

Kilrush Maritime Ltd.

# **Maintenance Dredging Activity – Kilrush Marina Risk Assessment for Annex IV Species**

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COMMERCIAL IN CONFIDENCE

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## 1. Introduction

### 1.1 Background

This report has been prepared by AQUAFACT - APEM Group (AQUAFACT) to provide relevant information to enable the competent authority (MARA) to carry out a Stage 1: Screening for Appropriate Assessment for Kilrush Marina maintenance dredging activity ('the Project') as required under Article 6(3) obligations of the Habitats Directive. MARA's functions and decision-making in this context are guided by the Maritime Area Planning Act 2021 and related statutory instruments, which establish its responsibility for assessing licence applications in line with European and national environmental law. This report considers the potential effects of the Project on European sites. The locations of the dredging and disposal work are shown in **Figure 1-1**. SACs found in the vicinity of the project can be seen below in **Figure 1-2**.

The aims of the Project can be summarised as follows:

- To restore and maintain safe navigational depths within the access channel to Kilrush Marina
- To ensure continued maritime access for recreational, commercial, and emergency vessels
- To prevent sedimentation-related access constraints that could impact the local economy and harbour operations
- To manage dredged material in an environmentally responsible manner through licensed at-sea disposal

The benefits resulting from the completion of the Project would include vessel transits to and from Kilrush Marina and the inner harbour will be facilitated with safe and efficient navigability, ensuring adequate under-keel clearance is maintained, thus mitigating the risk of grounding or navigational hazard.



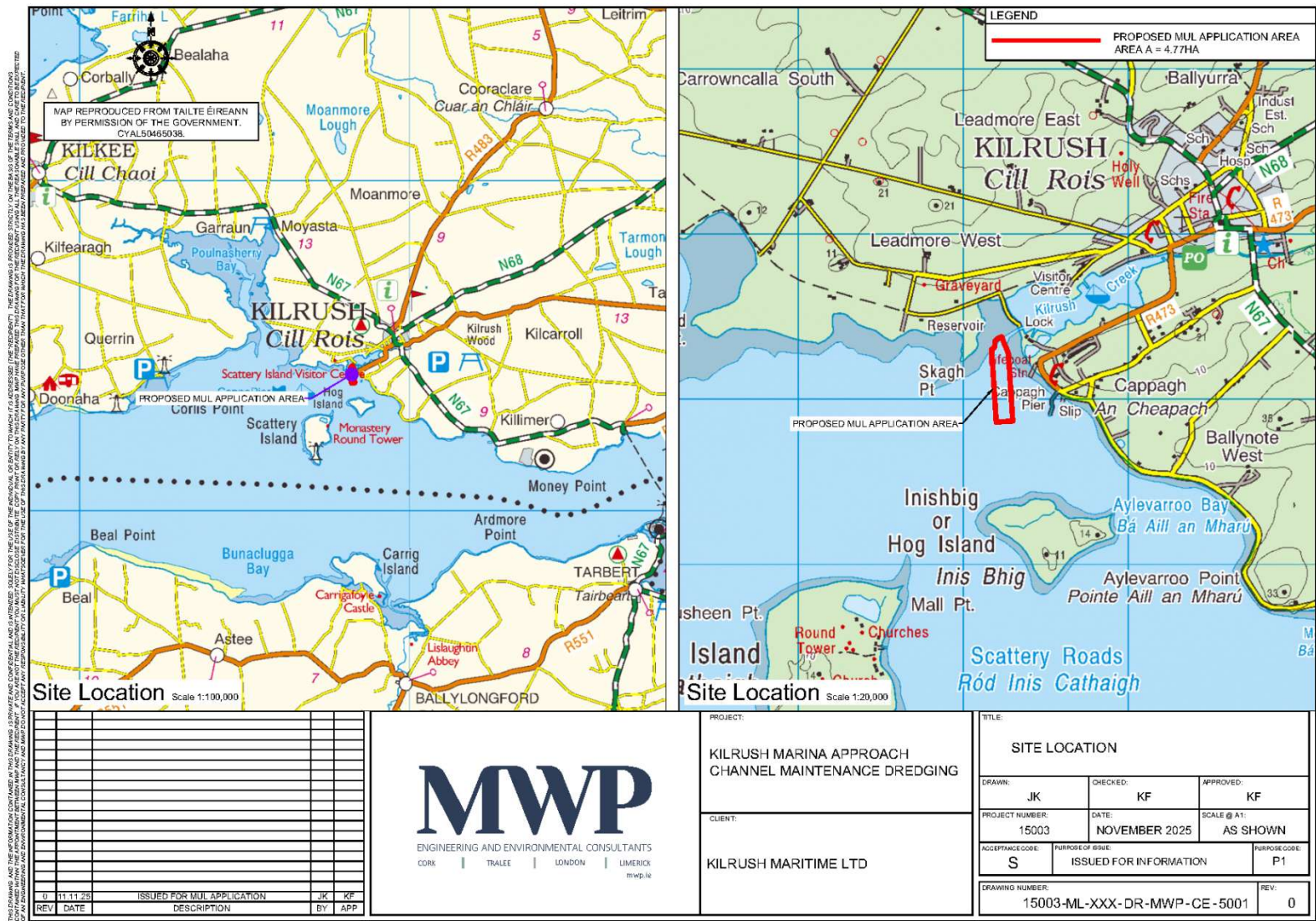


Figure 1-1: Location of dredging and dumping.

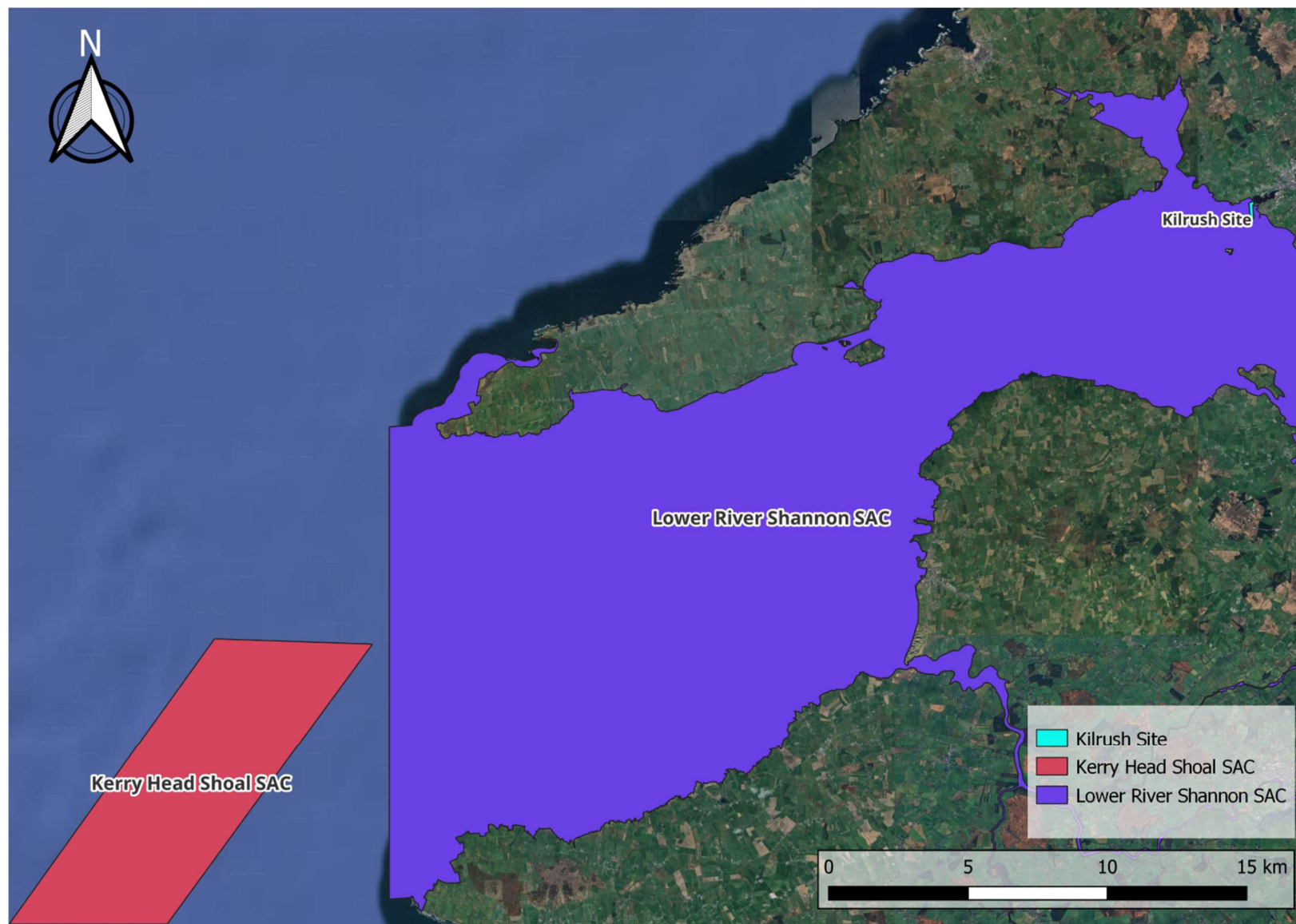


Figure 1-2: SACs in the vicinity of the proposed dredging.

## 1.2 Proposed Works

Maintenance dredging is required to ensure that navigable water depths are maintained at previously approved levels within the existing approach channel to Kilrush Creek. The dredging of the channel seaward of the lock gates is necessary to provide adequate under-keel clearance, thereby facilitating the safe and efficient passage of vessels to and from Kilrush Marina and the inner harbour.

The proposal described in this report forms part of a long-established programme of maintenance dredging in this area, which has been carried out periodically since the completion of Cappagh Pier in the mid-19th century. Dredging activities have become more regular and essential following the development of the adjacent Kilrush Marina, which was completed circa 1990.

The proposed works will be carried out over a period of approximately 6 working days per campaign. The equipment used to plough the marina approach channel will include a Multicat type tug towing an 8m wide plough blade suspended from an A-frame on the stern of the vessel. SFPC's Multicat Shannon 1 has been successfully used previously and will be commissioned again for this project, if it is not available a similar model will be used. The dredge area is 4.77 Ha which will produce approximately 8000T of material per campaign. The sides of the channel will have a gradient of 1:4. The ploughing rate is estimated to be 100m<sup>3</sup> per hour depending on the length of the haul.

The channel to be ploughed is *ca.* 250m long. Ploughing commences with a short run at the outermost end in a seaward direction. Each successive pass extends inwards until the ploughing run covers the full length of the channel. This is repeated daily for the duration of the campaign.

The licence is requested for a duration of 8 years, with 5 campaigns planned, spaced out approx. every 2 years for a total of 40,000T dredged material over the licence duration.

## 1.3 Purpose of this report

This report has been prepared to assess the impacts of the Project on relevant Annex IV species identified as having potential to be present in the Project, under Article 12 of the European Community (EC) Directive (92/43/EEC) on the conservation of natural habitats and of wild flora and fauna (commonly known as the Habitats Directive).



## 2. Legislation

### 2.1 Legislative background

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (commonly known as the Habitats Directive) is European Community legislation regarding nature conservation established to ensure biodiversity is conserved through the conservation of natural habitats and wild fauna and flora in Europe.

The Habitats Directive was originally transposed into Irish law by the *European Communities (Natural Habitats) Regulations, 1997* (S.I. No. 94 of 1997). The 1997 Regulations were subsequently revoked and replaced by the *European Communities (Birds and Natural Habitats) Regulations 2011*, as amended (herein referred to as the 2011 Birds and Natural Habitats Regulations).

A network of sites of conservation importance hosting habitats and species as needing to be either maintained at or restored to favourable conservation status have been identified by each Member State. These sites are known as European sites within the Natura 2000 network.

European sites in Ireland that form part of the Natura 2000 network of protected sites comprise Special Area of Conservation (SAC) sites designated due to their significant ecological importance for habitats and species protected under Annex I and Annex II respectively of the Habitats Directive, and Special Protection Areas (SPA) sites designated for the protection of populations and habitats of bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC). The sites are formally designated by the relevant minister under a statutory instrument. Candidate SAC and candidate SPA sites (*i.e.*, cSAC or cSPA) have the same level of protection as fully designated sites under Irish Law<sup>1</sup>. The specific named habitats and/or (non-bird) species for which an SAC or SPA are selected are called the 'Qualifying Interests' (QIs), of the site. The specific named bird species for which a SPA is selected is called the 'Special Conservation Interests' (SCIs). QIs and SCIs are collectively referred to as conservation features (OPR, 2021).

The Habitats Directive requirements are divided in two group chapters. The first includes the Articles 3 to 11, designated as 'Conservation of natural habitats and habitats of species'. The second group includes the Articles 12 to 16, designated as 'Protection of Species', which focus on establishing a system of strict protection for the animal species listed under Annex IV(a) of the Habitats Directive.

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<sup>1</sup> Candidate sites are those that have been submitted to the European Commission, but not yet formally adopted under Ministerial Statutory Instrument (S.I.). Legal protection, and therefore, the requirement for AA, arises from the date that the Minister gives notice of his/her intention to designate the site.

Article 12 of the Habitats Directive, under Regulation 51 of the 2011 Birds and Natural Habitats Regulations states:

1. *Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV(a) in their natural range, prohibiting:*
  - (a) *all forms of deliberate capture or killing of specimens of these species in the wild;*
  - (b) *deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;*
  - (c) *deliberate destruction or taking of eggs from the wild;*
  - (d) *deterioration or destruction of breeding sites or resting places.*
2. *For these species, Member States shall prohibit the keeping transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild, except for those taken legally before this Directive is implemented.*
3. *The prohibition referred to in paragraph 1(a) and (b) and paragraph 2 shall apply to all stages of life of the animals to which this Article applies.*
4. *Member States shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV(a). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.*

Additionally, protection measures implemented under Article 12 of the Habitats Directive should ensure or contribute to the maintenance or restoration, at favourable conservation status, of Annex IV species of Community Interest. In the marine environment, Annex IV animal species of the Habitats Directive include all cetaceans (whales and dolphins), the otter and some marine turtles.

## 2.2 Guidance

This report has been prepared in accordance with the following guidance:

- DAHG (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters
- MARA (2024) Applicant Technical Guidance (V7) for Maritime Area Consents and Licensing.
- EC (2021) Guidance document on the strict protection of animal species of Community interest under the Habitats Directive. Commission Notice (2021) and
- JNCC *et al.* (2010) The protection of marine European Protected Species from injury and disturbance: Guidance for the marine area in England and Wales and the UK offshore marine area' published by the Joint Nature Conservation Committee (JNCC), Natural England and Countryside Council for Wales (now Natural Resources Wales).

An overview of the previous literature regarding the Annex IV species baseline in Irish waters, included the following sources:

- Baseline desk studies and field surveys carried out for the proposed project area,
- Site Synopsis, Conservation Objective Reports and Natura 2000 Forms available from NPWS,
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, Species Action Plans, and Conservation Management Plans and

Existing relevant mapping and databases *e.g.* waterbody status, species and habitat distribution *etc.* (sourced from the Environmental Protection Agency - <http://gis.epa.ie/>, the National Biodiversity Data Centre - <http://maps.biodiversityireland.ie> and the NPWS - <http://www.npws.ie/mapsanddata/>).

### 3. Annex IV species in the Project area

All cetacean species are listed under Annex IV of the Habitats Directive, which makes them strictly protected in Ireland. To this day, 25 species of cetaceans have been recorded in Irish waters, ranging from resident species such as bottlenose dolphins located in the Shannon Estuary Co. Clare, to migratory species such as humpbacks and fin whales recorded along the south and southwest coast of Ireland. Data available<sup>234</sup> have shown the Project area hosts a resident breeding population of bottlenose dolphins and Eurasian otter during all seasons. Other cetacean species regularly recorded in the Project area include minke whale (typically May to September), and common dolphin recorded all year round. Grey and harbour seals are also regularly recorded in small numbers feeding in the area. Due to the location of the Project area, it is very unlikely to have deep diving species (e.g. sperm whales) within the Project area.

The zone of impact (Zol) has been established in the accompanying Appropriate Assessment report. A key factor in defining the Zol is the assessment of connectivity between the project's potential impact mechanisms (source) and the relevant conservation features.

The Zol for the proposed Project is defined as the area encompassing the dredging footprint (**Figure 3-1** and **Figure 3-2**) and the extent of predicted sediment dispersion identified in the sediment transport modelling report, included in the application as a separate document. The modelling indicates that dredged material will disperse effectively within the outer and middle Shannon Estuary, with only minor localised deposition near the disposal area. The Zol therefore includes areas subject to temporary increases in turbidity, minor sedimentation, and vessel activity. Underwater and airborne noise from plough dredging and associated vessel operations are expected to be low intensity and short duration, attenuating rapidly with distance. Consequently, the acoustic Zol is considered to be limited to the immediate vicinity of the dredging and disposal sites, with no significant effects anticipated beyond this local area.

Within the Zol of the proposed project, there is one Special Areas of Conservation (SAC) with Annex IV animal species listed as conservation features:

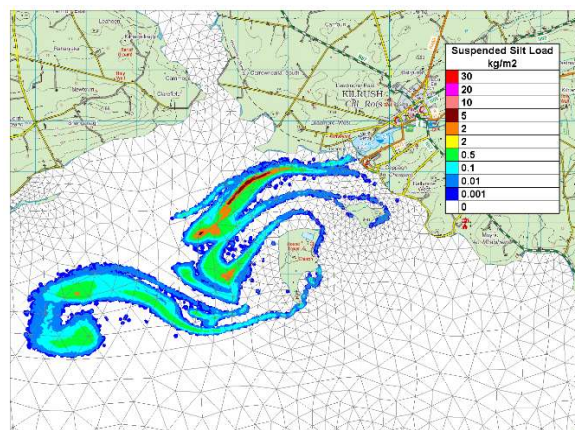
- Lower River Shannon SAC (Site code: 0002165) (Site code: 001141) (0km from Project area) – Otter (*Lutra lutra*) [1355] and Common bottlenose dolphin (*Tursiops truncatus*) [1349]

Overview of the Annex IV species distribution and abundance estimations are summarised in **Section 3.1** and **Section 3.2**, while **Section 3.4** provides a brief summary of other (non-Annex IV) species.

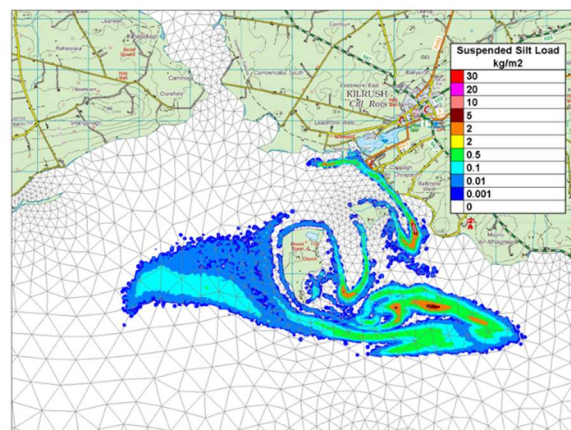
<sup>2</sup> [Identifying Potential MCZ's in Ireland's EEZ \(arcgis.com\)](#) (Accessed:18/08/2025) [Not working properly]

<sup>3</sup> [Site | Biodiversity Information System for Europe](#) (Accessed 18/08/2025)

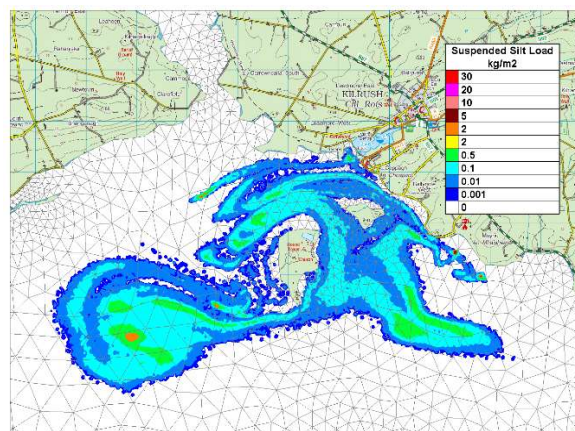
<sup>4</sup> [The Shannon \(Sionna\) Approaches IMMA - Marine Mammal Protected Areas Task Force](#) (Accessed 18/08/2025)



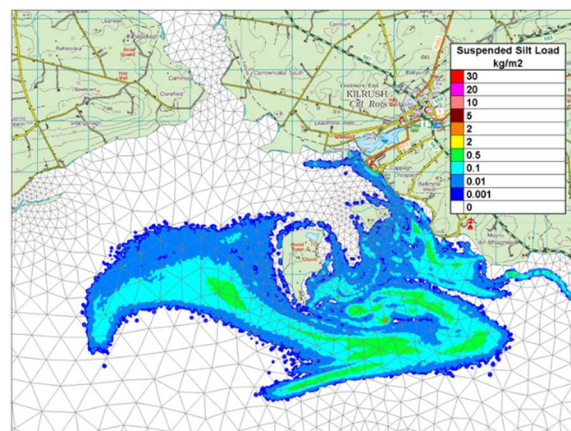
a) After 6 hours



b) After 12 hours



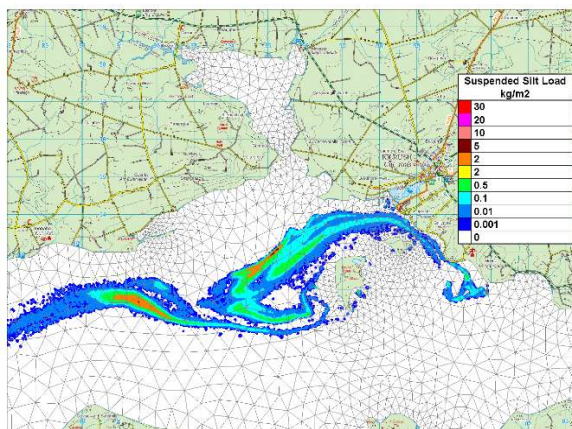
c) After 18 hours



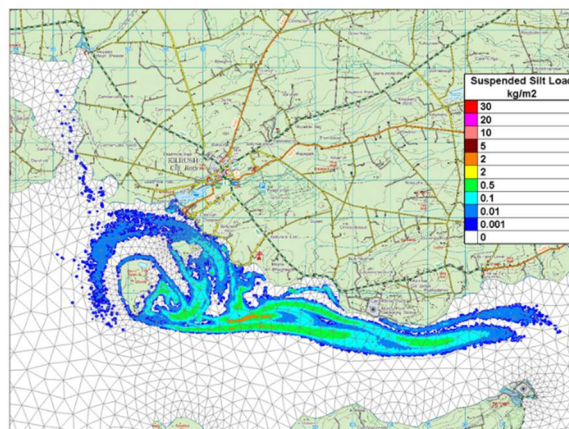
d) After 24 hours

Figure 3-1: Suspended sediment over 24-hour period after neap tide ploughing (100m<sup>3</sup> per hour).

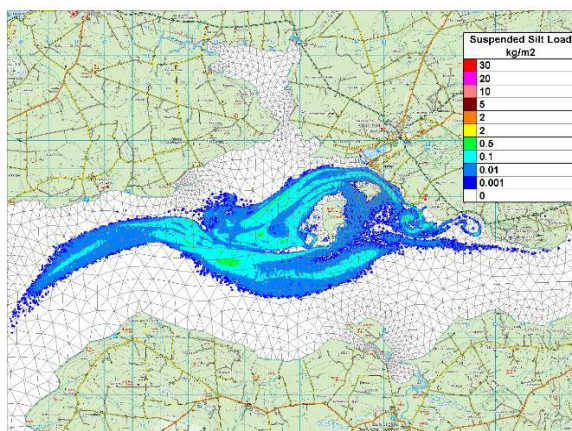




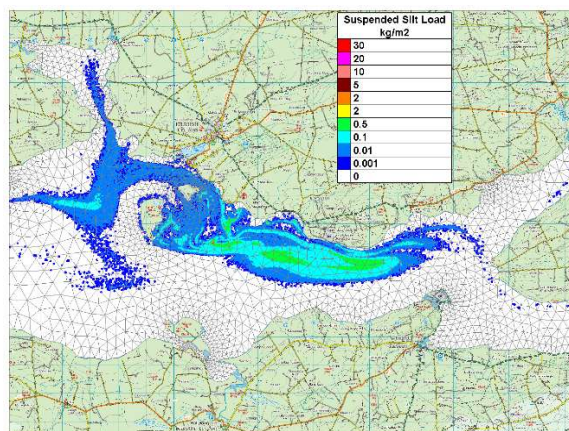
a) After 6 hours



b) After 12 hours



c) After 18 hours



d) After 24 hours

Figure 3-2: Suspended sediment over 24-hour period after spring tide ploughing (100m<sup>3</sup> per hour).

### 3.1 Otter (*Lutra lutra*) [1355]

The Eurasian otter is a top predator in freshwater systems; thus, its presence has a significant role in the well-being of these ecosystems (Reid *et al.*, 2013a). Aquatic prey and shelter availability are two basic requirements in the growth of otter populations. This species is strictly protected under Annex II and IV of the Habitats Directive, thus requires Member States to designate SACs for their protection. Otters have also been designated as species of conservation concern and high priority, due to major decline in numbers because of alterations in water quality chemistry (eutrophication) in river and estuaries habitats, habitat destruction, and introduction of alien invasive species (Reid *et al.*, 2013a; Gutleb & Kranz 1998; Leppakoski *et al.*, 2002). Consequently, otters have been designated as ‘sentinel species’ for the dynamics and diversity of pesticides in aquatic food webs (Reid *et al.*, 2013a; Lemarchand *et al.*, 2011). The Eurasian otter is currently listed as Near Threatened on the IUCN Red List global assessment of the species (Loy *et al.*, 2022).

In Ireland, the species is widespread throughout the country and there are 44 SACs<sup>5</sup> with otter as a QI, with associated habitats ranging from estuaries, lakes, coastal lagoons, dunes and alluvial forests (Bailey and Rochford 2006). For the proposed Project area, the Lower River Shannon SAC (IE0002165) includes otter as a QI under Annex II of the Habitats Directive. Records of European otters in the vicinity of the proposed works were obtained from the NBDC<sup>6</sup> online database. According to the NBDC database the most recent evidence of otter activity in the Kilrush area dates back to 2017, when spraint (otter faeces) was recorded. Kilrush Tidy Towns<sup>7</sup> which operates within the area of the proposed works, notes that otters are regularly observed by locals in Kilrush Marina. The area of the proposed works may serve as a foraging area for the otter as empty crab shells have also been observed by locals nearby spraint<sup>5</sup>. It is unlikely that the species uses the area of the proposed works as a breeding site as they typically utilise sheltered dens (holts) for breeding along banks of water sources away from human disturbance. Otters have shown breeding habitat selectivity, preferring well preserved areas with low human disturbance choosing areas with reduced human accessibility (Tolrà *et al.*, 2024). The proposed development will not alter preferred breeding habitat of the otter but may temporarily disrupt the species use of the area as a corridor to travel between resting and foraging areas.

All these European sites consist of river habitats and coastal lagoons which are suited for otter breeding. Ó Néill (2008) calculated estimates of otters during 1981 to 1982 based on species incidence from Chapman & Chapman (1982). Reid *et al.* (2013a) compared these estimates with estimates based on Reid *et al.* (2013b), which can be seen in the following table: **Table 3-1: Otter estimates for the coastline of Ireland, based on Table 17. of Reid *et al.* (2013a).** \*Population estimates were cumulative population within 44 SACs where otters were a designated feature (not from all SACs).

<sup>5</sup> NPWS 1355 *Lutra lutra* Conservation Status Assessment Report. <https://www.npws.ie/sites/default/files/general/otter-conservation-status-report.pdf> (Accessed 21/08/2025)

<sup>6</sup> National Biodiversity Data Centre, Ireland, Otter (*Lutra lutra*), <https://maps.biodiversityireland.ie/Species/119290> (Accessed 21/08/2025)

<sup>7</sup> Kilrush Tidy Towns: Our Biodiversity <https://kilrushtidytowns.ie/biodiversity/> (Accessed 21/08/2025)

Country	River Basin District	Population estimates		
		1981-1982	2010-2011	
		Total	Otter SACs*	Total
Republic of Ireland	Eastern	552 [497 - 684]	30 [29 - 40]	585 [556 - 742]
	Neagh Bann	121 [107 - 153]		223 [206 - 274]
	North Western	927 [850 - 1106]	153 [146 - 189]	1069 [1015 - 1316]
	Shannon	1515 [1401 - 1779]	199 [186 - 267]	1644 [1531 - 2200]
	South Eastern	1024 [918 - 1295]	106 [99 - 146]	1153 [1081 - 1593]
	South Western	1204 [1121 - 1384]	210 [199 - 266]	1311 [1158 - 1660]
	Western	1784 [1664 - 2073]	411 [379 - 545]	1809 [1671 - 2401]

### 3.2 Common bottlenose dolphin (*Tursiops truncatus*) [1349]

Common bottlenose dolphins are one of the most studied delphinid species and are widely distributed in both temperate and tropical marine waters worldwide with the species currently classified as Least Concern on the IUCN Red List (Wells and Scott, 2009; Wells *et al.*, 2019). Bottlenose dolphins are among the most commonly recorded cetaceans in Irish waters (NPWS, 2019), where they are observed year-round. The species is strictly protected under Annex II and IV of the Habitats Directive and therefore require Member States to designate SACs for their protection, with twelve SACs designated for this QI in Ireland. At least three genetically distinct populations occur in the waters off the west coast of Ireland including the resident group from the Shannon Estuary of which a small group of individuals utilise outer Cork Harbour, a more mobile population moving along the west coast referred to as the Connemara-Mayo-Donegal population and a less defined more oceanic population primarily represented by stranded animals (Rogan *et al.*, 2018).

The proposed works are set to take place within the Lower River Shannon SAC which lists bottlenose dolphins as a QI due to the presence of the resident Shannon population, making the Shannon Estuary one of the most important habitats for cetaceans in Ireland and Europe (O' Brien *et al.*, 2009; Rogan *et al.*, 2018). The species often occupy shallow, coastal habitats including inlets, bays, estuaries and rivers with the Shannon estuary serving as prime habitat for this species and they have shown long-term site fidelity to the estuary (Rogan *et al.*, 2018). Standardised boat surveys combined with mark-recapture photo-identification in the Lower River Shannon SAC (June–October 2018) estimated a total population of 139 bottlenose dolphins (95% CI: 121–160; CV = 0.109), within the range of previous estimates since 1997 thus indicating a stable population size (Rogan *et al.*, 2018). The population size estimated by Rogan *et al.*, 2018 was similar to that estimated by Blázquez *et al.*, 2020, based on surveys conducted in 2015 which provided an abundance of 145 extant individuals. Two critical areas of habitat within the SAC have been identified and have consistently shown to be important to dolphins in the estuary year-round, including a large area at the estuary mouth near Kilcredaun and a smaller area off Moneypoint (Rogan *et al.*, 2018). These two areas are approximately 15 and 6 kilometres respectively from the area of the proposed works. Year-round surveys have shown a seasonal reduction in the number of

bottlenose dolphins present within the estuary in winter which suggests the home range of this population extends beyond the extent of the Lower Shannon River SAC (Rogan *et al.*, 2018).

The coastal and offshore waters of Ireland provide some of the most important habitats for cetaceans in Europe (O'Brien *et al.*, 2009). In 2005, Small Cetaceans in the European Atlantic and North Sea project (SCANS-II) carried out shipboard and aerial surveys to estimate cetacean abundance in the continental shelf waters in the Northeast Atlantic. A total abundance of 313 individuals (CV = 0.81) was calculated around the coast of Ireland (Hammond *et al.*, 2013). The first attempt to assess the abundance estimates of bottlenose dolphins in the west coast of Ireland was by Ingram *et al.* (2009) which estimated a total of  $171 \pm 48$  (CV = 0.28, 95% CI = 100 -294), however surveys were restricted to north of Slyne Head, Connemara. Ingram *et al.* (2009) also stated that animals recorded in this study were present beyond the survey area, with sightings around Youghal, Co. Cork and in Co. Donegal. Local abundance estimates were calculated for bottlenose dolphins in north-west Connemara by Nykänen *et al.* (2015), during the summer months of 2013 and 2014, and can be seen in the following table:

**Table 3-2: Model averaged Bayesian multi-site estimates and maximum likelihood-based local  $M_{th}$  estimates of bottlenose dolphin abundance extracted from Table 6. in Nykänen *et al.* (2015).**

Method	Area	Year	Total Abundance	(Confidence Intervals) CI 95%	CV (Coefficient Variation)	$\Theta$
Multi-site	Connemara-Mullet Peninsula-Donegal	2013	145*	111-239	0.30	0.55
Multi-site	Connemara-Mullet Peninsula-Donegal(a)	2014	189*	162-232	0.11	0.57
Local ( $M_{th}$ )	Connemara	2013	56	34-90	0.25	0.63
Local ( $M_{th}$ )	Connemara	2014	83	49-140	0.27	0.56
Local ( $M_{th}$ )	Donegal	2014	143	113-181	0.12	0.63

(a) One encounter in Killala Bay has been included with the encounters in Donegal.

\*Median given in the Bayesian multi-site estimates, local  $M_{th}$  estimates are averages.



### 3.3 Other Annex IV Species

Other marine mammal species under Annex IV of the Habitats Directive include:

- Minke whale (*Balaenoptera acutorostrata*)
- Harbour Porpoise (*Phocoena phocoena*)
- Short-beaked common dolphin (*Delphinus delphis*)
- Leatherback turtle (*Dermochelys coriacea*)
- Loggerhead turtle (*Caretta caretta*) Bats

These species are not listed as QIs for any of the SACs located in the Zol, however, they are known for their foraging range which makes them a potential species to occur in the Project area.

#### 3.3.1 Minke whale (*Balaenoptera acutorostrata*)

Minke whales are the most frequently recorded baleen whale in Irish waters (Berrow *et al.*, 2010, IWDG, 2015). They can be seen off most coasts of Ireland year-round, while most sightings of the species are recorded from the south and west coast between May and October when a seasonal inshore movement of the species occurs in summer and autumn (Wall *et al.*, 2013; IWDG, 2015). While they are mostly observed in shallow waters of depths of 35-205 m (Wall *et al.*, 2004), a lack of sightings of the species in coastal waters in winter suggests an inshore-offshore movement and they are more often observed in deeper offshore waters around continental shelf areas during winter (Rogan *et al.*, 2018). The minke whale is currently listed as a species of Least Concern on the IUCN Red List (Cooke *et al.*, 2018). Estimates of group abundance, mean group size, animal abundance and animal density (individuals km<sup>-2</sup>) for minke whales calculated from SCANS-II for July 2005, around the south and west coast of Ireland (referred to as block R in Hammond *et al.*, 2013) can be seen in **Table 3-5**.

**Table 3-3: Estimates of minke whale abundance, extracted from Table 5. in Hammond et al. (2013). Note: Aerial survey estimates are corrected for availability bias but not for perception bias.**

Block	Group abundance		Mean group size		Animal abundance		Animal density	
	Estimate	CV	Estimate	CV	Estimate	CV	Estimate	CV
B	883	0.97	1.36	0.12	1199	0.98	0.010	0.98
J	614	1.03	1.36	0.12	833	1.04	0.022	1.04
O	789	0.91	1.36	0.12	1070	0.91	0.024	0.91
P	1531	0.43	1.14	0.18	1749	0.44	0.009	0.44
Q	1938	0.46	1.00	0.03	1938	0.46	0.013	0.46
R	1633	0.85	1.36	0.12	2216	0.86	0.057	0.86
T	1783	0.60	1.00	0.42	1783	0.60	0.013	0.60
U	3655	0.69	1.00	0.00	3655	0.69	0.023	0.69
V	4310	0.50	1.05	0.34	4515	0.51	0.028	0.51

#### 3.3.2 Harbour Porpoise (*Phocoena phocoena*)

Harbour Porpoises are one of the most widely distributed and observed cetacean species in European waters (Hammond *et al.*, 2002), inhabiting shallow waters around the northern hemisphere (Todd *et al.*, 2020). This species is strictly protected under Annex II of the Habitats Directive, thus requires Member States to designate SACs for their protection (Berrow *et al.*, 2014). There are sixteen SACs designated for harbour porpoises. Additionally, Broadhaven Bay located in the northwest of Ireland, was also identified as a site of high diversity for cetacean species, including harbour porpoises, and has the longest marine mammal monitoring programme in Ireland (Anderwald *et al.*, 2012; Todd *et al.*, 2020).

Previous studies have assessed the density and abundance of harbour porpoises in Irish waters. Berrow *et al.* (2014) surveyed eight sites around Ireland's east, south and west coast, and calculated density, abundance and group size for this species, which can be found in **Table 3-4**.

**Table 3-4: Overall mean density and abundance estimates of harbour porpoises at the eight sites, extracted from Table 3. in Berrow *et al.* (2014).**

Site	N (95 % CI)	SE	CV	Density (km <sup>-2</sup> )	Mean group size (95 % CI)
North County Dublin	211 (137 - 327)	47.1	0.22	2.03	1.41 (1.26 - 1.56)
Dublin Bay	138 (86 - 221)	33.2	0.24	1.19	1.22 (1.11 - 1.34)
Carnsore Point	87 (39 - 196)	36.3	0.42	0.58	1.91 (1.25 - 2.92)
Cork Coast	173 (92 - 326)	56.6	0.33	0.53	2.67 (1.96 - 3.64)
Roaringwater Bay	159 (95 - 689)	42.4	0.27	1.24	2.21 (1.85 - 2.64)
Blasket Islands	372 (216 - 647)	105.3	0.28	1.65	1.76 (1.50 - 2.07)
Galway Bay	402 (267 - 605)	84.1	0.21	0.73	2.15 (1.84 - 2.51)
Donegal Bay	249 (106 - 586)	111.5	0.45	0.88	2.40 (1.63 - 3.53)

**N – Abundance; CI – Confidence Intervals; SE – Standard Error; CV – Coefficient Variation.**

### 3.3.3 Short-beaked common dolphin (*Delphinus delphis*)

Short-beaked common dolphins (referred to as common dolphins) are one of the most abundant dolphin species around the Irish coast, inhabiting both continental shelf and offshore waters (Murphy *et al.*, 2013). This species is strictly protected under Annex II and IV of the Habitats Directive, thus requiring Member States to designate SACs for their protection. To this day, there are no SACs designated for common dolphins in Ireland, however previous literature has assessed that they are mostly sighted in water temperatures above 15°C at depths of 400-1000 meters (m) (Cañadas *et al.*, 2009). Cañadas *et al.*, (2009) also calculated an average group size of  $15 \pm 2.2$  individuals ( $\pm$  standard error; range 1-239), which showed an increasing trend with depth from  $8.0 \pm 1.44$  individuals in waters under 400 m of depth to  $18.6 \pm 2.76$  individuals for water depths more than 2000 m. In the western European waters, Reid *et al.* (2003) reported high numbers of common dolphins in the Celtic Sea, St. George's Channel, west of the English Channel and off southern and western Ireland, during the summer months between 1978 and 1998. Estimates of group abundance, mean group size, animal abundance and animal density (individuals km<sup>-2</sup>) for common dolphins calculated from SCANS-II for July 2005,

around the south and west coast of Ireland (referred to as block R in Hammond *et al.*, 2013) can be seen in **Table 3-5**.

**Table 3-5: Estimates of common dolphin abundance, extracted from Table 7. in Hammond *et al.* (2013).**

**Note: Aerial survey estimates are corrected for availability bias but not for perception bias.**

Block	Group abundance		Mean group size		Animal abundance		Animal density	
	Estimate	CV	Estimate	CV	Estimate	CV	Estimate	CV
B	378	0.73	13.00	0.36	4919	0.82	0.040	0.82
N	1256	0.58	1.75	0.14	2199	0.60	0.072	0.60
O	375	0.69	2.20	0.36	826	0.78	0.018	0.78
P	1058	0.33	11.60	0.30	15957	0.31	0.081	0.31
Q	558	0.98	3.08	0.32	2230	0.87	0.015	0.87
R	1266	0.70	9.21	0.19	11661	0.73	0.302	0.73
W	1470	0.29	12.30	0.27	18039	0.23	0.130	0.23
Z	314	0.84	1.25	0.20	392	0.86	0.012	0.86

### 3.3.4 Leatherback turtle (*Dermochelys coriacea*) and Loggerhead turtle (*Caretta caretta*)

Leatherback turtle is the most frequently sighted marine turtle species in Irish waters (King & Berrow, 2009), with a wide distribution throughout temperate waters during summer and autumn months (Houghton *et al.*, 2006). This species is strictly protected under Annex II and IV of the Habitats Directive, thus requires Member States to designate SACs for their protection, however there are no SACs designated for leatherback turtles in Ireland. King & Berrow (2009) have collected a total of 1069 records of marine turtles in Irish waters, which calculated a total of 863 records for this species. Leatherback turtles were found to mostly occur in summer months between June and September representing 90.8% of all recorded sightings.

Loggerhead turtle is the second most frequently recorded marine turtle species around the coast of Ireland (King & Berrow, 2009), occurring throughout the temperate and tropical regions of the Atlantic, Pacific and Indian oceans. This species is strictly protected under Annex II and IV of the Habitats Directive, thus requires Member States to designate SACs for their protection, however there are no SACs designated for loggerhead turtles in Ireland. King & Berrow (2009) have collected a total of 1069 records of marine turtles in Irish waters, which calculated a total of 56 records for Loggerhead turtles. This species has recorded in every month, showing a peak in March representing 23.6% of all records and, 60% occurring between January to April.

Marine turtles were found to occur more frequently along the south coast and off the headlands in west Cork representing 41.5% of all records, north Dingle Peninsula in Co. Kerry (13.2%), Killala Bay in north Co. Mayo, and off Arranmore and Malin Head in the northwest off Donegal (11.9%) (King & Berrow, 2009). Distribution of these marine turtle species by county in Ireland can be seen in **Table 3-6**.

**Table 3-6: Distribution of turtle species logged around Ireland, adapted from Table-2 King & Berrow (2009).**

County/Sea	Turtle species				
	Leatherback	Loggerhead	Kemp's Ridley	Hawksbill	Green
Derry	4	1	0	0	0
Antrim	10	0	0	0	0
Down	12	0	0	0	0
Louth	3	0	0	0	0
Dublin	10	1	1	0	0
Wicklow	4	0	0	0	0
Wexford	25	1	0	0	0
Waterford	63	3	0	0	0
Cork	378	12	1	1	1
Kerry	113	15	2	0	0
Clare	18	3	1	0	0
Galway	21	11	2	0	0
Mayo	49	5	1	0	0
Sligo	14	2	0	0	0
Leitrim	1	0	0	0	0
Donegal	109	2	2	0	0
Celtic Sea	9	0	0	0	0
Irish Sea	4	0	0	0	0
Offshore	16	0	0	0	0
<b>Total</b>	<b>863</b>	<b>56</b>	<b>10</b>	<b>1</b>	<b>1</b>

The most up-to-date information on marine turtle distribution in Ireland is available from the National Biodiversity Data Centre (NBDC)<sup>8</sup>, specifically through the *Irish Marine Turtle Records* dataset (last updated 8 May 2025). This dataset contains validated sightings, strandings, and captures from 1884 to 2023, contributed by researchers, citizen scientists, and verified expert observations. Records are dominated by the Leatherback Turtle. The Loggerhead Turtle (*Caretta caretta*) is also recorded, albeit far less frequently, with the most recent validated occurrence in November 2023. Occasional records also exist for other species such as the Green Turtle (*Chelonia mydas*), Hawksbill Turtle (*Eretmochelys imbricata*), and Kemp's Ridley (*Lepidochelys kempii*), though these are considered exceptional vagrants. The NBDC dataset integrates historic literature records (King and Berrow, 2009) with modern verified submissions, ensuring a comprehensive record of turtle presence in Irish waters.

<sup>8</sup> National Biodiversity Data Centre, Irish Marine Turtle Records, <https://newmaps.biodiversityireland.ie/Dataset/114> (Accessed 21/08/2025)



**Table 3-7: NBDC Marine turtle records.**

Species	Total Records	Most Recent Record	Approx. Location
Leatherback Turtle ( <i>Dermochelys coriacea</i> )	974	28 Nov 2021	Coastal waters – Irish Exclusive Economic Zone
Loggerhead Turtle ( <i>Caretta caretta</i> )	19	23 Nov 2023	Coastal and inshore waters
Other Marine Turtle Species	Cumulative (all species) 1,180 records across 421 sites (1884–2023)		

### 3.3.5 Bats

There are nine species of bats established in Ireland (Roche *et al.*, 2014; Aughney, 2022). All nine bat species resident in Ireland are protected under Annex IV of the Habitats Directive. No bat species are designated as QIs for the Lower River Shannon SAC however, records from the NBDC database show that all nine species occurring in Ireland have been observed in areas surrounding the SAC<sup>9</sup>. The bat landscape suitability modelling<sup>10</sup> for Kilrush Creek Marina gives an overall score of 30.11, with particularly high suitability for Brown long-eared bat (44), Soprano pipistrelle (39), Common pipistrelle (31), Lesser horseshoe bat (34), Leisler's bat (34), and Natterer's bat (30) as seen in **Table 3-8**. Most of the land surrounding the development falls within the medium–high suitability band of 21.33–36.44, suggesting the estuarine landscape may be favourable for foraging and commuting bat species however, waterbodies such as the Shannon estuary may also act as barriers of movement for bat species reducing the likelihood of overlap with the particular area of the proposed works (NPWS & VWT, 2022).

**Table 3-8 Bat habitat suitability indices for Kilrush Creek Marina, sorted highest to lowest; overall “All bats” index = 30.11, with most surrounding land in the medium–high suitability band (≈21.33–36.44).**

Common name	Scientific name	Suitability index
Brown long-eared bat	<i>Plecotus auritus</i>	44
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	39
Leisler's bat	<i>Nyctalus leisleri</i>	34
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	34
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	31
Natterer's bat	<i>Myotis nattereri</i>	30
Whiskered bat	<i>Myotis mystacinus</i>	23
Daubenton's bat	<i>Myotis daubentonii</i>	23
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	13

<sup>9</sup>NBDC, National Bat Database of Ireland, <https://newmaps.biodiversityireland.ie/Dataset/128> (Accessed 21/08/2025)

<sup>10</sup> The bat landscape suitability index is a scoring system (Lundy, M.G., et al, 2011) and was assessed through on-line mapping on the NBDC webpage (<https://maps.biodiversityireland.ie/>). The degree of favourability ranges from 0 – 100, with 0 being least favourable and 100 most favourable for bats. The values of the grid squares represent the range of habitat suitability values the bat species can tolerate within each individual square.

### 3.4 Other (Non-Annex IV) Species

The species included in this section are:

- Harbour seal (*Phoca vitulina*) [1365]
- Grey seal (*Halichoerus grypus*) [1364]
- Basking shark (*Cetorhinus maximus*)

Although these species are not listed in Annex IV of the Habitats Directive, they are known for their foraging range which makes them a potential species to occur in the Project area. An overview of the distribution abundance of these species is summarised in the **Section 3.4.1** through **Section 3.4.3**.

#### 3.4.1 Harbour seal (*Phoca vitulina*)

Common seals (also referred to as Harbour seals) are semi-aquatic marine mammal from the Pinnipeds group with a wide distribution in the northern hemisphere (Cronin *et al.*, 2007). Harbour seals are one of two seal species that inhabit Irish waters, predominantly on the west coast of Ireland. This species is included under Annex II of the Habitats Directive, thus requires Member States to designate SACs for their protection. There are 13 SACs designated for this species in Ireland, with the closest one (Galway Bay Complex SAC) located 59.5 Km from the Project area.

Cronin *et al.*, (2007) performed a combination of aerial and ground surveys, aiming to gather information on the abundance and distribution of harbour seals along the Irish coast, during February – July 2003. While the ground-truthing sites listed did not list any near the project site, their results indicated a total of 142 individuals recorded in County Clare during that survey. Morris and Duck (2019) carried out thermal-imaging surveys along the coastline of Ireland in August 2017 and August 2018, which also compiled the counts of harbour seals from surveys in 2003, in 2011/2012 and in 2017/2018. The counts of harbour seals in the southwestern coast of Ireland are provided in **Table 3-9** where area 7 includes the Project area.

**Table 3-9: Count of harbour in the south-west region of Ireland, from surveys in 2003, 2011/2012 and 2017/2018, extracted from Table 1. in Morris and Duck (2019).**

Region	Area	Harbour seals		
		2003	2011/2012	2017/2018
South-West	1	10	0	10
	2	52	88	115
	3	422	363	393
	4	399	345	441
	5	36	90	131
	6	0	1	11
	7	8	1	4

### 3.4.2 Grey seal (*Halichoerus grypus*)

Grey seals are the other seal species to inhabit the coast of Ireland, with greatest numbers around the western coast. This species is included under Annex II of the Habitats Directive, thus requires Member States to designate SACs for their protection. There are 10 SACs designated for this species in Ireland; however, there are no SACs designated for this species within or in close proximity to the Kilrush project area. The closest significant SAC supporting grey seals is the Blasket Islands SAC, located over 110 km to the southwest.

In combination with the harbour seal, Cronin *et al.*, (2007) performed a combination of aerial and ground surveys, aiming to gather information on the abundance and distribution of grey seals along the Irish coast, during February – July 2003. However, there were no haul-outs or significant numbers of grey seals within the Shannon Estuary. Subsequent thermal-imaging aerial surveys carried out by Duck and Morris (2012) in 2011 and by Morris and Duck (2019) in 2017–2018 confirmed this pattern, showing that the Shannon Estuary supports harbour seals in modest numbers but does not represent an important area for grey seal breeding or haul-outs. On this basis, it is considered unlikely that grey seals occur in the vicinity of the project site in more than a transitory manner, and the species is not regarded as a key receptor for the proposed dredging works. These counts of grey seals in the Irish southwestern region are provided in **Table 3-10** where area 7 includes the Project area.

**Table 3-10: Count of grey seals in the south-west region of Ireland, from surveys in 2003, 2011/2012 and 2017/2018, extracted from Table 1. in Morris and Duck (2019).**

Region	Area	Grey seals		
		2003	2011/2012	2017/2018
South-west	1	13	28	46
	2	58	198	411
	3	10	55	88
	4	8	11	12
	5	2	11	12
	6	45	150	222
	7	2	0	1

### 3.4.3 Basking shark (*Cetorhinus maximus*)

Basking sharks are the second-largest fish species, most frequently sighted between April and September in shallow coastal areas in the northern Atlantic (Doherty *et al.*, 2017). Basking sharks are protected under Section 23(2)(a) of the Irish Wildlife Act 1976, entitled the “Wildlife Act 1976 (Protection of Wild Animals) Regulations 2022”, making it an offense to hunt, injure, or disrupt their breeding and resting sites. They are listed under international legislation, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the United Nations Convention on the Law of the Sea (UNCLOS) and they are also listed in the International Union for Conservation of Nature (IUCN) Red List, classified as endangered in 2019.

Distribution patterns of basking sharks show inter-annual site-fidelity in areas around the Isle of Man (Dolton *et al.*, 2019), with the Irish Sea being identified as a migratory corridor for this species (Lieber *et al.*, 2020). Basking sharks sampled off West Kerry during early spring were found to be genetically distinct from other Northeast Atlantic populations, suggesting overwintering and seasonal migration connectivity that have important conservation implications. Due to their primary prey (zooplankton), basking shark abundance peaks have been shown to be positively correlated with peaks in plankton density, which can explain this species abundance during summer months (Sims and Quayle, 1998). Previous literature suggests that basking sharks go through extensive migrations from September to May (Doherty *et al.*, 2017), as an alternative to hibernation periods (Parker and Boseman, 1954).

Although their distribution patterns have been widely studied around Ireland and UK waters, their abundance and density estimations have not yet been assessed (Sims, 2008).

The number of sightings and average group sizes have dramatically increased. In 2024, the Irish Whale and Dolphin Group recorded 262 sighting events, with a total of 1,972 sharks observed, an average of about 7.5 sharks per sighting. That's nearly three times the average of around 2.6 sharks per sighting in 2009<sup>11</sup>.

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<sup>11</sup> <https://iwdg.ie/whale-and-basking-shark-watch-ireland-2024-sat-18th-may-1700/>

## 4. Potential Environmental Impacts

A detailed description of the proposed works is provided in **Section 1.2** above. Given the nature of the proposed works, the potential impact mechanisms identified to potentially have an impact on Annex IV species in the Project area are:

### 4.1 Potential Impact Mechanism 1: Pollution of marine environment from spills/leakages

Accidental spills or leakages from machinery poses a potential risk to the marine environment during the dredging and disposal operations. Such incidents could result in the release of polluting substances, including hydrocarbons (e.g. diesel, lubricants, hydraulic fluids), into the surrounding water column or sediment. These substances can be toxic to aquatic organisms, particularly filter feeders, benthic invertebrates, and fish species, and may contribute to the degradation of water quality within the zone of influence. Furthermore, any accidental release of contaminants may lead to indirect impacts on qualifying interests of nearby Natura 2000 sites, including designated bird species reliant on intertidal or subtidal foraging habitats. While the risk of such events is typically low if best practice measures are in place, it remains a relevant potential impact pathway and must be considered in the overall assessment of likely significant effects.

### 4.2 Potential Impact Mechanism 2: Noise and vibration

The dredging operations and associated vessel movements have the potential to generate underwater noise and vibration, which may cause temporary disturbance to sensitive marine fauna, particularly marine mammals and fish species. Mechanical dredging equipment, support vessels, and disposal activities can produce low to moderate levels of underwater acoustic emissions that may disrupt normal behaviour, including foraging, communication, or navigation. Species listed under Annex II of the Habitats Directive, such as the Harbour Porpoise (*Phocoena phocoena*), are known to be particularly sensitive to anthropogenic noise. Previous studies have assessed the potential impacts of noise on marine mammals (Weilgart, 2007; Southall *et al.*, 2007; Wright *et al.*, 2007). Acoustic masking is the term used when a frequency of anthropogenic noise overlaps with the frequencies used by marine mammals, which reduces their ability to detect important sounds for communication, navigation and prey detection (Weilgart, 2007). Acoustic Masking can occur anywhere within an organism's auditory range (Wright *et al.*, 2007), and can result in increased information ambiguity and, in extreme circumstances, inability for cetaceans to orientate themselves, hunt or evade predation in the marine environment (Wright *et al.*, 2007). Potential effects of noise disturbance on marine mammals can result in lethal effects, physical injury, auditory injury and behavioural response. Otters (*Lutra lutra*) spend 75% of their lives on land. They can be relatively tolerant of disturbance and adjust to circumstances. They are often present in urban areas with considerable human activity nearby. There are no

criteria to assess the significance of underwater noise on the Eurasian otter however it is thought they are similar to those of pinnipeds (Ghoul & Reichmuth, 2014).

Southall *et al.* (2019) have categorised pinnipeds (listed as phocid carnivores) and cetaceans into different functional groups based on several laboratory studies, audiometric data, and comparisons of anatomy. The functional groups for cetaceans were created in relation to their known auditory ability and functional frequencies, whilst all pinniped species were assessed based on their auditory ability in air, as well as their auditory ability in water.

While the anticipated noise levels are not expected to result in permanent hearing damage or physical harm, there remains the potential for temporary behavioural disturbance within the zone of acoustic influence. The significance of such impacts on the presence, abundance, and sensitivity of qualifying species within nearby European Sites, and must therefore be assessed in the context of the conservation objectives of those sites.

### **4.3 Potential Impact Mechanism 3: Loss of prey biomass**

The proposed dredging and disposal activities have the potential to result in a temporary loss or reduction of benthic and epibenthic prey biomass within the affected areas, which may impact species that rely on these resources for foraging. Physical disturbance of the seabed during dredging can displace, injure, or remove infaunal and epifaunal organisms, including polychaetes, molluscs, and small crustaceans, which form important components of the diet for a range of protected species. In particular, fish, marine mammals such as bottlenose dolphins (*Tursiops truncatus*), and waterbirds designated as qualifying interests of nearby European Sites (*e.g.* the River Shannon and Fergus Estuaries SPA) may be affected if their foraging grounds are temporarily degraded or their prey availability is significantly reduced. While recolonisation of disturbed areas typically occurs over time, the scale, timing, and frequency of the proposed works must be considered in assessing the potential for short-term prey depletion and whether this could lead to significant ecological impacts on designated species within Natura 2000 sites.

### **4.4 Potential Impact Mechanism 4: Physical Disturbance**

The proposed dredging operations have the potential to cause physical disturbance to the marine environment, both within the dredging footprint and at the offshore disposal site. This disturbance may result from the direct removal of seabed sediments, which can lead to temporary habitat loss or alteration, and from increased turbidity caused by sediment resuspension during dredging and disposal activities. Such physical impacts may affect benthic communities, particularly in areas supporting sensitive or slow-recovering species. While these effects are generally localised and temporary in nature, their potential to impact the conservation objectives of nearby European Sites must be carefully assessed, particularly where qualifying habitats or species are located within or adjacent to the zone of influence of the proposed works.

In addition to the direct disturbance caused by dredging activities, the operation of project vessels has the potential to cause additional physical disturbance to marine fauna. Increased vessel traffic in and around the dredge and disposal areas may lead to displacement of sensitive species, such as marine mammals and waterbirds, from important foraging or resting areas. Vessel movements can also increase the risk of collision with large marine fauna, including basking sharks, seals, and cetaceans. For species reliant on undisturbed intertidal or nearshore habitats, such as otters, increased vessel activity could cause temporary avoidance behaviour, thereby reducing habitat use in the vicinity of the works. While such disturbance is typically short-term and reversible once activity ceases, it remains an important impact pathway to consider, particularly where vessels operate in close proximity to known areas of ecological importance.

JNCC (2010) also stated that the two main potential causes of death and injury of marine European Protected Species (EPS) are physical contact (with a vessel) and anthropogenic noise.

## 5. Risk Assessment

A number of Annex IV species and other protected marine fauna may occur in or near the Kilrush site, either on a resident, transient, or occasional basis. These include the species listed in **Section 0**.

The potential for significant effects on these species from the proposed dredging and disposal activities has been considered in relation to four primary impact mechanisms: (1) pollution from accidental spills or leakages of hydrocarbons or other hazardous substances, (2) underwater noise and vibration arising from dredging plant and vessel movements, (3) temporary loss or reduction in benthic and epibenthic prey biomass due to seabed disturbance, and (4) physical disturbance from sediment removal, resuspension, and increased turbidity.

Given the nature of the works, the enclosed estuarine location, and the scale and duration of activities, any effects are expected to be temporary, highly localised, and largely reversible. Mobile species such as cetaceans, seals, sharks, and turtles are capable of avoiding the works footprint and are unlikely to experience sustained displacement or population-level effects. More sedentary or site-associated species such as otters may experience short-term foraging disruption if working areas overlap with key feeding locations, but otters within the estuary are generally habituated to vessel and human activity. While the potential for localised disturbance or prey reduction exists, the overall risk to these species is considered low when appropriate mitigation measures are implemented, and no adverse effects on the conservation status of Annex IV species are anticipated. A risk assessment of the potential impacts for Annex IV species can be seen in **Table 5-1**.



**Table 5-1: Annex IV Risk Assessment.**

Species/Group	Spills	Noise	Prey Loss	Physical Disturbance	Impact Assessment
Common dolphin	Low	Low–Mod	Low	Low	Widely ranging species; any spill risk is highly localised and short-term. May temporarily avoid works area during high activity but will return when disturbance ceases. Prey loss within footprint too small to affect population viability.
Harbour porpoise	Low	Low–Mod	Low	Low	Noise-sensitive small cetacean; temporary displacement from acoustic footprint possible, but impact zone is small in relation to available foraging habitat. Spill and prey effects negligible at population scale.
Bottlenose dolphin	Low	Low	Low	Low	Resident group in Shannon Estuary; potential for minor temporary foraging disruption. Prey depletion limited in scale and duration; effects reversible.
Grey & harbour seals	Low	Low	Low	Low	No haul-outs or breeding sites in works zone; transient animals may pass through. Disturbance effects limited to brief avoidance of vessels or noisy operations. No effect on haul-out availability or pup survival.
Larger whales	Neg–Low	Low	Neg–Low	Neg–Low	Rare visitors to inner estuary; occasional transits possible. Minimal overlap with works footprint; no risk of sustained displacement or food-web impact.
Basking shark	Low	Low	Low	Low	Occasional seasonal visitor; possible local avoidance during dredging but no population-level impact. Turbidity plume unlikely to persist or affect feeding success at wider scale.
Marine turtles	Neg	Neg	Neg	Neg	Very rare inshore occurrence; no realistic exposure to spill, noise, prey, or disturbance effects.
Otter	Low	Low	Low	Low	Known to use shoreline as commuting and foraging habitat; individuals in busy harbour environments often habituated. Temporary disruption possible near works but no lasting reduction in prey availability or resting site use.

## 6. Suggested Mitigation

To minimise potential impacts on Annex IV species and other protected marine fauna, the following measures will be implemented as part of the dredging and disposal operations:

### Pollution Prevention

- All machinery will be inspected prior to mobilisation and maintained in good working order to prevent leaks.
- Fuel and lubricant storage will comply with best practice standards, including bunded containment areas and spill response kits at all work locations.
- Refuelling will be undertaken in designated areas away from the water, where practicable, and by trained personnel.
- A site-specific Emergency Spill Response Plan will be in place, with immediate containment and clean-up procedures in the event of a leak.

### Noise and Vibration Control

- A qualified Marine Mammal Observer (MMO) will be appointed for the duration of works.
- MMO to conduct a 30-minute pre-start watch within 500 m of the vessel; dredging will not commence if marine mammals are observed until they leave the zone or a 30-minute clearance has elapsed.
- Gradual “soft-start” procedures will be used where possible, to allow mobile fauna to move away from the immediate works area.
- Dredging will commence only in daylight hours when effective visual monitoring is possible; if paused >30 minutes, pre-start monitoring must be repeated.
- Clear communication protocols will be maintained between MMO and crew for start/resume decisions.

### Minimising Prey Loss

- Dredging will be confined to the minimum footprint necessary to achieve navigational objectives.
- Duration of dredging works will be kept as short as practicable to allow for rapid recolonisation of disturbed areas.

### Reducing Physical Disturbance

- Silt control measures, such as careful bucket handling and optimised dredge cycles, will be used to minimise turbidity and sediment plume spread.
- Vessels will adhere to slow transit speeds within the works area to reduce the risk of collision with marine fauna, particularly seals, cetaceans, and basking sharks.

### Species-Specific Measures

- For otters, works along the shoreline will be planned to avoid obstruction of key commuting routes during night-time and crepuscular periods when activity peaks.
- Vessel crews will maintain a constant watch for marine mammals, basking sharks, and turtles; if individuals are observed within a pre-defined safety zone, operations will be paused until they move away voluntarily.

Implementation of these measures will ensure that the risk of significant adverse effects on Annex IV species and other protected marine fauna is reduced to negligible levels, consistent with the requirements of the Habitats Directive.

## 7. Conclusion

The assessment of Annex IV species in relation to the proposed maintenance dredging and disposal at sea activities at Kilrush Marina has considered all relevant potential impact pathways, including pollution from spills or leakages, underwater noise and vibration, loss of prey biomass, and physical disturbance (including vessel traffic).

Based on the available evidence, the Shannon Estuary and adjacent waters are of recognised importance for bottlenose dolphins and harbour seals, while otters are also known to occur in the vicinity of the shoreline. Other Annex IV species, such as grey seals, common dolphins, large baleen whales, basking sharks, and marine turtles, are only likely to occur occasionally and in low numbers in the project area. The potential for significant adverse effects on these species is therefore limited.

The effects of impact pathways such as temporary disturbance from noise, short-term reduction of prey biomass, and low-probability risks of pollution incidents are anticipated to be temporary, localised, and not significant at a population level. Furthermore, the application of best-practice mitigation measures, including strict adherence to spill prevention protocols, timing works to avoid sensitive periods where practicable, implementation of marine mammal observers and soft-start procedures, and careful management of vessel activity, will further minimise risks to Annex IV species.

In conclusion, the proposed dredging and disposal activities are not expected to give rise to significant adverse effects on the conservation status of any Annex IV species within the Shannon Estuary or wider zone of influence, either alone or in combination with other plans or projects with the implementation of standard mitigation and monitoring measures.

As no deliberate capture, killing, significant disturbance, or destruction of breeding/resting sites is anticipated, a derogation licence under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) is not required for this project.

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