RISK ASSESSMENT FOR ANNEX IV SPECIES

Extensive Aquaculture

in

Bantry Bay Co. Cork

Marine Institute

Rinville

Oranmore, Co. Galway

Date	Status	Author	Purpose/Changes
June 2026	Final	MI	New: T05-1010, T05-1011, T05-1023, T05-1024, T05-641A. Renewal & Review: T05-053N1,T05-053N6,T05-058N4,T05-058N5,T05-060N1, T05-060N2, T05-060N3, T05-060N4, T05-060N5, T05-067N1, T05-067N2, T05-067N4, T05-067N6, T05-069N1, T05-069N4 T05-069N5, T05-125N1, T05-214N1, T05-214N2, T05-577N1.Renewal:. T05-069N2, T05-214N3, T05-069N3, T05-053N4, T05-547A, T05-067N5, T05-125N2, T05-060N6, T05-069N6 T05-069N7.Review: T05-591A, T05-430A.

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1 Introduction

This Annex IV Risk Assessment has been prepared by the Marine Institute to comply with the provisions of Article 12 and 13 of Council Directive 92/43/EC in relation to the protection afforded to Annex IV species from disturbance or harm. Specifically, this Risk Assessment appraises the proposed aquaculture activities in respect of Bantry Bay, Co. Cork.

1.1 Legislative Context

The Habitats Directive has identified a number of animal and plant 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. Under Article 12 and 13 of the Habitats Directive, Member States must establish systems of strict protection for animal and plant species which are listed on Annex IV of the Habitats 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[1].

The aim of the strict protection measures (set out in Article 12 (for animals) and 13 (for plants) of the Directive) is that the species in question will reach and remain at favourable conservation status. This means that the population dynamics of the species concerned can maintain itself on a long-term basis as a viable component of its natural habitats. It also means that the natural range of the species is neither being reduced, nor is likely to be reduced for the foreseeable future, and that there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Annex IV species are afforded strict protection throughout their range, both inside and outside of designated protected areas. This protection is afforded to these species at all stages of their life cycle and wherever they occur. This protection includes from deliberate disturbance of these species, particularly 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 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 **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,

[1] European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 - Unofficial Consolidation (Updated to 28 July 2022)(1).pdf

[2] https://www.irishstatutebook.ie/eli/2021/si/293/made/en/print?q=293

b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation ar 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 Habita 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 list of Annex IV species which occur in Ireland and its waters[3] is set out in Table 1.

Table 1 Annex IV species which occur in Ireland (NPWS).

Animals	Plants
All bat species	Killarney Fern
Otter	Slender Naiad
Natterjack Toad	Marsh Saxifrage
Kerry Slug	
Dolphins, Whales and Porpoises	
Marine Turtles	

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

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

the probability of the protected species being present in the area affected by the works, using existing information, and applying the precautionary 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 Regulations 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, 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 needs to be examined to see if those impacts can be avoided through the design of the works[5].

1.2 Details of Proposed Aquaculture Activities

The MI has been requested to assess 37 applications, as follows:

- 5 new applications.
- 20 applications for a licence renewal and review (renew a current licence with changes).
- 10 applications for a licence renewal (renew a current licence with no changes).
- 2 applications for review (make changes to a currently active licence).

All licences are for extensive shellfish and/or seaweed aquaculture licenses in Bantry Bay (Table 2).

The location of the applications within the bay are displayed in Figure 1 and the primary culture type at each application site can be seen in Figure 2.

Table 2 Extensive aquaculture applications within the Bantry Bay area.

Site No.	Site Status	Aquaculture Type	Species	Area (ha)
T05-1010	New	Longlines with Oyster Baskets	Pacific Oyster (*Magallana gigas*), Native Oyster (*Ostrea Edulis*)	9.66
T05-1011	New	Longlines	Irish Wakame (*Alaria esculenta*), Sea Lettuce (*Ulva lactuca*), Dulse (*Palmaria palmata*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Digitata) (*Laminaria digitata*), Toothed wrack (*Fucus serratus*), Harpoon weed (*Asparagopsis armata*)	6.01
T05-1023	New	Longlines	Blue Mussel (Mytilus Edulis)	12.26
T05-1024	New	Longlines	Blue Mussel (*Mytilus Edulis*)	3.67
T05-641A	New	Longlines and Longlines with Oyster baskets	Pacific Oyster (*Magallana gigas*), European flat oyster (*Ostrea edulis*), Irish Wakame (*Alaria Esculenta*), Sugar Kelp (*Saccharina latissima*), Northern European Kelp (Digitata) (*Laminaria Digitata*), Dulse (*Palmaria palmata*), Bladderwrack (*Fucus vesiculosus*), Northern European Kelp (*Laminaria Hyperborea*), Knotted wrack (*Ascophyllum nodosum*), Sea Lettuce (*Ulva Lactuca*), Sea thong (*Himanthalia elongata*), Harpoon Weed (*Asparagopsis armata*)	19.56

[4] Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. 2021. National Parks and Wildlife Service Guidance Series 1. DHLGH Link

[5] Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. 2021. National Parks and Wildlife Service Guidance Series 1. DHLGH Link

Site No.	Site Status	Aquaculture Type	Species	Area (ha)
T05-053N1	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	13.12
T05-053N6	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	17.05
T05-058N4	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	13.37
T05-058N5	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	4.63
T05-060N1	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	7.42
T05-060N2	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	5.00
T05-060N3	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	5.03
T05-060N4	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	0.87
T05-060N5	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	36.09
T05-067N1	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	0.67
T05-067N2	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	4.12
T05-067N4	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	8.60
T05-067N6	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	9.92
T05-069N1	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	17.2
T05-069N4	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	8.37
T05-069N5	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	22.7
T05-125N1	Renewal and Review	Longlines	Blue Mussel (*Mytilus Edulis*)	2.04
T05-214N1	Renewal and Review	Longline	Blue Mussel (*Mytilus Edulis*)	4.64
T05-214N2	Renewal and Review	Longline	Blue Mussel (*Mytilus Edulis*)	1.65
T05-577N1	Renewal and Review	Bag and Trestle with Oyster baskets	Pacific Oyster (*Magallana Gigas*)	3.34
T05-069N2	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	14.2
T05-214N3	Renewal	Longline	Blue Mussel (*Mytilus Edulis*)	6.00
T05-069N3	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	5.4

Site No.	Site Status	Aquaculture Type	Species	Area (ha)
T05-053N4	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	2.56
T05-547A	Renewal	Longline	Irish Wakame (*Alaria esculenta*), Sea Lettuce (*Ulva lactuca*), Dulse (*Palmaria palmata*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Digitata) (*Laminaria digitata*), Toothed wrack (*Fucus serratus*), Harpoon weed (*Asparagopsis armata*)	5.99
T05-067N5	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	9.00
T05-125N2	Renewal	Longline	Blue Mussel (*Mytilus Edulis*)	7.10
T05-060N6	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	4.54
T05-069N6	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	6.49
T05-069N7	Renewal	Longlines	Blue Mussel (*Mytilus Edulis*)	2.20
T05-591A	Review	Longlines	Blue Mussel (*Mytilus Edulis*)	18.46
T05-430A	Review	Longlines	Blue Mussel (Mytilus Edulis), Irish Wakame (*Alaria esculenta*), North European Kelp (Digitata) (*Laminaria digitata*), Dulse (*Palmaria palmata*), Nori (*Porphyra umbilicalis*), Bladder wrack (*Fucus vesiculosus*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Hyperborea) (*Laminaria hyperborea*), Knotted Wrack (*Ascophyllum nodosum*), Sea Lettuce (*Ulva Lactuca*), Sea Thong (*Himanthalia elongata*), Harpoon Weed (*Asparagopsis armata)*.	24.22

This Section identifies the proposed aquaculture activities to be considered as part of this exercise.

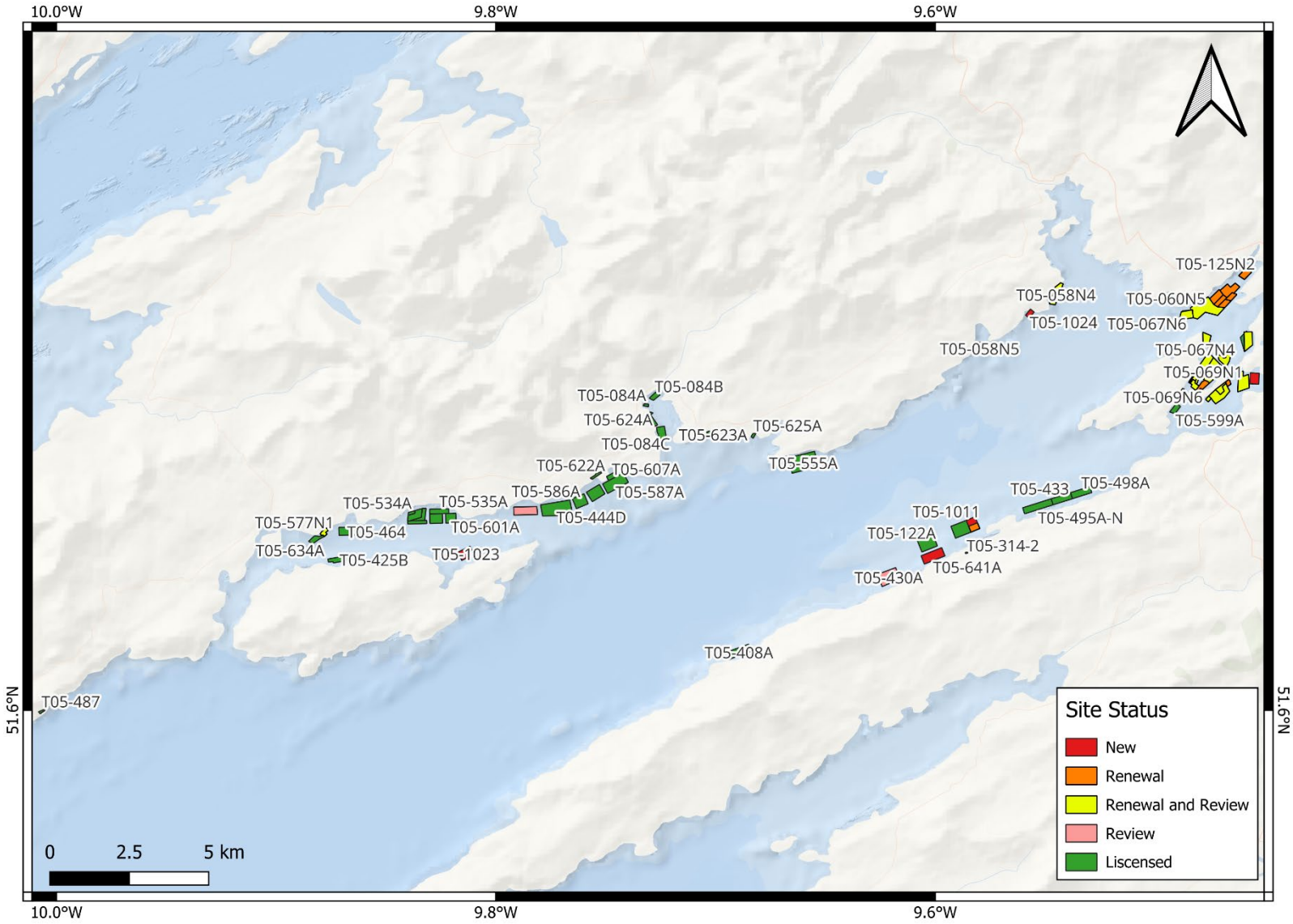


Figure 1 New, renewal, renewal and review, review and licensed aquaculture sites in Bantry Bay.

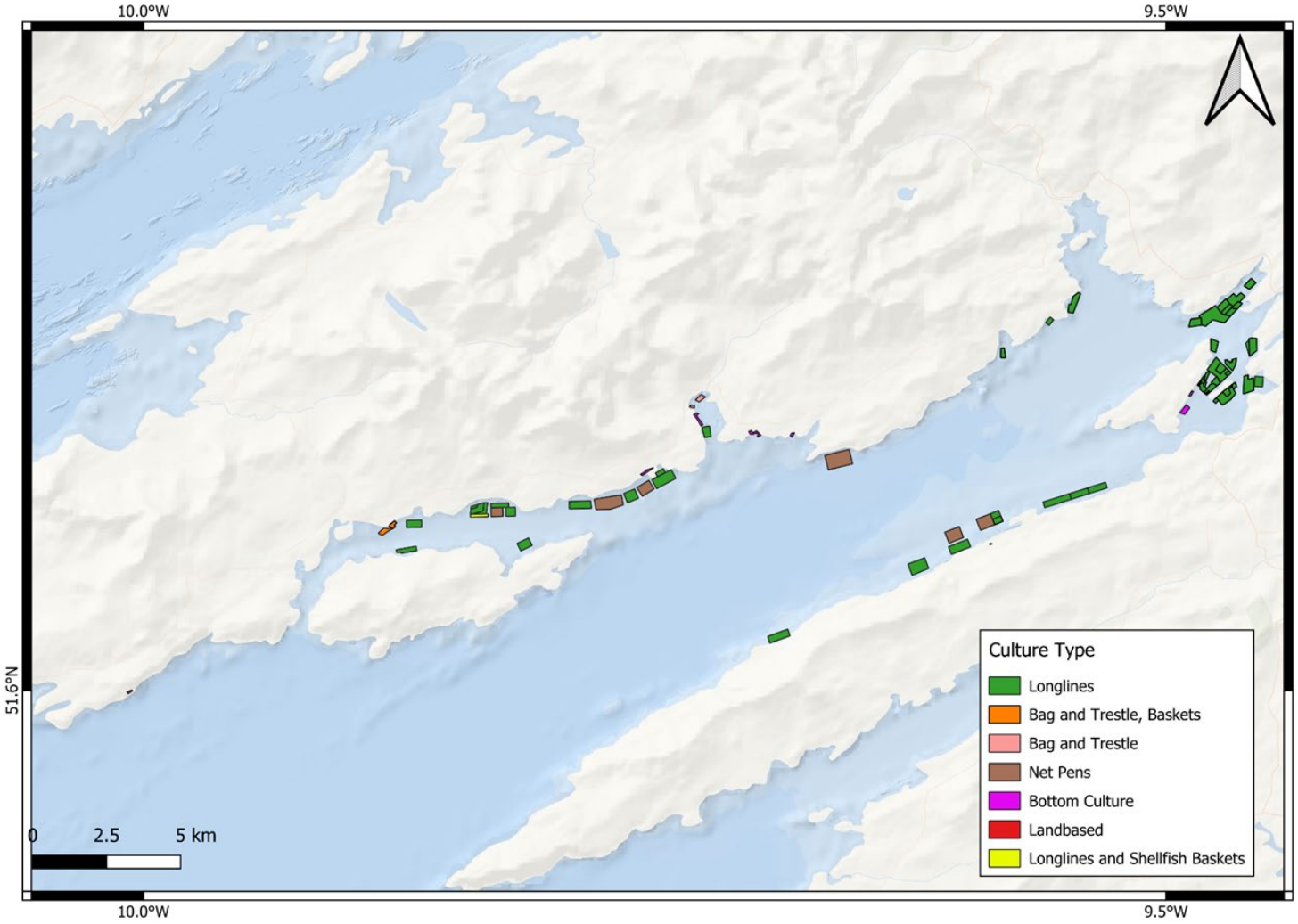


Figure 2 Primary culture type at each application site in Bantry Bay.

1.2.1 Blue Mussel Culture

The Blue Mussel, *Mytilus edulis*, forms the basis of mussel aquaculture operation in Bantry Bay.

Two new license applications (**T05-1023** and **T05-1024**) include application for the cultivation of Blue Mussel (*Mytilus edulis*).

T05-1023- is an application for a total of twenty longlines. Each line is approximately 110m in length with 25 m spacing between. Droppers are suspended approximately 7 metres below the surface. Seed will be sourced from natural spat collection. Lines are anchored at each end by 40 mm polypropylene rope and 45mm chain weighted to the seabed by 3 tonne concrete anchor blocks. The site will be harvested using the applicants existing barges and conveyor belt. The site will be accessed via Pontoon pier using the public road R572.

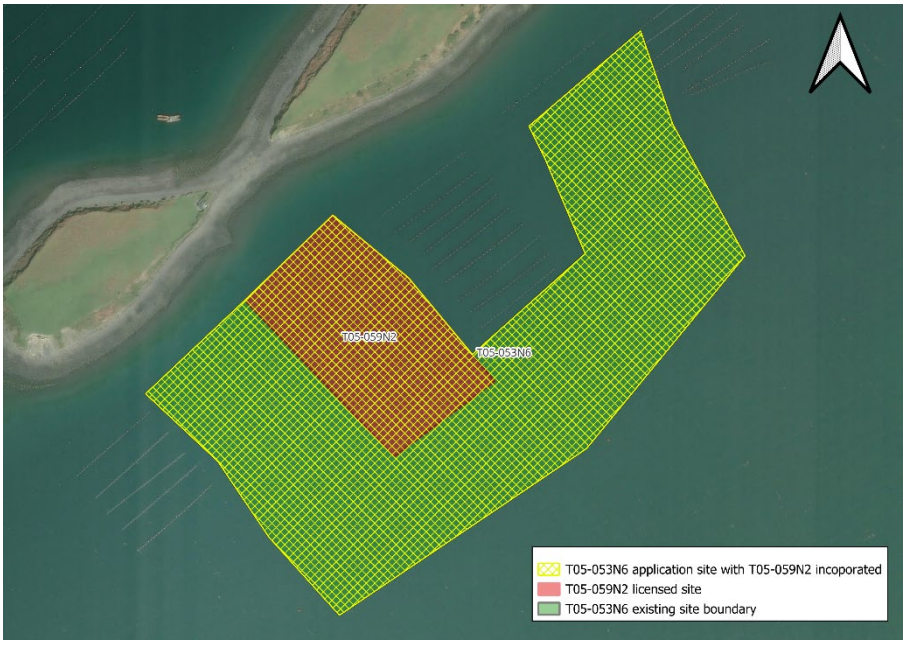
T05-1024- is an application for a total of five longlines. Each line is approximately 110m in length with 25 m spacing between. Droppers are suspended approximately 6 metres below the surface. Seed will be sourced from natural spat collection. Each line is anchored at each end by 40 mm polypropylene rope and 2 metres of 45mm chain weighted to the seabed by 5 tonne concrete anchor blocks. The site will be harvested using the applicants existing barges and conveyor belt. The site will be accessed from Glengarriff pier using the public road N71.

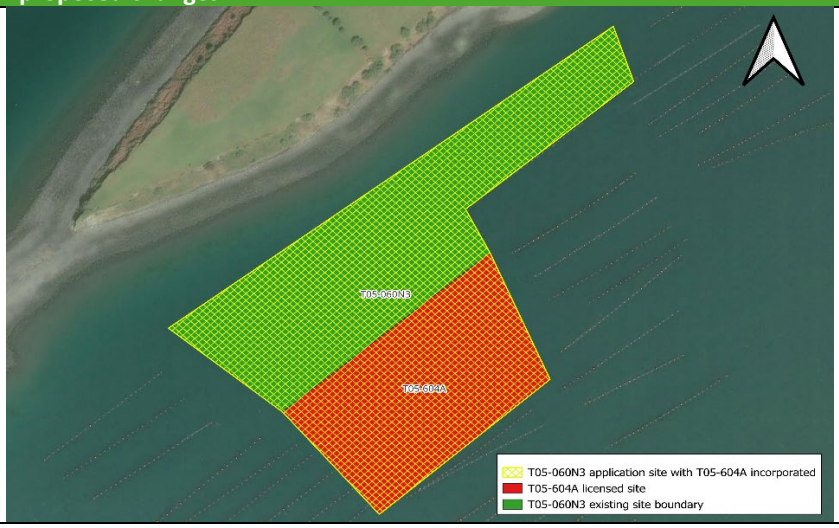
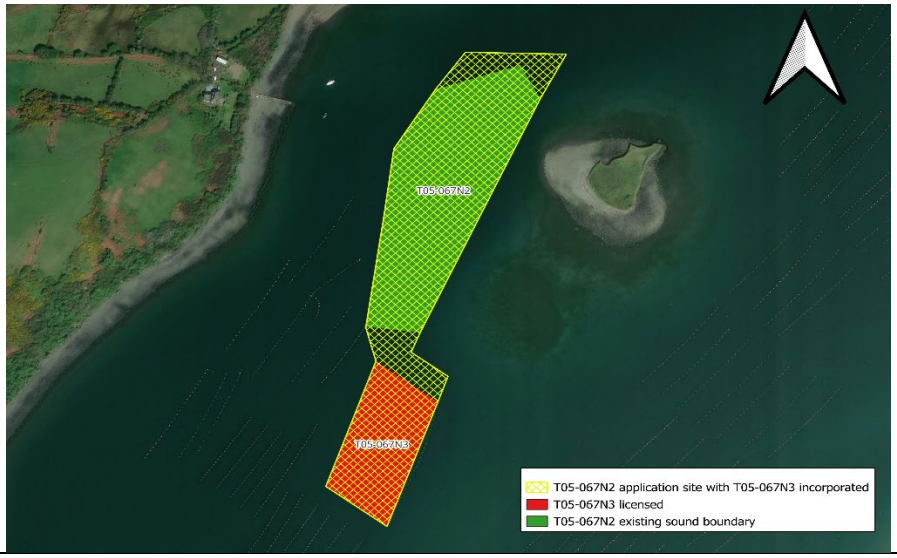
Nineteen renewal and review licence applications include applications for the cultivation of Blue Mussel (*Mytilus edulis*). The applications are to amend the existing site boundary or existing number of longlines present on site, as detailed in Table 3. Seed is sourced using suspended spat collector ropes, after which seed will be graded and socked onto longlines once it reaches the appropriate size. Sites will be harvested by harvesting vessel, continuous hauling of grow ropes will be carried out with the use of sheaves, elevators and rope stripper. Mussels are stripped from grow rope, washed and bagged in bulk bags for live export. Sites will be accessed via Bantry Pier and Glengarriff Pier, using the public road N71.

Nine renewal applications include an application for the cultivation of Blue Mussel (*Mytilus edulis*). Seed will be sourced from natural spat collection. Sites will be harvested by harvesting vessel, continuous hauling of grow ropes will be carried out with the use of sheaves, elevators and rope stripper. Mussels are stripped from grow rope, washed and bagged in bulk bags for live export. All sites will be accessed via Bantry Pier, using the public road N71.

One review application (**T05 591A**) includes an application for the amendment of the cultured species onsite to be amended from aquatic plants to the blue mussel (*Mytilus edulis*). Application for a total of 20 longlines. Each double headrope longline is 220 metres in length. Droppers will be suspended 5 metres below the surface. Seed will be sourced from natural spat collection. Each line is secured to the seabed by an anchor system consisting of polypropylene ropes, trawl ball, anchor chain and concrete anchor blocks. Sites will be harvested by harvesting vessel with the use of barges and conveyor belts. The site will be accessed by boat from Beal Lough using the public road R572.

Table 3 Proposed site changes in relation to Blue Mussel culture.

Site code	Boundary size		Other proposed changes
	Current (ha)	Proposed (ha)	
T05-053N1	10.9	13.12	-
T05-053N6	13.5	17.05	Increase from 36 to 46 longlines with 25 metre spacing between lines. Application for site T05-053N6 to increase the boundary to incorporate site T05-059N2. 
T05-058N4	13.2	13.37	Decrease from 17 longlines to 12 longlines. 8 x 220m, 2 x 110 and 2 x 180 longlines.
T05-058N5	3.8	4.63	-
T05-060N1	6.9	7.4	Amendment to line spacing proposed 10-20 metres, previously 24 metres.
T05-060N2	4.0	5.0	Amendment to line spacing proposed 10-20 metres, previously 24 metres.
T05-060N3	3.0	5.03	Increase from 6 to 11 longlines and amendment to line spacing proposed 10-20 metres, previously 24 metres. Site T05-060N3 is increasing the boundary to incorporate site T05-604A.

Site code	Boundary size		Other proposed changes
			
T05-060N4	0.80	0.87	Application to expand the southern boundary of current site and amendment to line spacing proposed 10-20 metres, previously 22 metres.
T05-060N5	33.9	36.09	Application to expand the western boundary of current site. Decrease in number of longlines present proposed 30 longlines, previously 33 longlines and amendment to line spacing proposed 20-30 metres, previously 30 metres.
T05-067N1	0.60	0.67	-
T05-067N2	2.5	4.12	Increase from 7 to 10 longlines. Application to amend site boundary to incorporate site T05-067N3. 
T05-067N4	8.2	8.6	Amendment to line spacing proposed 10-20 metres, previously 24 metres.
T05-067N6	7.6	9.92	-
T05-069N1	14.3	17.2	Amendment to line spacing proposed 24-25 metres, previously 24 metres.
T05-069N4	7.0	8.37	Increase from 20 to 22 longlines and amendment to line spacing proposed 18-19 metres, previously 20 metres.
T05-069N5	5.1	22.7	Increase from 14 to 47 longlines. Amendment to line spacing proposed 21 metres, previously 24 metres. Site T05-069N5 is increasing the boundary to incorporate sites T05-069N8, T05-053N3, T05-053N5 and T05-059N1.

Site code	Boundary size		Other proposed changes
T05-125N1	1.8	2.04	Amendment to line spacing proposed 10-20 metres, previously 24 metres.
T05-214N1	4.1	4.64	Increase from 12 to 16 longlines. Amendment to line spacing proposed 10-20 metres, previously 22 metres.
T05-214N2	1.4	1.65	Amendment to line spacing proposed 10-20 metres, previously 22 metres.

1.2.2 Oyster Culture

The Pacific Oyster (*Magallana gigas*) and the Native Oyster (*Ostrea edulis*) form the basis of oyster aquaculture operation in Bantry Bay.

Two producers (**T05-1010** and **T05-641A**) have applied for a new license to culture the Pacific Oyster (*Magallana gigas*) and the Native Oyster (*Ostrea edulis*). Site **T05-641A** has also applied to culture seaweed as details in section 1.2.3.

T05-1010- Application for a new licence to culture the Pacific Oyster (*Magallana gigas*) and the Native Oyster (*Ostrea edulis*). Oysters will be cultured using twenty-five litre hexcyl oyster baskets on longlines using a flip farm culture system (Figure 3)[6]. Oyster baskets are fitted with foam floats and are connected via 24 mm polypropylene support line. The use of a flip farm culture system allows baskets to be turned over allowing for 24-hour air exposure, ensuring the removal of predators from baskets. The suspension of baskets on longlines ensure baskets will not come in contact with the sea floor. A total of 13 longlines will be deployed, longlines will be 220m in length with 600 baskets per line. Wild seed will be imported from France and hatchery seed will be sourced from within Ireland, the United Kingdom and France. Each line will be secured to the seabed by an anchor system consisting of polypropylene ropes, trawl ball, anchor chain and concrete anchor blocks. Floating marker buoys are placed on each of the four corners of the site to mark the site boundary. The site will be harvested

[6] FlipFarm_System.pdf

by boat with a specified conveyor onboard for processing. The site will be accessed by boat from Bantry harbour through the public road N71.

T05-641A- Application for a new licence to culture the Pacific Oyster (*Magallana gigas*) and the Native Oyster (*Ostrea edulis*), the applicant has also applied to culture various different species of seaweed as identified in section 1.2.3. Oyster's will be cultured using longlines with attached 25 litre hexcyl hanging baskets using a flip farm culture system (Figure 3). A total of 10 longlines will be deployed, longlines will be 220 metres in length. Oyster baskets are fitted with foam floats and are connected via 24 mm polypropylene support line. Seed will be sourced from Triskell Seafood. Each line is secured to the seabed by an anchor system consisting of polypropylene ropes, trawl ball, anchor chain and concrete anchor blocks. Floating marker buoys are placed are each of the four corners of the site to mark the site boundary. The site will be harvested by boat with a hydraulic star wheel and crane, hand harvesting will also be carried out where necessary. The site will be accessed through Bantry Bay port through public road L-8709-0.

Figure 3 Flip farm longline culture system using hexcyl oyster baskets and a purpose-built harvesting platform. Image sourced from BIM, May 2026.

T05-577N1 – Applicant has applied for a renewal and review licence to review culture type to allow for the addition of SEAPA baskets to hang below trestles. The proposed development involves the installation of SEPA baskets on trestle infrastructure to facilitate an increase in biomass production. The baskets will be suspended within the water column beneath the trestles, above the seabed (Figure 4)[7]. Mesh oyster bags will continue to overlay the trestles structure. Application for a total of 318 trestles, a maximum of 12,720 mesh oyster bags and 12,720 oyster baskets (SEAPA or similar). Source of seed will be hatchery seed imported from French hatcheries. Oysters will be harvested by hand, washed graded and bagged for live export. The site will be accessed through the applicant's private land via public road R572.

[7] Adjustable-longline-system_final_compressed.pdf

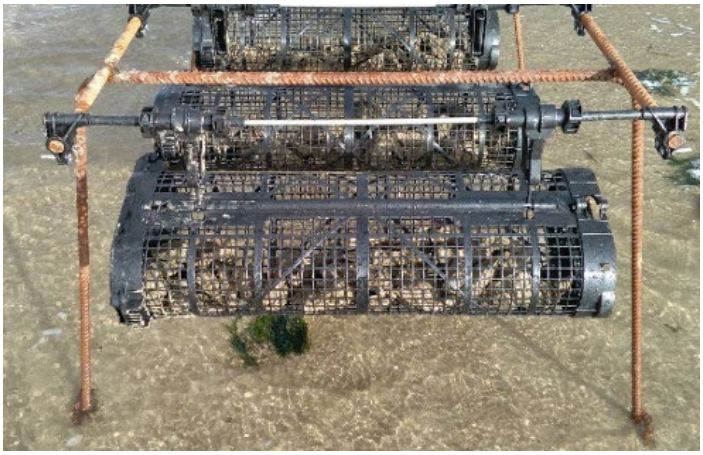


Figure 4 Seapa basket clipped onto modified trestle. Image sourced from BIM, May 2026.

1.2.3 Seaweed – Longline Cultivation

Two sites have applied for a new license (**T05-641A** and **T05-1011**) to cultivate various species of seaweed in Bantry Bay. One site (**T05-574A**) has applied for a renewal license to cultivate various species of seaweed in Bantry Bay. One site (**T05-403A**) has applied for a review of an existing license to amend the species cultured to include various species of seaweed.

Worldwide a wide range of techniques are used to cultivate seaweed depending on the species being farmed, the lifecycle and the biogeographical factors. In general fragments of adult plants, juvenile plants, sporelings or spores are seeded onto either rope or other substrata in hatcheries or nurseries, and the plants are on-grown to maturity at sea. Trials on various native species have taken place in Ireland since the 1990s.

T05-641A- Application for the culture of the native species Alaria *Esculenta*, *Saccharina Latissima* and native red, green and brown seaweeds and non-native species Harpoon weed (*Asparagopsis armata*). This site has also applied for the culture of pacific and native oysters as identified in section 1.2.2 above. Application for a total of 30 seaweed longlines, each longline is 220 metres in length with 10 metre spacing between lines. Lines are deployed approximately 1 metre below the surface. Each line is secured to the seabed by an anchor system consisting of polypropylene ropes, trawl ball, anchor chain and concrete anchor blocks. Four floating buoy markers are present; one buoy is located at each boundary of the site. Seed will be sourced from Bantry Marine Research facility. Spores will be sprayed on twine and attached to headropes and droppers for deployment. The site will be harvested by boat with a hydraulic star wheel and crane, The site will be accessed from a pier accessed through the public road L-870-090 and L-4703-59.

T05-1011- Application for the culture of the native species; Irish Wakame (*Alaria esculenta*), Sea Lettuce (*Ulva Lactuca*), Dulse (*Palmaria palmata*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Digitata) (*Laminaria digitata*), Toothed Wrack (*Fucus serratus*) and non- native species; Harpoon Weed (*Asparagopsis armata*). Application for a total of 19 longlines, each line is 110 metres in length with 10 metre spacing between lines. Lines are deployed approximately 1 metre below the surface. LD2 grey header buoy floats are position incrementally along lines at each station where seaweed culture is present with a total of 9 floats per line. An MF 130 mussel float is positioned at both ends of the longline. Each line is secured to the seabed by an anchor system consisting of polypropylene ropes, trawl ball, anchor chain and concrete anchor blocks. Four floating buoy markers are present; one buoy is located at each boundary of the site. The site proposes an inbuilt St. Andrews Cross and radar

reflectors. Seed will be sourced from Bantry marine research station hatchery. A boat operated crane will be used to remove longlines from the bay for harvesting. The site will be harvested with a boat operated crane which will be utilised to remove longings from the water and cleared into one tonne bins. The site will be accessed from a pier accessed through the public road L-870-090 and L-4703-50.

T05-430A- Application for a review and amendment, to update species culture to include the native species; Irish Wakame (*Alaria esculenta*), North European Kelp (Digitata) (*Laminaria digitata*), Dulse (*Palmaria palmata*), Nori (*Porphyra umbilicalis*), Bladder wrack (*Fucus vesiculosus*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Hyperborea) (*Laminaria hyperborea*), Knotted Wrack (*Ascophyllum nodosum*), Sea Lettuce (*Ulva Lactuca*), Sea Thong (*Himanthalia elongata*) and non-native species; Harpoon Weed (*Asparagopsis armata)* (Table 5). Application for a total of 10 longlines, longlines will be 220 metres in length. Seed will be source as wild see stock obtained from within a 50 km radius of the farm location. Seaweed will be harvested manually or organically by cutting ropes, and stripping biomass from droplines. The seaweed will then be transferred to shore from immediate processing. The site will be accessed via pier using local roads L-8709-0 and L-4703-59.

T05-574A – Application for a renewal license to culture native macro algae; Irish Wakame (*Alaria esculenta*), Sea Lettuce (*Ulva lactuca*), Dulse (*Palmaria palmata*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Digitata) (*Laminaria digitata*), Toothed Wrack (*Fucus serratus*) and non-native species; Harpoon Weed (*Asparagopsis armata)*. Application for a total of seventeen 110 metre longlines currently in use onsite. Each line is secured to the seabed by an anchor system consisting of polypropylene ropes, trawl ball, anchor chain and concrete anchor blocks. Seed will be sourced from the Bantry marine research station. The site will be harvested using a boat operated crane, harvested seaweed will be then cleared into one tonne bins. The site will be accessed from a pier using the local roads L-8709-0 and L-4703-59.

Table 4 Proposed site changes in relation to seaweed culture.

Site code	Boundary size		Other proposed changes
	Current (ha)	Proposed (ha)	
T05-430A	24.20	24.22	Update species culture to include Irish Wakame (*Alaria esculenta*), North European Kelp (Digitata) (*Laminaria digitata*), Dulse (*Palmaria palmata*), Nori (*Porphyra umbilicalis*), Bladderwrack (*Fucus vesiculosus*), Sugar Kelp (*Saccharina latissima*), North European Kelp (Hyperborea) (*Laminaria hyperborea*), Knotted Wrack (*Ascophyllum nodosum*), Sea Lettuce (*Ulva Lactuca*), Sea Thong (*Himanthalia elongata*), Harpoon Weed (*Asparagopsis armata)*.

2 Relevant Annex IV Species

The Habitats Directive has identified 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 proposed site investigation works should be included, 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 proposed development:

Dolphins, Whales and Porpoises

This is the list of dolphins, whales and porpoises that intersect, in some way, with Bantry Bay, based on data from the National Biodiversity Data Centre[8].

- Bottlenose Dolphin (*Tursiops truncatus*)
- Common dolphin (*Delphinus delphis*)
- Harbour porpoise (*Phocoena Phocoena*)
- Humpback whale (*Megaptera novaeangliae*)
- Minke Whale (*Balaenoptera acutorostrata*)
- Northern Bottlenose whale (*Hyperoodon ampullatus*)
- Risso's Dolphin (*Grampus griseus*)

It is likely that there could be Annex IV species from dolphins, whales and porpoises present in the area of the project, so they are considered in more detail in this risk assessment.

2.1.1 Otter

Ireland remains a European stronghold for the otter and the species is widespread here in our rivers and streams and along our coastline and lakeshores. Otter have two basic habitat requirements: adequate prey; and safe refuges where they can rest and breed. Otter maintain territories along riverbanks, lake shores 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, Otter forage within 80-100m of the coastline, typically in depth of <3m, but up to 10-12m. For foraging they prefer shallow, rocky environments with seaweed cover. Otter 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.

Otters have been reported within the area of Bantry Bay so are considered in more detail in this risk assessment.

[8] National Biodiversity Data Centre, Ireland Link

2.1.2 All bat species

These are marine sites at a distance from bat habitats. These aquaculture activities do not impact on trees, hedges, buildings, bridges, caves, souterrains or changes in lighting, so bats are not likely to be present or affected by the works. As bats are not likely to be present, the lack of 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.

2.1.3 Natterjack Toad

The natural ranges for the Natterjack Toad are freshwater and terrestrial. Populations are restricted to sites in County Kerry. Natterjacks are nocturnal and during the day they hide 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 around those ponds at these locations.

These extensive aquaculture sites are not a suitable habitat for Natterjack toads. There is not likely any overlap between these marine sites and this species, so there is no 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.

2.1.4 The Kerry Slug

The Kerry Slug are terrestrial and nocturnal (generally), with their natural ranges restricted to sites in County Kerry and west Cork (and more recently found in Galway, Limerick and Tipperary). Its habitats are woodland, and lichen covered rock outcrops and boulders.

These aquaculture sites are not a suitable habitat for the Kerry slug. There is not likely any overlap between this marine site and this species, so there is no 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.

2.1.5 Plants

The natural ranges for the Annex IV plants species (Killarney Fern, Slender Naiad, and Marsh Saxifrage) are terrestrial and they are highly unlikely to be impacted by these aquaculture activities, so there is no risk to these Annex IV species.

2.1.6 Marine Turtles

The most recent record of Leatherback Turtle (*Dermochelys coriacea*) is in outer mouth of Bantry Bay in 2013 by the Irish Whale and Dolphin Group (IWDG)[9]. Various turtle species are occasional visitors to Irish waters. Considering the rarity in Irish waters of these widely roaming marine species, that may utilise entire oceans, and the design of the infrastructure, it is not likely that there will be any significant interactions with these Annex IV species, and there is no 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.

[9] National Biodiversity Data Centre Link

2.1.7 Conclusion

The relevant Annex IV species which are likely to be present in the area or potentially affected by the project, and considered for further investigation, are:

- Dolphins, Whales and Porpoises.
- Otter.

3 Risk Assessment

Dolphins, Whales and Porpoises

It is likely that there could be dolphins, whales and porpoises that intersect with the proposed aquaculture activities, based on data from the National Biodiversity Data Centre Ireland, and therefore, in some way, with the aquaculture sites.

These are large mammals, that utilise a wide range of marine habitat environments. Whales tend to be migratory, following food, and are 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.

The main impacts associated with the proposed project on dolphins, whales and porpoises are related to:

- **Noise disturbance** – The sites will be serviced by small harvesting vessels (boats) and terrestrial vehicles (tractors) at low tide. Noise associated with these will not have an impact in the marine environment. Noise from the site during operation is considered to be not significant as the sound pressure would be minimal, low and would rapidly attenuate. There is therefore unlikely to be any significant effects on cetaceans in the area.
- **Collisions or entanglement** – Given intertidal and near-shore subtidal based nature of the proposed activities, it is not optimal habitat for dolphins, whales and porpoises in general, and it is highly unlikely they will interact with these subtidal and intertidal structures and activities.

  The locations of the structures are predominantly inshore, and as such they do not present a significant barrier to movement of this species in the area. Furthermore, the structures are such that echo-locating species (porpoise and dolphin) can easily detect and avoid, if necessary, the structures/sites and therefore, avoid any risk of collision or entanglement[10,11,12].
- **Obstruction and displacement** – the potential for the infrastructure to cause obstruction to dolphins, whales and porpoises is considered relatively low. These mobile species can avoid

[10] Watson-Capps JJ, Mann J (2005) The effects of aquaculture on bottlenose dolphin (Tursiops sp.) ranging in Shark Bay, Western Australia. Biological Conservation 124: 519–526.

[11] Heinrich, S. (2006) Ecology of Chilean dolphins and Peale's dolphins at Isla Chiloe, southern Chile (PhD dissertation). University of St Andrews, 239 p

[12] Ribeiro S, Viddi FA, Cordeiro JL, Freitas TRO (2007) Fine-scale habitat selection of Chilean dolphins (Cephalorhynchus eutropia): interactions with aquaculture activities in southern Chiloe Island, Chile. Journal of the Marine Biological Association of the United Kingdom 87: 119–128

and go around any obstructions without any significant disturbance [13]. Therefore, risk of obstruction and displacement can be ruled out.

- **Attraction** – some dolphins, whales or porpoises may be attracted to structures, similar to those used in culture operations[14] as the infrastructure can act as artificial reefs and encourage fish aggregation[15]. This would be limited to the direct vicinity of the site and would be considered very small scale. There are no significant energy sources (e.g., light, noise etc.) likely to result from activities at the sites that pose a risk.
- **Water quality** – there is no significant water quality impacts from shellfish farming and veterinary products are not required for shellfish culture, so water quality will not be impacted in any way that would affect dolphins, whales and porpoises.
- **Commissioning and decommissioning** – The infrastructure involved is relatively small and easily installed and removed, so commissioning and decommissioning will not be tasks that are likely to have significant impacts on dolphins, whales 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 isolated sightings in the vicinity, the lack of 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 by the existing and proposed shellfish aquaculture operations.

3.1.1 Otter

Otter are reported within the surrounding areas of Bantry Bay. Otter are an opportunist hunter, mainly eating fish, but also eats frogs, small birds, eggs, mussels, crabs and other invertebrates. The nature of this extensive aquaculture means it is not likely to have an effect on the number or availability of prey for the otter.

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

- **Obstruction (open water)** - The longlines and activities associated with this form of shellfish farming involve rope hanging in the water column. Otters generally forage within 80-100 m of the coastline, and in shallower waters. Some longline structures are located less than 100m from the shoreline however, the structures allow for sufficient space and will not interfere with the natural behaviour of otter.
- **Obstruction (intertidal)** - The trestles and activities associated with this form of oyster culture structures are positioned on, and rising to approximately 1 m above, the intertidal seabed. They are oriented in rows with gaps between structures, thus allowing free movement through and within the sites. The structures are placed on the lower-shore, in the intertidal area, which is covered by water for most of the tide. They will not interfere with the natural behaviour of the otter.

[13] Bath,G.E.,Rrice,C.A.,Riley,K.L.,Morris Jr,J.A.(2022) A global review of protected species interactions with marine aquaculture. DOI:10.1111/raq.12811.

[14] Díaz López, B. & Methion, S. (2017) The impact of shellfish farming on common bottlenose dolphins' use of habitat. Marine Biology 164: 83. doi:10.1007/s00227-017-3125-x

[15] Callier M, Byron C, Bengtson D, Cranford P, Cross S, Focken U, Jansen H, Kamermans P, Kiessling A, Landry T., O'Beirn F., Petersson E., Rheault, RB., Strand, O., Sundell, K., Svasand, T., Wikfors, GH., McKindsey, CW. (2017) Attraction and repulsion of mobile wild organisms to finfish and shellfish aquaculture: a review. Rev Aquac 0:1–26

- **Entanglement** – Longlines and trestles are highly unlikely to pose any risk to otter populations through entrapment or direct physical injury.
- **Displacement** - While the general habitat in the area is likely to support otters, the intertidal areas of extensive aquaculture are not considered ideal foraging areas for otter, which prefer shallow, rocky environments with seaweed cover for foraging. The extensive aquaculture, being in the intertidal and subtidal area, and the access routes, being in well-travelled routes, are highly unlikely to interfere with the couches and holts within its territory, nor to disturb the breeding locations.
- **Disturbance** –The proposed operations are generally carried out in daylight hours. The interaction with the otter will be minimal, given that otter foraging is primarily crepuscular. Disturbance associated with vessel traffic could potentially affect otter at these sites. However, the level of disturbance is considered low with minimal likely encounter rates.
- **Prey competition** - The nature of this extensive aquaculture means it is not likely to have an effect on the number or availability of prey for the otter.

The potential for impact from the listed hazards are generally highly 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.

3.2 Mitigation Measures

On the basis that any debris or loose material is removed in a timely manner, then otters and cetaceans are highly unlikely to interact with these extensive aquaculture farms in a manner to result in harm. Based on the information above, no mitigation measures for encounters are considered necessary for these projects.

4 Conclusions

Following a risk assessment of the proposed extensive aquaculture licence applications in Bantry Bay, Co. Cork, the activities pose no 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, for the Annex IV species which occur in Ireland and its waters.