch, Redpoll, Greenfinch, Robin, Dunnock, Hooded Crow, Jackdaw,
 Rook, Linnet, Blue Tit, Great Tit, Blackcap, Long-tailed Tit, Magpie, Meadow Pipit, Starling, Buzzard,
 Red Kite, Sparrowhawk, Skylark, House Sparrow, Mistle Thrush, Woodpigeon, Goldcrest.

Observations from 07.50hrs - 12.00hrs -

At field 1 five Yellowhammer were noted along the west side at 08.15hrs, 5 Skylark and 2 Meadow Pipit were foraging in the center at 08.40hrs. A Sparrowhawk was noted hunting along the east side of field 1 at 09.04hrs. Also noted in field 1 were – Song Thrush (<6), Blackbird (<2), Robin (<1), Wren (<3), Chaffinch (<6), Linnet (<9), Goldfinch (<6), Woodpigeon (<10), Jackdaw (<14), Magpie (<5) and Dunnock (<5). Two Buzzard were noted soaring over the east side of field 1 at 11.10hrs and one Red Kite passed north along the west side of field 1 at 11.40hrs was the second sighting at this site.

In fields 2 and 3 species recorded included – Yellowhammer (<1 at field 3), Bullfinch (<2), Goldfinch (<15), House Sparrow (<5), Goldcrest (<2), Linnet (<8), Dunnock (<8), Robin (<6), Greenfinch (<2), Starling (<25), Blackbird (<3), Song Thrush (<3), Woodpigeon (<17), Blue Tit (<6) and Meadow Pipit (<3).

Observations from 12.00hrs - 15.30hrs -

Two Buzzard were observed perched at the south end of field 1 from 12.40-13.15hrs. Minimum of 4 Yellowhammer were foraging around field 1 throughout. Other species recorded in field 1 were Blackbird (<4), Song Thrush (<3), Linnet (<6 foraging at south end), Goldfinch (<8), Dunnock (<5), Redpoll (<2), Woodpigeon (<15), Meadow Pipit (<1), Blue Tit (<2), Starling (<20), Skylark (<2) and Goldcrest (<1).

At fields 2 and 3 a foraging flock of Starling (<100) was noted at field 3 from 13.40hrs, two Yellowhammer were also present at field 3 intermittently, a Buzzard was noted perched at the north end of field 2 from 14.10-14.25hrs. Hooded Crow, Magpie and Blackbird were all observed nest building. Other species observed in fields 2 and 3 were – Song Thrush (<4), Mistle Thrush (<1) Blackbird (<5), Linnet (<10), Robin (<6), Goldcrest (<2), Dunnock (<8), Blue Tit (<7), Rook (<20), Jackdaw (<15), Wren (<5), House Sparrow (<8) and Chaffinch (<5). Minimum of 30 Herring, 4 Lesser black-backed Gull and 5 Black-headed Gull were observed passing over the site during the day.

Comments and observations on survey results

44 bird species were recorded in the survey area covered by these nine winter bird surveys. A great proportion of the species utilizing the mature hedgerow habitat bordering the fields on the site. In the context of wintering bird species that are red listed as species of conservation concern in the revised Birdwatch Ireland List of birds of conservation concern in Ireland (2020-2026) Redwing was recorded. Declining passerine species Yellowhammer was also noteworthy with the site being a consistent foraging site during the winter. Four gull species listed in the amber wintering species category were recorded (Herring, Lesser black-backed, Common and Black-headed), however these species pass through the site only. Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).

Introduction

In June 2021 breeding bird surveys were conducted at Mooretown and several nearby sites, at Swords, Co Dublin. Three breeding bird surveys were completed in all by Hugh Delaney, a freelance Ecologist (Birds primarily) with having completed work on numerous sites with ecological consultancies over 10+ years. Hugh is local to the Dun Laoghaire-Rathdown area in County Dublin and is especially familiar with the bird life and its ecology in the environs going back over 30 years.

Breeding Bird Survey Methodology

Breeding bird surveys are conducted from soon after sunrise or as early as so possible, taking several hours or longer depending on site size. They are conducted then in order to detect as many singing species as possible and birds that are generally more active early in the day. Optimal weather conditions are chosen when in order to gather the most data.

Site Locations (Map locations are as Winter Bird Surveys)

1 (Mooretown)

Three large agricultural fields (most recently of arable usage) south from Swords Community School, bordered and divided with mature hedgerow, along which interspersed with some larger trees.

2 – Area around Barn adjacent Site offices (Phase 5)

Arable agricultural field adjacent the Barn, remaining area rough ground/building site.

3- Area adjacent Broadmeadow River (Phase 10)

Pasture field area bordering Broadmeadow River to the north.

Survey Results -

June 8th, 2021

Sunrise- 04.58hrs/Sunset- 21.50hrs. Weather – Wind F2 South, Cloud 6/8, Dry, 18c, Excellent visibility. On-site 08.15hrs – 12.30hrs.

<u>1 (Mooretown)</u>

Species recorded – Song Thrush, Wren, Woodpigeon, Yellowhammer, Goldfinch, Linnet, Skylark, Jackdaw, Starling, Rook, Blackbird, Robin, Blue Tit, Chaffinch, House Martin, Pheasant, Greenfinch,

House Sparrow, Dunnock, Buzzard, Swallow, Herring Gull, Blackcap, Sparrowhawk, Magpie. <u>08.15hrs – 09.45hrs.</u> – All three fields traversed, following field edges all around and back in reverse. **Song Thrush** (x2) Two in song, in west and middle field.

Yellowhammer (X1) One in song, in west field next to entrance to site.

Goldfinch (x16) Four in song, also another flock of 12 foraging in west field, flock including some juveniles.

Woodpigeon (x3) Two observed engaging in display flights and one foraging in east field.

Wren (x8) Six in song around site and two calling juveniles also noted.

Linnet (x1) One foraging in west field.

Pheasant (x1) One foraging in west field.

Blackbird (x2) Two in west field including a bird in song.

Robin (x4) Four in song around site.

Blue Tit (x2) Two foraging on-site one each in west and in middle fields.

Chaffinch (x2) Two in song, one in west field and one in middle field.

Starling (x2) Two juveniles foraging in west field.

Dunnock (x2) Two in song, one in west field and one in east field.

Greenfinch (x1) One in song at the west field at south end.

Swallow (x1) One observed foraging over the site.

House Martin (x3) Observed foraging over the site.

Sparrowhawk (x1) One male observed hunting along hedgerow in middle and east field.

Blackcap (x2) Two in song on site at middle and east fields.

Magpie (x4) Foraging on-site.

House Sparrow (x2) Two foraging at the east field.

Skylark (x1) One in song over west side of the west field.

Buzzard (x1) One passed over the west field at 08.45hrs heading north.

Herring Gull (x2) Two passed over site at 09.05hrs.

Species proved breeding – Wren. Goldfinch and Woodpigeon also very likely breeding on-site.

2 – Area around Barn adjacent Site offices (Phase 5)

Species recorded – Skylark, Linnet, Goldfinch, Magpie, Hooded Crow.

<u>10.00hrs – 10.25hrs</u> – Area around barn checked and observed from vantage point over area.

Skylark (x2) Two in song in area one at north end of survey area and one at south end.

Linnet (x4) Four observed foraging in area.

Goldfinch (x2) Two birds foraging in area.

Magpie (x1) One foraging in area.

Hooded Crow (x2) – Two foraging in area.

Species proved breeding – None conclusively breeding, but likely Skylark in song highly indicative of breeding birds.

3- Area adjacent Broadmeadow River (Phase 10)

Species recorded – Skylark, Meadow Pipit, Blackcap, Magpie, House Martin, Blackbird, Herring Gull, Dunnock, Woodpigeon, Goldcrest, Rook, Hooded Crow, Mistle Thrush, Sand Martin, Goldfinch,

Linnet, Little Egret, Grey Wagtail, Bullfinch, House Martin, Greenfinch.

<u>10.40hrs – 12.30hrs</u> – Area traversed in full and observed from vantage point midway along south side viewing across site.

Skylark (x2) Two in song, one on west side of site and one in middle of site.

Meadow Pipit (x2) Two in song, one in middle of site and one in northwest side of site (alarm calling when entering birds' territory).

Blackcap (x2) One in song at southwest corner of site in hedgerow, also one juvenile observed in same area.

Woodpigeon (x1) One in display flight at southwest corner of site.

Goldcrest (x1) One in song in southwest corner of site.

Little Egret (x1) One foraging on the Broadmeadow River at northwest corner of site.

Wren (x2) Two in song at west side of site.

Sand Martin (x1) One observed foraging along north of site along river.

Mistle Thrush (x4) One observed foraging at north side of site, three foraging at east end of site. **Linnet** (x3) Three foraging at north side of site.

House Sparrow (x6) Six foraging at the east end of site.

Starling (x100) 100 foraging in middle of site with a good portion of juvenile birds.

Grey Wagtail (x2) Two foraging on Broadmeadow River at east end of site.

House Martin (x10) Ten foraging along Broadmeadow River at east end.

Blue Tit (x4) Two juveniles and two attendant adults at east end of site.

Dunnock (x1) One in song at east end of site.

Bullfinch (x3) Adult and two attendant juveniles at southwest corner of site.

Hooded Crow (x4) Two fledged juveniles at south end of site with two adults, nest observed in same area.

Species proved breeding – Meadow Pipit, Hooded Crow, Bullfinch, Blue Tit & Blackcap.

June 14th, 2021

Sunrise- 04.56hrs/Sunset- 21.54hrs. Weather – Wind F3 West, Cloud 6/8, Dry, 12c, Excellent visibility. On-site 07.45hrs – 12.20hrs.

<u>1 (Mooretown)</u>

Species recorded – Song Thrush, Wren, Woodpigeon, Yellowhammer, Mistle Thrush, Bullfinch, Goldfinch, Skylark, Jackdaw, Starling, Rook, Blackbird, Robin, Blue Tit, Chaffinch, House Martin,

Greenfinch, House Sparrow, Dunnock, Swallow, Blackcap, Magpie.

<u>07.45hrs – 09.15hrs.</u> – All three fields traversed, following field edges all around and back in reverse. **Song Thrush** (x1) One in song, in west field.

Yellowhammer (X1) One in song in west field midway along west side.

Goldfinch (x3) Five in song, also three recently fledged juveniles observed at east field.

Woodpigeon (x6) Two observed engaging in display flights and 4 foraging in middle field.

Wren (x7) Four in song around site and three calling juveniles also noted. Blackbird (x3) One in song in west field and two others noted in middle field. **Robin** (x5) Four in song around site and juvenile noted in middle field. Blue Tit (x8) Two adults and attendant six juveniles noted in hedgerow in east field. **Chaffinch** (x3) Three in song, one in west field and two in middle field. Starling (x15) Flock of 15 observed in west field including juveniles. Dunnock (x3) Three in song, one in west field and two in east field. **Greenfinch** (x1) One in song at the west field at south end. **Swallow** (x4) Four observed foraging over the site at west field. **House Martin** (x10) Observed foraging over the site. Blackcap (x1) One in song at middle field. Magpie (x6) Foraging on-site. **House Sparrow** (x7) Seven foraging in hedgerow at the east field. **Skylark** (x1) One again in song over west side of the west field. **Bullfinch** (x4) Two adults with two juveniles in middle field. Mistle Thrush (2) Two foraging in east field.

Jackdaw (12) Birds foraging in the three fields on-site.

Species proved breeding – Goldfinch, Wren, Robin, Blue Tit & Bullfinch.

2 – Area around Barn adjacent Site offices (Phase 5)

Species recorded – Skylark, Goldfinch, Magpie, Hooded Crow, Buzzard.

<u>09.30hrs – 10.00hrs</u> – Area around barn checked and observed from vantage point over area.

Skylark (x2) One in song over area north of barn, observed in song flight.

Goldfinch (x5) Five birds foraging in area.

Magpie (x2) Two foraging in area.

Hooded Crow (x1) One foraging in area.

Buzzard (x1) One passed west over site at 09.50hrs.

Species proved breeding – None conclusively breeding, but likely Skylark in song highly indicative of breeding birds.

3- Area adjacent Broadmeadow River (Phase 10)

Species recorded – Skylark, Meadow Pipit, Blackcap, Magpie, House Martin, Blackbird, Herring Gull, Dunnock, Woodpigeon, Rook, Hooded Crow, Mistle Thrush, Mallard, Swift, Sand Martin, Goldfinch, Linnet, Grey Wagtail, Kingfisher, House Martin, Greenfinch.

<u>10.15hrs – 12.20hrs</u> – Area traversed in full and observed from vantage point midway along south side viewing across site.

Skylark (x2) Two in song, one at northwest side of site and one in middle of site.

Meadow Pipit (x4) Two pairs, one in middle of site and one at northwest side of site – parent seen provisioning food.

Blackcap (x2) Adult and juvenile seen at south side of site.

Woodpigeon (x6) Four birds foraging on-site, and two others observed in display flight.

Kingfisher (x1) One observed midway along north side of site flying east along river.

Wren (x3) Two in song and one juvenile observed on-site.

Sand Martin (x4) Four observed foraging along Broadmeadow River.

Mistle Thrush (x2) Two foraging in middle of site.

Mallard (x2) One pair observed at east end of site on Broadmeadow River.

Swift (x4) Four observed foraging over the site.

House Sparrow (x10) Observed foraging in hedgerows at east side of site.

Starling (x60) Foraging in pasture at east end of site with attendant juveniles.

Grey Wagtail (x2) Two foraging on Broadmeadow River at east end of site.

House Martin (x6) Foraging at east end of site.

Blue Tit (5) Two adults with two attendant juveniles at east end of the site.

Dunnock (x2) In song one at east end and one at west end.

Hooded Crow (x5) Two adults and three fledged juveniles at south end of site, nest observed in same area.

Linnet (x6) Foraging at east end of site.

Species proved breeding – Meadow Pipit, Hooded Crow, Blackcap, Wren, Blue Tit.

June 25th, 2021

Sunrise- 04.58hrs/Sunset- 21.57hrs. Weather – Wind F2 Northwest, Cloud 3/8, Dry, 10c, Excellent visibility. On-site 07.30hrs – 12.15hrs.

<u>1 (Mooretown)</u>

Species recorded – Song Thrush, Wren, Woodpigeon, Yellowhammer, Mistle Thrush, Goldfinch, Skylark, Jackdaw, Starling, Rook, Blackbird, Robin, Blue Tit, Chaffinch, House Martin, Goldcrest, House Sparrow, Dunnock, Swallow, Buzzard, Magpie, Rook.

<u>07.30hrs – 09.00hrs.</u> – All three fields traversed, following field edges all around and back in reverse. **Song Thrush** (x3) One provisioning food to two juveniles in west field.

Yellowhammer (x2) Two foraging in west field.

Goldfinch (x4) Four in song around site.

Woodpigeon (x8) Six foraging in middle field and two in west field.

Wren (x9) Five in song around site and four calling juveniles also noted.

Blackbird (x2) One in song in west field and one in song in middle field.

Robin (x5) Three in song around site and two juveniles noted in west field.

Blue Tit (x5) Two adults and attendant three juveniles noted in hedgerow in east field.

Chaffinch (x2) Two in song, one in west field and one in middle field.

Starling (x75) Flock of 75 observed in west field including juveniles.

Dunnock (x1) One in east field.

Goldcrest (x6) Two adults and four attendant juveniles in hedgerow in middle field.

Swallow (x8) Observed foraging over the site at west field and middle field.

House Martin (x12) Observed foraging over the site mainly over west field.

Magpie (x5) Foraging on-site.

House Sparrow (x14) Foraging in hedgerows at the east field and middle field.

Skylark (x2) Two foraging in west field.

Sparrowhawk (x1) Male hunting east field at 08.35hrs

Buzzard (x2) Pair soaring over site at 09.00hrs.

Jackdaw (x15) Birds foraging in the three fields on-site.

Rook (x6) Foraging in the three fields on-site

Species proved breeding – Song Thrush, Wren, Robin, Blue Tit, Goldcrest.

2 – Area around Barn adjacent Site offices (Phase 5)

Species recorded – Skylark, Linnet, Magpie, Hooded Crow.

<u>09.15hrs – 10.00hrs</u> – Area around barn checked and observed from vantage point over area.

Skylark (x2) Pair, one bird observed provisioning food to nest site.

Linnet (x4) Foraging around barn area.

Magpie (x3) Two foraging in area.

Hooded Crow (x1) One foraging in area.

Species proved breeding – Skylark.

3- Area adjacent Broadmeadow River (Phase 10)

Species recorded – Skylark, Meadow Pipit, Blackcap, Magpie, Pied Wagtail, House Martin, Blackbird, Herring Gull, Dunnock, Woodpigeon, Rook, Hooded Crow, Mistle Thrush, Sparrowhawk, Sand

Martin, Goldfinch, Great Tit, Blackbird, Grey Wagtail, House Martin, Redpoll, Greenfinch.

<u>10.15hrs – 12.20hrs</u> – Area traversed in full and observed from vantage point midway along south side viewing across site.

Skylark (x2) Two in song, one at northwest side and one in middle of site.

Meadow Pipit (x5) Pair at west side of site and three birds foraging in middle of site.

Blackcap (x2) Two adults at south side of site.

Woodpigeon (x8) Six birds foraging on-site, and two others observed in display flight.

Wren (x5) Five in song around site.

 $\label{eq:sand-Martin} \textbf{(x2)} \ \textbf{Two observed for aging along Broadmeadow River}.$

Mistle Thrush (x4) Four foraging in middle and east of site.

Redpoll (x3) Birds passing north over site at 11.05hrs.

Sparrowhawk (x1) Female passed west over site at 10.50hrs.

House Sparrow (x15) Observed foraging in hedgerows at east side of site.

Starling (x35) Foraging in pasture at east end of site with attendant juveniles.

Grey Wagtail (x5) Two foraging on Broadmeadow River with three attendant juveniles at east end of site.

House Martin (x16) Foraging at middle and east end of site.

Blackbird (x5) Two adults and three attendant juveniles in hedgerow at south end of site.

Pied Wagtail (x2) Foraging on Broadmeadows River at middle of site.

Blue Tit (8) Two adults with six attendant juveniles at southwest corner of the site.

Great Tit (2) Two foraging in southwest corner of site.

Dunnock (x1) In song one at east end.

Hooded Crow (x7) Seven foraging around site.

Rook (x20) Passing over mainly and occasionally foraging in middle of site.

Magpie (x8) Noted around site.

Species proved breeding – Grey Wagtail, Blackbird and Blue Tit.

Summary of Breeding Bird Survey observations at Mooretown (Swords) site, June 2021

37 Bird species were recorded at the Mooretown site over 3 visits in June 2021. Of these 13 species were proved breeding. Of those species recorded breeding Meadow Pipit and Grey Wagtail are now red listed on the recently updated Birdwatch Ireland's Birds of Conservation Concern in Ireland List (2020-2021), with at least 1-2 pairs of Meadow Pipit breeding at the north of the site adjacent the Broadmeadow River and a pair of Grey Wagtail in the same area.

Other species recorded breeding on-site now placed on Birdwatch Ireland's Birds of Conservation Concern in Ireland amber list include Skylark and Goldcrest.