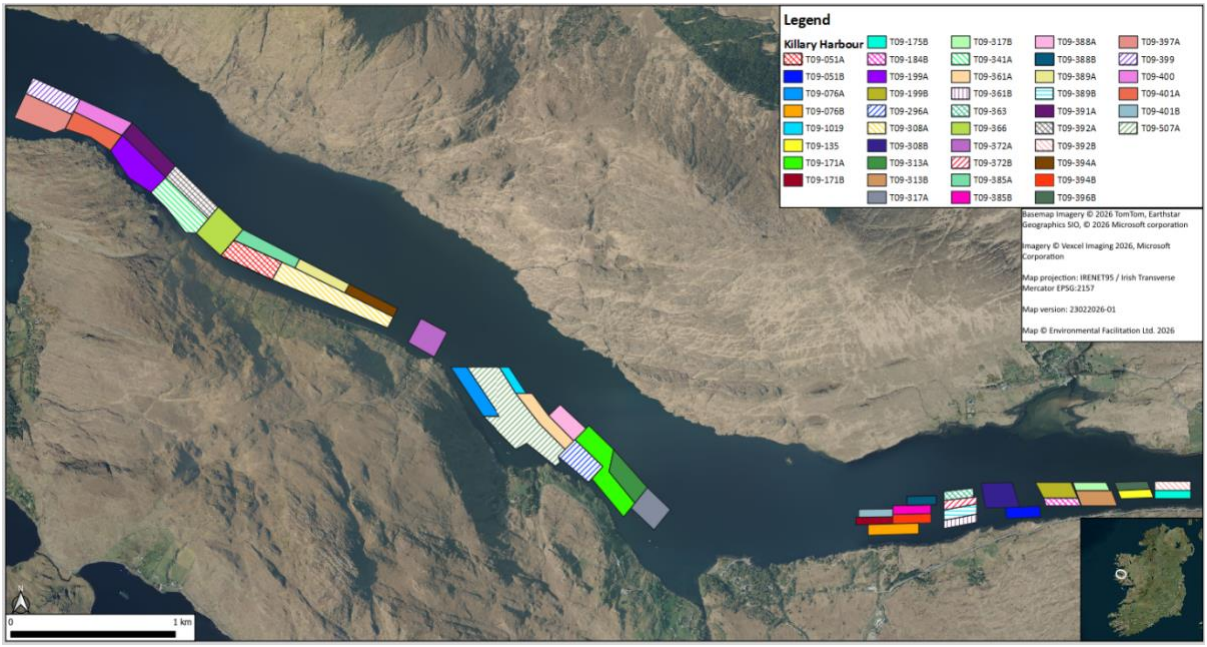
Risk Assessment for Annex IV Species

for renewal, review and new aquaculture and foreshore licence applications in Killary Harbour, Co. Galway.



	Prepared by Environmental Facilitation Ltd on behalf of the Department of Agriculture, Food and the Marine. Date: 18/03/2026

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1. Introduction

This Annex IV risk assessment has been prepared by Environmental Facilitation Ltd on behalf of the Department of Agriculture, Food and the Marine to comply with the provisions of Article 12 and 13 of Council Directive 92/43/EEC[1] (Habitats Directive) in relation to the protection afforded to Annex IV species from disturbance or harm. Specifically, this risk assessment appraises the renewal and review of 43 aquaculture and foreshore licences plus one new (T09-1019) aquaculture and foreshore licence (hereinafter referred to as the 'projects') for Blue Mussel (*Mytilus edulis)* rope culture within Killary Harbour, Co. Galway (see
Figure ***1***).

1.1. Legislative context

Council Directive 92/43/EEC[1] (Habitats Directive) identifies a suite of animal and plant species across Europe which are rare or are threatened with extinction and which require the application of special measures to ensure their long-term survival. Under Article 12 and 13 of the Habitats Directive, Member States must establish systems of strict protection for animal and plant species listed under Annex IV of the Directive. Article 12 and 13 of the Habitats Directive are transposed into Irish law by Regulations 51 and 52 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended[2].

The strict protection measures mentioned above aim to bring these animal and plant species to a healthy population level (favourable conservation status) and keep them that way. This means their populations can maintain themselves on a long-term basis as a viable component of their natural habitat. It also means that the natural range of the species is neither being reduced, nor is likely to reduce in the future and that there is (and will be) sufficiently large habitat to maintain its populations in the long-term.

Annex IV species are afforded strict protection throughout their range, within and outside designated protected areas, and throughout all stages of their life cycle, wherever they occur including during periods of breeding, rearing, hibernation and migration. It is an offence to deliberately capture or kill, keep, transport or sell, injure or disturb a specimen in the wild, or to damage or destroy a breeding site or resting place of an Annex IV animal species. For plants it is an offence to deliberately pick, collect, cut, uproot or destroy any specimen of these species in the wild, or keep, transport, or sell any specimen of these species taken in the wild.

S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 (inc. Amendment SI 293 of 2021[2])
Protection of fauna referred to in the First Schedule

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01992L0043-20130701
[2] https://www.npws.ie/legislation

51.

(1) The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the species referred to in Part 1 of the First Schedule.

(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under Regulation 54 or 54A, a person who in respect of the species referred to in Part 1 of the First Schedule—

a) deliberately captures or kills any specimen of these species in the wild,

b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,

c) deliberately takes or destroys eggs of those species from the wild,

d) damages or destroys a breeding site or resting place of such an animal, or

e) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive,

shall be guilty of an offence.

(3) The prohibitions referred to in paragraph (2) shall apply to all stages of life of the biological cycle of fauna to which this Regulation applies.

(4) The Minister shall establish a system to monitor the incidental capture and killing of fauna consisting of the animal species referred to in Part 1 of the First Schedule and, having regard to the information gathered, he or she shall conduct further research or take such conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.

Protection of flora referred to in the First Schedule

52.

(1) The Minister shall take the requisite measures to establish a system of strict protection for the flora consisting of the plant species referred to in Part 1 of the First Schedule.

(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under Regulation 54 or 54A, a person who in respect of the plant species referred to in Part 1 of the First Schedule—

a) deliberately picks, collects, cuts, uproots or destroys any specimen of these species in the wild, or
b) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 13(1)(b) of the Habitats Directive,

shall be guilty of an offence.

(3) The prohibitions referred to in paragraph (2) shall apply to all stages of the biological cycle of the flora to which this Regulation applies.

The following is a list of Annex IV species which occur in Ireland and its waters[3]

The animal species listed in Annex IV, which occur in Ireland, are:

- Otter
- All bat species
- All cetaceans (whales, dolphins and porpoises)
- Natterjack toad
- Leatherback (or leathery) turtle
- Loggerhead turtle
- Kemp's Ridley turtle
- Hawksbill turtle
- Green turtle
- Kerry slug

The plant species listed in Annex IV, which occur in Ireland, are:

- Slender Naiad
- Yellow Marsh Saxifrage
- Killarney Fern

As an Annex IV species may be found throughout the country, the protection of these species is not restricted in geographical terms and is not necessarily associated with areas subject to specific designations. Any works or projects must ensure compliance with the requirements of the Regulations, which means avoiding impacts to Annex IV species. To do this a project must determine the probability of the protected species being present in the area affected by the works, using existing information, and applying the precautionary

[3] https://www.npws.ie/legislation

principle. If it is highly unlikely that an Annex IV species could be present or affected by the works, then the works will be compliant with Regs 51 and 52[4].

If information shows that the Annex IV species is present, or may be present, then an investigation to establish presence is required. The Precautionary Principle must be applied in relation to this matter at this stage. If the investigation finds the species to not be present within relevant distances of concern, then the project may proceed. If an Annex IV species is found to be present, or there is a breeding or resting place to which the animals are likely to return, then the likely impacts of the project need to be examined to see if those impacts can be avoided through the design of the works[4].

2. Outline of aquaculture activities

The projects are located within Killary Harbour, Co. Galway, in close proximity (within 7.5 km from east to west) to each other (see

Figure ***1***). Killary Harbour is a narrow glacial fjord, 15km long and over 1km wide at its widest point. It runs from east to west, from the village of Leenane into the Atlantic Ocean. The underlying geology is primarily composed of Ordovician and Silurian sedimentary and volcanic rocks (Meehan *et al*., 2019). This deepwater, marine/estuarine inlet is flanked by the Mweelrea/Sheeffry/Erriff Complex SAC to the north (Co. Mayo) and both the Maumturk Mountains SAC and The Twelve Bens/Garraun Complex SAC to the south (Co. Galway).

All projects propose culturing Blue Mussel (*Mytilus edulis*) using the same method: double head rope longlines. All project applications state that mussel spat will be sourced through natural settlement onto collection meshes and longlines. Production estimates across the 44 projects vary significantly over the five-year period and are detailed in Table 1 below.

[4] https://www.npws.ie/sites/default/files/files/strict-protection-of-certain-animal-and-plant-species.pdf

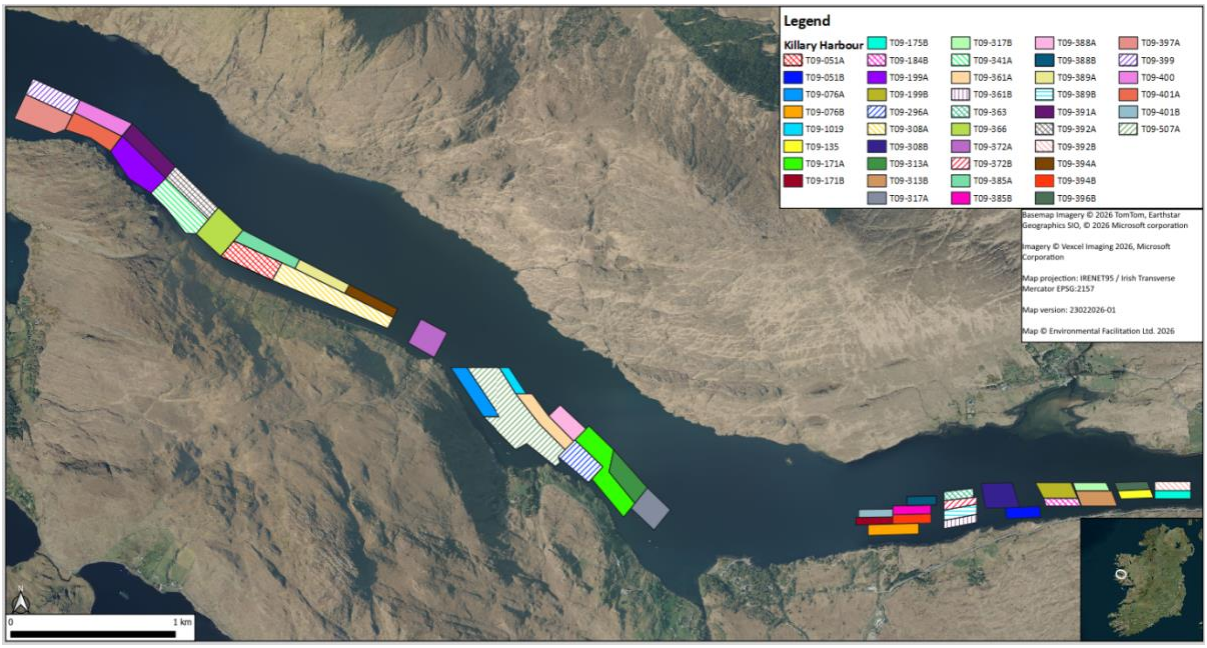

Figure 1 - The location of the 44 aquaculture and foreshore licence applications considered in this Appropriate Assessment screening.

Table 1 Production estimates (in tonnes) across projects over a five-year period.

File Ref.	Year 1	Year 2	Year 3	Year 4	Year 5
T09-076A	60	60	60	60	60
T09-171A	100	100	100	100	100
T09-171B	20	20	20	20	20
T09/317A	40	40	40	40	40
T09/366	40	40	40	40	40
T09/372A	60	60	60	60	60
T09/385A	20	20	20	20	20
T09/385B	10	10	10	10	10
T09/389A	100	0	100	0	100
T09/389B	40	0	40	0	40
T09/392A	40	40	40	40	40
T09/392B	20	20	20	20	20
T09/396B	20	20	20	20	20
T09/399	120	120	120	120	120
T09-184B	10	10	10	10	10
T09-199A	100	100	100	100	100
T09-199B	40	40	40	40	40
T09-341A	100	100	100	100	100
T09-361A	60	60	60	60	60
T09-361B	20	20	20	20	20
T09-372B	25	25	25	25	25
T09-388A	40	40	40	40	40
T09-388B	20	20	20	20	20
T09-391A	60	60	60	60	60
T09-394A	40	40	40	40	40
T09-394B	20	20	20	20	20
T09-400	30	30	30	30	30
T09-401A	100	100	100	100	100
T09-401B	20	20	20	20	20
T09/135	20	20	20	20	20
T09/051A	60	60	60	60	60
T09/051B	40	40	40	40	40
T09/308A	40	40	40	40	40
T09/308B	30	30	30	30	30
T09/076B	10	10	10	10	10
T09/363	16	16	16	16	16

File Ref.	Year 1	Year 2	Year 3	Year 4	Year 5
T09/296A	30	30	30	30	30
T09/313A	70	70	70	70	70
T09/397A	90	90	90	90	90
T09-1019	20	20	20	20	20
T09-507A	120	120	120	120	120

The following applicants/companies are listed for the 44 projects: Cluggam Mussels Ltd, Pat Lydon, Lettergesh Mussels Ltd, Killary Fjord Shellish Ltd, Purple Spade Ltd., Bartley O Malley, Black Pearl Shellfish Ltd, Brian Spellman, Kevin Lydon, Killary Fish Farming Co-Op Ltd., Jim O Malley, Peter Nee, Ciaran Coyne, Edward Nee Junior, Liam Laffey, Kevin and Michael Lydon, Brid Kavanagh, Eddie Nee, Online Mussels Ltd.

The location (approximate centroid) and applicant's name of each project is set out in Table below. Further information on the location characteristics where these 44 projects are situated is provided in Table, including information on access points, water quality, hydrological regime, approximate water depth and underlying marine habitats.

Table 2: The approximate size (ha) and location (approx. centroid) of the projects considered in this assessment where relevant.

File Ref.	Hectarage	Applicants	Approximate centroid (lat/long)	Further information
T09-076A	3	Cluggam Mussels Ltd	53.6045°N, 9.8062°W	
T09-171A	6.15	Pat Lydon	53.6005°N, 9.7939°W	
T09-171B	1	Lettergesh Mussels Ltd	53.5981°N, 9.7689°W	
T09/317A	3.08	Purple Spade Ltd	53.5985°N, 9.7896°W	
T09/366	4.25	Purple Spade Ltd	53.6129°N, 9.8289°W	
T09/372A	3.04	Bartley O'Malley	53.6074°N, 9.8105°W	
T09/385A	2.95	Purple Spade Ltd	53.6121°N, 9.8255°W	
T09/385B	1.25	Purple Spade Ltd	53.5987°N, 9.7659°W	
T09/389A	2.1	Black Pearl Shellfish Ltd	53.6106°N, 9.8202°W	
T09/389B	1.25	Black Pearl Shellfish Ltd	53.5987°N, 9.7608°W	
T09/392A	3.36	Black Pearl Shellfish Ltd	53.6152°N, 9.8325°W	
T09/392B	1.2	Black Pearl Shellfish Ltd	53.6004°N, 9.7419°W	
T09/396B	1	Brian Spellman	53.6003°N, 9.7457°W	
T09/399	3.3	Black Pearl Shellfish Ltd	53.6201°N, 9.8452°W	
T09-184B	1	Kevin Lydon	53.5993°N, 9.7522°W	
T09-199A	5	Killary Fish Farming Co-Operative Society Ltd	53.6165°N, 9.8373°W	
T09-199B	2	Killary Fish Farming Co-Operative Society Ltd	53.5998°N, 9.7512°W	
T09-341A	5	Cluggam Mussels Ltd	53.6143°N, 9.8333°W	

T09-361A	3.15	Jim O'Malley	53.6031°N, 9.7992°W	
T09-361B	1	Jim O'Malley	53.5982°N, 9.7602°W	
T09-372B	1	Bartley O'Malley	53.5992°N, 9.7612°W	
T09-388A	2.19	Peter Nee	53.6031°N, 9.7974°W	
T09-388B	1	Peter Nee	53.5992°N, 9.7651°W	
T09-391A	3.5	Ciaran Coyne	53.6174°N, 9.8373°W	
T09-394A	1.95	Edward Nee Junior	53.6095°N, 9.8166°W	
T09-394B	1.25	Edward Nee Junior	53.5982°N, 9.7654°W	
T09-400	3	Liam Gerard Laffey	53.6189°N, 9.8402°W	
T09-401A	3.3	Black Pearl Shellfish Ltd	53.6182°N, 9.8418°W	
T09-401B	1	Black Pearl Shellfish Ltd	53.5984°N, 9.7691°W	
T09/135	1	Kevin and Michael Lydon	53.5998°N, 9.7451°W	
T09/051A	4	Brid Kavanagh	53.6155°N, 9.8266°W	
T09/051B	1.4	Brid Kavanagh	53.5987°N, 9.7555°W	
T09/308A	7.5	Kevin and Michael Lydon	53.6087°N, 9.8163°W	
T09/308B	3	Kevin and Michael Lydon	53.5996°N, 9.7581°W	
T09/076B	2	Kevin and Michael Lydon	53.5976°N, 9.7673°W	
T09/363	1	Eddie Nee	53.5997°N, 9.7614°W	
T09/296A	3.25	Online Mussels	53.6008°N, 9.7957°W	
T09/313A	3.17	Online Mussels	53.6001°N, 9.7913°W	
T09/397A	4.63	Online Mussels	53.6188°N, 9.8441°W	
T09-1019	1	Black Pearl Shellfish Ltd	53.6051°N, 9.8022°W	
T09-507A	12.69	Killary Fjord Shellfish Ltd	53.6031°N, 9.8000°W	
T09/313B	2	Online Mussels	53.5996°N, 9.7477°W	Seed Collection only
T09/175B	1.1	Killary Fjord Shellfish Ltd	53.5999°N, 9.7419°W	
T09/317B	1	Purple Spade Ltd	53.6003°N, 9.7495°W	

Table 3 - Location characteristics where the 44 projects are situated.

General Access	Small boat access to the aquaculture projects will be from Bundorragha Pier (accessed via R335) or from Rossroe Pier (accessed via L5102).
WFD EPA water body name and quality	The proposed aquaculture projects lie within the Killary Harbour coastal waterbody, in good ecological status / WFD Risk is under review[5].
Hydrological regime (exposure (wave) and tidal currents)	Modelled datasets for kinetic energy at the seabed due to waves[6] and currents[7], developed as part of the EUSeaMap project (Populus *et al*, 2017), indicate that Killary Harbour has a relatively high kinetic energy at the seabed due to waves and relatively low levels of kinetic energy

[5] https://www.catchments.ie/data/#/waterbody/IE_WE_310_0000?_k=7y4rtd

[6] https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/2a2659c4-ce1b-4feb-81cf-a2bcbc362a3f

[7] https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/d72bfeca-ceb5-4faa-b7b0-e95db8c6310b

	at the seabed due to currents, suggesting it is fairly exposed to the prevailing Atlantic swell.
Water depth range	The inlet is 45m deep immediately inside the mouth of the fjord, has an average depth of 20m (Hennessy *et al*., 2019) and has a residency time of approximately 7 to 15 days (McMahon *et al*., 1992).
Underlying/adjacent marine habitats	Modelling from EUSeaMap (Populus *et al*, 2017) (see Figure 2) suggest the seabed is dominated by low energy infralittoral and circalittoral seabed habitats.

The projects are situated within the Killary Harbour Classified Bivalve Mollusc (BLM) Production Area[8]. There are currently two existing aquaculture sites licensed within Killary Harbour. The details are listed in Table 3 and illustrated in Figure 3 below.

Table 4 - Existing aquaculture site (for Atlantic salmon) in the vicinity of the projects being assessed within this Appropriate Assessment.

Licence No.	Species	Area (hectares)	Name of Applicant
T09-143	Atlantic Salmon	22.51	DOCON LTD
T09-408A	Blue mussel	1.40	Black Pearl Shellfish Ltd

[8] https://www.sfpa.ie/LinkClick.aspx?fileticket=BdHd0-39ThU%3d&portalid=0&resourceView=1

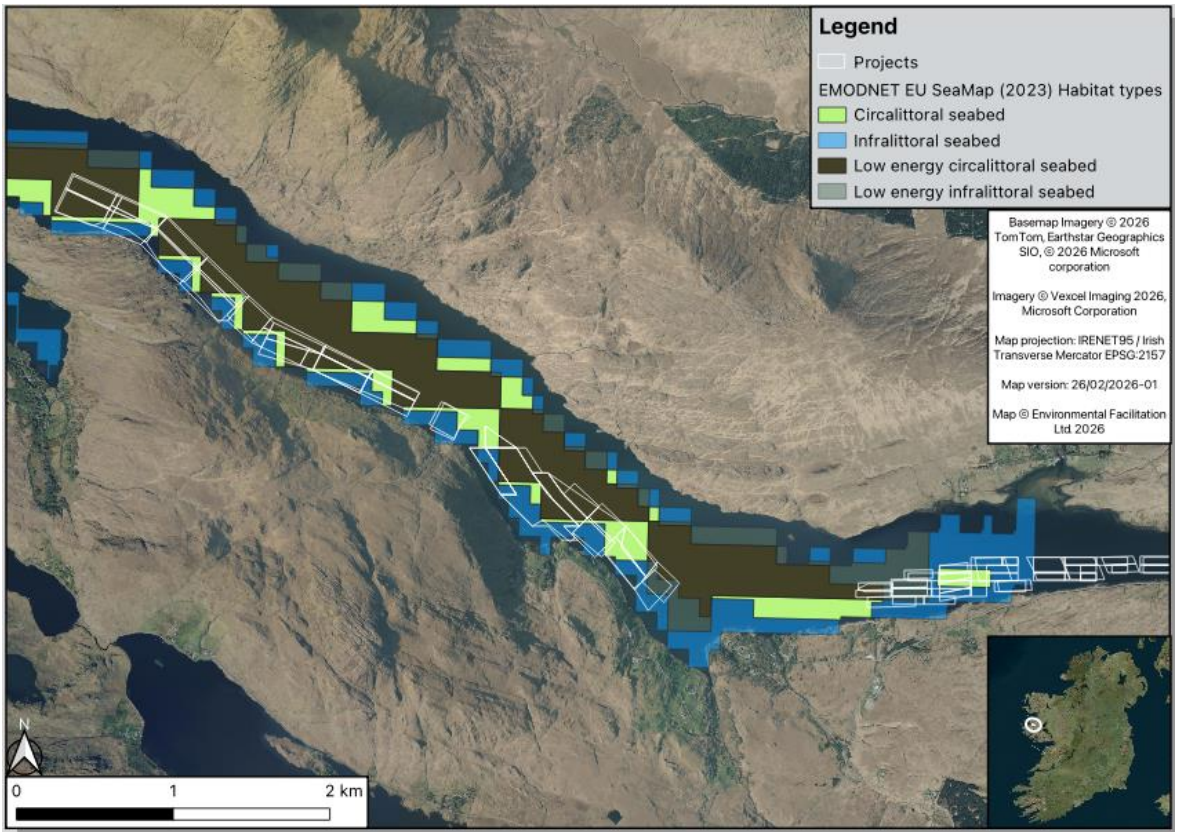

Figure 2 - EMODnet EUSeaMap (2023) seabed habitat types in the vicinity of the aquaculture projects. https://emodnet.ec.europa.eu/geoviewer/

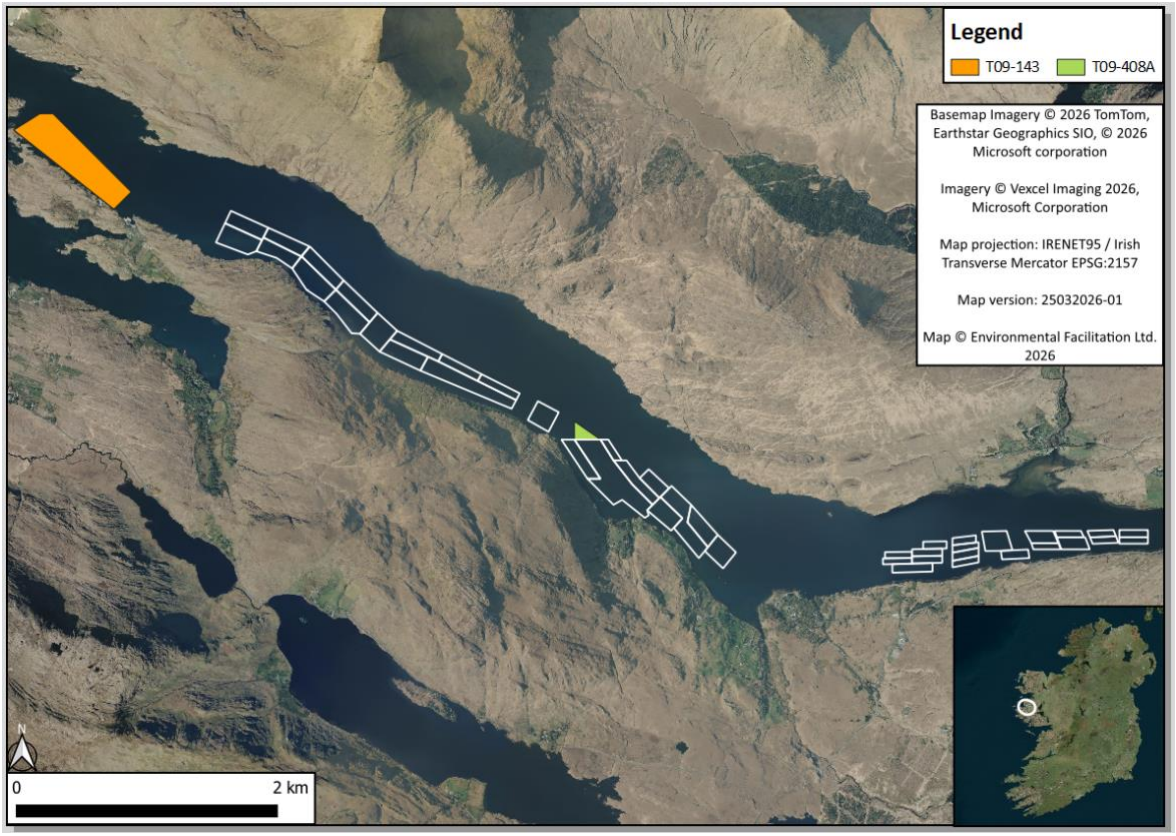

Figure 3 - Location of the two existing aquaculture sites licensed within Killary Harbour; T09-143 and T09-408A.

3. Relevant Annex IV species provisional risk assessment

The Habitats Directive identifies a number of plant and animal species across Europe, which are rare, or are threatened with extinction and which need special measures to be taken to ensure their long-term survival. All species listed under Annex IV with the potential to be impacted by the existing and proposed aquaculture activities have been included within the following section, even if they have been separately assessed in the AA process.

Of the animal and plant species on Annex IV known to occur in Ireland, the following species were identified as relevant to the existing and proposed aquaculture sites:

3.1. Otter

Ireland remains a European stronghold for the otter and the species is widespread in rivers, streams and along coastlines and lakeshores. Otters have two basic habitat requirements: adequate prey and safe refuges where they can rest and breed. Otters maintain territories along riverbanks, lakeshores and coasts. Coastal territories require a freshwater source for the otter to wash, so will always include a stream or spring. In productive areas, such as coastlines, territories are in the range of 5-6 km. On the coast, otters forage within 80-100m of the coastline, typically in depths of <3m, but up to 10-12m. For foraging they prefer shallow, rocky environments with seaweed cover. Otters maintain numerous resting places, known as couches (above-ground, hidden in foliage) and holts (underground, among roots, rocks, or tunnels) within its territory. They breed all year, nesting in a well-hidden natal holt.

Otter is a Qualifying Interest feature of The Twelve Bens/Garraun Complex SAC (002031) which slightly overlaps with the western section of the aquaculture projects, and the Mweelrea/Sheeffry/Erriff Complex SAC (001932) which sits along the northern boundary of Killary Harbour. The two SACs flank the boundaries of Killary Harbour, and distribution data from the National Biodiversity Data Centre (accessed on 04/03/2026) indicated several records of Otter in the vicinity of the projects (see Figure 2).

Conclusion: Further consideration to assess risk.

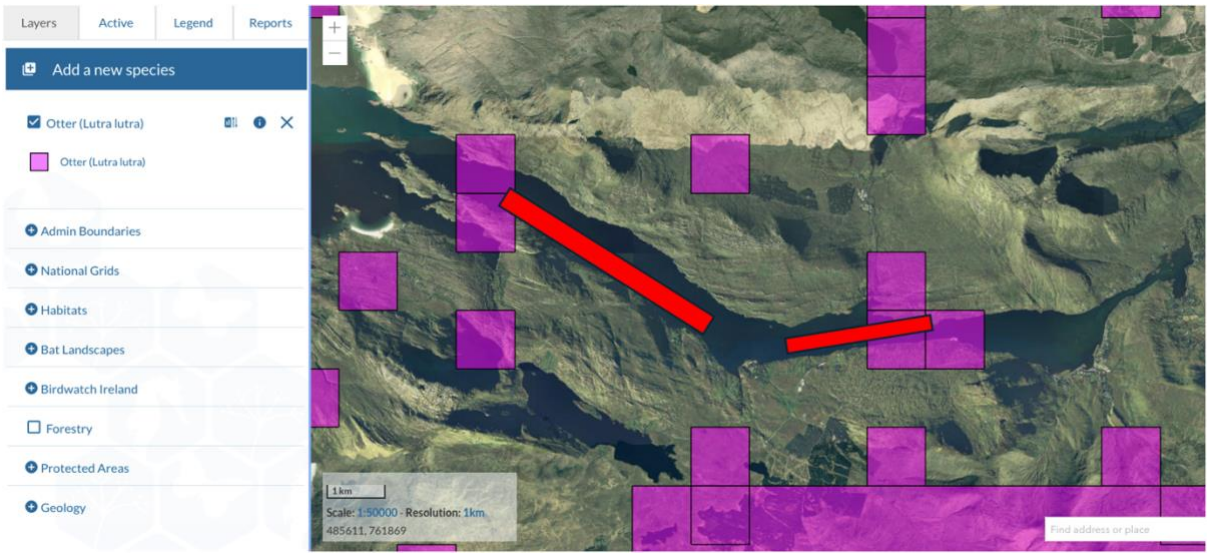

Figure 5: Records of Otter (Lutra lutra) in the vicinity of the projects (red polygons show approx. project locations). Source: https://maps.biodiversityireland.ie/

3.2. Bat species

Considering that this aquaculture activity will not impact trees, hedges, buildings, bridges, caves, souterrains or include changes in lighting, bats are unlikely to be affected by the proposed works. Noting the subtidal nature of the project areas, the lack of spatial overlap or likely interactions between the Annex IV species and the aquaculture activities means there will be no significant risk to the number of individuals to breed successfully, nor to the survival of the population; the species' natural range is secure and will not be reduced.

Conclusion: Negligible risks to species.

3.3. Dolphins, Whales and Porpoises

Data on the distribution of cetacean species from the National Biodiversity Data Centre (accessed on 04/03/2026) was used to help inform this Annex IV assessment; data was also visualized via Biodiversity Maps[9]. Data on all Annex IV cetacean species from within two 10km grid cells (L76, L86) encompassing all planned aquaculture activities (including proposed support vessel routes) under the aquaculture and foreshore licence applications (43 renewal and review, 1 new application) collectively within Killary Harbour. This data was compiled and is shown in Table 5 below. Example outputs from Biodiversity Maps showing sightings data in the vicinity of the proposed aquaculture activities are shown in Figures 6 and 7.

[9] https://maps.biodiversityireland.ie/

Table 5: Counts of dolphins, whales and porpoises from two 10km grid cells (L76, L86) encompassing all projects, including support vessel routes

Species name	Record count	Date of last record	Title of dataset
Bottle-nosed Dolphin (Tursiops truncatus)	31	07/06/2023	IWDG Casual Cetacean Sightings
Common Dolphin (Delphinus delphis)	21	23/02/2023	IWDG Cetacean Strandings Database
Long-finned Pilot Whale (Globicephala melas)	4	21/02/2022	IWDG Cetacean Strandings Database
Dolphin species possibly Harbour Porpoise	3	22/04/2022	IWDG Casual Cetacean Sightings
Common or Striped Dolphin	2	14/04/2023	IWDG Cetacean Strandings Database
Cuvier's Beaked Whale (Ziphius cavirostris)	2	14/07/2019	IWDG Cetacean Strandings Database
Minke Whale (Balaenoptera acutorostrata)	2	26/04/2022	IWDG Casual Cetacean Sightings
Risso's Dolphin (Grampus griseus)	1	28/04/2019	IWDG Cetacean Strandings Database
Whale species	1	15/12/2019	IWDG Cetacean Strandings Database
Pygmy Sperm Whale (Kogia breviceps)	1	02/10/2015	IWDG Cetacean Strandings Database
Atlantic White-sided Dolphin (Lagenorhynchus acutus)	1	30/05/2011	IWDG Cetacean Strandings Database
Common Porpoise (Phocoena phocoena)	1	04/05/2023	IWDG Cetacean Strandings Database

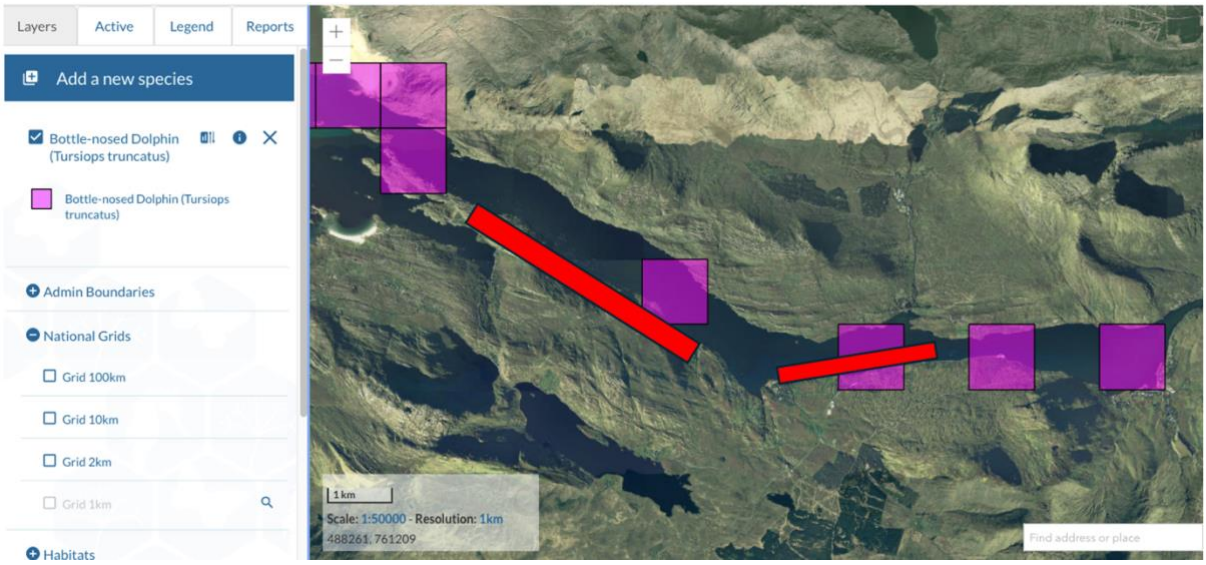

Figure 6: Records of Bottle-nosed Dolphin (Tursiops truncatus) are in the area surrounding the projects (red polygons show approx. locations of projects. Source: https://maps.biodiversityireland.ie/

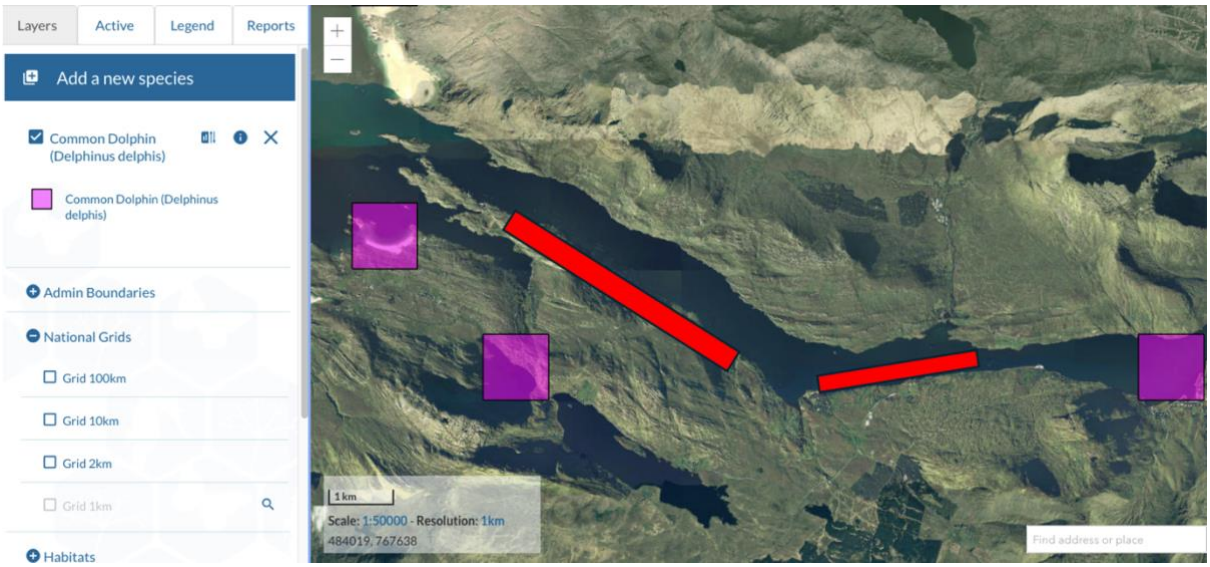

Figure 7: Records of Common Dolphin (Delphinus delphis) are in the area surrounding projects (red polygons show approx. locations of projects. Source: https://maps.biodiversityireland.ie/

From the evidence reviewed, it is likely that there may be cetaceans (Annex IV species) particularly dolphin present in the vicinity of the projects associated support vessel' routes. Therefore, these species are considered in more detail in this risk assessment.

Conclusion: Further consideration to assess risk.

3.4. Natterjack Toad

The natural ranges for the Natterjack Toad are freshwater and terrestrial with populations generally restricted to sites in County Kerry (although records were also noted in County Wexford[10]). Natterjacks are nocturnal, hiding during the day under logs and stones. Over winter, natterjacks hibernate in burrows that they dig themselves in sandy soils, or in piles of rocks or dry-stone walls. The toad breeds in shallow ponds and forages in the areas surrounding the ponds.

The planned aquaculture activities under the aquaculture and foreshore licence applications within Killary Harbour are in habitat unsuitable for Natterjack toads. There is no overlap between these marine aquaculture sites and the toad's natural habitat and thus there is no risk to the number of individuals being able to breed successfully, nor to the survival of the population; the species' natural range is secure and will not be reduced.

Conclusion: Negligible risks to species.

3.5. Marine Turtles

Five species of marine turtle have been recorded in Irish waters (Botterell *et al.* 2020): the Leatherback (or Leathery) turtle (*Dermochelys coriacea*), Loggerhead (*Caretta caretta*), Kemp's Ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*) and Green turtle (*Chelonia mydas*). Hawksbill and Green turtles are considered very rare, with one Green turtle record noted from the National Biodiversity Data Centre (accessed on 31st March 2024) located off the southern coast of County Cork in 1995 and a Hawksbill caught in herring nets off Cork harbour in 1983 (O'Riordan *et al.,* 1984).

The majority of records of hard-shell turtles observed were juveniles and occurred in the boreal winter months when the waters are coolest in the North-east Atlantic. They generally occurred on the western aspects of the UK and Ireland highlighting a pattern of decreasing records with increasing latitude, supporting previous suggestions that juvenile turtles arrive in these waters via the North Atlantic current systems (Botterell *et al.* 2020).

Leatherback (or Leathery) turtles (*Dermochelys coriacea*) are the largest sea turtle species living today and have many unique anatomical and physiological adaptations (Doyle, 2007). Leatherback turtles were most commonly recorded in the boreal summer months with the majority of strandings being adult sized, of which there has been a recent decrease in annual records (Botterell *et al.* 2020).

Data on the distribution of marine turtles from the National Biodiversity Data Centre (accessed on 04/03/2026) was used to help inform this Annex IV assessment; data was also visualized via Biodiversity Maps[11]. Data on all Annex IV marine turtle species from two 10km grid cells (L76, L86) encompassing all planned aquaculture activities (including proposed support vessel routes) under the aquaculture and foreshore licence applications (43 renewal and review, 1

[10] https://maps.biodiversityireland.ie/Map
[11] https://maps.biodiversityireland.ie/

new application) collectively within Killary Harbour. This data was compiled and is shown in Table 6 below.

The closest turtle record, a Leatherback, in the National Biodiversity Data Centre is located ca. 3.3km from the aquaculture and foreshore licence application within Killary Harbour and outside the harbour itself (see Figure 8).

Table 6: Counts of marine turtles from two 10km grid cells (L76, L86) encompassing projects and support vessel routes).

Species name	Record count	Date of last record	Title of dataset
Leatherback Turtle (Dermochelys coriacea)	2	06/11/2023	Explore Your Shore

Figure 8: Records of the Leatherback (or Leathery) turtle (Dermochelys coriacea) in the area surrounding the projects (red polygons show approx. project locations.) Source: https://maps.biodiversityireland.ie/

Loggerhead turtles are stranded regularly in Ireland with records reported once every few years (Doyle 2007); they are rarely sighted alive in Irish waters. Loggerhead sightings recorded in the National Biodiversity Data Centre within the vicinity of the proposed aquaculture projects are shown in Figure 10 below (the closest was a dead, stranded specimen in 2015).

Botterell *et al* (2020) reported that records showed 143 marine turtles were indirectly captured as bycatch in fishing nets, ropes and lines (7.2% of total turtle records). This comprised six loggerhead turtles (2.5% of 240 conspecific records; all alive), two Kemp's ridley turtles (3.3% of 61 conspecific records; both alive) and 135 leatherback turtles (8% of 1683 conspecific records; 95 alive). Of the bycaught leatherback turtles, a substantial number were associated with ropes from lobster pots, crab pots and creels (49.6%, 67 of 135), and nets including trawls and drift nets (31.9%, 43 of 135). Botterell *et al* (2020) also reported that five

leatherback turtles (0.3% of conspecific records, one alive) had injuries consistent with collision with boats and their propellers.

Considering that the project is situated inshore within a relatively enclosed fjord, and noting the absence of any historical turtle records within this fjord and the consequent rarity of these widely roaming oceanic species to enter these waters, it is highly unlikely that there will be any significant interactions with these Annex IV species. It is concluded these is negligible risk to the number of individuals that breed successfully, nor to the survival of the population, and the species natural range is secure and will not be reduced.

Conclusion: Negligible risks to species.

3.6. Kerry Slug

The Kerry Slug is a terrestrial and nocturnal (generally) mollusc, with a natural range restricted to sites in County Kerry and west Cork (and more recently in Galway, Limerick and Tipperary). Its preferred habitat is woodland, lichen covered rock outcrops and boulders. Therefore, this marine aquaculture site is not a suitable habitat for this species. There is no overlap between this marine aquaculture site and the slug's natural habitat and thus there is no risk to the number of individuals being able to breed successfully, nor to the survival of the population; the species' natural range is secure and will not be reduced.

Conclusion: Negligible risks to species.

3.7. Plants

The natural ranges for these Annex IV plant species (Killarney Fern, Slender Naiad, and Marsh Saxifrage) are terrestrial and therefore it is highly unlikely that the proposed aquaculture activities will impact these species; there is no risk to these Annex IV species.

Conclusion: Negligible risks to species.

3.8. Provisional Investigation Summary

The relevant Annex IV species which may either be present in the area, or potentially affected by these aquaculture projects, and considered for further investigation, are:

- Otter
- Whale, dolphin and porpoise species (and in particular, from the abundance data reviewed, Bottle-nosed Dolphin (*Tursiops truncatus*) and Common Dolphin (*Delphinus delphis*)

4. Further Assessment of Risk

To be able conclude that there no risks to the species, we should be able to confidently state that there are no risks:

- of deliberate disturbance
- of damage or destruction of breeding sites or resting places
- to ecological functionality of breeding/resting sites.
- to the survival of the population
- to the species' natural range.

4.1. Otter

Otter is a Qualifying Interest feature of The Twelve Bens/Garraun Complex SAC (002031) which slightly overlaps with the western section of the aquaculture projects, and the Mweelrea/Sheeffry/Erriff Complex SAC (001932) which sits along the northern boundary of Killary Harbour. The National Biodiversity Data Centre (accessed on 04/03/2026) indicated records in the vicinity of the project area (see Figure 5) with these records mainly either side of the projects rather than within the main project concentration.

Otters are opportunistic predators whose diet consists primarily of fish, but also includes amphibians, small avian species, eggs, mollusks, crustaceans, and other invertebrates. The nature of this aquaculture activity means it is not likely to have an influence on the number or availability of prey for the otter. While the general habitat in the area is likely to support otters, the project area is located in the subtidal zone with no immediate breeding disturbance area concenrs. Otters prefer shallow, rocky environments with seaweed cover for main foraging, and the project area is in an area that is unlikely to interfere with couches and holts within its territory.

4.1.1. Summary of Potential Impacts and Risk Assessment

The potential for impacts associated with the proposed projects on otter are related to:

Obstruction (open water)

The longlines and activities associated with this form of mussel farming involve ropes suspended from a float rope, hanging in the water column. Otters generally forage within 80-100m of the coastline, and in shallower waters. The project(s) is within this range from the shore. While there is no local evidence of otter activity within these areas, operators should ensure there are clear corridors along lengths of coastline and avoid continuous "walling".

Entanglement

Shellfish production activities are generally classed as highly unlikely to pose any risk to otter populations through entrapment or direct physical injury and no additional factors related to this project suggest the potential for harm. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

Displacement

Otters are a highly adaptable mobile species, however the number of couching sites and holts or the distribution of otter is not anticipated to be directly affected by this aquaculture activity. No additional information following additional inspection of available data and the surrounding seascape suggest additional concerns. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

Disturbance

Disturbance associated with vessel traffic could potentially affect otter at these sites. However, the level of disturbance is likely to be very low given the likely encounter rates will be low, dictated primarily by tidal state and in daylight hours. Routine vessel activity associated with the projects is limited in frequency, localised in extent and undertaken at low operational speeds within the harbour environment. The projects do not require continuous vessel activity, night-time operations, shoreline excavation or high-intensity disturbance events. Given that otter foraging is primarily crepuscular, interaction with personnel involved in the aquaculture project is also likely to be minimal. The potential for impact from the listed hazards is generally unlikely or of low intensity. The lack of significant spatial overlap or likely interactions between the Annex IV species and the aquaculture activities means there is no significant risk to the number of individuals to breed successfully, nor to the survival of the population, and the species' natural range is secure and will not be reduced. In conclusion, the projects do not involve shoreline modification, removal of riparian habitat, or interference with known breeding or resting sites. No evidence has been identified that the scale, frequency or distribution of operational activity would result in significant disturbance capable of impairing commuting behaviour, breeding success, resting site functionality or territorial integrity. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

4.2. Dolphins, Whales and Porpoises

Data reviewed from the National Biodiversity Data Centre, Ireland shows that dolphins, whales and porpoises (particularly dolphin) have been recorded in the vicinity of the project area and proposed support vessel routes. These are typically large mammals, that utilise a wide range of habitats in the marine environment. Whales tend to be migratory, following food, and are generally found in open ocean. Dolphins are found from shallow coastal waters to the deeper open ocean. They feed on a variety of fish and invertebrates, such as squid. Porpoises are also found from shallow coastal waters to the deeper open ocean and are generally shy and elusive and prefer to avoid contact with boats and humans.

4.2.1. Summary of Potential Impacts and Risk Assessment

The potential for impacts associated with the proposed projects on dolphins, whales and porpoises are related to:

Noise disturbance:

The level and persistence of any associated underwater noise from aquaculture activities may be minimal relative to other underwater noise sources, such as commercial vessels, but will vary according to farm features (e.g. type, size), habitat characteristics (e.g. location, depth, type of bottom sediments, shape of coastline) and compounding factors, such as the number of farms and/or other noise sources in nearby regions (Keeley *et al.,* 2009). The increase in marine traffic resulting from the proposed project is considered minimal, when considering the acclimatisation to existing fishing vessels and recreation vessels already utilising the marine space. Small craft would be used on an infrequent basis from a support basis, and there is no regular maintenance required with the proposed aquaculture species. Noise associated with small marine vessels is considered low, and noise from the site during operation is not considered to be significant as the sound pressure would be minimal, low and would rapidly attenuate. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

Collisions or entanglement

Mussel aquacultures rely on the deployment of ropes for long periods of time in the water column, which may pose an entanglement risk to marine animals such as cetaceans. Young (2015) reported that in contrast to fishing gear, there were fewer entanglement cases in mussel aquaculture gear although there has been little data collected on this issue to date. Following this review in 2015, a total of seven entanglement reports were collected related to mussel aquaculture, including four baleen whales and one harbour porpoise. A majority of cases involved mussel spat collecting ropes, which suggests this part of the gear may pose the greatest entanglement risk (Young, 2015). Lloyd (2003) reported that the risk of entanglement was probably greater with thinner or untensioned ropes, such as spat collecting ropes and lost ropes. As they don't echolocate (Tyack & Clark 2000), baleen whales (e.g. minke, northern right whale and humpback) are more prone to entanglement. Over 60% of northern right whales in the North Atlantic have entanglement scars, with at least two deaths during a three-year period attributed to entanglements (Hamilton *et al*. 1998).

However, noting the shallow, coastal location of the project, whales would not typically inhabit this very shallow fjord habitat in Irish waters. Therefore, there is an extremely low likelihood of interaction between whales and mussel culture cultivation lines.

The small number of vessels that will be required for the projects will not significantly increase vessel traffic in the area. These vessels will be travelling at slow speeds, in a predefined trajectory, allowing for animals to avoid vessels.

Regarding dolphin and porpoise, whilst there is a potential for interaction with the existing and proposed suspended culture aquaculture sites and activities, considering the small

footprint of the aquaculture structures, the likelihood of interactions are small. In addition, the structures do not present a significant barrier to movement of these species due to their small size, and because of their echolocation capabilities, these structures should be easily detectable. Therefore, dolphins and porpoises are considered to be at lower risk of becoming entangled in lines (Lloyd, 2003). The implementation of standard operational line-management procedures, including maintenance of tensioned infrastructure and prompt retrieval of damaged or detached gear, ensures that no reasonably foreseeable risk of significant entanglement arises.

Obstruction and displacement

The potential for the aquaculture infrastructure within the project area to cause obstruction to dolphins, whales and porpoises is considered very low. These mobile species can avoid and go around any obstructions without any significant disturbance. The size of the projects is relatively limited and not significant when considered against the overall area and not likely to cause loss of habitat to these wide-ranging species. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

Attraction

Some cetacean species (predominantly dolphins and porpoises) may be attracted to structures similar to those used in aquaculture operations as the infrastructure can act as artificial reefs or fish aggregation devices, encouraging fish aggregations and thus predators (Callier *et al.,* 2017). However, with the small footprint of the project sites, this effect would be limited to the immediate vicinity of and would be temporary in nature, noting the relatively short growing cycle. There are no significant energy sources (e.g., light, noise etc.) likely to result from activities at the sites that pose a risk. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

Water quality

Research has shown that the large concentrations of mussels found in mussel farms can extract a significant proportion of phytoplankton, causing phytoplankton depletion (Broekhuizen *et al.* 2002). The magnitude and extent of depletion is poorly understood and may vary, depending on factors such as farm size, crop density, water depth, currents and season (Lloyd, 2003). Phytoplankton can be reduced by up to 60% within farm boundaries (Waite 1989), and a 50 ha farm may consume >20% of phytoplankton passing through it (Broekhuizen *et al.* 2002). These phytoplankton depletion halos are usually limited to within 80 m of farm (Grange & Cole 1997, in Lloyd, 2003), so may be fairly localised in their extent. Mussels and other associated fauna also release dissolved sources of nitrogen (e.g. ammonium) directly into the water column as metabolic waste products (Keeley *et al.,* 2009). Unlike for finfish culture, no veterinary products are used during the mussel cultivation process. In summary, water quality is not anticipated to be impacted in any way which could impact whales, dolphins or porpoises. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

Commissioning and decommissioning

The infrastructure involved with mussel cultivation is relatively small, with a small footprint, easily installed and removed. Therefore, commissioning and decommissioning of these structures are tasks that are not anticipated to have significant impacts on whales, dolphins or porpoises.

The potential for impact from the listed hazards is generally unlikely or of low intensity. While there may be some changes present in the environment, they are not likely to be significant.

While there may be sightings in the vicinity, the location of the project area within a predominantly subtidal area, the lack of spatial overlap or likely interactions between the Annex IV species and the aquaculture activities means that there is no significant risk to the number of individuals to breed successfully, nor to the survival of the population, and the species' natural range is secure and will not be reduced by the existing and proposed shellfish aquaculture operations. Negligible risks are concluded in any of the categories outlined in section 4 introduction.

5. Conclusion

Recommended mitigation: Operators shall maintain taut backbone, droppers and mooring systems at all times and shall implement procedures for the inspection and prompt removal or repair of damaged, detached or storm-displaced infrastructure in order to minimise entanglement risk to protected species. The Department reserves the right to inspect compliance with these requirements.

Following a risk assessment of the aquaculture and foreshore licence applications (renewal and review applications for 43 aquaculture sites[12], and one new application; with the recommended mitigation implemented, it is concluded that the described activities pose no risk:

- of deliberate disturbance
- of damage or destruction of breeding sites or resting places
- to ecological functionality of breeding/resting sites.
- to the survival of the population
- to the species' natural range.

With implementation of the recommended mitigation measures, residual risk to Annex IV species is considered negligible.

[12] Aquaculture and foreshore licence applications KILLARY HARBOUR

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