

Screening for Appropriate Assessment
Fenit Harbour Maintenance Dredging and
Dumping at Sea (2020 – 2027)

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1 SUMMARY OF FINDINGS

1.1 SCREENING FOR APPROPRIATE ASSESSMENT

Project Title	Fenit Harbour Maintenance Dredging and Dumping at Sea (2020 – 2027)
Project Proponent	Kerry County Council
Project Location	Fenit Harbour, Fenit, Co. Kerry
Conclusion	<p>It has been objectively concluded during the screening process that significant impacts on the following Natura 2000 sites, as a result of the proposal, are not considered likely:</p> <ul style="list-style-type: none"> • Slieve Mish Mountains (002185) • Mount Brandon SAC (000375) • Ballyseedy Wood SAC (002112) • Castlemaine Harbour SAC (000343) • Castlemaine Harbour SPA (004029) • Dingle Peninsula SPA (004153) • Kerry Head SPA (004189) • Kerry Head Shoal SAC (002263) <p>It cannot be objectively concluded, at this stage, that significant impacts to the following sites will not occur:</p> <ul style="list-style-type: none"> • Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070) • Akeragh, Banna and Barrow Harbour SAC (000332) • Tralee Bay Complex SPA (004188) • Magharee Islands SAC (002261) • Magharee Islands SPA (004125) • Lower River Shannon SAC (002165) <p>Therefore, it is necessary to proceed to Appropriate Assessment and as such a Natura Impact Statement is required for these sites.</p>

2 INTRODUCTION

2.1 PURPOSE OF ASSESSMENT

This Screening for Appropriate Assessment has been undertaken to determine the potential for significant impacts of a proposal to carry out proposed maintenance dredging at Fenit Harbour and disposal of dredge material to a dumpsite in Tralee Bay, County Kerry, on nearby sites with European conservation designations (i.e. Natura 2000 Sites). The proposal relates to annual dredging over an eight year dredge campaign.

A foreshore licence (FL) application for consent under the Foreshore Act for dredging at the harbour and dumping operations at the dumpsite for a single event in 2020 will be sought from the Department of Housing, Planning and Local Government (DHPLG). A Dumping at Sea (DaS) permit application to dispose of the material at the proposed dumpsite will be sought from the Environmental Protection Agency (EPA) under the Foreshore and Dumping at Sea (Amendment) Act 2009 for an eight year period (2020 – 2027). This Screening for Appropriate Assessment will accompany both these applications to allow a full assessment of the implications of the proposal on Natura 2000 sites. Any FL granted will be subject to conditions and the Marine Planning – Foreshore Unit of the DHPLG will be responsible for management and enforcement of such conditions. Similarly, a DaS licence will be subject to conditions imposed by the EPA who will be responsible for management and enforcement of such conditions.

This Screening for Appropriate Assessment has been undertaken by Malachy Walsh and Partners ecologists while additional specialist marine surveys were undertaken by AquaFact International Services, Hydrographic Surveys Ltd, and the Irish Whale and Dolphin Group Consulting (IWDG).

2.2 LEGISLATIVE CONTEXT

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and of wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. The Habitats Directive has been transposed into Irish law and the relevant Regulations are the European Communities (Birds and Natural Habitats) Regulations 2011. The requirement for Appropriate Assessment of the implications of plans and projects on the Natura 2000 network of sites comes from the Habitats Directive (Article 6(3)). Under the European Communities (Birds and Natural Habitats) Regulations 2011 a public authority is required to carry out a Screening for Appropriate Assessment of a proposed development prior to issuing consent. The information presented in this Screening for Appropriate Assessment will be used by the public authority to complete their screening exercise. Further information is available at:

<http://ec.europa.eu/environment/nature/legislation/habitatsdirective/>

<http://www.npws.ie/planning/appropriateassessment/>

2.3 STAGES OF APPROPRIATE ASSESSMENT

The Appropriate Assessment process is a four-stage process with issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The stages are set out in Appendix 1.

3 ASSESSMENT METHODOLOGY

3.1 APPROPRIATE ASSESSMENT GUIDANCE

This screening for Appropriate Assessment, or Stage 1, has been 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) and the European Commission Guidance 'Managing Natura 2000 sites' (EC, 2000) and guidance prepared by the NPWS (DoEHLG, 2009).

3.2 DESK STUDY

In order to complete the screening for Appropriate Assessment certain information on the existing environment is required. A desk study was carried out to collate available information on the site's natural environment. This comprised a review of the following publications, data and datasets:

- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS)
- National Biodiversity Data Centre (NBDC) (on-line map-viewer)
- BirdWatch Ireland
- Ireland's Marine Atlas (IMA) (on-line map-viewer)
- The Dingle Peninsula Bird Reports from 2008-2010 & 2011-2013
- General ornithology literature
- Teagasc soil area maps (NBDC website)
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- Other information sources and reports footnoted in the course of the report

3.3 FIELD SURVEYS

A number of marine surveys were completed by AquaFact International Services Ltd, Hydrographic Surveys Ltd, and IWDG (Irish Whale and Dolphin Group) Consulting, all specialist marine consultancies. These surveys, carried out in support of either the current or previous FL and DaS licence applications for dredging in Fenit Harbour, were in turn used to inform the screening for Appropriate Assessment and include:

- Bathymetric Survey Fenit Harbour - Inner Harbour (Hydrographics Survey Ltd., 2018)
- Bathymetric Survey Fenit Harbour - Dumpsite (Hydrographic Survey Ltd., 2018)
- Tidal Current Metering (Hydrographic Survey, 2014)
- Sediment Transport Model (STM)(AquaFact)
- Fenit Harbour Dredging and Disposal Operations Marine Benthic Study Report (AquaFact, 2018)
- Fenit Harbour Dredging and Disposal Operations Marine Sediment Characterisation Report (AquaFact, 2018)

- Fenit Harbour Marine Benthic Flora and Fauna Survey (see Marine section of Chapter 4 Ecology of Fenit Harbour and Marina Extension EIS - Doc. No: 12693-6001-A (marine section authored by Aquafact, 2009, EIS produced and compiled by MWP)
- Assessment of Risk to Marine Mammals from Proposed Dredging and Dumping at Sea Activity, Fenit Harbour (O'Brien & Berrow, 2017)

The following sections summarise the methodologies employed for each of the elements listed above.

3.3.1 Bathymetry

A bathymetric survey was completed by Hydrographic Surveys Ltd. in October 2018 to map the sea floor terrain and depths within the inner harbour/marina area and approach channel to Fenit Harbour. This survey followed on from a previous bathymetric survey of the same area completed in February 2018. A bathymetric survey of the proposed dumpsite was completed by Hydrographic Surveys Ltd. in January 2018.

3.3.2 Current and Tidal Metering

A current and tidal survey was completed by Hydrographic Surveys during the summer of 2014 to characterise the hydrodynamic environment at the dumpsite. An ADCP (Acoustic Doppler Current Profiler) was deployed at grid location E70524, N120342 from 17th July 2014 to 1st Aug 2014 providing almost 15 days of records.

3.3.3 Baseline Characterisation of Dredge Area

3.3.3.1 Benthic Faunal Sampling

In 2009 Aqua-Fact undertook benthic survey work at 10 sampling stations in and around Fenit Harbour to inform the Fenit Harbour and Marina Expansion project. The aim of these surveys was to map the faunal communities in the vicinity of the harbour. The results of the 2009 surveys were used in the current assessment of the proposed dredging works at Fenit Harbour.

3.3.3.2 Marine Sediment Characterisation Survey

Surveys to inform sediment characterisation of the proposed dredge area were conducted in November 2017. A total of 12 sampling stations within the harbour area were selected (see Figure 1 below). A grab sample was collected at each sampling station for the analysis of organics and contaminants. Once back in the laboratory, all sediment samples were sent to the SOCOTEC Laboratories in Burton on Trent (Aquafact, 2018).

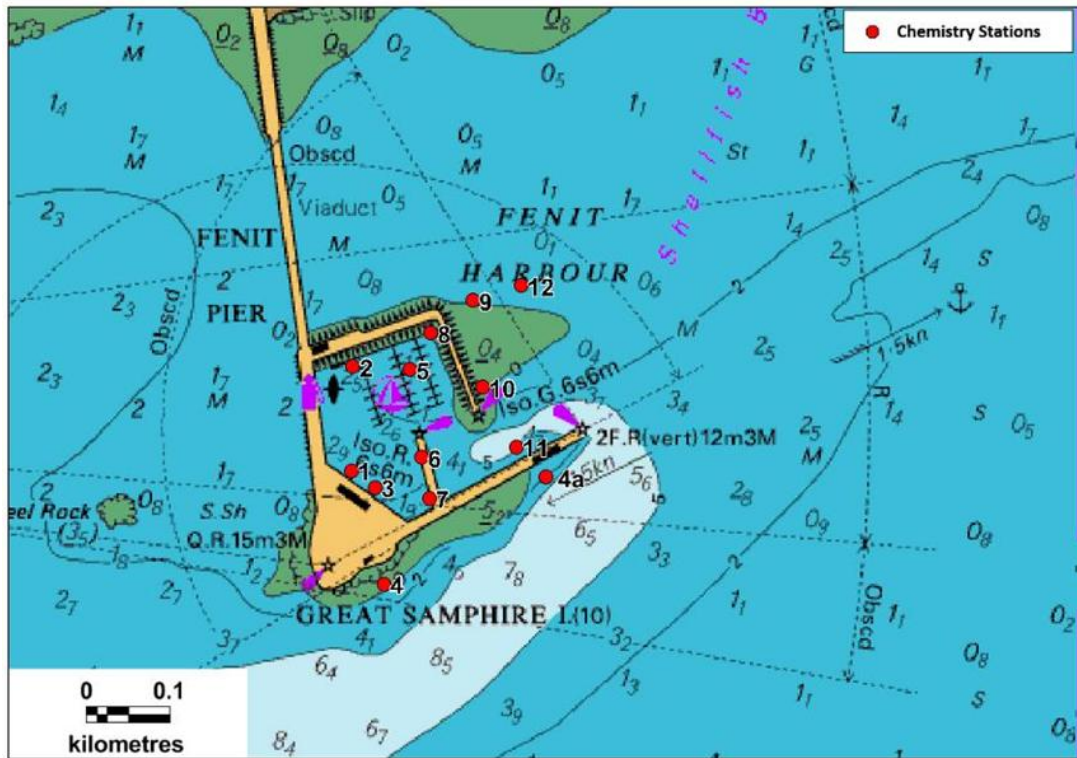


Figure 1. Location of chemistry sampling sites (AquaFact, 2018)

3.3.4 Baseline Characterisation of the Dumpsite

3.3.4.1 Benthic Faunal Sampling

To carry out the sub-tidal benthic faunal assessment of the proposed dumpsite AquaFact International Services Ltd. sampled 8 sites within and around the area in question in November 2017 (see Figure 2 below)(AquaFact, 2018).

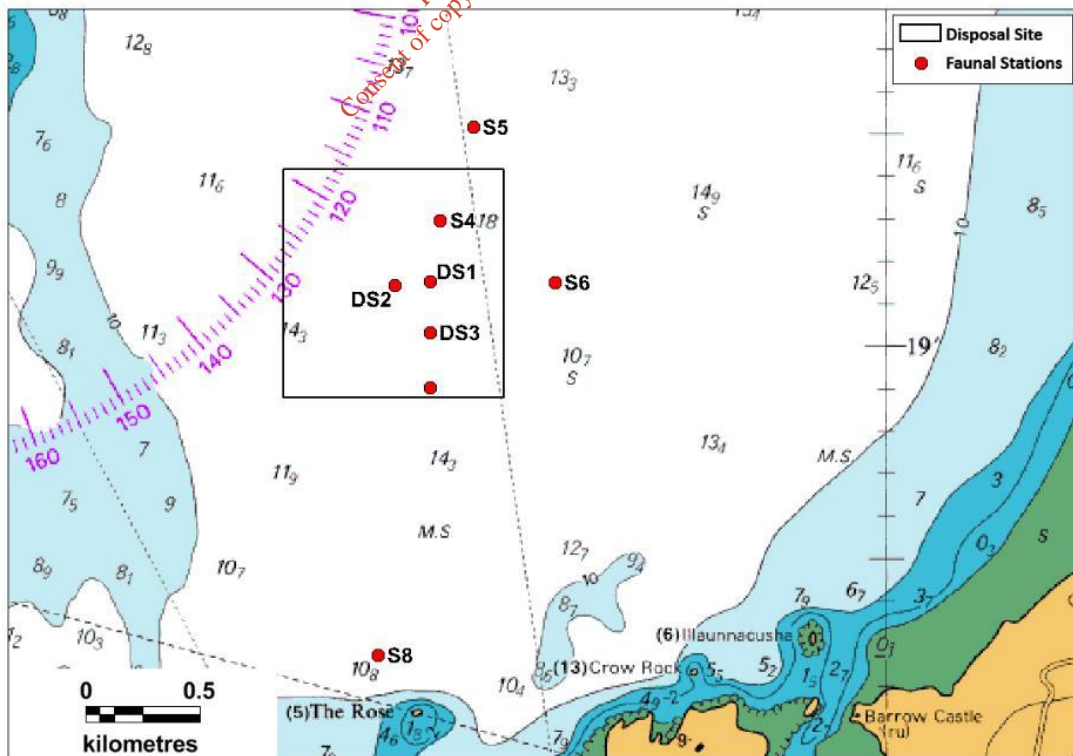


Figure 2. Location of faunal stations sampled in November 2017 (AquaFact, 2018)

3.3.4.2 Granulometry and Organic Carbon Sampling

At the same time as benthic faunal sampling surveys conducted in November 2017, an additional sample was collected at all 8 stations for grain size analysis and organic carbon content. Organic carbon by Loss on Ignition for the faunal samples was carried out by ALS Labs in Loughrea. AquaFact carried out the particle size analysis and moisture and density content analysis (AquaFact, 2018).

With regards to baseline characterisation of the dumpsite, AquaFact International Services Ltd. carried out the baseline study for the same dumpsite for the 2015 dredging campaign. The stations sampled for the 2015 survey were revisited. Samples were retrieved using a 0.025m² Day grab. At the laboratory all samples were sorted and identified to species level. Statistical evaluation of the faunal data was undertaken.

3.3.5 Sediment Transport Model (STM)

Sediment transport modelling has been undertaken previously by Hydro Environmental Ltd. This investigated a proposed dredge disposal site for dredge spoil from Fenit Harbour Co. Kerry. The objective of this study was to identify where suspended dredge material would disperse to from the dredge disposal site during the disposal and thereafter (AquaFact, 2014). The software which was utilised to undertake the sediment transport modelling was the TELEMAC system and specifically the Telemac-2D hydrodynamic module, the software of choice for modelling the complicated hydrodynamics of Tralee Harbour and Approaches. TELEMAC is a software system designed to study environmental processes in free surface transient flows. It is therefore applicable to seas and coastal domains, estuaries, rivers and lakes. Its main fields of application are in hydrodynamics, water quality, sedimentology and water waves (AquaFact, 2014).

The hydrodynamics from Telemac are determined for a 50-day period covering nearly two lunar spring and neap tidal cycles and inputted to a STM PSED. PSED is a Lagrangian particle tracking model for simulating non-cohesive sediments developed by the Canadian Hydraulics Centre. PSED simulates the transport of both suspended and bed load of a variety of non-cohesive sediment types from fine silts and sands to coarser sands and gravels. The model computes the mobility, entrainment, advection, dispersion and settling of sediments under steady and unsteady flows (AquaFact, 2014). A 2-dimensional depth averaged hydrodynamic model of Fenit Harbour, Tralee bay and the Atlantic from head of the Dingle Peninsula to Kerry Head and extending 30km offshore was developed to model the tidal hydrodynamics and sediment transport (see Figure 3 below).

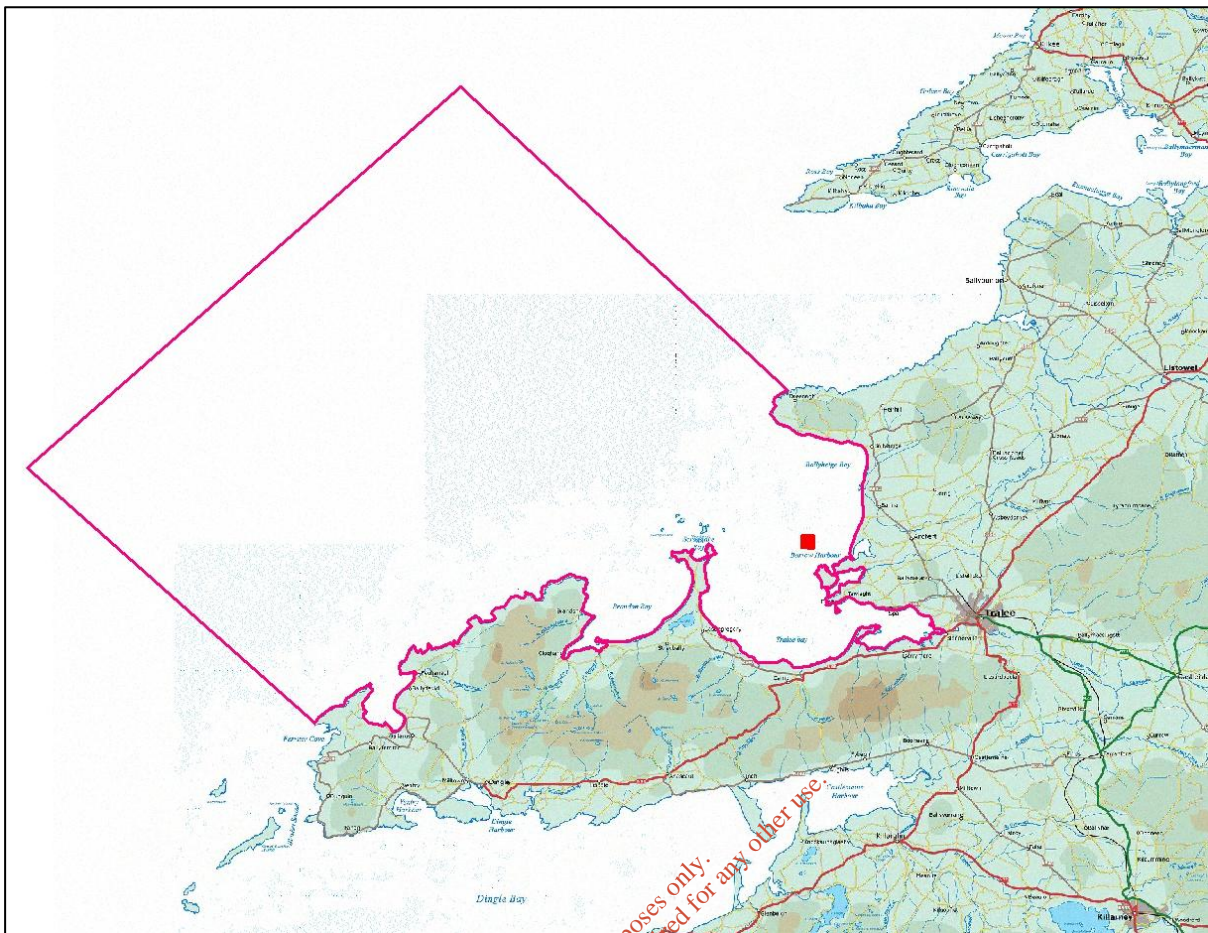


Figure 3. Extent of Hydrodynamic Model (Aquafact, 2014)

3.3.6 Assessment of Risk to Marine Mammals

A risk assessment of the proposed works to marine mammals was carried out by the Irish Whale and Dolphin Group (IWDG) based on a review of available literature and data sources. Maps of the distribution of cetacean sightings within the Tralee Bay region were prepared using data from the IWDG sightings database (O'Brien & Berrow, 2017).

3.4 SCREENING FOR APPROPRIATE ASSESSMENT

As set out in the NPWS guidance, the task of establishing whether a plan or project is likely to have an effect on a Natura 2000 site is based on a preliminary impact assessment using available information and data, including that outlined above, and other available environmental information, supplemented as necessary by local site information and ecological surveys (DoEHLG, 2009). This is followed by a determination of whether there is a risk that the effects identified could be significant. The precautionary principle approach is required.

Once the potential impacts that may arise from the proposal are identified the significance of these is assessed through the use of key indicators:

- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species
- Water quality and resource

4 SCREENING FOR APPROPRIATE ASSESSMENT

Screening for Appropriate Assessment (Stage 1) determines the need for a full Appropriate Assessment (Stage 2) and consists of a number of steps, each of which is addressed in the following sections of this report:

- Establish whether the proposal is necessary for the management of a Natura 2000 site
- Description of the project (Fenit Maintenance Dredging)
- Identification of Natura 2000 sites potentially affected
- Identification and description of individual and cumulative impacts of the project
- Assessment of the significance of the impacts on the integrity of Natura 2000 sites
- Conclusion of screening stage

4.1 MANAGEMENT OF NATURA 2000 SITES

The proposal is not connected with or necessary to the conservation management of a Natura 2000 site.

4.2 DESCRIPTION OF PLAN/PROJECT

4.2.1 Brief Project Description

This project involves the excavation of sediment from the seabed, termed maintenance dredging, at Fenit Harbour, a commercial shipping port. Dredging is an activity carried out by a dredge, which removes material from the sea bed and deposits it elsewhere. Dredged material will be transported to outer Tralee Bay to a proposed dumpsite (used previously in the 2016 dredge campaign)(See Section 4.2.3 and 4.2.4 below for location of proposed dredge area and dump-site). Please refer to Planning Drawings.

A foreshore licence (FL) application for consent under the Foreshore Act for dredging at the harbour and dumping operations at the dumpsite in 2020 will be sought from the Department of Housing, Planning and Local Government (DHPLG). A separate FL consent will be required from the DHPLG for each dredging event undertaken during the eight year dredge campaign (2020 – 2027). A Dumping at Sea (DaS) permit application to dispose of the material at the proposed dumpsite will be sought from the Environmental Protection Agency (EPA) under the Foreshore and Dumping at Sea (Amendment) Act 2009. The previous DaS licence expired in October 2016. The current DaS permit application pertains to an eight year dredge campaign (2020 – 2027) with dredging to take place on an annual basis.

4.2.2 Purpose of the Project

Maintenance dredging is required to deepen or maintain navigable channels, which are at risk of becoming silted over time due to the transport of suspended sediments into the sheltered waters of the harbour, that in turn deposit on the seabed. The project will increase the navigability of Fenit Harbour and thereby reduce the associated safety concerns for commercial ships and boats.

4.2.3 Description of the Dredge Site (Fenit Harbour and Marina)

4.2.3.1 Site Location and Land Use

The site is located on the west coast of Ireland, in County Kerry on the northern side of Tralee Bay. The bay is sheltered from the Atlantic by the Maharee tombolo, which extends northwards from the Dingle Peninsula. Fenit Harbour and Marina is located about 10km west of Tralee Town, just south of the mouth of the Shannon Estuary (Lat 52°16'N Long 9°52'W). The village of Fenit lies north of the harbour. A location map of the site is presented in Figure 4 below.



Figure 4. Location of Fenit Harbour

A 400 m long causeway and viaduct connects the site to the village. The footprint of the existing harbour and marina is 7ha. From the viaduct the fishing quays stretch south to the rocky outcrop that is Samphire Island and turns east to the newer commercial shipping quays and spur/spring pier. The marina area is located within the shelter of the rubble mound breakwater to the northeast of the site. A plan of the existing site is given in Figure 5 below.

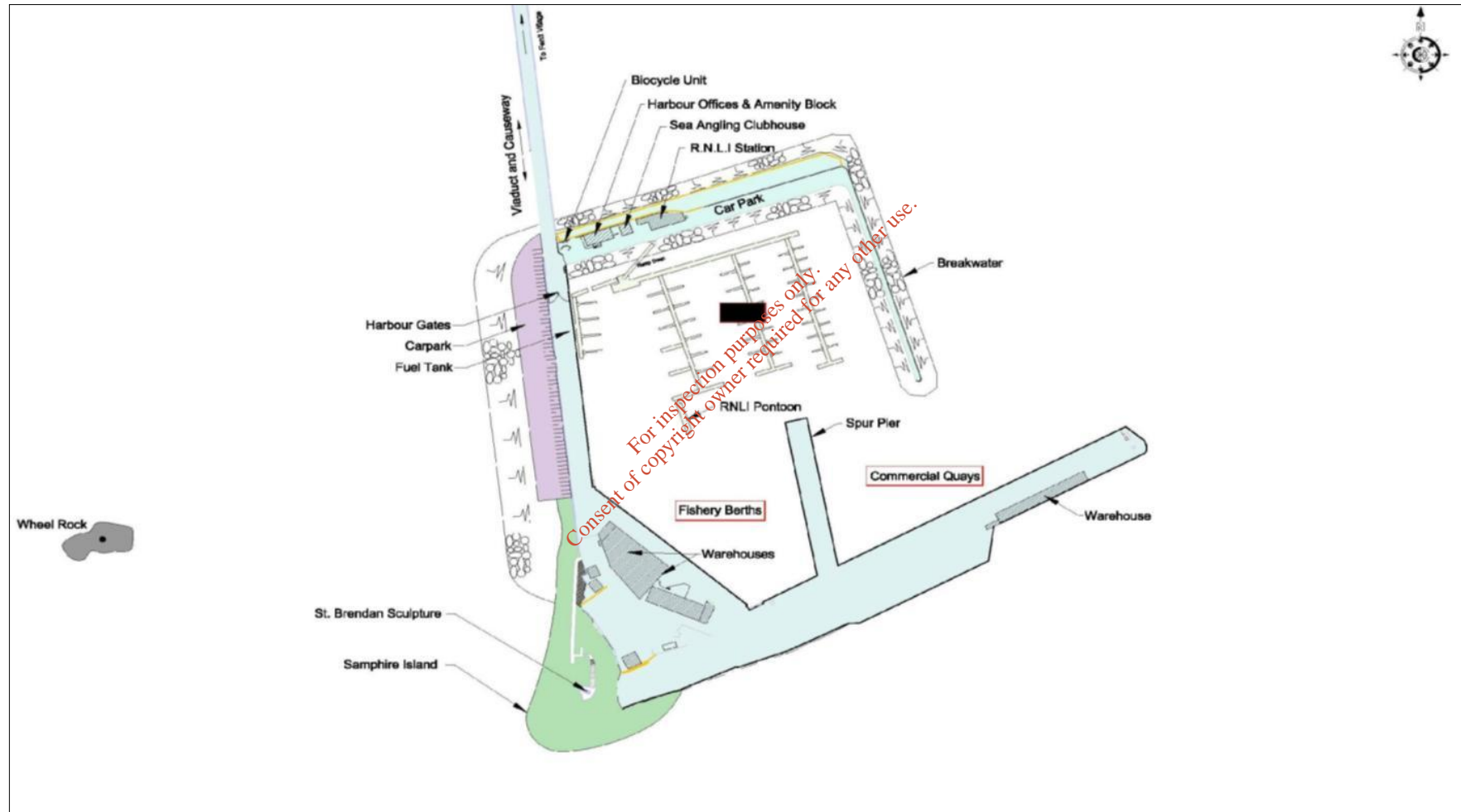


Figure 5. Plan of Fenit Harbour

Land use in the vicinity of the harbour on the mainland includes agricultural, recreational, residential, commercial and open space. The harbour is approximately 500m south of Fenit village. The land directly to the north of the proposed expansion is primarily amenity, residential and open space. The Fenit blue flag beach is located to the northwest of the site and is an important amenity area for the local community. A further stony beach is located to the northeast of the site

Fenit is the most westerly commercial port in Ireland and is the only commercial port between Foynes and Cork. It is used for commercial shipping, servicing a domestic fishing fleet, as well as leisure, amenity and lifesaving. The main deep sea pier is 175m long with extensive storage facilities available. The landing quays have a design dredge depth of -7.5mCD. Fenit Harbour is an important logistical base for the Killarney based Liebherr cranes. The commercial shipping quays facilitate 15,000 tonne ships of container cranes of a frequency of approximately 15 to 20 per annum. Currently, the fishing fleet operating out of Fenit includes approximately 1 large trawler, 2 medium trawlers and 24 half-decker trawlers in addition to a number of charter sea angling vessels. Fenit Marina was built in 1997 and has a 130 berth marina and caters to leisure craft from 6m to 15m in length. It has a plan area of approximately 1.5ha. The marina has a design dredge depth of -3.5mCD. The existing marina berths facilitate leisure craft during the peak summer months and a mixture of both fishing and leisure in the off-season.

Tralee Bay is sheltered from Atlantic waves by the Dingle Peninsula to the south and the Maharees Peninsula to the west. Wave action and tidal currents enter the Bay from the north. Tidal currents, filling the bay under flood tide, sweep past the harbour in a west to east direction. On the ebb, relatively strong currents approach the harbour from the east. The currents are strong enough to move considerable volumes of sediment in the vicinity of the harbour. Tidal currents and the nature of the seabed result in large volumes of sediment being moved around the bay.

Both the commercial berth and marina dredge areas are encompassed within the Tralee Bay and Magharees Peninsula, West to Cloghan SAC (002070).

4.2.3.2 Bedrock geology and coastline to the north of Dredge Site

Fenit Harbour is situated on the northern shore of Tralee Bay, north of the Dingle Peninsula. According to Geological Survey of Ireland (GSI) mapping and supporting data the Dingle Peninsula which makes up the southern shore of the bay is a syncline of Devonian Sandstone with Namurian Sandstone on its flanks. In addition, the GSI map indicates that Tralee Bay is underlain with Carboniferous Limestone as is the Tralee area with the hills to the west consisting of Namurian sandstone.

The Carboniferous Limestone outcrops within the harbour at Samphire Island. Geotechnical investigations undertaken in 1996 indicate that the rock dips away under the surrounding overburden which forms the bed of the harbour and nearby area. The existing harbour was constructed on the rock of Samphire Island with an original L-shaped pier extending north and east-northeast of the rocky outcrop. The north oriented leg of the harbour is connected to the mainland via a piled viaduct and causeway. The shore to the north of the harbour consists of a glacial till cliff to the northeast and a short sandy beach to the northwest. Further west the beach merges into a rocky foreshore. The shore immediately east of the viaduct consists of a rock cliff becoming a glacial till cliff further east. Fronting the glacial till cliff is a layer of sand, gravel and cobbles overlying an eroded

platform in the till. The shoreline at Fenit comprises sandy beach, rocky shore and cobble and gravel shingle.

4.2.3.3 Bathymetry of Dredge Site

A bathymetry survey of the proposed dredge site was conducted by Hydrographic Services Ltd in 2018 (Refer to application drawings 18598-5003A and 18598-5007A). The bathymetry survey indicates that depths are variable throughout the dredge area and that there is an accumulation of sediment in all parts of the harbour including the navigational channel since the last maintenance dredge of this area in 2016.

The survey indicates depths within the Marina (Area A) range from -1.9mCD to -3.0mCD, which is up to 1.6mCD in places from the optimum design depth of -3.5mCD. Within the commercial shipping berth and navigational channel (Area B), water depths typically range between circa -4.5mCD and -7mCD which is between 0.5 and 3mCD from the optimum design depth of -7.5mCD. The survey shows areas in the outer manoeuvring area (Area C) drying out at 1.4mCD immediately east of the eastern breakwater and due north of the main shipping pier.

4.2.3.4 Marine Sediments at Dredge Site

Previous reports and site investigations indicate that the composition of the material to be dredged is a clean sand silt gravel mix with no rock. Sediment sampling for quality analysis was undertaken at twelve locations across the harbour area including two at the fishing berth (F1, F3) and commercial berth (F6, F7). Three sampling locations were located within the marina (F2, F5, F8), with another three immediately east of the eastern breakwater (F9, F10, F12). One sampling location was located in the maneuvering area (F11) while another was in the navigation channel (F4a, moved from F4 due to hard ground). F1-F8 and F11 stations are representative of the dredge area sediment quality while locations F9-F12 are representative of the edge of the backslope dredge areas (see Figure 1 above).

There are no current or historic heavy industries, boat building or repair associated with Fenit Harbour. The principal sources of pollutants within the harbour would be hydrocarbons associated with vessels, machinery and equipment. The sediments from the harbour area were classified as muddy sand throughout by Folk (1954), being dominated by silt-clay and very fine sand for the most part.

Arsenic values were below the lower guidance level of 9 mg kg^{-1} at stations 9 and 12 while all others exceeded the lower guidance level, ranging from 9.8 mg kg^{-1} to 18.6 mg kg^{-1} . None of the sampling stations exceeded the upper Irish action level for arsenic, or the U.S. probable effects level (PEL) used for biological effects guidelines of 41.6 mg kg^{-1} (Cronin *et al.*, 2006). Arsenic can be naturally present in marine sediment and in some locations natural levels of arsenic can exceed the upper value of 70 mg kg^{-1} (Aquafact, 2018).

Nickel was below the lower guidance level at four stations (4, 9, 10 and 12) while nickel levels exceeded the lower Irish action level of 21 mg kg^{-1} for the remaining eight sampling stations for sediment quality, namely F1, F2, F3, F5, F6, F7, F8 and F11. None of the sampling stations exceeded the upper Irish action level for nickel of 60 mg kg^{-1} , or the U.S. probable effects level (PEL) used for biological effects guidelines of 42.8 mg kg^{-1} (Cronin *et al.*, 2006).

Zinc was below the lower guidance level at all stations except station 1, which was above the lower guidance level of 160 mg kg^{-1} . None of the sampling stations exceeded the upper Irish action level for zinc of 410 mg kg^{-1} , or the U.S. probable effects level (PEL) used for biological effects guidelines of 271 mg kg^{-1} (Cronin *et al.*, 2006). Station 1 lies outside the proposed dredge area.

Copper was below the lower guidance level at all stations except station 1, which was above the upper guidance level. A copper concentration of 263 mg kg^{-1} was recorded for sampling station 1 which exceeds the upper Irish guidance level of 110 mg kg^{-1} (Aquafact, 2018). This also exceeds the U.S. probable effects level (PEL) used for biological effects guidelines of 108 mg kg^{-1} (Cronin *et al.*, 2006). Station 1 lies outside the proposed dredge area.

Cadmium, chromium, lead and mercury were all below the lower Irish action limit at all stations. See Table 1 below for the full list of parameters and results.

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Table 1. Results of sediment chemistry analysis, with reference to Irish Action Levels (Aquafact, 2018)

Parameter	Units (dry wt) ^{Note 2}	Lower Action Limit	Upper Action Limit	Sampling points							
				S1	S2	S3	S4	S5	S6	S7	S8
Arsenic	mg kg ⁻¹	9	70	18.6	18.6	18	10.8	16.5	18.4	16.7	15.6
Cadmium	mg kg ⁻¹	0.7	4.2	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.6
Chromium	mg kg ⁻¹	120	370	62.6	54.9	53.6	40.1	52.1	54.7	53.8	54.9
Copper	mg kg ⁻¹	40	110	263	31.4	18.2	18	19.3	20.5	30.3	18.8
Lead	mg kg ⁻¹	60	218	49.8	22.9	21.6	15.9	21.8	22.9	26.1	21.9
Mercury	mg kg ⁻¹	0.2	0.7	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05
Nickel	mg kg ⁻¹	21	60	28.2	26.5	27.3	20.4	26.6	27.5	27	28.7
Zinc	mg kg ⁻¹	160	410	205	118	146	68.7	82.6	87.9	106	89
Σ TBT & DBT ^{Note 3}	mg kg ⁻¹	0.1	0.5	<0.002	<0.002				<0.002		<0.002
γ-HCH (Lindane) ^{Note 4}	μg kg ⁻¹	0.3	1	<0.1	<0.1				<0.1		<0.1
HCB ^{Note 5}	μg kg ⁻¹	0.3	1	<0.1	<0.1				<0.1		<0.1
PCB (individual congeners of ICES 7) ^{Note 6}	μg kg ⁻¹	1	180	<0.08	<0.08				<0.08		<0.08
PCB 028	μg kg ⁻¹			<0.08	<0.08				<0.08		<0.08
PCB 052	μg kg ⁻¹			<0.08	<0.08				<0.08		<0.08
PCB 101	μg kg ⁻¹			<0.08	<0.08				<0.08		<0.08
PCB 138	μg kg ⁻¹			<0.08	<0.08				<0.08		<0.08
PCB 153	μg kg ⁻¹			<0.08	<0.08				<0.08		<0.08
PCB 180	μg kg ⁻¹			<0.08	<0.08				<0.08		<0.08
PCB 118	μg kg ⁻¹			<0.08	<0.08				<0.08	<0.08	
PCB (Σ ICES 7) ^{Note 6}	μg kg ⁻¹	7	1260	<0.56	<0.56				<0.56		<0.56
PAH (Σ 16) ^{Note 7}	μg kg ⁻¹	4000		411.10	391.30				288.30		421.30
Total Extractable Hydrocarbons	g kg ⁻¹	1.0		0.158	0.107				0.099		0.15

*Note: Sample station 1 is outside the proposed dredge area

Parameter	Units (dry wt) Note 2	Lower Action Limit	Upper Action Limit	Sampling points			
				S9	S10	S11	S12
Arsenic	mg kg ⁻¹	9	70	7.9	9.8	13.9	7.9
Cadmium	mg kg ⁻¹	0.7	4.2	0.4	0.4	0.5	0.3
Chromium	mg kg ⁻¹	120	370	32.7	40.7	51.1	29.4
Copper	mg kg ⁻¹	40	110	11.8	14.1	36.9	13
Lead	mg kg ⁻¹	60	218	11.5	15.4	27	9
Mercury	mg kg ⁻¹	0.2	0.7	0.02	0.03	0.05	0.02
Nickel	mg kg ⁻¹	21	60	16.1	20.2	23.7	14.3
Zinc	mg kg ⁻¹	160	410	52.5	61.6	149	47.5
Σ TBT & DBT Note 3	mg kg ⁻¹	0.1	0.5	<0.002		<0.002	
γ-HCH (Lindane) Note 4	μg kg ⁻¹	0.3	1	<0.1		<0.1	
HCB Note 5	μg kg ⁻¹	0.3	1	<0.1		<0.1	
PCB (individual congeners of ICES 7) Note 6	μg kg ⁻¹	1	180	<0.08		<0.08	
PCB 028	μg kg ⁻¹			<0.08		<0.08	
PCB 052	μg kg ⁻¹			<0.08		<0.08	
PCB 101	μg kg ⁻¹			<0.08		<0.08	
PCB 138	μg kg ⁻¹			<0.08		<0.08	
PCB 153	μg kg ⁻¹			<0.08		<0.08	
PCB 180	μg kg ⁻¹			<0.08		<0.08	
PCB 118	μg kg ⁻¹			<0.08		<0.08	
PCB (Σ ICES 7) Note 6	μg kg ⁻¹	7	1260	<0.56		<0.56	
PAH (Σ 16) Note 7	μg kg ⁻¹	4000		104.20		809.60	
Total Extractable Hydrocarbons	g kg ⁻¹	1.0		0.061		0.11	

*Note: Sample station 1 is outside the proposed dredge area

	Exceed Lower Irish Action Limit
	Exceed Upper Irish Action Limit

- Note 1:** Applicants should highlight in Table B.1 any results which exceed either the upper or lower Irish action levels. Action levels are published in: *Cronin et al. 2006. Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters. Marine Environment & Health Series, No. 24. Marine Institute.*
- Note 2:** Total sediment <2 mm
- Note 3:** Sum of tributyl tin and dibutyl tin
- Note 4:** 1 α ,2 α ,3 β ,4 α ,5 α ,6 β -hexachlorocyclohexane
- Note 5:** Hexachlorobenzene
- Note 6:** ICES 7 polychlorinated biphenyls: PCB 28, 52, 101, 118, 138, 153, 180.
- Note 7:** Polyaromatic hydrocarbons (measured as individual compounds): Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenzo(ah)anthracene, Benzo(ghi)perylene, Indeno(123-cd)pyrene.

Based on the results, all sediment samples, except at sampling station 1, can be placed into Class 2 (Aquafact, 2018). Class 2 sediments hold contaminant concentrations between Level 1 and Level 2 and are considered marginally contaminated (Cronin *et al.*, 2006). Due to an elevated concentration of copper at sampling station 1 (263 mg kg⁻¹), which exceeds the upper Irish guidance level, this sediment can be categorized as Class 3. Class 3 sediments are those above Level 2 and are considered heavily contaminated and very likely to cause biological effects (Cronin *et al.*, 2006). However, sampling station 1 is located outside the proposed dredge area, as shown in Figure 1, and so will not be subject to dredging activity carried out as part of the proposal.

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4.2.3.5 Benthic Ecology at Dredge Site

In 2009 Aqua-Fact undertook benthic survey work at 10 sampling stations in and around Fenit Harbour to inform the Fenit Harbour and Marina Expansion project. The western part of the inner harbour area (grab Stations S1 and S2) was dominated by fine muds (>98% silt-clay content). Only three species were recorded in any appreciable numbers in this area but numbers were still low when compared to the stations outside the harbour. *Nephtys hombergii* and nemerteans dominated here. The harbour entrance area (grab Stations S3) was dominated by silt-clay, with Stations S4 and S6 dominated by sandy mud. All stations had a poor species assemblage with *Nephtys hombergii* dominated each site.

The area east of the harbour was relatively homogenous consisting of sandy mud formed into small wavelets by the action of the tidal currents. Further east, areas of compact clay formed large shallow mounds on the bottom. Apart from drift algae, no flora or fauna was observed. Faunal grab station S4 revealed the dominance of the infaunal polychaete *Nephtys hombergii* in this location along with the bivalve molluscs *Abra nitida* and *Nucula nucleus*. The community here was consistent with the SS.SMU Sub-littoral cohesive mud and sandy mud community biotope.

4.2.4 Description of Dumpsite

4.2.4.1 Site Location and Land Use

The dumpsite is located approximately 3km west of the coast at Carrahane Lower townland and approximately 1.5km north-northwest of Fenit Island in the outer part of Tralee Bay. It lies between 1.5km to 2.5km south and southeast of Illaunnabarnagh and Mucklaghmore Islands, which are essentially small rocky outcrops. The seabed in the general surrounds is classified as sand and muddy sand with reefs located over 1km to the northwest.

The boundary extents of the dumpsite are square in shape with each side measuring 1km giving a total area of 100ha (see Figure 6 below). Tidal currents are generally low at the dump site. The current largest velocities occur at mid ebb and mid flood with magnitudes ranging from 0.2 to 0.3 m/s. The proposed dump site was selected as a suitable location after consultation with a number of stakeholders in the area as well as conforming to navigational safety of the port authority.

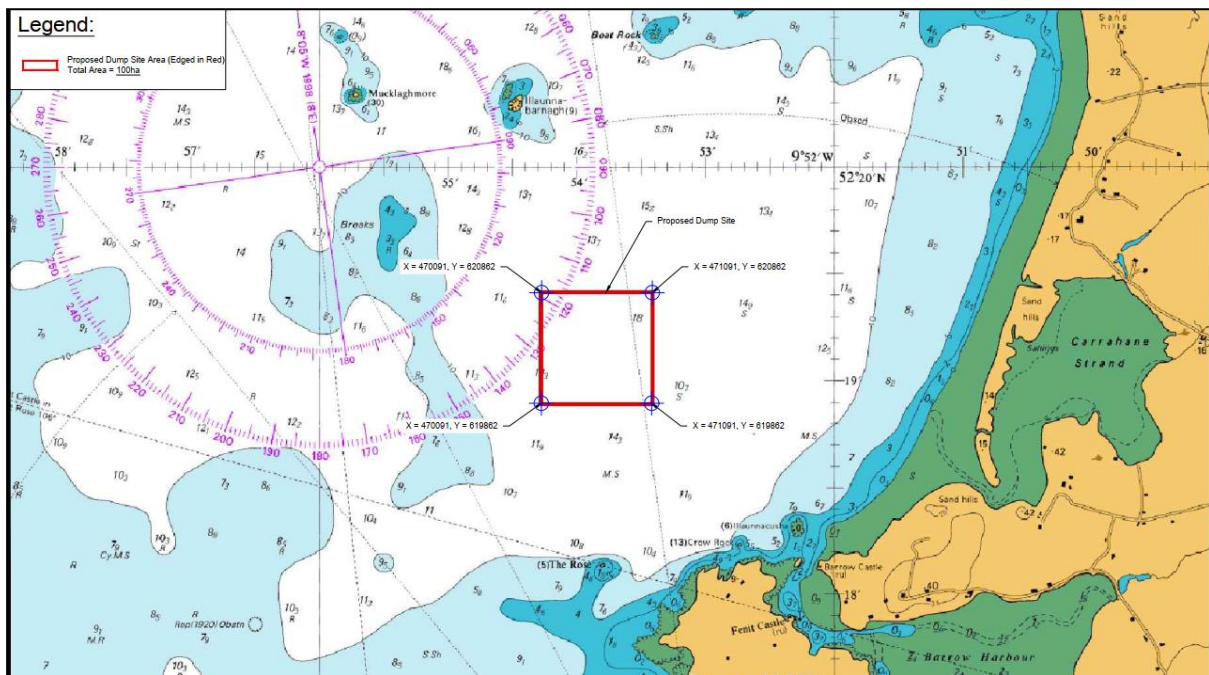


Figure 6. Dumpsite location in outer Tralee Bay

4.2.4.2 Bedrock geology at Dumpsite

The GSI map indicates that Tralee Bay is underlain with Carboniferous Limestone as is the Tralee area.

4.2.4.3 Bathymetry at Dumpsite

The bathymetry survey conducted by Hydrographic Services Ltd indicates that depths in the dumpsite range between 16.4m and 19.6m and outside the dumpsite range from 13.7m to 19.1m.

4.2.4.4 Marine Sediments at Dumpsite

The sediment type in the disposal site consists of fine/medium sand, coarse/medium sand, gravelly coarse sand and sandy gravel. Areas of hard ground occur in the western half. Very fine sands dominate just over 1km south of the dumpsite. Fine/very fine sand dominates to the east of the dumpsite and gravelly coarse/very coarse sand dominates to the north. All sediments were classified as sand, gravelly sand or sandy gravel by Folk (1954). Silt-clay fractions were low throughout (<10%).

4.2.4.5 Benthic Ecology at Dumpsite

The habitat in the area of the dumpsite can be described (according to Fossitt, 2000) as *SS1 Infralittoral gravels and sands*. Variation in community type and dominant species between the stations was evident. These local variations are common in the natural environment. All species observed are typically of the gravelly/sandy habitat in the area. The species present represent a balanced mix of longer lived deeper burrowing equilibrium species and smaller shorter lived opportunistic species. Some of the main dominants of the assemblage include the bivalve *Spisula subtruncata* and the polychaetes *Magelona johnstoni*, *Nephtys* sp. and *Syllis pontxioi* (Aquafact, 2018).

4.2.5 Characteristics of the Project

4.2.5.1 Requirement for Maintenance Dredging

Fenit Harbour acts as a barrier within the bay, reducing and impeding flow, thus interrupting the natural hydrodynamics of the area. This contributes to an ongoing accumulation of material within the commercial berth and the inner harbour area and hence the requirement for routine maintenance dredging. Historically, this has been done in a 3 or 5 year cycle depending on whether dredging is required in the commercial shipping berth or inner marina harbour area. The first and only capital dredging operation was undertaken in 1995/6 to develop the new marina, spring pier and breakwater, and to provide sufficient navigation depth for fishing vessels, yachts and commercial shipping during all tides. The volume of capital dredging in 1996 amounted to 200,000m³ of material. Following this dredging operation the optimum design depths were a minimum of -3.5mCD for the inner harbour and marina area, -7.5mCD for the commercial shipping berth and -5mCD for the shipping manoeuvre area. Since 1996 maintenance dredging of the commercial berth was undertaken in 2000, 2003, 2008 and 2016. Material from these dredging campaigns was disposed of in the licensed site to the north of Tralee Bay.

The previous DaS licence (EPA Dumping at Sea permit no. S0007-02 and Foreshore licence no. FS 6474 issued by the Foreshore unit of the Department of Environment) covered the period of 20th October 2015 to 20th October 2016. Within that period, over 130,000 tonnes of material were dredged from the harbour over the course of ten days in April 2016. Since the area was last dredged in 2016, the area has silted up and safe navigation and berthing of commercial ships is compromised based on recent bathymetry data. Recent assessments have highlighted the need for annual dredging to avoid having to deal with excessive accumulation.

Currently, the commercial berth, which is actively used by Liebherr Crane shipping activities, is depositing sediment at a rate of approximately 2m over a 3 year period. This is considered to be a relatively rapid deposition rate. One of the reasons for such a relatively rapid accumulation rate with the commercial berth in recent years is believed to be related to the accumulation of sediment adjacent to the eastern breakwater leg. As a result it is believed that the accumulated sediment outside the breakwater at the harbour mouth is directing flow and material into the berth at a faster rate than in the past. Inadequate navigation depth leads to reduced control of ship movement and resulting safety and navigation issues. Admiralty chart shows the optimum design depths for navigation and berthing safely, however, the site as evident from the recent bathymetry data currently does not meet these.

The current application is for an eight year period for an ongoing maintenance dredging campaign requirement. The proposed works aim to remove approximately 1,000,000m³ of sediment over the 8 year period. Within this period, dredging will take place on an annual basis. The volume of material to be removed will be approximately 250,000 tonnes in 2020, decreasing to between 75,000 and 150,000 tonnes per year thereafter (see Table 2 below). These figures are the maximum dredge volumes, where actual volumes will be determined at the time by funding availability. The increase in volume of material to be removed relative to the 2015/2016 dredge campaign can be attributed to the larger dredge area which is proposed, encompassing almost the entire harbour area, as well as turning area and part of the approach channel outside the harbour. It is proposed that works will take place between February and the end of May over a 4-6 week period in 2020 and annually thereafter over a 3-4 week period.

Table 2. Approximate annual estimates of material to be removed on an annual basis (2020-2027)

Year	Area	(Tonnes)
1	B,C	250,000
2	A,B,C	100,000
3	A,B,C	150,000
4	A,B,C	75,000
5	A,B,C	150,000
6	A,B,C	75,000
7	A,B,C	100,000
8	A,B,C	100,000

As part of the proposal, material will be removed from three main areas; the inner harbour and marina area (Area A), the commercial shipping berth and navigational channel (Area B) and the outer shipping manoeuvre area (Area C) located just east of the harbour (see Figure 7 below). Area A, the inner harbour and marina, covers an area of 25,495m². Area B, the commercial shipping berth which encompasses the harbour mouth, covers an area of 44,875m². Area C which lies east of the harbour mouth comprises the shipping manoeuvre area. This area encompasses approximately 47,040m². The maintenance dredging footprint will take place within zones that have been subject to previous dredging and also in zones where dredging has not yet occurred.

**Figure 7. Proposed dredge areas within Fenit Harbour**

The maintenance dredging project will prioritise dredging adjacent to the commercial berth. The total maximum area or footprint to be dredged is 11.8ha and the total maximum volume is 1,000,000m³. These figures are the maximum dredge areas and volumes because in reality it will be funding and financial constraints that will determine the actual area and volume of maintenance dredging. Deposition rates in the marina and fishing berth are relatively slower than the commercial berth and manoeuvring area.

Once the conditioned DaS licence is in place, KCC will have to notify EPA of the next planned campaign as well as documenting and notifying OSPAR of all dredged quantities. Furthermore, KCC will have to notify the EPA of the selected dredger that will be used for the each dredging event. The FL applies to singular dredging events; therefore, KCC will need to apply to the DHPLG for each proposed dredging event.

4.2.5.2 Dredging Operation

A suction hopper dredger is the proposed primary dredging method to be used. In conjunction with the suction dredger, a plough dredger or a mechanical dredger such as a grab or backhoe may also be used where limited access for large dredging plant occurs. The suction hopper dredge will be on site for a maximum of six weeks, subject to weather and tides. The suction hopper dredger enables removal of material from the bed in a controlled fashion. This type of dredger has greater controls in terms of the accuracy of dredging and minimisation of any plumes within the water column in comparison to a back-hoe dredger. The suction hopper dredger moves in a linear defined corridor and dredges in stages. In effect it does so by a series of passes over a defined footprint area until it reaches its design depth.

One of two suction pipes descends to the bottom of the seabed with a trailing head at the end, which also serves to loosen material on the seabed. The trailing head moves across the dredge area sucking up the sediment, comparable to a large vacuum cleaner. Material is then discharged to the hopper and the material will sink while the seawater is discharged overboard.

Dredging pumps suck water through the pipes to prime them and once this is complete the pipe then begins to suck sediment. The dredging operation is fully automated and linked to satellite GPS. The area and volume of dredging is pre-programmed to an automated computerised system. Sensors estimate the area and volume of dredge material. Furthermore, cameras are placed on the boat and suction dredge. Depth is determined using sounders. The crew visually monitor during the dredging operation for any plumes or any rubbish that might damage the dredge equipment. The harbour also provides good shelter against poor weather conditions. In summary, much of the dredge operation is automated through a computer management system and thus the operation is well controlled within harbour. The use of the suction hopper dredger method and associated automation of the dredging operation is relatively clean, fast and efficient and is thus the most suitable method for sensitive sites and this is the method of maintenance dredging used in sensitive marine environments such as the Shannon Estuary, Port of Cork and Dublin Port, and has also been used in past dredging campaigns at Fenit.

As the dredger progresses it fills its on-board storage bay. When full the dredger then steams to the dumpsite location. Once there the location within the footprint of the dumpsite is recorded and the dredger opens its sea doors that close the hopper and deposit the excavated silt material onto the seabed. The position over which the dredger deposits each load and the deposited volume is recorded.

Once the dredger is finished the disposal process it then steams back to port and recommences the dredging operation. This process is repeated until such time as all material is removed and the design depths are achieved. A bathymetry survey is then undertaken to confirm dredge depths. Deposition is undertaken at optimum times of the tide, within good weather windows. Visual monitoring of the plume at the deposition site is undertaken as part of normal good practice.



The dredging period is limited to February-May and will take place over a four to six week period in the initial year, reducing to a three to four week period in each subsequent year of the campaign. The inner Tralee Bay area due east of the harbour has an area designated for shellfish, which in this case is the native oyster. Accordingly, any potential impact on the shellfish areas has to be avoided or minimised. Therefore, the dredging must avoid the oyster spatting (settlement and recruitment of larvae) period between June and July and ideally the oyster harvesting period between November and end of January/early February due to relatively heavy use of the harbour during this time. The summer leisure period will also be avoided. Once dredging operations are completed a full report of the volumes removed and deposited at the dump site will be produced following a bathymetry survey. This will also include drawings and details presenting the dump footprint, its co-ordinates and the volumes deposited.

4.2.5.3 Dredge material

The characteristics of the dredge material have been described in Section 4.2.3.4 above.

4.2.5.4 Selection of Dumpsite

The dump site which is proposed to be used for the deposition of all material dredged under the current proposed eight year dredge campaign is the same dumpsite as previously used for the previous 2016 campaign (see Figure 6). The western half of the dumpsite overlaps with two dumpsites where dredged material was dumped between 1996 and 2003. A further historic dumpsite occurs approximately 0.5km west of Fenit Island where dredged material was dumped between 1985 and 1996.

A Dump Site Selection Report for the selected dumpsite was completed by Malachy Walsh and Partners in 2015, prior to the 2016 dredge campaign, where alternative sites were examined in a systematic manner. This report provides detail on the criteria for dumpsite selection, consultation

and the staged and iterative process involved in the selection process. Some of the characteristics for selecting the dumpsite over other sites included:

- Avoidance of shipping lanes and main navigation routes
- Avoidance of known seabed archaeological features
- Avoidance of Natura 2000 sites
- Avoidance of fishing grounds and nursery areas for fish and aquaculture
- Avoid impacts on Blue Flag beaches
- Selection of area of sea bed with reasonable depths of water
- Selection of an area of sea bed that has a suitable profile or depression
- Location that has favourable current regime
- Location that has suitable bed characteristics for receipt of dredged material
- Minimisation of impacts on benthic communities within and surrounding the dump site
- Examination of previously used dump site locations and experience with these locations

A DaS permit is required for the deposition of dredge material. Over the years a number of DaS permits were issued by the Department of Marine and Department of Environment. The last DaS permit expired in October 2016 after the most recent dredging project was completed.

4.2.5.5 Sediment Transport Model (STM)

Based on past models simulated, during the dredging operations there will be a localised increase in turbidity as there will be disturbance of silt/sand on the bed as it is removed and there will also be spill over from the hopper as it is filled. This in effect will generate a localised dredge plume in the immediate vicinity of the dredge vessel. Increases in suspended sediment will be greatest as a result of plough dredging at the dredge site.

Previous modelling shows that suspended sediment generated as a result of dredging activity moves east out of the harbour but at very low quantities with sediment suspensions rates ranging from $0.006\text{kg}/\text{m}^3$ at high water (Figure 8) to $0.03\text{kg}/\text{m}^3$ at mid flood (Figure 9).

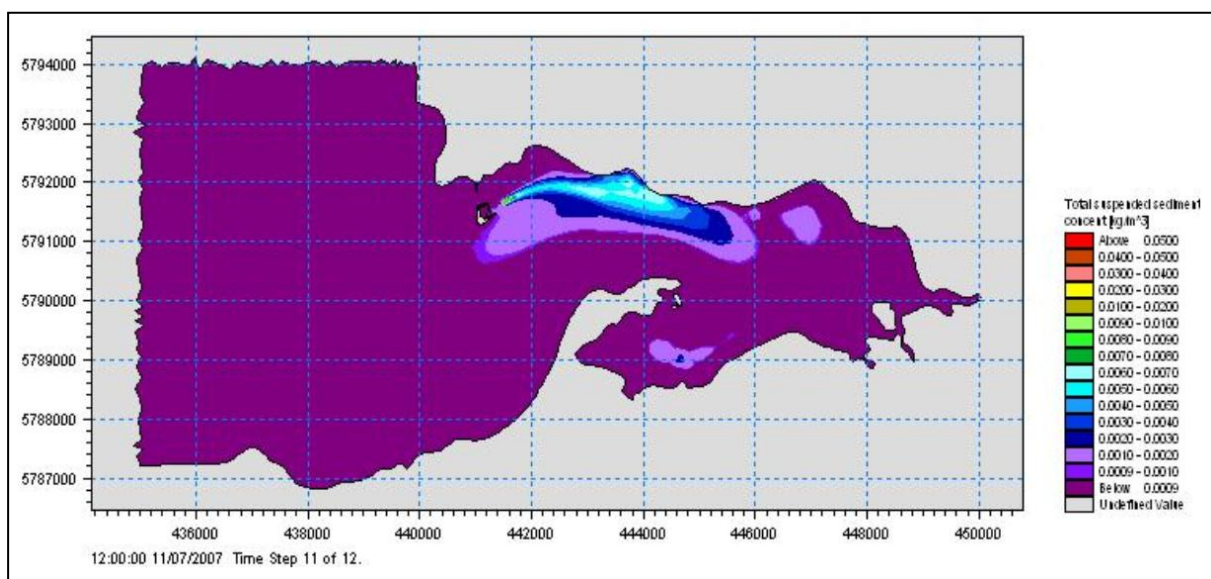


Figure 8. Suspended sediment concentration at high water after 12 days dredging

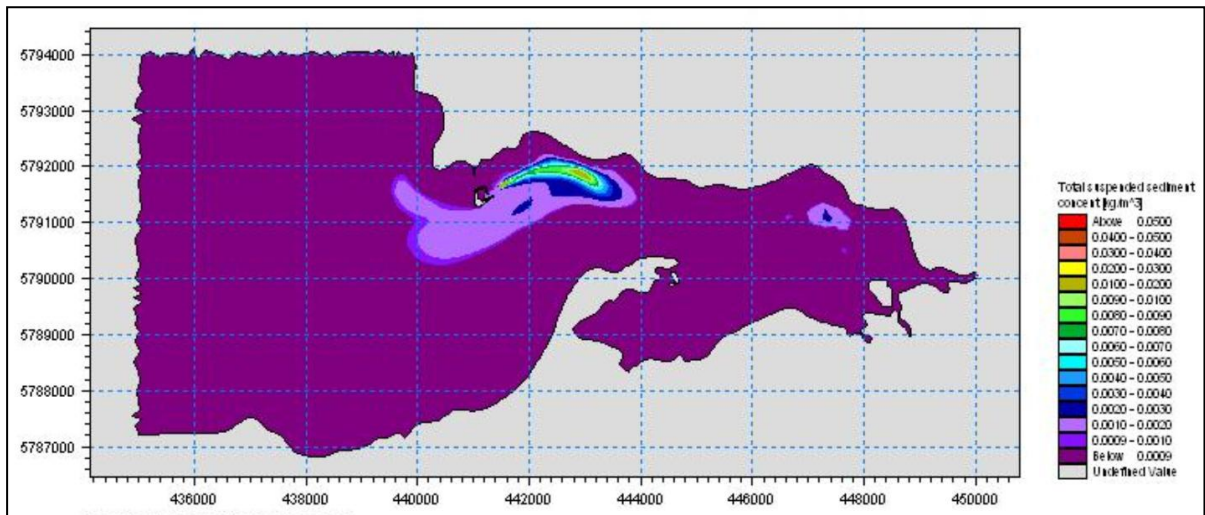


Figure 9. Suspended sediment concentration at mid flood tide after 13 days dredging

The dump site was also previously subject to extensive tidal and sediment transport modelling. Tidal currents are generally low at the dump site, which is shown as a red box in Figures 10 and 11.

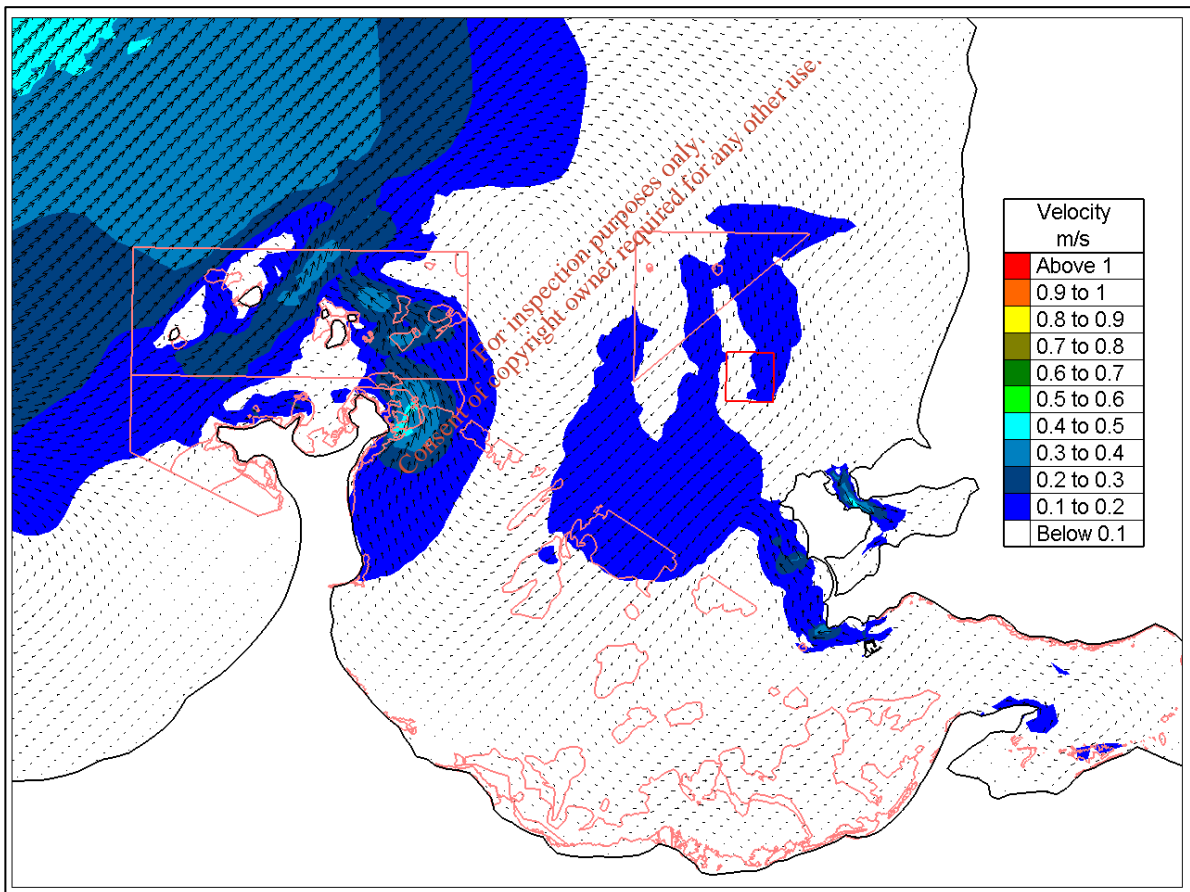


Figure 10. Computed depth averaged velocities at high water spring tide

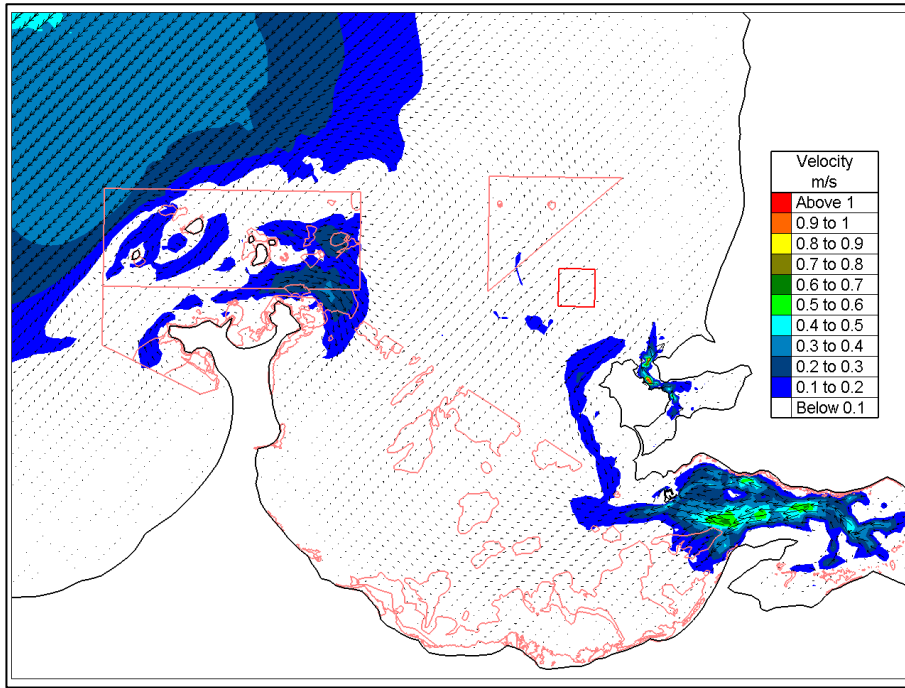


Figure 11. Computed depth averaged velocities at low water spring tide

At the dump site previous modelling was undertaken to simulate the effect of dumping with a dredge disposal rate of 5,500m³ per day. The modelling output presented here looks at the two key indicators namely total deposition and suspended sediment resulting from the disposal (Figures 12 to 15).

Over the course of these simulations it is shown that at the dumpsite the total deposition reduces from a maximum of 100kg/m² initially to a maximum of 30kg/m² in within the site. Generally the majority of the initial load is shown to remain at the site (see total deposition after 9 days of disposal (Figure 12) and after 49 days of disposal (Figure 13).

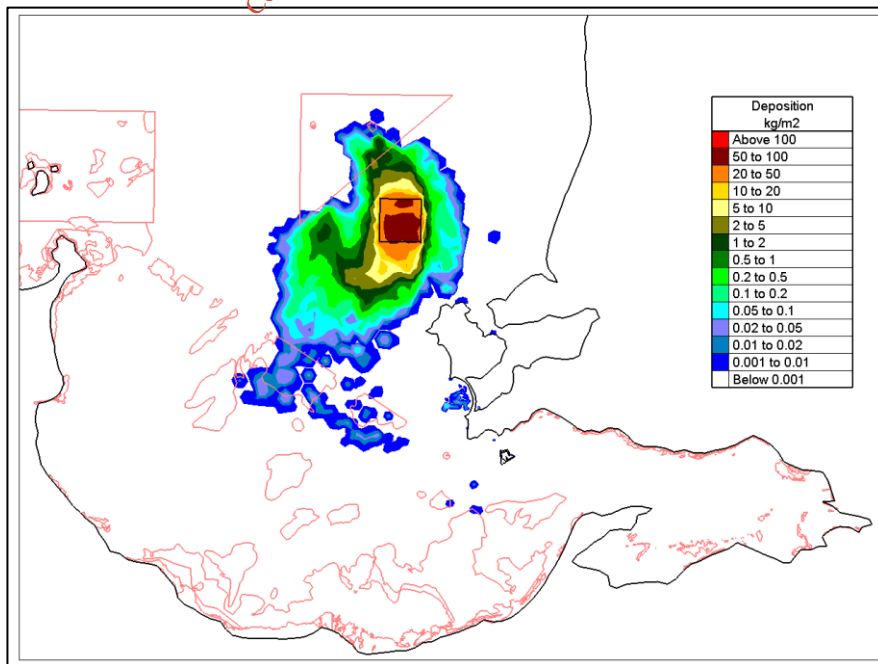


Figure 12. Total deposition of sand and silt after 9 days disposal

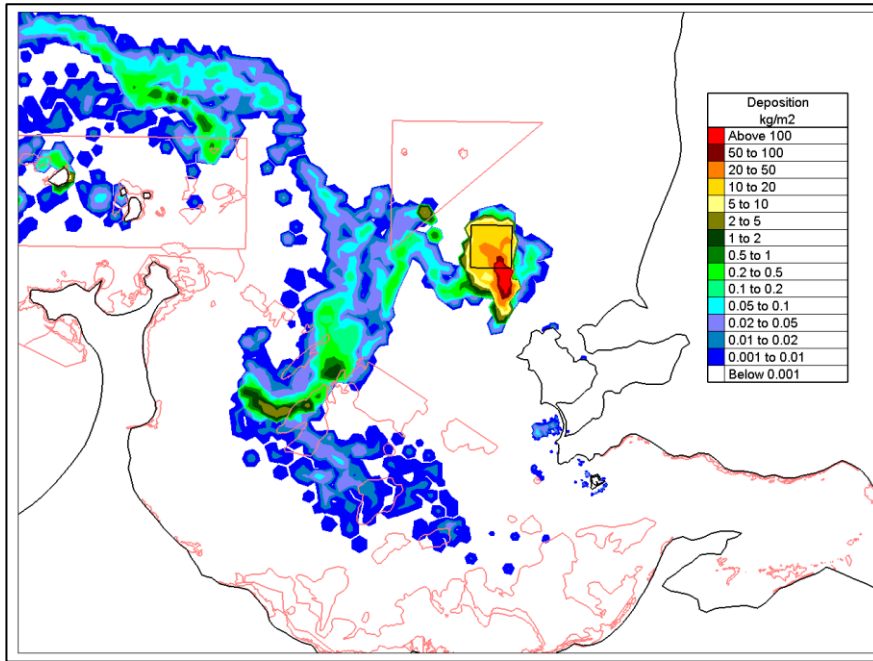


Figure 13. Total deposition of sand and silt after 49 days disposal

The suspended silt fractions released during the disposal show an interesting circulation pattern of material firstly moving south similar to the 50day trend of total load, but then migrating north-west and west (Figures 14 and 15). The maximum concentrations of suspended sediment are in the 50mg/l after 50 days. Deposition rate are less than 0.2kg/m² with highs of 3kg/m² around the max concentration locations.

It should be noted that for the proposed dredging campaign the greatest amount of dredging will be a rate of 3,000m³ per day albeit over a longer period than previously modelled. It is considered reasonable to assume that at the dumpsite approximately 2mm per m² of coarse sediments is likely to be deposited with the remaining finer silt fractions migrating offshore.

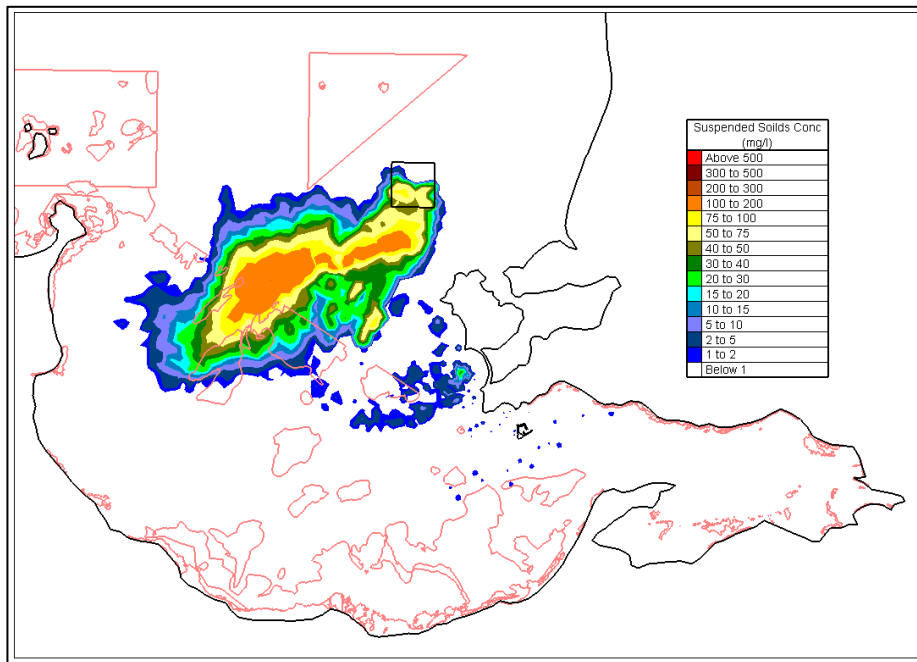


Figure 14. Silt fraction suspended solids concentration after 9 days disposal

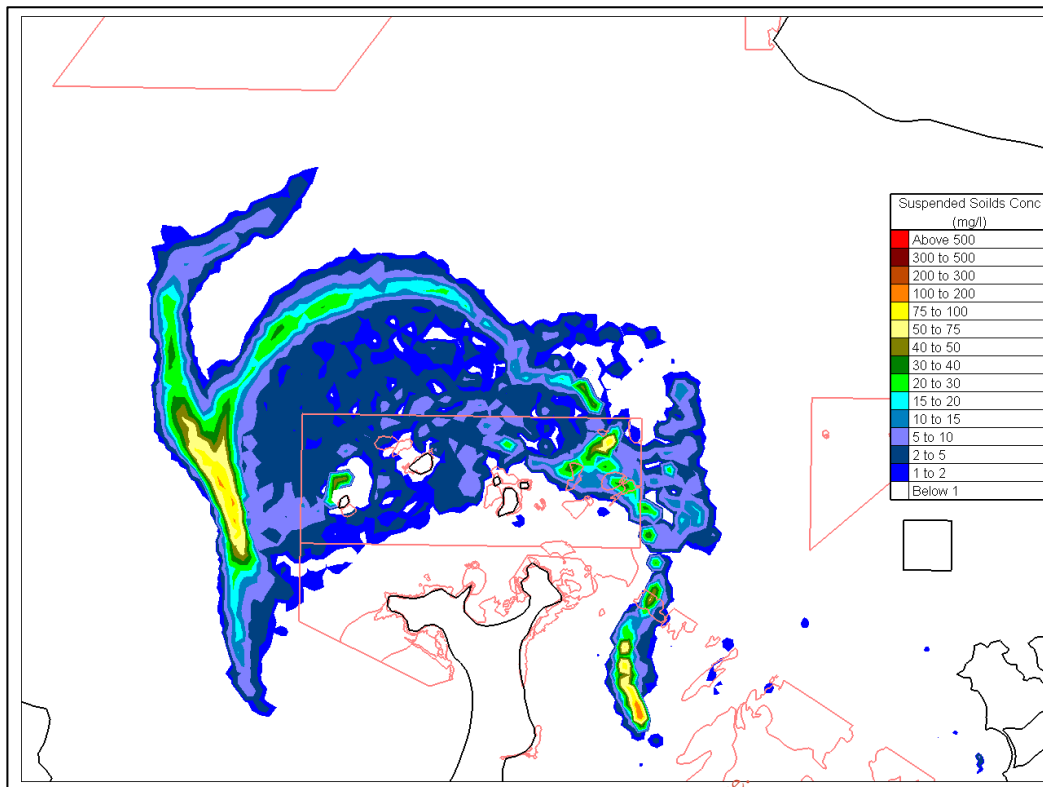


Figure 15. Silt fraction suspended solids concentration after 49 days disposal

4.2.5.6 Project Characteristics Summary

The following table provides a summary of the characteristics of the project.

<p><i>Size, scale, area, land-take</i></p>	<ul style="list-style-type: none"> - The current FL is for a singular dredge event in 2020 for 250,000 tonnes of material which will be dredged from Fenit Harbour, the harbour manoeuvring area and harbour approach channel and deposited at the dumpsite. - The current DaS application is for an eight year period (2020 – 2027) for an ongoing maintenance dredging campaign requirement on an annual cycle (see table 2 above). - The dredge material currently covers an area of 11.8ha with dredge depths of up to 3m (~2m on average).
<p><i>Details of physical changes that will take place during the various stages of implementing the proposal</i></p>	<p>Eight year DaS licence application:</p> <ul style="list-style-type: none"> - The optimum design depths are a minimum of -3.5mCD for the inner harbour and marina area, -7.5mCD for the commercial shipping berth and -5mCD for the shipping manoeuvre area. An ongoing maintenance dredging campaign will be required on an annual cycle to maintain these depths. - This material will then be disposed of at a dumpsite approximately 3km off the coast in the outer bay in annual dredging events over the 8 year period. - The dumpsite is the same dumpsite used in the previous 2015 dredge campaign. <p>FL application:</p> <ul style="list-style-type: none"> - A FL will be required for each proposed dredging event within the eight year period. A FL will also be required for the dumpsite, which addresses a maximum volume to be deposited over an eight year period. The NIS is completed in support of the current FL application only. - The current sediment depths in Area A, the inner harbour and marina, are between -1.9mCD and -3mCD. This area will be dredged to design depth of -3.5mCD. - The current sediment depths in Area B, the commercial berth, are

	<p>approximately -5mCD and this will be dredged to -7.5mCD allowing ships and boats greater draught.</p> <ul style="list-style-type: none"> - The current sediment depths in Area C, the outer manoeuvring area, are approximately -3mCD and this will be dredged to -5mCD allowing ships and boats greater draught. - This material will then be disposed of at a dumpsite approximately 3km off the coast in the outer bay.
<i>Description of resource requirements for the construction/operation and decommissioning of the proposal (water resources, construction material, human presence etc)</i>	<ul style="list-style-type: none"> - Suction hopper dredger equipped with one or two rearward extending suction pipes, dredging pumps, an overflow to discharge the water - Fuel and oils
<i>Description of timescale for the various activities that will take place as a result of implementation (including likely start and finish date)</i>	The dredging works will take place between February and the end of May annually to avoid adversely affecting oysters in the bay and summer leisure activities. The suction hopper dredger will be on site for a 4-6 week period in the initial year (250,000T) and annually thereafter over a 3-4 week period (between 75,000 and 150,000T p/a), subject to weather and tides.
<i>Description of wastes arising and other residues (including quantities) and their disposal</i>	The principal waste is the dredge material, which comprises of muddy sand dominated by silt-clay and very fine sand for the most part.
<i>Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network</i>	Parameters that lie within Class 2 are considered marginally contaminated and include arsenic, nickel and zinc. With the exception of arsenic, nickel, and zinc all other parameters are below the lower Irish action limit within the proposed dredge area.
<i>Description of any additional services required to implement the project or plan, their location and means of construction</i>	N/A

4.3 IDENTIFICATION OF OTHER PROJECTS OR PLANS OR ACTIVITIES

4.3.1 Harbour operations

Fenit harbour forms the main access point to the sea for various water based activities, including commercial shipping, fishing, sailing, casual boating and lifesaving. Land use within the existing harbour includes commercial shipping, fishing, leisure and amenity, lifesaving and maintenance dredging.

4.3.2 Fenit Harbour and Marina Expansion Project

Planning permission for Fenit Harbour and Marina Expansion project was granted by KCC in 2010. The total proposed development will result in a 7ha expansion of the existing harbour and includes the following key elements:

- Moving and extending the existing rubble-mound breakwater eastwards of its current location
- Expanding the existing Marina into the extended harbour space. Including the provision of 210 additional berths consisting of pontoons, fingers and an access bridge and bank seat
- Sheet piled wave wall
- Expansion of the landmass on the northern side of the harbour to create space for a new boatyard and boat lift, washdown area, refuse area, and oyster landing area
- Provision of additional parking to compliment the above
- Expansion of the existing commercial pier by widening it and lengthening the existing mooring length by 20m
- Upgrading of the existing site services to compliment the proposed development
- Capital Dredging Works to facilitate the above

4.3.3 Other Current/Outstanding Grants of Planning permission

The Fenit Development Association is currently seeking a grant of planning permission in relation to the re-instatement of diving boards at Fenit Bathing Slip. The development comprises construction and installation of new diving boards, modification of existing concrete structures, and construction of new access platforms, railings and associated services.

Conditional planning permission was granted by Kerry County Council to Liebherr Container Cranes Ltd. on 30/09/2014 in relation to a development in Fenit Harbour. The permitted development involved the demolition of all existing buildings located on the Cross Quay, the construction of a new building comprising single-storey industrial hall and three-storey ancillary building, alterations to existing services and site features including relocation and integration of existing electricity sub-station¹. This project has been completed.

4.3.4 Oyster Fishing

Oysters are harvested in the months of November until the end of January/early February. Oyster fishermen harvest oysters using a dredge plough over a relatively large portion of the inner bay and within the Shellfish designated area, both of which occur approximately 0.5km east of the head of Fenit pier. The dredge is towed along the seabed by a boat and rakes up the oysters into a net causing sediment to become suspended in the water column resulting in sediment plumes. Fishermen must seek an oyster dredge licence from IFI.

¹ <http://mapping.kerrycoco.ie/PlanningEnquiryV424/MainFrames.aspx> Accessed 30/04/19

4.3.5 Diffuse and Point Sources of Pollution

Polluting substances from point (industrial pollutants, wastewater effluents, stormwater sewers) and diffuse (urban and agricultural runoff) sources associated with ongoing activities in the Tralee Bay catchment area enter the lower catchment and estuary. The following is a list of known point sources:

- Tralee WWTP, status: pass (*source: EPA*)
- Ballyheigue WWTP, status: pass (*source: EPA*)
- Fenit Septic Tank, status: fail due to lack of secondary treatment (*source: EPA*)
- Ardfert WWTP, status: fail due to lack of secondary treatment (*source: EPA*)
- Castlegregory Septic Tank, status: fail due to lack of secondary treatment (*source: EPA*)
- Two WWDL (Waste Water Discharge Licences or Certificates) occur within the bay hinterland (*source: North Kerry – Tralee Bay WMU, 2009-2015*)

An application for consent for an urban WWTP at Fenit and Castlegregory has been lodged to the EPA and KCC, respectively. This has been approved for Castlegregory WWTP.

4.4 IDENTIFICATION OF NATURA 2000 SITES

4.4.1 Likely Zone of Impact Influence

As described above, the test for the screening for Appropriate Assessment is to assess, in view of best scientific knowledge, if the development, individually or in combination with other plans or projects is likely to have a significant effect on a Natura 2000 site. If there are any significant, potentially significant, or uncertain effects, it will be necessary to proceed to Appropriate Assessment and submit an NIS. National guidance recommends that a list is compiled of all Natura 2000 sites within what is described as a 'likely zone of impact of [a] plan or project' (DoEHLG, 2009, p.32) and which may, or ultimately may not, be impacted upon by the proposal. In the case of plans it is recommended that this zone extends out for a distance of 15km (Scott Wilson *et al.*, 2006, cited in DoEHLG, 2009). With regard to projects such as the proposal considered in this report, the guidance goes on to state, as follows:

For projects, the distance could be much less than 15km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects. (DoEHLG, 2009)

The Natura 2000 sites within this 'likely zone of impact' and their qualifying features of Special Conservation Interest are identified in section 4.4.2, below, and the conservation objectives of the sites are described in accordance with the guidance. Following this, the potential impacts associated with the proposal will be identified before an assessment is made of the likely significance of these impacts. If, at the end of the screening process, it cannot be objectively concluded that no significant impacts are likely or, if screening concludes that there is uncertainty about the significance of the impacts, it will be necessary to proceed to Stage 2, Appropriate Assessment.

4.4.2 Identification of Natura 2000 Sites

Adopting the precautionary principle in identifying potentially affected European sites, it has been decided to include all cSACs and SPAs within 15km of the proposal site.

Table 3 below lists designated cSACs and SPAs within 15km or the zone of influence of the proposal site including their proximity. A map showing these designated sites in relation to the proposal is given in Appendix 3.

Table 3: Natura 2000 sites within 15km radius of proposal site

No.	Designated Site	Site Code	Proximity of dredge site to nearest point of designated site	Proximity of dumpsite to nearest point of designated site
1	Tralee Bay and Magharees Peninsula, West to Cloghane SAC	002070	Both the commercial berth and dredge areas lie within this site.	3.2km to the northeast
2	Akeragh, Banna and Barrow Harbour SAC	000332	0.8km to the southeast	1.4km to the northwest
3	Tralee Bay Complex SPA	004188	1.2km to the south, separated by Fenit neck of land, and 1.6km to the west	1.9km to the northwest
4	Slieve Mish Mountains SAC	002185	4km to the north	9.4km to the north
5	Magharee Islands SAC	002261	7.1km to the southeast	0.8km to the southeast
6	Magharee Islands SPA	004125	8km to the southeast	1.6km to the south
7	Dingle Peninsula SPA	004153	10.4km to the east-southeast	8km to the northeast
8	Mount Brandon SAC	000375	10.8km to the northeast	11.1km to the northeast
9	Castlemaine Harbour SAC	000343	12.1km to the north-northwest	17.4km to the north
10	Castlemaine Harbour SPA	004029	12.4km to the north	17.4km to the north
11	Ballyseedy Wood SAC	002112	12.9km to the west-northwest	16.4km to the northwest
12	Kerry Head SPA	004189	13.4km to the south	7.6km to the south-southwest
13	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	004161	14.9km to the southwest	16.6km to the west
14	Lower River Shannon SAC	002165	15.9km to the southeast	9.3km to the south-southeast
15	Kerry Head Shoal SAC	002263	20.4km to the southeast	14.4km to the southeast

4.4.3 Characteristics of Natura 2000 Sites

The following table lists the qualifying features of conservation interest for the cSACs and SPA sites that lie within 15km of the proposal site. Information pertaining to designated sites is from site synopses, conservation objectives and other information available on www.npws.ie².

Table 4: Natura 2000 sites with qualifying features of conservation interest

Designated Site	Qualifying features of conservation interest
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Annual vegetation of drift lines [1210]

² As of 03/08/2017

Designated Site	Qualifying features of conservation interest
	Perennial vegetation of stony banks [1220] <i>Salicornia</i> and other annuals colonizing 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] Dunes with <i>Salix repens ssp. argentea</i> (<i>Salix arenariae</i>) [2170] Humid dune slacks [2190] <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] Otter (<i>Lutra lutra</i>) [1355] Petalwort (<i>Petalophyllum ralfsii</i>) [1395]
Akeragh, Banna and Barrow Harbour SAC (000332)	Annual vegetation of drift lines [1210] <i>Salicornia</i> and other annuals colonizing 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 <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] European dry heaths [4030]
Tralee Bay Complex SPA (004188)	Whooper Swan (<i>Cygnus cygnus</i>) [A038] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Mallard (<i>Anas platyrhynchos</i>) [A053] Pintail (<i>Anas acuta</i>) [A054] Scaup (<i>Aythya marila</i>) [A062] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Lapwing (<i>Vanellus vanellus</i>) [A142] 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] Common Gull (<i>Larus canus</i>) [A182] Wetlands [A999]
Slieve Mish Mountains SAC (002185)	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030]

Designated Site	Qualifying features of conservation interest
	Alpine and Boreal heaths [4060] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] <i>Trichomanes speciosum</i> (Killarney Fern) [1421]
Magharee Islands SAC (002261)	Reefs [1170]
Magharee Islands SPA (004125)	Storm Petrel (<i>Hydrobates pelagicus</i>) [A014] Shag (<i>Phalacrocorax aristotelis</i>) [A018] Common Gull (<i>Larus canus</i>) [A 182] Common Tern (<i>Sterna hirundo</i>) [A193] Arctic Tern (<i>Sterna paradisaea</i>) [A194] Little Tern (<i>Sterna albifrons</i>) [A195] Barnacle Goose (<i>Branta leucopsis</i>) [A396]
Dingle Peninsula SPA (004153)	Fulmar (<i>Fulmarus glacialis</i>) [A009] Peregrine (<i>Falco peregrinus</i>) [A103] Chough (<i>Pyrhocorax pyrrhocorax</i>) [A346]
Mount Brandon SAC (000375)	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Trichomanes speciosum</i> (Killarney Fern) [1421]
Castlemaine Harbour SAC (000343)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] <i>Salicornia</i> and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170] Humid dune slacks [2190] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion)

Designated Site	Qualifying features of conservation interest
	<p>incanae, <i>Salicion albae</i>) [91E0] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Petalophyllum ralfsii</i> (Petalwort) [1395]</p>
Castlemaine Harbour SPA (004029)	<p>Red-throated Diver (<i>Gavia stellata</i>) [A001] Cormorant (<i>Phalacrocorax carbo</i>) [A017] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Wigeon (<i>Anas penelope</i>) [A050] Mallard (<i>Anas platyrhynchos</i>) [A053] Pintail (<i>Anas acuta</i>) [A054] Scaup (<i>Aythya marila</i>) [A062] Common Scoter (<i>Melanitta nigra</i>) [A065] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Sanderling (<i>Calidris alba</i>) [A144] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Redshank (<i>Tringa totanus</i>) [A162] Greenshank (<i>Tringa nebularia</i>) [A164] Turnstone (<i>Arenaria interpres</i>) [A169] Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346] Wetlands & Waterbirds [A999]</p>
Ballyseedy Wood SAC (002112)	<p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, <i>Salicion albae</i>) [91E0]</p>
Kerry Head SPA (004189)	<p>Fulmar (<i>Fulmarus glacialis</i>) [A009] Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]</p>
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)	<p>Hen Harrier (<i>Circus cyaneus</i>) [A082]</p>
Lower River Shannon SAC (002165)	<p>Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] <i>Salicornia</i> and other annuals colonizing mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, <i>Salicion albae</i>) [91E0] Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) [1029] Sea lamprey (<i>Petromyzon marinus</i>) [1095]</p>

Designated Site	Qualifying features of conservation interest
	Brook lamprey (<i>Lampetra planeri</i>) [1096] River lamprey (<i>Lampetra fluviatilis</i>) [1099] Salmon (<i>Salmo salar</i>) [1106] Bottle-nosed dolphin (<i>Tursiops truncatus</i>) [1349] Otter (<i>Lutra lutra</i>) [1355]
Kerry Head Shoal SAC (002263)	Reefs [1170]

4.4.4 Conservation Objectives

According to the Habitats Directive, the *conservation status of a natural habitat* will be taken as 'favourable' within its bio-geographic range when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined below.

According to the Habitats Directive, the conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' within its bio-geographic range when:

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

The specific conservation objectives for each site are available on www.npws.ie. These have been accessed for the sites listed in the tables above on the 29/04/2019.

Site specific and detailed conservation objectives were available for the following sites:

- Tralee Bay and Magharees Peninsula West to Cloghane SAC (002070). Version 1. Produced February 2014
- Akeragh, Banna and Barrow Harbour SAC (000332). Version 1. Produced January 2017
- Tralee Bay Complex SPA (004188). Version 1. Produced April 2014
- Magharee Islands SAC (002261). Version 1. Produced December 2013
- Mount Brandon SAC (000375). Version 1. Produced July 2016
- Castlemaine Harbour SAC (000343), Castlemaine Harbour SPA (004029). Version 2.0. Produced July 2011
- Lower River Shannon SAC (002165). Version 1. Produced August 2012
- Kerry Head Shoal SAC (002263). Version 1. Produced October 2013

Generic conservation objectives were available for the following sites:

- Slieve Mish Mountains SAC (002185). Generic version 6.0. Produced February 2018
- Magharee Islands SPA (004125). Generic version 6.0. Produced February 2018
- Dingle Peninsula SPA (004153). Generic version 6.0. Produced February 2018
- Ballyseedy Wood SAC (002112). Generic version 6.0. Produced February 2018
- Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161). Generic version 6.0. Produced February 2018
- Kerry Head SPA (004189). Generic version 6.0. Produced February 2018

Management plans are not available for any of the sites.

All conservation objectives together with other designated site information are available on <http://www.npws.ie/protectedsites/>.

4.5 IDENTIFICATION OF POTENTIAL IMPACTS

Potential likely ecological impacts arising from the project are identified in this section.

<p><i>Description of elements of the project likely to give rise to potential ecological impacts.</i></p>	<ul style="list-style-type: none"> - Maintenance dredging operations at Fenit Harbour to be conducted annually over an eight year dredge campaign - The dredge site is located within a Natura 2000 site - Disposal of dredge material at dumpsite following each dredge event - Yearly dredging and dumping activities will be subject to the granting of individual FL to be applied for on a yearly basis - Dumping activities at dumpsite will be subject to a DaS licence (this is being sought for the full eight year period).
<p><i>Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of:</i></p> <ul style="list-style-type: none"> ○ <i>Size and scale;</i> ○ <i>Land-take;</i> ○ <i>Distance from Natura 2000 Site or key features of the Site;</i> ○ <i>Resource requirements;</i> ○ <i>Emissions;</i> ○ <i>Excavation requirements;</i> ○ <i>Transportation requirements;</i> ○ <i>Duration of construction, operation etc.; and</i> ○ <i>Other.</i> 	<ul style="list-style-type: none"> - Loss and alteration of seabed habitat and associated species at the location of the dredge areas, which lie within an Natura 2000 site - Loss and alteration of seabed habitat and associated species (smothering effects) at the location of the dumpsite, which lies within 1km of the nearest Natura 2000 site - Potential water quality impacts from increased suspended sediment and turbidity levels in the water column and/or marine sediment contaminants at the dredge and dumpsite - Potential water quality impacts from accidental oil spill associated with fuelling activities of the suction hopper dredger - Potential low-level disturbance to marine mammals through underwater noise emissions.

4.6 ASSESSMENT OF SIGNIFICANCE OF POTENTIAL IMPACTS

This section considers the list of sites identified in Section 4.4.2 above, together with the potential ecological impacts identified in the previous section and determines whether the project is likely to have significant effects on a Natura 2000 site.

When assessing impact, Natura 2000 sites are only considered relevant where a credible or tangible source-pathway-receptor link exists between the proposed development and a protected species or habitat type. In order for an impact to occur there must be a risk initiated by having a 'source' (e.g. marine dredging), a 'receptor' (e.g. a protected habitat/species and/or the habitats on which they depend), and an impact pathway between the source and the receptor (e.g. a waterbody which connects the proposal site to the protected species or habitats). An evaluation based on these factors to determine which Natura 2000 sites are the plausible ecological receptors for potential impacts of the proposed programme of dredging works will be conducted in Sections 4.6.1 and 4.6.2 below. The evaluation takes cognisance of the scope, scale, nature and size of the project, its location relative to the Natura 2000 sites listed in Table 3 above, and the degree of connectedness that exists between the project and each Natura 2000 site's potential ecological receptors.

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4.6.1 Natura 2000 sites outside the zone of potential impact influence

With regards to the proposal, it is considered that the project does not include any element that has the potential to significantly alter the conservation objectives for which certain Natura 2000 sites, listed in Table 3 above, are designated. It is considered that these Natura 2000 sites are outside the zone of potential impact influence of the proposal due to the absence of plausible impact pathways and/or the attenuating effect of the distance intervening. Therefore, it is objectively concluded that significant impacts on these sites are not reasonably foreseeable as a result of the programme of works described at Section 4.2.5. These sites, which are listed in Table 5 below, along with their distance and the rationale for exclusion, will not be considered further in this document.

Table 5. Natura 2000 sites outside the zone of potential impact influence

Natura 2000 site	Proximity of subject sites to nearest point of designated site	Rationale for exclusion from assessment
Slieve Mish Mountains SAC (002185)	Dredge site is 4km to the north, dumpsite is 9.4km to the north	<ul style="list-style-type: none"> • Designated for a variety of terrestrial habitats and one terrestrial plant species • No overlap - Intervening distance of in excess of 4km between site and SAC • Marine nature and location of the works • Marine habitats not suitable for Killarney fern • No plausible impact pathway for qualifying habitat or species effects
Dingle Peninsula SPA (004153)	Dredge site is 10.4km to the east, dumpsite is 8km to the northeast	<ul style="list-style-type: none"> • Designated for two coastal/upland species (chough, peregrine) and one species of seabird (fulmar) • Marine nature and location of the works • Intervening distance of in excess of 8km between site and SPA • Significant impacts not reasonably foreseeable
Mount Brandon SAC (000375)	Dredge site is 10.8km to the northeast, dumpsite is 11.1km to the northeast	<ul style="list-style-type: none"> • Designated for variety of terrestrial and freshwater habitats, one freshwater invertebrate and one terrestrial plant species • No overlap - Intervening distance of in excess of 10km between site and SAC • Marine nature and location of the works • Marine habitats not suitable for freshwater pearl mussel or Killarney fern • No plausible impact pathway for qualifying habitat or species effects

Natura 2000 site	Proximity of subject sites to nearest point of designated site	Rationale for exclusion from assessment
Castlemaine Harbour SAC (000343)	Dredge site is 12.1km to the north-northwest, dumpsite is 17.4km to the north	<ul style="list-style-type: none"> • Designated for a variety of coastal and terrestrial habitats, marine and freshwater species and one liverwort species • Due to the separation buffer provided by the intervening Dingle Peninsula landmass between the SAC and the proposed dredge area and dumpsite the SAC is outside of the zone of influence of the project • Significant habitat or species impacts are not reasonably foreseeable
Castlemaine Harbour SPA (004029)	Dredge site is 12.4km to the north, dumpsite is 17.4km to the north	<ul style="list-style-type: none"> • Designated for variety of seabird, wader, wildfowl and coastal/upland species • Due to the separation buffer provided by the intervening Dingle Peninsula landmass between the SPA and the proposed dredge area and dumpsite the SPA is outside of the zone of influence of the project • Significant habitat or species impacts are not reasonably foreseeable
Ballyseedy Wood SAC (002112)	Dredge site is 12.9km to the west-northwest, dumpsite is 16.4km to the northwest	<ul style="list-style-type: none"> • Designated for one woodland habitat-type • No overlap - Intervening distance of in excess of 12km between site and SAC • Marine nature and location of the works • No plausible impact pathway for qualifying habitat or species effects
Kerry Head SPA (004189)	Dredge site is 13.4km to the south, dumpsite is 7.6km to the south-southwest	<ul style="list-style-type: none"> • Designated for one seabird (fulmar) and one coastal/upland (chough) species • Marine nature and location of the works • Intervening distance of in excess of 7km between site and SPA • Significant impacts not reasonably foreseeable
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)	Dredge site is 14.9km to the southwest, dumpsite is 16.6km to the west	<ul style="list-style-type: none"> • Designated for one species, namely hen harrier • No overlap - Intervening distance of in excess of 14km between site and SPA • Marine nature and location of the works • Marine habitats not suitable for hen harrier • Significant impacts not reasonably foreseeable

4.6.2 Natura 2000 sites within the zone of potential impact influence

Of the designated sites listed in Table 5 above, seven are considered to have the potential to be impacted as a result of the proposal. There is potential for habitat alteration, species disturbance/displacement and/or water quality impacts to occur within these remaining Natura 2000 sites as a result of the proposal. These Natura 2000 sites are intrinsically linked to the proposal site and to each other through the coastal water bodies of 'Inner Tralee Bay', 'Outer Tralee Bay', 'Brandon Bay', 'Southwestern Atlantic Seaboard' (HA 23), 'Mouth of the Shannon' (HAs 23;27), and 'Shannon Plume' (HA's 27;28)³. Therefore, the assessment of significance of potential impacts that follows focuses on the following designated sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Tralee Bay Complex SPA (004188)
- Magharee Islands SAC (002261)
- Magharee Islands SPA (004125)
- Lower River Shannon SAC (002165)
- Kerry Head Shoal SAC (002263)

The likelihood of significant effects to a Natura 2000 site from the project was determined based on a number of indicators including:

- Habitat loss
- Habitat alteration
- Water quality and resource
- Habitat or species fragmentation
- Disturbance and/or displacement of species

The likelihood of significant cumulative/in-combination effects is assessed in Section 4.6.7.

³ Available at <http://gis.epa.ie/Envision>. Accessed 10/04/2018

4.6.3 Habitat Loss and Alteration

There will be habitat loss as a result of dredging of the marina, commercial berth and manoeuvring area within Fenit Harbour. These areas were last dredged in 2016 and in the intervening period sediment has deposited and accumulated up to 3m in places; this level of sedimentation is considered to be relatively high. There will be habitat loss within:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)

The proposed dumpsite is not located within a Natura 2000 site; therefore, disposal of dredge material at the dumpsite will not result in habitat loss within any Natura 2000 site.

With regards to the potential for habitat alteration there will be a temporary local increase in suspended solids in the vicinity of the dredging operation at Fenit Harbour. With regard to the dumpsite, according to the results of previous sediment transport modelling there is potential for increased suspended sediments and sediment deposition within and outside of the bay. Previous modelling indicated that suspended silt fractions released during the disposal show an interesting circulation pattern of material firstly moving south but then migrating north-west and west. This material becomes well-dispersed with the tide eventually flushed out to sea in a north-westerly direction away from the mouth of the Shannon estuary. Therefore, based on the results of sediment transport modelling simulations, it is anticipated that the project will not result in significant effects to marine/inter-tidal/coastal habitats within the Lower River Shannon SAC.

Due to the intervening distance of over 14km between the dumpsite and the Kerry Head Shoal SAC, which lies to the northwest of the dumpsite, and the dilution factor available off the western Irish coast, it is anticipated that the proposal will not have a significant effect on the conservation objectives of 'Reefs' for which the site is designated.

It is considered that there is potential for habitat alteration as a result of increased suspended sediments and sediment deposition within the following Natura 2000 sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Tralee Bay Complex SPA (004188)
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Magharee Islands SAC (002261)
- Magharee Islands SPA (004125)

4.6.4 Habitat or Species Fragmentation

Habitat fragmentation can be described as discontinuities in an organisms preferred habitat. This can result in species fragmentation through fragmentation of the population. Habitat loss or alteration can result in habitat fragmentation. There is potential for habitat/species fragmentation within the following Natura 2000 sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Tralee Bay Complex SPA
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Magharee Islands SAC (002261)

- Magharee Islands SPA (004125)

Due to the intervening distance and the results of sediment transport modelling simulations, as discussed in Section 4.6.3 above significant habitat or species fragmentation are not expected to occur within the following Natura 2000 sites:

- Lower River Shannon SAC (002165)
- Kerry Head Shoal SAC (002263)

4.6.5 Disturbance and/or Displacement of Species

Disturbance or displacement of species will result from habitat loss/alteration within Fenit Harbour as a result of the dredging operations and at the dumpsite through deposition of sediment on the seabed. Indirect species disturbance/displacement may also potentially result from underwater noise emissions associated with dredging/vessel activity or from water quality effects associated with dredging operations such as increased turbidity in the water column or the potential release of contaminants to the aquatic environment. It is considered that there is potential for disturbance/and or displacement of species within the following Natura 2000 sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Tralee Bay Complex SPA
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Magharee Islands SAC (002261)
- Magharee Islands SPA (004125)
- Lower River Shannon SAC (002165)

4.6.6 Water Quality

It is estimated that a relatively low percentage volume of sediment will be lost to the water column during dredging operations. Loss of this material will result in an increase in the volume of suspended sediments and an increase in turbidity levels in the water column. It is predicted that the greatest increase in suspended sediment concentration will occur in the vicinity of the proposed dredging areas. It is expected that concentrations will lower significantly with distance from the dredging operations. Disturbance of the seabed during dredging events also has the potential to result in the release of contaminants and polluting material to the aquatic environment where such substances are found to occur in marine sediments at higher levels. There is also potential for water quality impacts via accidental oil spill associated with fuelling activities of the suction hopper dredger.

It is considered that there is potential for water quality effects within the following Natura 2000 sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Tralee Bay Complex SPA
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Magharee Islands SAC (002261)
- Magharee Islands SPA (004125)

Due to the intervening distance, the results of sediment transport modelling simulations, as discussed in Section 4.6.3 above, and the available dilution factor off the west Irish coast, significant water quality impacts are not expected to occur within the following Natura 2000 sites:

- Lower River Shannon SAC (002165)
- Kerry Head Shoal SAC (002263)

4.6.7 Cumulative/In-combination Impacts

Other projects/activities that could potentially interact with the proposed dredging and dumping operations to result in cumulative or in-combination impacts to the environment include regular harbour activities such as commercial shipping, fishing, and casual boating. It is considered that there is potential for cumulative water quality or species disturbance/displacement impacts as a result of interaction between the proposal and other projects/activities to the following Natura 2000 sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Tralee Bay Complex SPA
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Magharee Islands SAC (002261)
- Magharee Islands SPA (004125)
- Lower River Shannon SAC (002165)

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4.7 CONCLUSION OF SCREENING STAGE

In conclusion, to determine the potential impacts, if any, of the proposal to carry out maintenance dredging at Fenit Harbour and disposal of the dredge material to a dumpsite in Tralee Bay on nearby Natura 2000 sites, a screening for Appropriate Assessment was undertaken. The proposed development is within 15km of fifteen Natura 2000 sites.

It has been objectively concluded during the screening process that eight sites within 15km of the project are likely not to be significantly affected by the proposal to dredge Fenit harbour and dispose of the dredge material at a dumpsite in Tralee Bay, and these include:

- Slieve Mish Mountains (002185)
- Mount Brandon SAC (000375)
- Ballyseedy Wood SAC (002112)
- Castlemaine Harbour SAC (000343)
- Castlemaine Harbour SPA (004029)
- Dingle Peninsula SPA (004153)
- Kerry Head SPA (004189)
- Kerry Head Shoal SAC (002263)

It has been concluded that the proposal to dredge Fenit harbour and dispose of the dredge materials at a dumpsite in Tralee Bay is likely to have a significant effect, or significant effects cannot be ruled out at this stage, on the following Natura 2000 sites:

- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)
- Tralee Bay Complex SPA (004188)
- Akeragh, Banna and Barrow Harbour SAC (000332)
- Magharee Islands SAC (002261)
- Magharee Islands SPA (004125)
- Lower River Shannon SAC (002165)

Further assessment is required to determine whether the project is likely to adversely affect the integrity of these Natura 2000 sites.

5 REFERENCES

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Appendix 1

Stages of Appropriate Assessment

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Stage 1 - Screening

This is the first stage of the Appropriate Assessment process and that undertaken to determine the likelihood of significant impacts as a result of a proposed project or plan. It determines need for a full Appropriate Assessment.

If it can be concluded that no significant impacts to Natura 2000 sites are likely then the assessment can stop here. If not, it must proceed to Stage 2 for further more detailed assessment.

Stage 2 - Natura Impact Statement (NIS)

The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 site with respect to the conservation objectives of the site and its ecological structure and function. This is a much more detailed assessment than Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.

If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions

A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exist.

Where no alternatives exist the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain

The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 site where no less damaging solution exists.

Appendix 2

Site Synopses

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Site Name: Tralee Bay and Magharees Peninsula, West to Cloghane SAC

Site Code: 002070

This large site in Co. Kerry stretches from Tralee town westwards to Fenit Harbour and Cloghane, encompassing Tralee Bay, Brandon Bay and the Magharees Peninsula. It includes extensive mudflats at the eastern end, the beaches of Derrymore Island, the sand dunes and lagoons of the Magharees Peninsula, as well as the rocky headlands at its end. The site includes two Statutory Nature Reserves, Tralee Bay and Derrymore Island, and much of the estuarine part of the site has been designated a Special Protection Area (SPA) for birds and their habitats.

The site is mostly underlain by limestone, but significant parts of this are covered with glacial drift or windblown sand. The main exposures occur at Fenit port, Oyster Hall, Blennerville and at Rough Point and Fahamore, but there are some other low outcrops on the beaches west to Castlegregory. Elsewhere the sandstones and slates of the Dingle Beds appear.

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).

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1150] Coastal Lagoons*
- [1160] Large Shallow Inlets and Bays
- [1170] Reefs
- [1210] Annual Vegetation of Drift Lines
- [1220] Perennial Vegetation of Stony Banks
- [1310] *Salicornia* Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [2170] Dunes with Creeping Willow
- [2190] Humid Dune Slacks
- [6410] *Molinia* Meadows
- [91E0] Alluvial Forests*
- [1355] Otter (*Lutra lutra*)
- [1395] Petalwort (*Petalophyllum ralfsii*)

Both the Tralee and Brandon (Owenmore) estuaries feature wide expanses of sheltered intertidal flats, often fringed with saltmarsh vegetation. Plant species are typically scarce on the flats, although there are some eelgrass (*Zostera* spp.) beds and patches of green algae (e.g. *Ulva* spp. and *Enteromorpha* spp.). The eelgrass beds at Derrymore Island include *Zostera noltii*, a species which has a limited distribution in Ireland. A variety of polychaetes (worms) and bivalve molluscs are also present in the intertidal sections.

The majority of Tralee Bay is shallow and composed of sublittoral sediments. In the more sheltered areas of the bay, there is a variety of important sublittoral sediment communities in which a number of rare species occur. Seagrass beds in sandy substrates are characterized by oysters and the rare anemone *Calliactis parasitica* which lives on shells inhabited by the hermit crab *Pagurus bernhardus*. The little known hydroid, *Laomedea angulata*, is also found on the fronds of the seagrass. The native oyster, *Ostrea edulis*, occurs in sediment communities throughout the bay. Maerl beds, composed of the free-living coralline algae *Lithothamnion corallioides* and *Phymatolithon calcareum*, and characterized by anemones (*Anthopleura balli*) and oysters, occur in the middle of the bay. The rare anemone *Halcampa chrysanthellum* has been recorded here.

The intertidal reefs of Tralee Bay and the Magharees peninsula range from being exposed to sheltered from wave action, and the communities present are good examples of the communities typically found on these types of shores. The barnacle/limpet community with the lichen *Lichina pygmaea* is an uncommon community and is found in the upper-mid shore at Rough Point. The low shore at Rough Point, which is moderately exposed to wave action, and the shore at Coosanea, which is sheltered from wave action, are both very species-rich. Rocky outcrops on the shore half way round the bay near Camp are known to support a community of the uncommon honeycomb worm *Sabellaria alveolata*. The sublittoral reefs support communities characterised by a variety of red foliose algae, as well as the brown algae *Dictyota dichotoma*, and are typical of communities that are subjected to sand scour as indicated by the presence of the red algae *Furcellaria lumbricalis* and *Polyides rotundus*.

In the transition zone between the intertidal flats and saltmarsh, specialised colonisers of mud predominate - swards of Common Cord-grass (*Spartina anglica*) are extensive on the leeward side of Derrymore Island, while swards of Glasswort (*Salicornia europaea* agg.) also occur in parts of the site.

Saltmarsh vegetation frequently fringes the mudflats, with the most extensive areas being found at Blennerville, Derrymore Island and Formoyle in Brandon Bay. The dominant type of saltmarsh present is Atlantic salt meadow. Characteristic species occurring include Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*), Creeping Bent (*Agrostis stolonifera*), Saltmarsh Rush (*Juncus gerardi*), Long-bracted Sedge (*Carex extensa*), Lesser Sea-spurrey (*Spergularia marina*) and Sea Arrowgrass (*Triglochin maritima*). Areas of

Mediterranean salt meadows, characterised by clumps of Sea Rush (*Juncus maritimus*), occur occasionally.

Sandy beaches backed by strips of 'white' dunes are common along the southern shore of the site. The vegetation of these 'white' dunes is dominated by Marram (*Ammophila arenaria*). However, the main dune area on this southern shore occurs on the Magherees Peninsula - a tombolo which joins a number of the Magherees Islands with the mainland. Here there are extensive areas of fixed 'grey' dunes, which feature a number of damp hollows or dune slacks. The fixed dunes are species-rich, with characteristic species such as White Clover (*Trifolium repens*), Lesser Hawkbit (*Leontodon taraxacoides*), Common Centaury (*Centaureum erythraea*), Lady's Bedstraw (*Galium verum*) and grasses (e.g. *Festuca rubra*, *Poa trivialis* and *Avenula pubescens*).

Relatively scarce plants found on the dunes include the following: Fringed Rock-cress (*Arabis brownii*), Fragrant Orchid (*Gymnadenia conopsea*), Squinancywort (*Asperula cynanchica*), Autumn Lady's-tresses (*Spiranthes spiralis*) and Dodder (*Cuscuta epithimum*). Dune slack species include Strawberry Clover (*Trifolium fragiferum*), Chaffweed (*Anagallis minima*) and the fungus *Inocybe halophila*.

Lough Gill, a natural sedimentary lagoon, is located at the base of the Magherees Peninsula. The lagoon is only slightly brackish and therefore contains freshwater species along with lagoon specialists. Submerged flora present includes Beaked Tasselweed (*Ruppia maritima*) and Horned Pondweed (*Zannichellia palustris*), while species fringing the lagoon include Common Reed (*Phragmites australis*), Sea Club-rush (*Scirpus maritimus*) and Grey Club-rush (*S. lacustris* subsp. *tabernaemontani*).

Other coastal habitats that occur within the site include shingle beaches, rocky shores and vegetated sea-cliffs. The site also contains fragments of terrestrial habitats such as deciduous woodland, scrub heath, dry limestone grassland, wet grassland and freshwater marshes.

There is some good limestone flora on the hill at Oyster Hall, with Burnet Rose (*Rosa pimpinellifolia*), Southern Polypody (*Polypodium australe*) and Hairy Rock-cress (*Arabis hirsuta*) occurring. There is an old record for the Red Data Book species, Sea-kale (*Crambe maritima*). At Fahamore and Rough Point it is the intertidal communities that are particularly rich, benefiting from a multitude of microhabitats in the eroded limestone. Red algae are frequent, including the agar seaweeds *Gelidium* and *Pterocladia*.

A small area of *Molinia* meadow is found in the site, with species such as Purple Moor-grass (*Molinia caerulea*), Devil's-bit Scabious (*Succisa pratensis*), Sharp-flowered Rush (*Juncus acutiflorus*) being common, and species such as Greater Tussock-sedge (*Carex paniculata*), Tormentil (*Potentilla erecta*), Marsh Cinquefoil (*Potentilla palustris*), Wild Angelica (*Angelica sylvestris*) and Common Valerian (*Valeriana officinalis*) also frequent.

Beach features dominate the northern coast of the Dingle Peninsula with an excellent series of shingle ridges forming Derrymore Island and the tombolo which links

former Magheree Islands (Rough Point, etc.) to the mainland. Here there is a large area of well developed sand dunes with an exceptionally rich flora and great topographic variation. The flora includes Fringed Rock-cress, Squinancywort, Dodder, Autumn Lady's-tresses and Chaffweed - all plants with a restricted distribution in the west of Ireland. These occur in a vegetation with abundant Red Fescue, scattered Marram, and herbs such as Lady's Bedstraw, Wild Thyme (*Thymus praecox*), Common Bird's-foot-trefoil (*Lotus corniculatus*) and Kidney Vetch (*Anthyllis vulneraria*). Yellow-rattle (*Rhinanthus minor*), eyebrights (*Euphrasia* spp.), Pyramidal Orchid (*Anacamptis pyramidalis*) and Heath Spotted-orchid (*Dactylorhiza maculata*) are four sensitive species which also occur here.

At the seaward edge drift line vegetation is often present. The more stable areas of shingle support Sea Beet (*Beta vulgaris* subsp. *maritima*), Sea Mayweed (*Matricaria maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), Curled Dock (*Rumex crispus*), oraches (*Atriplex* spp.), Sea Sandwort (*Honkenya peploides*) and Silverweed (*Potentilla anserina*).

Between the dunes where erosion has removed the sand down to the water table there are temporary ponds or dune slacks with many additional species. Marsh Pennywort (*Hydrocotyle vulgaris*), Silverweed, various sedges (*Carex panicea* and *C. nigra*) and, in places, Strawberry Clover, Adder's-tongue (*Ophioglossum vulgatum*), Knotted Pearlwort (*Sagina nodosa*) and the orchids *Dactylorhiza majalis* and *D. incarnata* all occur. Some parts of the dune slacks feature a vegetation community characterised by the presence of Creeping Willow (*Salix repens*).

Woodland is rare on the Dingle Peninsula so the three stands included in this site are locally important. A deserted river valley at Killelton, the steep valley of the Finglas River at Camp and the west-facing slopes of Drom Hill opposite Cloghane all have features of significant interest. The last site has many species of lower plant (liverworts and lichens) that form distinctive elements of the westernmost natural woods in Ireland. At Garrahies Wood, adjacent to the Finglas River, there is an example of wet woodland on base-rich soils subject to flooding. The woodland type falls into the ash-alder alluvial forest category. The most common tree species are Alder (*Alnus glutinosa*), Downy Birch (*Betula pubescens*) and willows (*Salix* spp.). Bluebell (*Hyacinthoides non-scripta*), grasses and Bramble (*Rubus fruticosus* agg.) are the most common species in the ground layer.

The dune complex on the Magharees Peninsula supports the largest Irish breeding population of Natterjack Toads. Indeed, the population may be the largest breeding population in Britain and Ireland. The Natterjack Toad is listed as vulnerable in the Red Data Book and is protected under both European and national legislation. The toads require shallow warm water to spawn in and sandy habitats for over-wintering. Their tadpoles are vulnerable to predation in permanent lakes but despite this they have some success in Lough Gill which is a shallow lake with flat shores of sand, wet grassland or marsh. Natterjack Toads also breed within the site at Fermoy, to the west. Also recorded from Fermoy is the rare whorl snail *Vertigo angustior*, a species listed on Annex II of the E.U. Habitats Directive. Two species of

hover fly - *Platycheris perpilladus* and *Sphaerophoria loewi* - have their only Irish records from the Magharees Peninsula dune system and a water beetle, *Cercyon sternalis*, was first recorded in Ireland in 1997 in Lough Gill.

The site supports populations of several rare plant species which have not been mentioned already. The bryophyte Petalwort (*Petalophyllum ralfsii*), which is listed on Annex II of the E.U. Habitats Directive, is known from the dune slacks on the Magharees Peninsula and Smooth Brome (*Bromus racemosus*), a Red Data Book grass, has been recorded from two wet meadows within the site. Several aquatic plants of interest grow in Lough Gill, the rarest being the Red Data Book stonewort *Chara canescens*. The Slender-leaved Pondweed (*Potamogeton filiformis*) occurs far to the south of its distribution elsewhere in Ireland and Britain, while there are also old records for Spiral Tasselweed (*Ruppia spiralis*). The marshes along the southern shore in the past support a rich variety of vegetation including several species rare in Kerry such as Water Dock (*Rumex hydrolapathum*) and Greater Spearwort (*Ranunculus lingua*), as well as sedges (*Carex dioica*, *C. limosa* and *C. diandra*) on patches of peat. Despite local reclamation it is likely that most of these still survive.

Otters regularly feed within this extensive site though it is not known if they breed. Otter is listed on Annex II of the E.U. Habitats Directive.

Tralee Bay, including Lough Gill, is an internationally important wetland for wintering waders and wildfowl. Species present which are listed on Annex I of the E.U. Birds Directive include Whooper Swans (24, mid-1980s), Golden Plover (3,053, 1994-95) and Bar-tailed Godwit (903, 1995-96). The dunes also provide an important feeding ground for Chough, a resident Annex I species.

Other wintering waders and wildfowl present include: Pale-bellied Brent Goose (944, mid-1980s), Shelduck (218, 1995-96), Gadwall (14, 1994-95), Teal (860, 1994-95), Pintail (56, 1995-96), Shoveler (144, mid-1980s), Scaup (1560, 1994-95), Scoter (620, 1994-95), Red-breasted Merganser (46, 1994-95), Ringed Plover (332, 1994-95), Grey Plover (674, 1995-96), Lapwing (5700, 1994-95), Knot (320, 1994-95), Sanderling (270, 1994-95), Purple Sandpiper (103, mid-1980s), Dunlin (4122, 1995-96), Black-tailed Godwit (508, 1994-95), Curlew (826, 1994-95), Redshank (352, 1995-96), Greenshank (21, 1994-95) and Turnstone (477, mid-1980s). Most of these species are present in nationally important numbers.

The dunes at this site face pressures from intensive farming practises and recreational use by visitors. The most threatening activities include fertilisation of the species-rich dune grasslands, over-grazing, and trampling of areas of dunes adjacent to tourist facilities (e.g. caravan parks). These activities may lead to severe erosion and eutrophication of the dune grasslands and dune slacks. Parts of the dune system are also vulnerable to invasion by Sea Buckthorn (*Hippophae rhamnoides*).

Agricultural run-off from areas of fertilised dune grasslands in the vicinity of Lough Gill pose a continued threat to the nutrient status of the lagoon; algal blooms and fish

kills have occurred in the past. Removal of sand has also occurred and poses a threat to the integrity of the system.

Generally, the intertidal areas are relatively robust, although certain communities are vulnerable. For example, *Spartina* has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds. Other activities, such as land reclamation and aquaculture, pose potential threats in terms of damage to habitats and potential disturbance to wintering birds.

Domestic and industrial wastes are discharged into inner Tralee Bay, but water quality is generally satisfactory - except in the inner bay, reflecting the sewage load from Tralee Town. Further industrial development along the bay in the vicinity of Tralee Town and Fenit and water polluting operations are potential threats.

This site is of considerable ecological and conservation significance for the excellent diversity of habitats it contains, many of which are listed on Annex I of the E.U. Habitats Directive. The occurrence of a species listed on Annex II of the E.U. Habitats Directive adds further importance to the site. The presence of a number of Red Data Book species, including the largest population of Natterjack Toads in Ireland, is also notable, as is the occurrence of several species listed on Annex I of the E.U. Birds Directive.

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Site Name: Akeragh, Banna and Barrow Harbour SAC

Site Code: 000332

Akeragh, Banna and Barrow Harbour SAC is a large coastal site covering a 10 km section of coastline in Co. Kerry, and including a wide diversity of habitats. The underlying rock is limestone, which outcrops only in the southern part of the site, in the impressive columns and hillsides north of Fenit. Elsewhere shell sand is predominant with occasional development of peat.

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):

- [1210] Annual Vegetation of Drift Lines
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2110] Embryonic Shifting Dunes
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [2190] Humid Dune Slacks
- [4030] Dry Heath

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Sand dunes run southwards from Ballyheigue and they become especially interesting south of the Akeragh outflow where they show great variety in both physiography and vegetation. The largest proportion of the sand dune system is fixed dune grassland. The vegetation is made up of a mosaic of Marram (*Ammophila arenaria*) tussocks interspersed with low-lying patches of a Red Fescue-Lady's Bedstraw (*Festuca rubra-Galium verum*) community. Other species occurring include Smooth Meadow-grass (*Poa pratensis*), Daisy (*Bellis perennis*), Ribwort Plantain (*Plantago lanceolata*) and Bulbous Buttercup (*Ranunculus bulbosus*). There is a sparse occurrence of moss species, including *Brachythecium rutabulum*, *Tortula ruralis* ssp. *ruraliformis* and *Homalothecium lutescens*. These tend to be restricted to areas close to rabbit burrows, where they are associated with species such as Germander Speedwell (*Veronica chamaedrys*), Squinancywort (*Asperula cynanchica*) and Dog Lichen (*Peltigera* spp.). A number of other species typical of Mesobromion grasslands are found in this habitat type, reflecting the calcareous nature of the site. These include Pyramidal Orchid (*Anacamptis pyramidalis*), Thyme-leaved Sandwort (*Arenaria serpyllifolia*) and Hairy Rock-cress (*Arabis hirsuta*). Dodder (*Cuscuta epithimum*), a parasitic plant, grows in abundance on the fixed dune slopes at Carrahane.

Mobile Marram dunes occur as a narrow band running along the seaward side of the entire coastal strip. There is a slight increase in dune mobility towards the growing tip at Carrahane. The main ridges are dominated by Marram and reach heights in excess of 20 m in places. Companion species include Sea Spurge (*Euphorbia paralias*), Colt's-foot (*Tussilago farfara*), Sea-holly (*Eryngium maritimum*) and Sand Sedge (*Carex arenaria*). Also occurring are embryonic dunes, with such species as Sand Couch (*Elymus farctus*) and Sea Rocket (*Cakile maritima*). The latter species, along with Spear-leaved Orache (*Atriplex prostrata*), has also been recorded from the 'annual vegetation of drift lines' habitat at this site.

The site contains a number of dune slack areas, these being best developed on the landward side of Carrahane dunes. Species present in these dune slacks include Common Bent (*Agrostis stolonifera*), Red Clover (*Trifolium pratense*), Glaucous Sedge (*Carex flacca*), Water Mint (*Mentha aquatica*), Creeping Willow (*Salix repens*) and the scarce Marsh Helleborine (*Epipactis palustris*).

Of particular ecological interest is the gradation from fixed dune and dune slack to saltmarsh at Carrahane. Saltmarsh here is particularly well-developed but also occurs at Barrow Harbour. Common saltmarsh species include Thrift (*Armeria maritima*), Red Fescue, Sea Plantain (*Plantago maritima*), Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*Juncus maritima*). A number of scarce species are associated with the saltmarsh, notably Hard-grass (*Parapholis strigosa*), Saltmarsh Flat-sedge (*Blysmus rufus*), Strawberry Clover (*Trifolium fragiferum*) and a species of sea-lavender (*Limonium recurvum*). Glassworts (*Salicornia* spp.) occur on the edges of the saltmarsh and in sheltered areas extends onto the intertidal muds.

The harbour is surrounded by low hills of limestone which support an interesting grassland community where they remain unfertilised. This is best seen at the entrance to Carrahane Bay but recurs sporadically elsewhere. Coastal heath occurs scattered on limestone rocky areas in the southern part of the site. It generally occurs in association with dry grassland. Species which occur include Gorse (*Ulex europaeus*), Western Gorse (*U. gallii*), Burnet Rose (*Rosa pimpinellifolia*), Blackthorn (*Prunus spinosa*), Biting Stonecrop (*Sedum acre*), Black Medick (*Medicago lupulina*), Common Whitlowgrass (*Erophila verna*), Kidney Vetch (*Anthyllis vulneraria*) and Wild Madder (*Rubia peregrina*), among others.

Akeragh Lough now supports extensive areas of brackish vegetation. It was formerly richer in birdlife, but the lake level has been controlled by a sluice on the outflow, the total water area has declined. Also, the peaty land to the east has been afforested. The site supports important wintering waterfowl populations. Brent Goose occur in internationally important numbers (360 in winter 1996/97), while in winter 1996/97 nationally important populations of Ringed Plover (130), Grey Plover (62), Lapwing (approx. 2000), Sanderling (280) and Bar-tailed Godwit (345) occurred. Notable populations of Golden Plover, Oystercatcher, Dunlin, Curlew and Redshank also occur. The regular occurrence of Golden Plover and Bar-tailed Godwit is of note as these species are listed on Annex I of the E.U. Birds Directive.

This large site is of major ecological interest due both to its range of floristically-rich coastal habitats, nine of which are listed on Annex I of the E.U. Habitats Directive, including one priority habitat, and as a wintering site for significant numbers of waterfowl (including two Annex I species).

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SITE SYNOPSIS

SITE NAME: TRALEE BAY COMPLEX SPA

SITE CODE: 004188

The Tralee Bay Complex SPA is located along the coast of north Co. Kerry between Ballyheige in the north, Tralee in the east and Stradbally in the west. The site includes the inner part of Tralee Bay, including Derrymore Island, the inlets of Barrow Harbour and Carrahane Strand, Akeragh Lough, Lough Gill, and much of the intertidal habitat from Scraggane Point at the northern end of the Magharees Peninsula around the coast to c. 2 km south of Ballyheige. Inner Tralee Bay is well sheltered by the Derrymore Island peninsula. The intertidal sediments vary from muddy sands on the upper shore to firm rippled sands on the lower, more exposed shore. The sediments have a diverse macro-invertebrate fauna, with such species as Cockle (*Cerastoderma edule*), Lugworm (*Arenicola marina*), Ragworm (*Hediste diversicolor*), Baltic Tellin (*Macorna balthica*) and Shrimp (*Crangon crangon*) occurring. The intertidal flats have extensive beds of Eelgrass (*Zostera* spp.).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Light-bellied Brent Goose, Shelduck, Wigeon, Teal, Mallard, Pintail, Scaup, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull and Common Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. 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.

Tralee Bay Complex SPA is an internationally important wetland for wintering waders and wildfowl. It supports an internationally important population of Light-bellied Brent Goose (1,412) and nationally important populations of a further 21 species, i.e. Whooper Swan (101), Shelduck (220), Wigeon (1,634), Teal (623), Mallard (571), Pintail (54), Scaup (892), Oystercatcher (1,011), Ringed Plover (344), Golden Plover (6,393), Grey Plover (195), Lapwing (6,106), Sanderling (228), Dunlin (2,444), Black-tailed Godwit (139), Bar-tailed Godwit (608), Curlew (1,170), Redshank (635), Turnstone (229), Black-headed Gull (1,320) and Common Gull (599) – all figures are five year mean peak counts for the period 1995/96 to 1999/2000, except the gulls which are four year mean peak counts for the period 1996/97 to 1999/2000.

Tralee Bay Complex SPA is of high ornithological importance as it annually supports over 20,000 wintering waterbirds, including an international important population of Light-bellied Brent Goose and nationally important populations of 21 other species. It is of note that three of the species that regularly occur, Whooper Swan, Golden Plover and Bar-tailed Godwit, are listed on Annex I of the E.U. Birds Directive. Tralee Bay is a Ramsar Convention site and parts of the Tralee Bay Complex SPA are designated as Nature Reserves. Lough Gill is a Wildfowl Sanctuary.

20.1.2015



Site Name: Slieve Mish Mountains SAC

Site Code: 002185

The Slieve Mish Mountains form the backbone of the eastern half of the Dingle Peninsula in Co. Kerry. The highest peak is Baurtregaum (851 m). The range is composed predominantly of Old Red Sandstone.

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):

[4010] Wet Heath
[4030] Dry Heath
[4060] Alpine and Subalpine Heaths
[8110] Siliceous Scree
[8210] Calcareous Rocky Slopes
[8220] Siliceous Rocky Slopes
[1421] Killarney Fern (*Trichomanes speciosum*)

The dominant habitat within Slieve Mish Mountains SAC is heath. Wet heath, dry heath and acid grassland occur in mosaics on the lower slopes of the mountains, while dry heath tends to dominate the upper, steeper slopes. Typical species of the wet heath include Purple Moor-grass (*Molinia caerulea*), Cross-leaved Heath (*Erica tetralix*), Common Cottongrass (*Eriophorum angustifolium*) and Deergrass (*Scirpus cespitosus*). The dry heath is dominated by Heather (*Calluna vulgaris*), with grasses (e.g. *Agrostis capillaris*, *A. canina* and *Festuca ovina*) and mosses. Some alpine heath occurs on the highest ridges; this supports a number of locally scarce species, including Dwarf Willow (*Salix herbacea*), Stiff Sedge (*Carex bigelowii*), Thrift (*Armeria maritima*) and Crowberry (*Empetrum nigrum*).

The site is intersected, particularly on its northern flank, by several steep-sided glaciated river valleys or glens. The head of Derrymore Glen features a classic oligotrophic corrie lake which is surrounded by steep cliffs. Steep cliffs, scree and rocky ridges are features of the site above 650 m. Cliffs within the site support a number of rare bryophytes, i.e. *Bazzania pearsonii*, *Daltonia splachnoides*, *Dumortiera hirsute*, *Mastigophora woodsii*, *Moerckia hibernica*, *Paraleptodontium recurvifolium*, *Radula carringtonii* and *Scapania ornithopodioides*, along with several relatively scarce vascular plant taxa typical of high-altitude inland cliffs, i.e. Starry Saxifrage (*Saxifraga stellaris*), Roseroot (*Rhodiola rosea*), Alpine Scurvygrass (*Cochlearia officinalis* subsp. *alpina*), Alpine Hair-grass (*Deschampsia cespitosa* subsp. *alpina*), Mountain Everlasting (*Antennaria dioica*), Mountain Sorrel (*Oxyria digyna*), Brittle Bladder-fern (*Cystopteris*

fragilis) and Irish Saxifrage (*Saxifraga rosacea*). The cliffs also support Kidney Saxifrage (*Saxifraga hirsuta*), St Patrick's-cabbage (*Saxifraga spathularis*) and the hybrid between these two species.

The site includes a small area of dry deciduous woodland, supporting species such as Sessile Oak (*Quercus petraea*), Ash (*Fraxinus excelsior*) and Holly (*Ilex aquifolium*).

The site contains a good population of Killaney Fern (*Trichomanes speciosum*), a species that is listed on Annex II of the E.U. Habitats Directive. Two other plants that are also listed in the Irish Red Data Book occur, namely Betony (*Stachys officinalis*) and Cornish Moneywort (*Sibthorpia europaea*). In Ireland, the latter species is confined to the Dingle Peninsula - its most easterly known station lies within the site. Other notable plant species recorded from the site include Whorled Caraway (*Carum verticillatum*), Lemon-scented Fern (*Oreopteris limbosperma*) and Ivy-leaved Bellflower (*Wahlenbergia hederacea*). Killarney Fern (*Trichomanes speciosum*) and Betony are protected under the Flora (Protection) Order, 2015.

Peregrine Falcons breed on cliffs within the site, and Chough are known to feed in the area. Both of these species are listed on Annex I of the E.U. Birds Directive.

Most of the site is grazed by sheep, with a smaller area being grazed by cattle. Over-grazing on parts of the site has led to some habitat degradation, particularly of the wet heath covering the lower slopes. Most of the blanket bog within the site has been extensively cut for turf and some of the turbarry is still active. The lack of forestry within the Slieve Mish range is notable.

Overall, the site is of considerable conservation significance, particularly for the presence of several habitats and species that are listed on Annexes I and II of the E.U. Habitats Directive. The presence of two bird species that are listed on Annex I of the E.U. Birds Directive and the populations of several rare or scarce plant species adds to the importance of the site.

Site Name: Magharee Islands SAC

Site Code: 002261

This marine site is centred around the Magharee Islands, which lie about 2 km north of the Magharee Peninsula in Co. Kerry. The site includes two of the smaller islands, Illaunnabarnagh and Mucklaghmore, which lie about 5 km to the north-east of the main group. The islands are exposed on their west coasts and more sheltered on their east coasts with moderately strong currents between them. The islands are composed of Carboniferous limestone.

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):

[1170] Reefs

The shallow water reefs around and between the Magharee Islands consist of areas that are exposed to wave action on the west coasts of the islands, more sheltered on the east coasts and subject to weak or moderate tidal streams. For the most part, the reefs are a mixture of boulders, cobbles, pebbles and sand, but in some areas are solid bedrock. In shallow water areas that are sheltered from wave action, mixed kelp forests of *Laminaria hyperborea*, *Saccorhiza polyschides* and *L. saccharina* colonize larger boulders and bedrock. On some reefs only *L. hyperborea* and *L. saccharina* are present with a sparse understory of red algae - this is an uncommon community. The sea squirts *Polycarpa scuba* and *Distomus variolosus* occur in the kelp communities and both of these species have a limited distribution in Ireland and Britain. *P. scuba* (=rustica) has only previously been recorded from the Irish Sea, English Channel and Brittany, but was common on the south-east coast. *D. variolosus* in Ireland is only known from between Galway and Tralee Bay on the west coast, and the east and south-east coasts.

In areas exposed to wave action the reefs at depths of 19-28 m are generally characterised by a community of foliose red algae, in particular *Callophyllis laciniata*, *Schottera nicaeensis*, *Plocamium cartilagineum* and *Delesseria sanguinea* and the hydroid *Sertularia argentia*, indicating the tide-swept nature of the habitats. Branching and cushion sponge may also be common in this community. The sea squirt *Diazona violacea* and the sponge *Thymosia guernei* were recorded twice and both occur at the reef north-west of Gurrig Island. *D. violacea* is more characteristic of the deeper water Axinellid sponge community. The small crevice dwelling brittlestar *Ophiothrix balli* is frequent at several sites. Red algal species such as *Plocamium cartilagineum* and *Acrosorium venulosum* colonise small boulders and cobbles, and the red alga *Radicilingua thysanorhizans* is also present at the Mucklaghmore reefs.

Illaunbarnagh is of national importance for breeding terns. In 1995 there were 46 pairs of Common Tern and 68 pairs of Arctic Tern. All tern species are listed on Annex I of the E.U. Birds Directive. Illaunabarnagh and Mucklaghbeg also have a nationally important population of Black Guillemots (113+ individuals in 1999).

This site is of conservation significance in particular for the reefs and associated communities which it hosts. The fact that the site supports important bird colonies adds further to its value.

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SITE SYNOPSIS

SITE NAME: MAGHAREE ISLANDS SPA

SITE CODE: 004125

The Magharee Islands lie about 2 km north of the Magharees Peninsula on the north side of the Dingle Peninsula, Co. Kerry. The site includes the main Magharee Islands (“Seven Hogs”), the islands of Mucklaghmore and Illaunnabarnagh to the east, Illaunnaon and Doonagaun Island to the south and several smaller rocky islets. Illaunimmill and Illauntannig are the largest of the islands included in the site. The islands are most exposed on their west coasts, and there are moderately strong sea currents between them. The bedrock of the islands is Carboniferous limestone; the larger ones have a covering of glacial boulder clay. The islands are low-lying, being mostly less than 15 m above sea level. Illaunimmill and Illauntannig were at one time inhabited and both are still grazed by cattle and sheep. The remains of an early Christian church can be seen on Illauntannig. Areas of the surrounding seas are included around all of the islands.

This site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Barnacle Goose, Storm Petrel, Shag, Common Gull, Common Tern, Arctic Tern and Little Tern.

The Magharee Islands are of national importance for breeding seabirds and also for wintering geese. In winter, the islands are utilised by a Barnacle Goose flock of national importance (85 – four survey mean between 1993 and 2003). The Magharee Islands are also an important site for breeding terns, which have been known from here since the 1850s. In 1995 the following were recorded: Common Tern (58 pairs), Arctic Tern (232 pairs) and Little Tern (36 pairs). The Little Tern population comprised over 20% of the national total. Sandwich Tern has bred in the past, for example in 1978, and a pair of Roseate Tern was also recorded breeding on Illaunnabarnagh in 2006. The site also supports nationally important populations of Storm Petrel (1,272 in 2007), Shag (61 pairs in 2001) and Common Gull (43 pairs in 2001). Other breeding seabirds recorded during a survey in 2001 were as follows: Fulmar (85 pairs), Cormorant (20 pairs), Lesser Black-backed Gull (20 pairs), Herring Gull (7 pairs) and Great Black-backed Gull (21 pairs). A recent survey in 2007 recorded the following breeding seabirds: Fulmar (137 pairs), Cormorant (91 pairs), Shag (223 pairs), Common Gull (178 pairs), Lesser Black-backed Gull (146 pairs), Herring Gull (82 pairs), Great Black-backed Gull (74 pairs), Common Tern (128 pairs), Arctic Tern (163) and Little Tern (18 pairs).

A possible breeding pair of Chough was recorded on the islands in 1992 and birds breeding on the mainland are known to forage on some of the islands.

Magharee Islands SPA is of high ornithological importance for breeding seabirds, especially terns, as well as for wintering Barnacle Geese, which are at the most southerly point of their range in Europe. It is of note that six of the species that occur,

i.e. Storm Petrel, Barnacle Goose, Chough, Common Tern, Arctic Tern and Little Tern are listed on Annex I of the E.U. Birds Directive.

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31.10.2014

SITE SYNOPSIS

SITE NAME: DINGLE PENINSULA SPA

SITE CODE: 004153

The Dingle Peninsula SPA is a large site situated on the west coast of Co. Kerry. It encompasses the high coast and sea cliff sections of the peninsula from just south of Brandon Point in the north, around to the end of the peninsula at Slea Head, and as far east as Inch in the south. The site includes the sea cliffs, the land adjacent to the cliff edge, areas of sand dune on the Magharees Peninsula and near Murreagh, and also several upland areas further inland of the coast about Ballybrack, Lough Doon, Anscaul Lough, Arraglen and Ballynane. The high water mark forms the seaward boundary. The site is underlain by a variety of sedimentary rock types of various ages, predominantly Devonian and Devonian/Silurian sandstones, conglomerates and siltstones, but also Ordovician mudstones, siltstones and breccias, and Silurian siltstones. An area of volcanic rocks of Silurian age is found about Clogher Head/Dunquin.

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

The site supports some of the highest densities in Ireland of breeding Chough, a Red Data Book species that is listed on Annex I of the E.U. Birds Directive. The abundance of Chough on the Dingle Peninsula was first noted in the 1800s. When the first modern survey of Chough was undertaken in 1982 the species was seen to be still abundant there. Since then the high importance of the site for Chough has been demonstrated by surveys in 1992 and 2002/03 when 107 and 105 breeding pairs respectively were recorded within the SPA.

The topography of the Dingle Peninsula, with its mosaic of grazed semi-improved and improved pastures, extensive well-drained uplands, and sand dune systems in close proximity to breeding cliffs, favours Chough. Particularly high densities of Chough occur at Reenbeg in the south of the site, The Three Sisters in the north-west and Ballydavid Head in the north. Large post-breeding flocks gather, particularly in the autumn, at the dune systems at Castlegregory and Inch (which is included in an adjacent SPA). Marked individuals have provided evidence that young birds converge in these flocks from throughout the peninsula and it is possible that Chough gather in the dunes here from even further afield. Known roost sites within the SPA include a site on the Magharees Peninsula and a number of inland locations such as the cliffs at Anscaul Lough, Arraglen and Lough Doon. Flocks of up to 80 birds form in the mountains during the summer months. Studies have shown that Chough forage mainly within 300 m inland of the cliff tops used for breeding and these areas have been included in the site.

The site also supports nationally important populations of Peregrine (5 pairs in 2002) and Fulmar (1,016 pairs), as well as smaller populations of other breeding seabirds: Razorbill (3 pairs), Herring Gull (33 pairs), Lesser Black-backed Gull (2 pairs), Shag

(23 pairs) and Great Black-backed Gull (1 pair) – all seabird data from 1999-2000. The site also holds a population of Black Guillemot.

The Dingle Peninsula SPA is of ornithological importance as it supports an internationally important population of Chough. It also supports nationally important populations of Fulmar and Peregrine. The presence of Chough and Peregrine, both species that are listed on Annex I of the E.U. Birds Directive, is of particular significance. Part of the Dingle Peninsula SPA is a Statutory Nature Reserve.

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5.11.2014



Site Name: Mount Brandon SAC

Site Code: 000375

This site comprises the central and north-western parts of the Dingle Peninsula. It is a mountainous area that encompasses several peaks including Mount Brandon (952 m), which is the highest peak outside of the Macgillycuddy's Reeks, Brandon Peak (840 m), and the Stradbally range which includes Beenoskee (826 m). The site includes the high sea cliffs of Brandon Head, as well as low-lying areas such as the Owenmore River/Cloghane River valley. Glaciation has played a large part in shaping the landscape into a series of ridges and valleys, with corrie lakes and steep cliffs. The underlying geology features Old Red Sandstone and Dingle Beds (the oldest Devonian rocks in Ireland). Conglomerates are also present.

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):

- [1230] Vegetated Sea Cliffs
- [3110] Oligotrophic Waters containing very few minerals
- [3130] Oligotrophic to Mesotrophic Standing Waters
- [4010] Wet Heath
- [4030] Dry Heath
- [4060] Alpine and Subalpine Heaths
- [6230] Species-rich *Nardus* Grassland*
- [7130] Blanket Bogs (Active)*
- [8110] Siliceous Scree
- [8210] Calcareous Rocky Slopes
- [8220] Siliceous Rocky Slopes
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1421] Killarney Fern (*Trichomanes speciosum*)

Arctic and arctic-alpine species, including important bryophyte and lichen assemblages, are found on the dramatic north- to east-facing inland cliffs and on the alpine heath of the highest ridges (above 750 m). Species present include Dwarf Willow (*Salix herbacea*), Alpine Bistort (*Polygonum viviparum*), Alpine Saw-wort (*Saussurea alpina*), Mountain Sorrel (*Oxyria digyna*), Alpine Lady's-mantle (*Alchemilla alpina*), Alpine Hair-grass (*Deschampsia alpina*), Alpine Meadow-grass (*Poa alpina*), Roseroot (*Rhodiola rosea*), saxifrages (*Saxifraga stellaris* and *S. rosacea*), and ferns such as Holly Fern (*Polystichum lonchitis*), Green Spleenwort (*Asplenium viride*), Wilson's Filmy-fern (*Hymenophyllum wilsonii*) and Brittle Bladder-fern (*Cystopteris fragilis*).

These inland cliffs correspond to the habitats Calcareous Rocky Slopes, Siliceous Rocky Slopes and Siliceous Scree, and are particularly important for their range of rare oceanic bryophyte species, including *Adelanthus lindenbergianus*, *Scapania nimbosa*, *S. ornithopodioides*, *Lejeunea* spp. and many more.

The most common habitats within the site are heath, upland grassland and blanket bog. The heath occurs in areas of shallow peat and on the mineral soils of the mountain sides. It varies in nature from dry to wet. The dry heath is dominated by Heather (*Calluna vulgaris*) and Western Gorse (*Ulex gallii*), while the wet contains Cross-leaved Heath (*Erica tetralix*), Purple Moor-grass (*Molinia caerulea*), Carnation Sedge (*Carex panicea*) and bog mosses (*Sphagnum* spp.). The dry heath often grades into upland grassland which supports a range of characteristic grasses: Mat-grass (*Nardus stricta*), Common Bent (*Agrostis capillaris*) and Viviparous Fescue (*Festuca vivipara*).

Areas of blanket bog occur on level or gently sloping ground. There are three main areas of particular interest: two upland bogs and a lowland, valley bog. Coumanare Bog is an impressive tract of mountain bog dominated by Purple Moor-grass and Deergrass (*Scirpus cespitosus*). It features a large and particularly well-developed scraw (i.e. area of floating vegetation), associated with a series of springs along the Scorid River, where bog mosses dominate (e.g. *Sphagnum cuspidatum*, *S. auriculatum* var. *auriculatum*, *S. papillosum* and *S. subnitens*). Another upland blanket bog, located on the south-facing slopes of Beenator and Cumbaun Mountains, is heavily grazed and dominated by Deergrass, Heather and Common Cottongrass (*Eriophorum angustifolium*). Some of the lowland bog in the Owenmore River/Cloghane River valley is intact and is dominated by Deergrass, with Black Bog-rush (*Schoenus nigricans*), Purple Moor-grass, Great Sundew (*Drosera anglica*) and bog mosses also occurring.

Oligotrophic corrie lakes are a feature of the site, including a string of Paternoster lakes below the Brandon range. Characteristic plant species found include Shoreweed (*Littorella uniflora*), Quillwort (*Isoetes lacustris*) and Six-stamened Waterwort (*Elatine hexandra*).

Vegetated sea cliffs, which stretch for some 12 km along the north-western edge of the site, are amongst the highest in Ireland (over 400 m above sea level). The cliffs support a good variety of plant species typical of the habitat, including Thrift (*Armeria maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), Sea Spleenwort (*Asplenium marinum*) and Rock Sea-spurrey (*Spergularia rupicola*). Populations of a number of relatively scarce plants, including Roseroot, Irish Saxifrage (*Saxifraga rosacea*) and Mountain Sorrel also occur. The cliff tops support heath or coastal grassland, and here such species as Creeping Willow (*Salix repens*), Crowberry (*Empetrum nigrum*) and Allseed (*Radiola linoides*) are found. The scarce Small Adder's-tongue (*Ophioglossum azoricum*) has been recorded from cliff tops in the site.

A suite of rare Red Data Book plant species have been recorded, associated with the inland cliffs and alpine heath: Alpine Bistort, Alpine Meadow-grass, Alpine Saw-

wort, Alpine Lady's-mantle and Holly Fern. Mount Brandon is one of the most southern locations in Britain and Ireland for Alpine Bistort, a species which is protected under the Flora (Protection) Order, 2015. Cornish Moneywort (*Sibthorpia europaea*), also a Red Data Book species, occurs at several locations within the site. In Ireland this species is found only on the Dingle Peninsula. Killarney Fern (*Trichomanes speciosum*), protected under the E.U. Habitats Directive and the Flora (Protection) Order, 2015, occurs within the site.

A population of Freshwater Pearl Mussel (*Margaritifera margaritifera*) occurs within the site. This is an endangered species that is listed on Annex II of the E.U. Habitats Directive. Other fauna of interest recorded from the site includes Large Heath (*Coenonympha tullia*), a vulnerable butterfly, and Arctic Char (*Salvelinus alpinus*), a Red Data Book fish species found recently in Anascaul Lough.

The Dingle Peninsula supports some of the highest densities in Ireland of breeding Chough, a Red Data Book species that is listed on Annex I of the E.U. Birds Directive. The abundance of Chough on the peninsula was first noted in the 1800s and has been demonstrated in recent surveys. In the site the birds are particularly to be found close to the Brandon Head sea cliffs, but also as large roosting flocks in several inland upland areas, as at Ballybrack, Lough Doon, Anascaul Lough and Arraglen. Peregrine, also an E.U. Birds Directive Annex I species, uses the site, as well as a variety of seabird species that breed on the sea cliffs.

The main land use within the site is sheep grazing. The serious effects of over-grazing are widespread and are exacerbated by the upland, exposed nature of the site. Other threats come from turbarry and afforestation. Part of the site is state-owned, the Mount Brandon Nature Reserve.

The site is of high conservation value due to the presence of good quality examples of 11 habitats that are listed on Annex I of the E.U. Habitats Directive, as well as populations of two species that are listed on Annex II of this Directive. The presence of the E.U. Birds Directive Annex I species, Chough and Peregrine, as well as of populations of a suite of rare Red Data Book plant species, adds considerably to the significance of the site.



Site Name: Castlemaine Harbour SAC

Site Code: 000343

This is a large site located on the south-east corner of the Dingle Peninsula, Co. Kerry. It consists of the whole inner section of Dingle Bay, i.e. Castlemaine Harbour, the spits of Inch and White Strand/Rosbehy and a little of the coastline to the west. The River Maine, almost to Castlemaine, and much of the River Laune catchment, including the Gaddagh, Gweestion, Glanooragh, Cottoner's River and the River Loe, are also included within the site.

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):

- [1130] Estuaries
[1140] Tidal Mudflats and Sandflats
[1210] Annual Vegetation of Drift Lines
[1220] Perennial Vegetation of Stony Banks
[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts
[1310] *Salicornia* Mud
[1330] Atlantic Salt Meadows
[1410] Mediterranean Salt Meadows
[2110] Embryonic Shifting Dunes
[2120] Marram Dunes (White Dunes)
[2130] Fixed Dunes (Grey Dunes)*
[2170] Dunes with Creeping Willow
[2190] Humid Dune Slacks
[91E0] Alluvial Forests*
- [1095] Sea Lamprey (*Petromyzon marinus*)
[1099] River Lamprey (*Lampetra fluviatilis*)
[1106] Atlantic Salmon (*Salmo salar*)
[1355] Otter (*Lutra lutra*)
[1395] Petalwort (*Petalophyllum ralfsii*)

Inch Spit holds a fine sand dune system. It is one of the largest and best remaining dune systems in the country. Fore dunes are found on the western side of Rosbehy and Inch. In these younger, mobile dunes, Marram (*Ammophila arenaria*) is common, with Groundsel (*Senecio vulgaris*), Sea Rocket (*Cakile maritima*) and Dandelion

(*Taraxacum* agg.) also present. Other characteristic species include Sand Couch (*Elymus farctus*), Lyme-grass (*Leymus arenarius*) and Sea Spurge (*Euphorbia paralias*). Fixed dune, a priority habitat under the E.U. Habitats Directive, is well-represented at the site, and in particular towards the tip of Inch Spit. Such areas support species such as Lady's Bedstraw (*Galium verum*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Wild Thyme (*Thymus praecox*), Kidney Vetch (*Anthyllis vulneraria*), Wild Pansy (*Viola tricolor*), Biting Stonecrop (*Sedum acre*), Common Centaury (*Centaureum erythraea*), Thyme-leaved Sandwort (*Arenaria serpyllifolia*) and Common Whitlowgrass (*Erophila verna*), among others. There is also a rich lichen and bryophyte flora. The slightly damper conditions which prevail in dune slacks support Creeping Bent (*Agrostis stolonifera*), Crested Dog's-tail (*Cynosurus cristatus*), Glaucous Sedge (*Carex flacca*), Creeping Willow (*Salix repens*) and Jointed Rush (*Juncus articulatus*). The rare bryophyte Petalwort (*Petalophyllum ralfsii*), which is listed on Annex II of the E.U. Habitats Directive, has been recorded in this system. A smaller spit, with a similar diversity of dune types, occurs at Rosbehy on the southern shore, from where Yellow Centaury (*Cicendia filiformis*) and Knotted Pearlwort (*Sagina nodosa*) have been recorded from a dune slack along with other, more common, species.

The sand spits, and also the Coomore peninsula, are underlain by shingle and in places the shingle is exposed and supports a characteristic flora. Species present include Lyme-grass and Sea Sandwort (*Honkenya peploides*). Strandline communities are well-developed along Inch spit, with the exception of the north-western end where recreational pressure is high. Typical species of the strandline include Prickly Saltwort (*Salsola kali*), Sea Rocket, oraches (*Atriplex* spp.) and Sea Sandwort. Two Red Data Book plants, Sea Pea (*Lathyrus japonicus* subsp. *maritimus*) and Sea-kale (*Crambe maritima*), are found associated with the shingle and strandline communities.

The coastline is fringed in many places by saltmarsh. The vegetation here includes Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Sea Rush (*Juncus maritimus*) and Sea Plantain (*Plantago maritima*). Upper saltmarsh communities extend inland, along estuarine channels, where they are mixed with freshwater communities. Sea Club-rush (*Scirpus maritimus*) and Common Reed (*Phragmites australis*) occur at these locations. Common Cord-grass (*Spartina anglica*) has colonised the lower part of the saltmarsh at Inch and extends out onto the open mudflat. Glassworts (*Salicornia* spp.) occur in association with saltmarsh.

West of Inch, cliffs of glacial drift occur, which support such plants as Ivy (*Hedera helix*), Red Fescue (*Festuca rubra*), Heather (*Calluna vulgaris*), Thrift, Sea Plantain, Sea Mayweed (*Matricaria maritima*), Kidney Vetch and Honeysuckle (*Lonicera periclymenum*). Along the cliff-tops there is coastal grassland with species such as Sweet Vernal-grass (*Anthoxanthum odoratum*), Cock's-foot (*Dactylis glomerata*) and Wood Sage (*Teucrium scorodonia*).

Much of the site consists of intertidal sand and mudflats, supporting a number of soft sediment communities, including beds of eelgrass (mostly *Zostera noltii*) in some

places. A subtidal mixed sediment community complex is also present in the channel between Rossbehy Point and Inch Point.

The rivers and their associated habitats also make up a considerable portion of the site. These associated habitats include wet grassland, woodland, scrub and bog/heath. In the valley up-river of Killorglin, is an interesting area of alluvial wet woodland, dominated by Alder (*Alnus glutinosa*) and willows (*Salix* spp.). The vegetation is quite diverse, and there are spectacular tussocks of Greater Tussock-sedge (*Carex paniculata*). Other species which occur include Ash (*Fraxinus excelsior*), Wild Angelica (*Angelica sylvestris*), Cuckooflower (*Cardamine pratensis*), Meadowsweet (*Filipendula ulmaria*), Common Nettle (*Urtica dioica*), Remote Sedge (*Carex remota*) and a range of bryophytes. While small in area, this is one of the few examples in Ireland of woodland on riverine alluvium dominated by native tree species.

Five plants listed in the Irish Red Data Book have been recorded at this site: Sea-kale, Corn Cockle (*Agrostemma githago*), Sea Pea, Pennyroyal (*Mentha pulegium*) and Irish Lady's-tresses (*Spiranthes romanzoffiana*). The three last-named are legally protected under the Flora (Protection) Order, 1999, as is the rare bryophyte, Petalwort. Other scarce species which occur here are Yellow Bartsia (*Pareutocellia viscosa*), Lax-flowered Sea-lavender (*Limonium humile*) and Blue-eyed-grass (*Sisyrinchium bermudiana*).

The vicinity of Castlemaine Harbour is also important as one of few areas in Ireland (all of which are in Co. Kerry) where the Natterjack Toad naturally occurs. This amphibian is listed in the Irish Red Data Book and on Annex IV of the E.U. Habitats Directive.

The site also supports a small colony of Common Seal, while two Lamprey species have been recorded in the Laune river catchment. The Laune catchment is used by Otter and is also an important Salmon system with nurseries, riffles pools and glides.

Castlemaine Harbour is a very important site for passage and wintering waterfowl. The following figures are derived from counts between 1994/5 and 1996/7. One species occurs here in internationally important numbers - Brent Goose (734) - with 16 species having populations of national importance: Cormorant (215), Shelduck (129), Pintail (167), Scaup (138), Wigeon (3,513), Red-breasted Merganser (51), Oystercatcher (1,539), Ringed Plover (330), Golden Plover (1,940), Grey Plover (122), Knot (347), Sanderling (207), Dunlin (1,360), Redshank (299), Greenshank (26) and Turnstone (296).

Castlemaine Harbour is of major ecological importance. It contains a range of coastal habitats of excellent quality, including many that are listed on Annex I of the E.U. Habitats Directive, and two which are listed with priority status (fixed dunes and alluvial forests). It also includes long stretches of river and stream which are excellent habitats for Salmon, Lamprey and Otter. Inch dunes are recognised as among the finest in the country, with particularly well-developed dune slacks. The

site supports internationally important waterfowl populations, rare plant species, the rare Natterjack Toad, as well as populations of several animal species that are listed on Annex II of the E.U. Habitats Directive. Part of the site is designated a Special Protection Area (SPA) and is listed as a site under the Ramsar Convention. Part of Castlemaine Harbour is a Statutory Nature Reserve, while Inch and Rosbehy are Wildfowl Sanctuaries.

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SITE SYNOPSIS

SITE NAME: CASTLEMAINE HARBOUR SPA

SITE CODE: 004029

Castlemaine Harbour SPA is a large coastal site occupying the innermost part of Dingle Bay. It extends from the lower tidal reaches of the River Maine and River Laune to west of the Inch and Rosbehy peninsulas (c. 16 km from east to west). The average width of the estuary is 4-5 km though it is c. 11 km wide at the outer limit. The site comprises the estuaries of the River Maine and the River Laune, both substantial rivers, and has extensive areas of intertidal sand and mud flats. A number of other rivers, e.g. the Caragh and the Emlagh, flow into the site, as well as numerous small streams. Conditions in the bay are very sheltered due to the presence of three protruding sand spits on its seaward side. These spits overly gravel bars. Two of the spits, Rosbehy and Inch, are included within the site. Salt marshes fringe much of the shoreline. A very large dune system occurs on the Inch peninsula. A substantial area of shallow marine water is included in the site.

The intertidal flats are mostly muds or muddy sands and have high densities of polychaete worms such as Ragworm (*Hediste diversicolor*) and Lugworm (*Arenicola marina*), along with a good variety of bivalves and molluscs. Eelgrass (*Zostera* spp.) is common in places. The introduced Common Cord-grass (*Spartina anglica*) is found in sheltered areas of the intertidal flats and has colonised the lower part of the saltmarsh at Inch. Salt marsh vegetation includes Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Sea Rush (*Juncus maritimus*) and Sea Plantain (*Plantago maritima*). The sand dune system at Inch is the largest and arguably the best remaining intact dune system in the country and includes large areas of embryo dunes, Marram (*Ammophila arenaria*) dunes and fixed dunes, as well as dune slacks.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Red-throated Diver, Cormorant, Light-bellied Brent Goose, Wigeon, Mallard, Pintail, Scaup, Common Scoter, Oystercatcher, Ringed Plover, Sanderling, Bar-tailed Godwit, Redshank, Greenshank, Turnstone and Chough. 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.

Castlemaine Harbour SPA is one of the most important sites for wintering waterfowl in the south-west. It provides habitats for an excellent diversity of waterbirds, including divers and seaduck. It is of international importance for its Light-bellied Brent Goose population (694) - figures given are mean peaks for the five winters 1995/96-1999/2000, as well as nationally important populations of a further fourteen waterbird species, i.e. Red-throated Diver (56), Cormorant (136), Wigeon (6,819), Mallard (487), Pintail (145), Scaup (74), Common Scoter (3,637), Oystercatcher (1,035), Ringed Plover (206), Sanderling (335), Bar-tailed Godwit (397), Redshank

(341), Greenshank (46) and Turnstone (144). The population of Wigeon is of note, being 7.6% of the all-Ireland total, while that of Sanderling is over 5%. Other species which occur include Great Northern Diver (22), Shelduck (90), Teal (287), Red-breasted Merganser (29), Golden Plover (972), Grey Plover (46), Knot (199), Dunlin (933), Curlew (474) and Black-headed Gull (538). The site provides good quality habitat for the feeding and roosting requirements of the various bird species which winter here. Whilst not breeding within the site, Chough occur in nationally important numbers and are regularly found on the sand dunes at Inch where they feed and socialise; during the autumn in 2002/03 and 2003/04 the dunes at Inch held flocks of up to 40 and 64 birds respectively.

Castlemaine Harbour SPA is a very important ornithological site, with one species, Light-bellied Brent Goose, occurring in numbers of international importance. In addition, it supports nationally important populations of a further fifteen species. Of particular note is that five species that occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Red-throated Diver, Great Northern Diver, Golden Plover, Bar-tailed Godwit and Chough. Castlemaine Harbour is a Ramsar Convention site and parts of Castlemaine Harbour SPA are designated as a Statutory Nature Reserve and as Wildfowl Sanctuaries.

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Site Name: Ballyseedy Wood SAC

Site Code: 002112

Ballyseedy Wood lies south of the River Lee, some 2 km south-east of Tralee, Co. Kerry. Most of the wood is situated in the floodplain of the River Lee on sticky, gleyed clay.

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):

[91E0] Alluvial Forests*

The woodland at the site is dominated by native tree species: Ash (*Fraxinus excelsior*), Alder (*Alnus glutinosa*), Rusty Willow (*Salix cinerea* subsp. *oleifolia*) and Hazel (*Corylus avellana*), with oak (*Quercus* spp.), Yew (*Taxus baccata*), elm (*Ulmus* sp.) and Spindle (*Euonymus europaeus*) also occurring. Non-native tree species found include Sycamore (*Acer pseudoplatanus*), Horse-chestnut (*Aesculus hippocastanum*), poplar (*Populus* sp.), Beech (*Fagus sylvatica*) and Hornbeam (*Carpinus betulus*). Three semi-natural woodland types are represented - areas dominated by Alder and Ash (following and adjacent to the River Lee); areas dominated by Ash and Hazel (on sloping, better-drained soil, mostly in the western half of the site); and areas dominated by Alder and Rusty Willow (on level sections further removed from the river).

The Alder/Ash-dominated woodland is a high canopy wood. The very large Alder trees present were probably planted, but much of the secondary regeneration is also very mature, being up to 100 years old. Sycamore, Horse-chestnut, poplar and Beech can also be found here. In the understorey species such as Hawthorn (*Crataegus monogyna*), Holly (*Ilex aquifolium*), elm, Spindle and Guelder-rose (*Viburnum opulus*) are found. The Alder/Ash-dominated woodland conforms well with the woodland type 'Alluvial Forest', listed with priority status on Annex I of the E.U. Habitats Directive.

The Ash/Hazel-dominated woodland is also mature, with Sycamore, Hornbeam and Beech also present. Hazel is frequent in the sub-canopy, with Hawthorn and the occasional elm also occurring.

The Alder/willow woodland stands are, for the most part, dominated by Alder, with Rusty Willow occurring as scattered trees.

The ground flora is represented by Wild Angelica (*Angelica sylvestris*), Meadowsweet (*Filipendula ulmaria*), Golden-saxifrage (*Chrysosplenium oppositifolium*), Enchanter's-nightshade (*Circaea lutetiana*), Soft Shield-fern (*Polystichum setiferum*), Broad Buckler-fern (*Dryopteris dilatata*), Scaly Male-fern (*Dryopteris affinis*), Thin-spiked Wood-sedge (*Carex strigosa*), Remote Sedge (*C. remota*) and Pendulous Sedge (*C. pendula*).

Several plant species which are nationally or locally scarce are found on the site, including Rough Horsetail (*Equisetum hyemale*), Thin-spiked Wood-sedge, Dark-leaved Willow (*S. myrsinifolia*) and Wood Horsetail (*E. sylvaticum*). The rare moss *Pylaisia polyantha*, a species known in Ireland only from Counties Donegal, Kerry and Mayo, has also been recorded from the site.

Ballyseedy Wood is a nesting site for Long-eared Owl, and the river is frequented by Otters, a species listed on Annex II of the E.U. Habitats Directive.

The site is undisturbed and apparently infrequently visited by man. Non-native tree species are present within the site but account for less than 30% of the woodland. Exotic and potentially invasive species present include Rhododendron (*Rhododendron ponticum*), Snowberry (*Symphoricarpos albus*), Cherry Laurel (*Prunus laurocerasus*), Japanese Knotweed (*Reynovtria japonica*) and Bamboo. These are, however, localised within the site and are not found throughout the woodland. In fact, some stands of woodland are remarkable for the complete absence of exotic species.

Ballyseedy Wood is of prime importance for its Alder/Ash-dominated woodland stands, a habitat type that is rare and threatened in Europe. The site is also of significance for several rare or scarce plant species that occur there. The scarcity of woodlands in north Kerry adds to the importance of the site.

SITE SYNOPSIS

SITE NAME: KERRY HEAD SPA

SITE CODE: 004189

Kerry Head SPA is situated on the south side of the mouth of the River Shannon in north Co. Kerry. It encompasses the sea cliffs from just west of Ballyheigue, around the end of Kerry Head to the west and north-eastwards as far as Kilmore. The site includes the sea cliffs and land adjacent to the cliff edge. The high water mark forms the seaward boundary. Most of the site is underlain by Devonian siltstones, sandstones and mudstones; a small section of the site has rocks of Carboniferous age.

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

The site supports an internationally important population of breeding Chough, a Red Data Book species that is listed on Annex I of the E.U. Birds Directive; 32 breeding pairs were recorded from the site in the 1992 survey and 30 in the 2002/03 survey. In addition, a flock of 20 birds was noted on the northern coast of the site during the latter survey. The site is of particular note for the density of breeding pairs found.

The site also supports a nationally important population of Fulmar (421 pairs), as well as a small population of Shag (8 pairs) – all seabird data from 2000. The site is also used by Peregrine (2 pairs in 2002).

Kerry Head SPA is one of the most important sites in the country for Chough. It also supports a population of Fulmar of national importance. The presence of Chough and Peregrine, both species that are listed on Annex I of the E.U. Birds Directive, is of particular significance

20.1.2015

SITE SYNOPSIS

SITE NAME: STACK'S TO MULLAGHAREIRK MOUNTAINS, WEST LIMERICK HILLS AND MOUNT EAGLE SPA

SITE CODE: 004161

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is a very large site centred on the borders between the counties of Cork, Kerry and Limerick. The site is skirted by the towns of Newcastle West, Ballydesmond, Castleisland, Tralee and Abbeyfeale. The mountain peaks included in the site are not notably high or indeed pronounced, the highest being at Knockfeha (451 m). Other mountains included are Mount Eagle, Knockanefune, Garraunbaun, Taur, Rock Hill, Knockacummer, Mullaghmuish, Knight's Mt, Ballincollig Hill, Beennageeha Mt, Sugar Hill, Knockanimpuba and Knockathea, amongst others. Many rivers rise within the site, notably the Blackwater, Owentaraglin, Owenkeal, Glenlara, Feale, Clydagh, Allaghaun, Allow, Oolagh, Galey and Smerlagh.

The site consists of a variety of upland habitats, though almost half is afforested. The coniferous forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). A substantial part (28%) of the site is unplanted blanket bog and heath, with both wet and dry heath present. The vegetation of these habitats is characterised by such species as Ling Heather (*Calluna vulgaris*), Bilberry (*Vaccinium myrtillus*), Common Cottongrass (*Eriophorum angustifolium*), Hare's-tail Cottongrass (*Eriophorum vaginatum*), Deergrass (*Scirpus cespitosus*) and Purple Moor-grass (*Molinia caerulea*). The remainder of the site is mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This SPA is a stronghold for Hen Harrier and supports the largest concentration of the species in the country. A survey in 2005 resulted in 40 confirmed and 5 possible breeding pairs, which represents over 29% of the national total. A similar number of pairs had been recorded in the 1998-2000 period. The mix of forestry and open areas provides optimum habitat conditions for this rare bird, which is listed on Annex I of the E.U. Birds Directive. The early stages of new and second-rotation conifer plantations are the most frequently used nesting sites, though some pairs may still nest in tall heather of unplanted bogs and heath. Hen Harriers will forage up to c. 5 km from the nest site, utilising open bog and moorland, young conifer plantations and hill farmland that is not too rank. Birds will often forage in openings and gaps within forests. In Ireland, small birds and small mammals appear to be the most frequently taken prey.

Short-eared Owl, also listed on Annex I of the E.U. Birds Directive and very rare in Ireland, has been known to breed within the site. Nesting certainly occurred in the late 1970s and birds have been recorded intermittently since. The owls are considered to favour this site due to the presence of Bank Voles, a favoured prey item. Merlin, a further E.U. Birds Directive Annex I species, also breeds but the size of the population is not known. Red Grouse is found on some of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed.

The main threat to the long-term survival of Hen Harriers within the site is further afforestation, which would reduce and fragment the area of foraging habitat, resulting in possible reductions in breeding density and productivity. The site has a number of wind farm developments but it is not yet known if these have any adverse impacts on the Hen Harriers.

Overall, the site provides excellent nesting and foraging habitat for breeding Hen Harrier, and is considered to be among the top two sites in the country for the species.



Site Name: Lower River Shannon SAC

Site Code: 002165

This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. Rivers within the sub-catchment of the Feale include the Gale, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarne. Rivers within the sub-catchment of the Mulkear include the Killeenagarriff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

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):

- [1110] Sandbanks
- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1150] Coastal Lagoons*
- [1160] Large Shallow Inlets and Bays
- [1170] Reefs
- [1220] Perennial Vegetation of Stony Banks
- [1230] Vegetated Sea Cliffs
- [1310] *Salicornia* Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [6410] *Molinia* Meadows
- [91E0] Alluvial Forests*
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1095] Sea Lamprey (*Petromyzon marinus*)
- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1349] Bottle-nosed Dolphin (*Tursiops truncatus*)
- [1355] Otter (*Lutra lutra*)

The Shannon and Fergus Rivers flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones predominate (except at Kerry Head, which is formed from Old Red Sandstone). The eastern sections of the Feale catchment flow through Namurian rocks and the western stretches through Carboniferous limestone. The Mulkear flows through Lower Palaeozoic rocks in the upper reaches before passing through Namurian rocks, followed by Lower Carboniferous shales and Carboniferous limestone. The Mulkear River itself, immediately north of Pallas Green, passes through an area of Rhyolites, Tuffs and Agglomerates.

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary.

Both the Fergus and inner Shannon Estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some eelgrass (*Zostera* spp.) beds and patches of green algae (e.g. *Ulva* sp. and *Enteromorpha* sp.). The main macro-invertebrate community which has been noted from the inner Shannon and Fergus estuaries is a *Macoma-Scrobicularia-Nereis* community.

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate. For example, swards of Common Cord-grass (*Spartina anglica*) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (*Salicornia europaea* agg.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (*Phragmites australis*) and club-rushes (*Scirpus maritimus*, *S. tabernaemontani* and *S. triquetrus*). In addition to the nationally rare Triangular Club-rush (*Scirpus triqueter*), two scarce species are found in some of these creeks (e.g. Ballinacurra Creek): Lesser Bulrush (*Typha angustifolia*) and Summer Snowflake (*Leucojum aestivum*).

Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*), Creeping Bent (*Agrostis stolonifera*), Saltmarsh Rush (*Juncus gerardi*), Long-bracted Sedge (*Carex extensa*), Lesser Sea-spurrey

(*Spergularia marina*) and Sea Arrowgrass (*Triglochin maritima*). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (*Juncus maritimus*) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus estuary: a type of robust saltmarsh-grass (*Puccinellia foucaudii*), sometimes placed within the species Common Saltmarsh-grass (*P. maritima*) and Hard-grass (*Parapholis strigosa*).

Saltmarsh vegetation also occurs around a number of lagoons within the site, two of which have been surveyed as part of a National Inventory of Lagoons. Cloonconeen Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat. The adjacent shore features one of the best examples of a drowned forest in Ireland. Aquatic vegetation in the lagoon includes typical species such as Beaked Tasselweed (*Ruppia maritima*) and green algae (*Cladophora* sp.). The fauna is not diverse, but is typical of a high salinity lagoon and includes six lagoon specialists (*Hydrobia ventrosa*, *Cerastoderma glaucum*, *Lekanesphaera hookeri*, *Palaemonetes varians*, *Sigara stagnalis* and *Enochrus bicolor*). In contrast, Shannon Airport Lagoon (2 ha) is an artificial saline lake with an artificial barrier and sluiced outlet. However, it supports two Red Data Book species of stonewort (*Chara canescens* and *Chara* cf. *connivens*).

Most of the site west of Kilcredaun Point/Kilconely Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (*Beta vulgaris* subsp. *maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), Thrift and plantains (*Plantago* spp.). A rare endemic type of sea-lavender, *Limonium recurvum* subsp. *pseudotranswallianum*, occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (*Anthyllis vulneraria*) and Common Bird's-foot-trefoil (*Lotus corniculatus*).

The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action. Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top, and below this each of the shores has different characteristic species giving a range of different shore types.

The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well developed lichen zones and littoral reef communities offering a high species richness in the sublittoral fringe and strong populations of the Purple Sea Urchin *Paracentrotus lividus* are found. The communities found are tolerant to sand scour and tidal streams. The infralittoral reefs range from sloping platforms with some vertical steps, to ridged bedrock with

gullies of sand between the ridges, to ridged bedrock with boulders or a mixture of cobbles, gravel and sand. Kelp is very common to about 18 m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae.

Other coastal habitats that occur within the site include stony beaches and bedrock shores (these support a typical zonation of seaweeds such as *Fucus* spp., *Ascophyllum nodosum* and kelps), shingle beaches (with species such as Sea Beet, Sea Mayweed - *Matricaria maritima*, Sea Campion and Curled Dock - *Rumex crispus*), sandbanks which are slightly covered by sea water at all times (e.g. in the area from Kerry Head to Beal Head) and sand dunes (a small area occurs at Beal Point, where Marram - *Ammophila arenaria* is the dominant species).

Freshwater rivers have been included in the site, most notably the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (along with some of its tributaries, including a short stretch of the Kilmastulla River), the Fergus up as far as Ennis, and the Cloon River. These systems are very different in character: the Shannon is broad, generally slow flowing and naturally eutrophic; the Fergus is smaller and alkaline; while the narrow, fast flowing Cloon is acid in nature. The Feale and Mulkear catchments exhibit all the aspects of a river from source to mouth. Semi-natural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, but improved grassland is the most common habitat type. One grassland type of particular conservation significance, *Molinia* meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy. Here are found areas of wet meadow dominated by rushes (*Juncus* spp.) and sedges (*Carex* spp.), and supporting a diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*C. pallescens*).

Floating river vegetation characterised by species of water-crowfoot (*Ranunculus* spp.), pondweeds (*Potamogeton* spp.) and the moss *Fontinalis antipyretica* are present throughout the major river systems within the site. The rivers contain an interesting bryoflora with *Schistidium alpicola* var. *alpicola* recorded from in-stream boulders on the Bilboa, new to Co. Limerick.

Alluvial woodland occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick. The woodland is up to 50 m wide on the banks and somewhat wider on the largest island. The most prominent woodland type is gallery woodland where White Willow (*Salix alba*) dominates the tree layer with occasional Alder (*Alnus glutinosa*). The shrub layer consists of various willow species with Rusty Willow (*Salix cinerea* ssp. *oleifolia*) and what appear to be hybrids of *S. alba* x *S. viminalis*. The herbaceous layer consists of tall perennial herbs. A fringe of bulrush (*Typha* sp.) occurs on the river side of the woodland. On slightly higher ground above the wet woodland and on the raised embankment remnants of mixed oak-ash-alder woodland occur. These are poorly developed and contain numerous exotic species but locally there are signs that it is invading open grassland. Alder is the principal tree species, with occasional Pedunculate Oak (*Quercus robur*), elm (*Ulmus glabra* and *U. procera*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and

the shrubs Guelder-rose (*Viburnum opulus*) and willows. The ground flora is species-rich.

While woodland is infrequent within the site, however Cahiracon Wood contains a strip of old oak woodland. Sessile Oak (*Q. petraea*) forms the canopy, with an understorey of Hazel and Holly (*Ilex aquifolium*). Great Wood-rush (*Luzula sylvatica*) dominates the ground flora. Less common species present include Great Horsetail (*Equisetum telmateia*) and Pendulous Sedge (*Carex pendula*).

In the low hills to the south of the Slievefelim Mountains, the Cahernahallia River cuts a valley through the Upper Silurian rocks. For approximately 2 km south of Cappagh Bridge at Knockanavar, the valley sides are wooded. The woodland consists of birch (*Betula* spp.), Hazel, oak, Rowan (*Sorbus aucuparia*), some Ash (*Fraxinus excelsior*) and willow (*Salix* spp.). Most of the valley is not grazed by stock, and as a result the trees are regenerating well. The ground flora features prominent Great wood-rush and Bilberry (*Vaccinium myrtillus*), along with a typical range of woodland herbs. Bracken (*Pteridium aquilinum*) is a feature in areas where there is more light available.

The valley sides of the Bilboa and Gortnageragh Rivers on higher ground north-east of Cappamore, support patches of semi-natural broadleaf woodland dominated by Ash, Hazel, oak and birch. There is a good scrub layer with Hawthorn, willow, Holly and Blackthorn (*Prunus spinosa*) common. The herb layer in these woodlands is often open, with a typically rich mixture of woodland herbs and ferns. Moss species diversity is high. The woodlands are ungrazed. The Hazel is actively coppiced in places.

There is a small area of actively regenerating cut-away raised bog at Ballyrorheen. It is situated approximately 5 km north-west of Cappamore in Co. Limerick. The bog contains some wet areas with good cover of bog mosses (*Sphagnum* spp.). Species of particular interest include Cranberry (*Vaccinium oxycoccos*) and White Sedge (*Carex curta*), along with two regionally rare mosses, including the bog moss *S. fimbriatum*. The site is being invaded by Downy Birch (*Betula pubescens*) scrub woodland. Both commercial forestry and the spread of Rhododendron (*Rhododendron ponticum*) has greatly reduced the overall value of the site.

A number of plant species that are listed in the Irish Red Data Book occur within the site, and several of these are protected under the Flora (Protection) Order, 1999. These include Triangular Club-rush (*Scirpus triquetrus*), a species which is only found in Ireland only in the Shannon Estuary, where it borders creeks in the inner estuary. Opposite-leaved Pondweed (*Groenlandia densa*) is found in the Shannon where it passes through Limerick City, while Meadow Barley (*Hordeum secalinum*) is abundant in saltmarshes at Ringmoylan and Mantlehill. Hairy Violet (*Viola hirta*) occurs in the Askeaton/Foynes area. Golden Dock (*Rumex maritimus*) is noted as occurring in the River Fergus estuary. Finally, Bearded Stonewort (*Chara canescens*), a brackish water specialist, and Convergent Stonewort (*Chara connivens*) are both found in Shannon Airport Lagoon.

Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bar-tailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland White-fronted Goose were regularly found, but none were seen in 1993/94.

Other wintering waders and wildfowl present include Greylag Goose (216; 1995/96), Shelduck (1,060; 1995/96), Wigeon (5,976; 1995/96), Teal (2,319; 1995-96), Mallard (528; 1995/96), Pintail (45; 1995/96), Shoveler (84; 1995/96), Tufted Duck (272; 1995/96), Scaup (121; 1995/96), Ringed Plover (240; 1995/96), Grey Plover (750; 1995/96), Lapwing (24,581; 1995/96), Knot (800; 1995/96), Dunlin (20,100; 1995/96), Snipe (719; 1995/96), Black-tailed Godwit (1,062; 1995/96), Curlew (1,504; 1995/96), Redshank (3,228; 1995/96), Greenshank (36; 1995/96) and Turnstone (107; 1995/96). A number of wintering gulls are also present, including Black-headed Gull (2,216; 1995/96), Common Gull (366; 1995/96) and Lesser Black-backed Gull (100; 1994/95). This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregrine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4,010 individuals at Loop Head, 1987).

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be 140 ± 12 individuals. Otter, a species also listed on Annex II of this Directive, is commonly found on the site.

Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon, while the Mulkear catchment excels as a grilse fishery, though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of lamprey.

Two additional fish species of note, listed in the Irish Red Data Book, also occur, namely Smelt (*Osmerus eperlanus*) and Pollan (*Coregonus autumnalis pollan*). Only the former has been observed spawning in the Shannon.

Freshwater Pearl Mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River.

There is a wide range of land uses within the site. The most common use of the terrestrial parts is grazing by cattle, and some areas have been damaged through over-grazing and poaching. Much of the land adjacent to the rivers and estuaries has been improved or reclaimed and is protected by embankments (especially along the Fergus estuary). Further, reclamation continues to pose a threat, as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale.

In the past, cord-grass (*Spartina* sp.) was planted to assist in land reclamation. This has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds.

Domestic and industrial wastes are discharged into the Shannon, but water quality is generally satisfactory, except in the upper estuary where it reflects the sewage load from Limerick City. Analyses for trace metals suggest a relatively clean estuary with no influences of industrial discharges apparent. Further industrial development along the Shannon and water polluting operations are potential threats.

Fishing is a main tourist attraction on the Shannon and there are a large number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. The River Feale is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting. Some of these may pose threats to the birds and dolphins through disturbance. Specific threats to the dolphins include underwater acoustic disturbance, entanglement in fishing gear and collisions with fast moving craft.

This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitats lagoon and alluvial woodland, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.



Site Name: Kerry Head Shoal SAC

Site Code: 002263

Kerry Head Shoal, Co. Kerry is situated on the west coast of Ireland, to the north of Tralee Bay and to the west of Kerry Head. It is a deep (20-46 m) limestone reef running in a north-east to south-west direction. The reef is exposed to the full force of swells from the Atlantic.

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):

[1170] Reefs

The Kerry Head Shoal is of high importance as it is the best known example of the Axinellid sponge community in Ireland. Several species occur in associations that are unique in Ireland. The site contains a rich and diverse flora and fauna that is characterized by rare erect and encrusting sponges *Tetilla cranium*, *Quasillina brevis*, *Axinella flustra* and *Hexadella racovitzae*. These species are only known from one other locality in Ireland, while *T. zetlandica* has only been found in two other localities on the west coast.

The shallow water reef communities of Kerry Head Shoal are extremely exposed to wave action and subject to weak tidal streams. Sparse kelp (*Laminaria hyperborea*) on bedrock with occasional ridges and overhangs at 21-26 m overlies an understory of foliose red algae (*Callophyllis laciniata*, *Kallymenia reniformis*, *Acrosorium venulosum*, *Cryptopleura ramosa* and *Delesseria sanguinea*). The red alga *Drachiella spectabilis* is abundant and the brown alga *Carpomitra costata* is common. Both of these species are characteristic of clear Atlantic water. The fauna is characterised by a diverse assemblage of sponges including *Pachymatisma johnstonia*, *Cliona celata* and *Polymastia boletiformis*. Other species that are present include hydroids (*Aglaophenia pluma* and *Nemertesia antennina*), sea-fans (*Eunicella verrucosa*), sea-slugs (*Aplysia punctata*), bryozoa (*Membranipora membranacea* and *Electra pilosa*), and echinoderms (*Holothuria forskali*). Four species that generally occur in deeper water - the hydroid *Gymnangium montagui*, the sea-fan *Eunicella verrucosa*, the sea-squirt *Diazona violacea* and the sponge *Axinella dissimilis* - are present in the kelp community

In deeper water, at 33-46 m, the bedrock ranges from large and relatively flat terraces cut by gullies, to ridged bedrock and angular boulders. Here the reefs are colonised by excellent examples of the Axinellid cup sponge community with an extremely high number of sponge species (44 species) and few algal species. The sponges *Axinella infundibuliformis*, *Phakellia ventilabrum* and *P. vermiculata* are frequent in this

community, as are a number of rare species including two sponges *Hexadella racovitzai* and *Axinella flustra*, the bryozoan rose 'coral' *Pentapora foliacea*, the sea-squirt *Diazona violacea* and the red soft coral *Alcyonium glomeratum*. In the deepest examples of this community the rare sponges *Tetilla zetlandica*, *T. cranium*, and *Quasillina brevis* are also present. The rare species of sea-slug *Aldisa zetlandica* has also been recorded from the deep reefs.

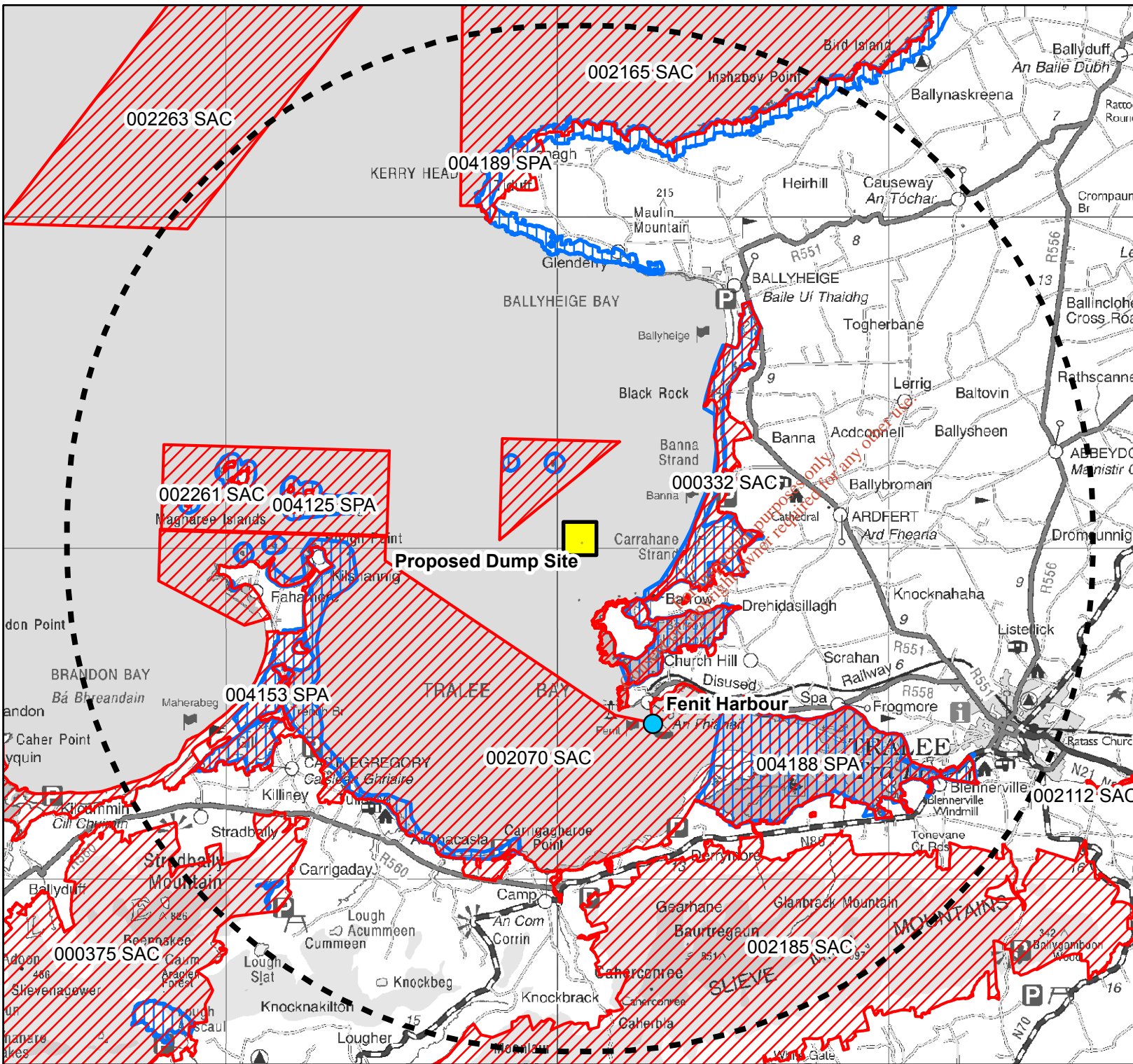
The reefs of the Kerry Head Shoal support a remarkable diversity of fauna and flora, including the best known example of the Axinellid sponge community in Ireland. The presence of a number of very rare sponge species (*Tetilla cranium*, *Axinella flustra*, *Hexadella racovitzai*, *T. zetlandica* and *Quasillina brevis*), known from only one or two other locations in Ireland, is of particular note.

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Appendix 3

Figures

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Legend

- Proposed Dump Site
- Fenit Harbour
- Proposed Dump Site 15km Buffer
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)

SPA Codes:
 004125 Magharee Islands
 004153 Dingle Peninsula
 004188 Tralee Bay Complex
 004189 Kerry Head

SAC Codes:
 000332 Akeragh, Banna and Barrow Harbour
 000375 Mount Brandon SAC
 002070 Tralee Bay And Magharees Peninsula, West To Cloghane
 002165 Lower River Shannon
 002185 Slieve Mish Mountains
 002263 Kerry Head Shoal SAC
 002112 Ballyseedy Wood
 002261 Magharee Islands

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Project Title:
 Fenit Harbour Maintenance
 Dredging and Dumpsite 2019

Drawing Title:
 Natura 2000 Sites

Client: Kerry County Council

Drawn By: JK
Checked By: HD
Drawing Date: 29/04/2019

Scale (A3): 1:160,000



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