

Ballyness Bay Oyster and Clam Aquaculture Sites

**Revised Screening for Appropriate Assessment & Natura Impact
Assessment**

Produced by

AQUAFACT – APEM Group

On behalf of

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1. Introduction

1.1. Overview

This Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) has been prepared by AQUAFACT - APEM Group to provide relevant information to enable the competent authorities to carry out an Appropriate Assessment ('the Project') as required under Article 6(3) obligations under the Habitats Directive. This report considers the potential effects of the Project to European sites within its zone of influence.

The objective of the Project is the establishment of several aquaculture sites within Ballyness Bay, Co. Donegal. These aim to cultivate Pacific oysters (*Magallana gigas* formerly *Crassostrea gigas*) using bags and trestles on the intertidal foreshore for 9 of the 10 sites and Manila Clams (*Ruditapes philippinarum*) on wooden trays under mesh on the intertidal/subtidal foreshore for 3 of the 10 sites, outlined in **Table 1-1**. Estimated annual production tonnages have been provided by the applicant for each site and represent best estimates of anticipated production. These may differ from original licence application figures due to changes in licensed area and subsequent operational downsizing. The location of the aquaculture sites currently under appeal are shown in **Figure 1-1**.

The aims/benefits of the Project can be summarised as follows:

- Cultivation of Pacific oysters (*C. gigas*) using bags and trestles on the intertidal foreshore
- Cultivation of Manila Clams (*R. philippinarum*) on wooden trays under mesh on the intertidal/subtidal foreshore.

Figure 1-1 below illustrates the proposed aquaculture sites currently under appeal with ALAB (Aquaculture Licences Appeals Board) and are the focus of this report. Originally 20 aquaculture sites were applied for in Ballyness Bay and a subset of these were granted or granted with variation under the Ministers decision. Subsequently, the granted sites were then quashed during judicial review and remitted to ALAB for reconsideration. The appeals are currently back with ALAB at Stage 3: Information Gathering.

Response to ALAB Revised Notice dated 1 May 2026

This AA & NIS has been prepared having regard to the Revised Notice issued by the ALAB on 1 May 2026 under Regulation 42(8) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. The Revised Notice confirms that, following ALAB's updated Screening for AA, it cannot be excluded on the basis of objective scientific information that the proposed aquaculture activities, either individually or in combination with other plans or projects, may have a significant effect on European sites.

This report responds to the Revised Notice as follows:

- **Section 2** provides the updated Screening for AA, including the description of the project, receiving environment, source-pathway-receptor assessment, identification of European sites within the Zone of Influence, and screening of potential significant effects.
- **Table 2-6** and **Table 2-7** identify the Qualifying Interests and Special Conservation Interests brought forward to Stage 2 assessment, including the relevant impact pathways identified through the source-pathway-receptor assessment.
- **Section 2.1** and **Section 2.2** provide updated baseline information, including confirmation of the current status of aquaculture activity within Ballyness Bay and the condition of the sites following cessation of previously commenced activities.
- **Section 3** provides the Stage 2 NIS and assesses whether the proposed project, alone or in combination with other plans or projects, would adversely affect the integrity of the European sites screened in for AA, having regard to their conservation objectives.
- **Section 3.4** assesses the updated potential in-combination effects and **Section 3.5** presents the overall conclusion of the NIS.

Accordingly, this NIS should be read as the applicants' consolidated response to the ALAB Revised Notice dated 1 May 2026.

Table 1-1: List of appealed aquaculture sites granted by the Minister for Agriculture, Food and the Marine included in this NIS.

Site Ref.	Cultivation licence	Estimated Production Tonnage	Applicant	Ministers Decision
T12/407B	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the inter-tidal foreshore on site ref T12/407B in Ballyness Bay, Co. Donegal.	3	Joseph Coll	Grant
T12/409A	Cultivation of clams (<i>Ruditapes philippinarum</i>) on wooden trays under mesh on the inter-tidal/sub-tidal foreshore on site ref T12/409A in Ballyness Bay, Co. Donegal.	10	Edward & Paul O'Brien	Grant with variation
T12/409B (1&2)	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles and cultivation of clams (<i>Ruditapes philippinarum</i>) on wooden trays under mesh on the inter-tidal/sub-tidal foreshore on site ref T12/409B in Ballyness Bay, Co. Donegal.	3 (clams) 15 (oyster)	Edward & Paul O'Brien	Grant with variation
T12/441A	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles and cultivation of clams (<i>Ruditapes philippinarum</i>) on wooden trays under mesh on the foreshore on site ref T12/441A in Ballyness Bay, Co. Donegal.	< 1 (clam) 3 (oyster)	Anthony McCafferty	Grant
T12/441B	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the foreshore on site ref T12/441B in Ballyness Bay, Co. Donegal.	4	Anthony McCafferty	Grant
T12/441C	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the foreshore on site ref T12/441C in Ballyness Bay, Co. Donegal.	4	Anthony McCafferty	Grant
T12/500A	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the inter-tidal foreshore on site ref T12/500A in Ballyness Bay, Co. Donegal.	5	Joseph Coll	Grant
T12/502A	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the inter-tidal foreshore on site ref T12/502A in Ballyness Bay, Co. Donegal.	12	Joseph Coll	Grant with variation
T12/515A	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the inter-tidal foreshore on site ref T12/515A in Ballyness Bay, Co. Donegal.	2	Joseph Coll	Grant
T12/516A	Cultivation of Pacific Oysters (<i>Crassostrea gigas</i>) using bags and trestles on the inter-tidal foreshore on site ref T12/516A in Ballyness Bay, Co. Donegal.	1	Joseph Coll	Grant

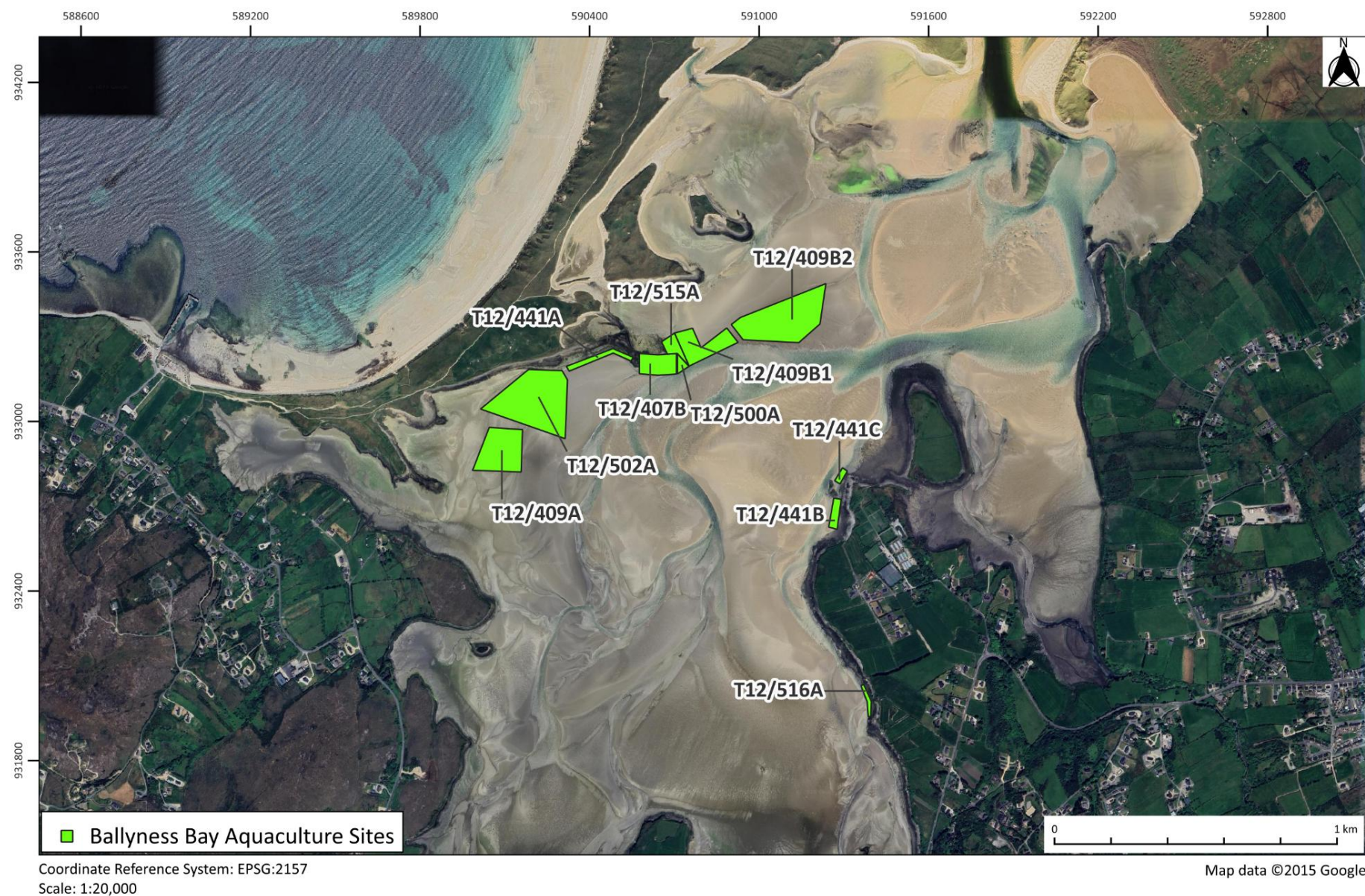


Figure 1-1: Proposed aquaculture sites under appeal in Ballyness Bay.

1.2. Appropriate Assessment Process

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (commonly known as the Habitats Directive) is the European Community legislation based on nature conservation established to ensure biodiversity is conserved through the conservation of natural habitats, wild fauna and flora in Europe. A network of sites of conservation importance hosting habitats and species as needing to be either maintained at or, where appropriate, restored to favourable conservation status have been selected as a Special Area of Conservation (SAC) and Special Protection Area (SPA), which are collectively referred to (in Ireland) as European sites. Together these comprise the Natura 2000 network of protected sites (OPR, 2021). The specific named habitat and/or (non-bird) species for which a SAC is selected are called 'Qualifying Interests' (QI) of the site while specific named bird species for which a SPA is selected are called 'Special Conservation Interest' (SCIs) of the site (OPR, 2021). In this report, QIs and SCIs are collectively referred to as 'conservation features'.

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). The Habitats (92/43/EEC) and Birds (2009/147/EC) Directives were transposed into the Irish legislation by Part XAB of the 2000 Act and the Birds and Natural Habitats Regulations 2011. The legislative provisions for AA Screening for planning applications are set out in Section 177U of the 2000 Act.

Articles 6(3) and Article 6(4) of the Habitats Directive outlines the decision-making tests for considering plans and projects that may have a significant effect on a Natura 2000 site. The Department of the Environment Heritage and Local Government guidelines (DEHLG, 2009, reviewed in 2010) promotes a four-stage process (**Figure 1-2**) to complete the AA and outlines the issues and tests at each stage. Stage 1 and Stage 2 encompass the main requirements for assessment under Article 6(3) of the Habitats Directive. Stage 3 may be part of the Article 6(3) Assessment or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).



Figure 1-2: Four stages of the Appropriate Assessment process.

An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Aquaculture operations existed in coastal areas prior to the designation of areas as SACs and/ or SPAs under the Directives. Ireland is undertaking AA of existing and proposed aquaculture activities in SACs and SPAs. This is an incremental process, as agreed with the EU Commission in 2009, and will eventually cover all aquaculture activities in all Natura 2000 sites. Appropriate Assessment of aquaculture operations are carried out against the Conservation Objectives for the conservation features of the Natura 2000 site. The Conservation Objectives are defined by the National Parks and Wildlife Services (NPWS).

Aquaculture activities are licenced by the Department of Agriculture, Food and Marine (DAFM). For aquaculture operations, DAFM receives applications to undertake such activity and submits a set of applications and existing licences, at a defined point in time, for AA. If the AA process finds that the possibility of significant adverse effect cannot be discounted or that there is a likelihood of negative consequence for the conservation features for which a site is designated, then such activities will need to be mitigated further if they are allowed to continue. The assessment reports are not always explicit on how this mitigation might be achieved but rather indicate whether mitigation is required or not and what results should be achieved.

1.3. Guidance/Legislation

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

- European Commission (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission notice.
- Office of Planning Regulator (2021) Practice Note PN01 Appropriate Assessment screening for development management.
- Department of Environment, Housing and Local Government (2009) Appropriate Assessment of plans and projects in Ireland guidance for planning authorities (Revised 2010).
- European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites – methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC Commission notice.
- Habitats Directive (Council Directive 92/43/EEC) 1992.
- Birds Directive (Directive 79/409/EEC) 1979, amended Directive 2009/147/EC.
- European Communities (Birds and Natural Habitats) Regulations 2011-2021
- Department of Arts, Heritage and the Gaeltacht – National Parks and Wildlife Service (DAHG - NPWS) (2012) Marine Natura Impact Statements in Ireland Special Areas of Conservation, a working document.
- NPWS (2014) Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters.

- Maritime Area Planning Act (2021) – provisions relating to Appropriate Assessment (AA) and Environmental Impact Assessment (EIA) for maritime projects.

This assessment includes a desk-based review of available records of protected QIs and SCIs including the following sources:

- Conservation status assessment reports, backing documents and maps prepared to inform national reporting required under Article 17 of the Habitats Directive¹.
- 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.
- Existing relevant mapping and databases *e.g.*, waterbody status, species and habitat distribution, *etc.* (sourced from the Environmental Protection Agency (EPA)², the National Biodiversity Data Centre (NBDC)³ and the NPWS⁴).
- Birdwatch Irelands website⁵ was accessed for information about SCIs in the relevant SPAs.
- Previous Appropriate Assessment of Ballyness Bay for aquaculture activities carried out by the Marine Institute in 2019.

1.4. Statement of Authority

This report has been prepared by Dr. Brendan O'Connor (B.Sc., Ph.D., MCIEEM), Aisling Hearty (B.Sc., M.Sc., ACIEEM) and Alanna Mitchell (B.Sc., M.Sc., CIEEM).

Brendan is the ecology lead for the Ballyness Bay Aquaculture NIS. He is expert in ecological matters and the full spectrum of environmental assessment techniques, methodologies and statutes. Professionally, he is a member of relevant institutes requiring the highest standards of professional competence and integrity. He is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Brendan has 40 years of experience in the field of marine science and has published c. 100 scientific papers and numerous reports specialising in the biology and ecology of sea-floor communities. Brendan is an internationally recognised polychaete taxonomist and has led numerous international workshops in polychaete taxonomy including workshops as part of the UK BEQUALM/NMBAQC. He has 33 publications on marine invertebrate taxa including descriptions of new species, revisions of families and additions to the European and Irish fauna.

This report has been reviewed by Aisling Hearty (BSc, MSc & ACIEEM). Aisling is a Principal ecologist with over 7 years of experience in consultancy and marine ecology. She is a graduate of B.Sc Science from University of Galway (UG, formerly National University of Ireland, Galway) and a First-Class Honours M.Sc in Marine Biology

from UCC (University College Cork) where she completed her thesis on habitat distribution modelling of odontocetes using bioacoustic analysis. She then went on to co-author a published paper on the findings of this thesis which supported the designation of the Southeastern Rockall Slope and Canyons as an Important Marine Mammal Area (IMMA). Aisling has a wide range of experience in the preparation of Appropriate Assessment Screening reports, Natura Impact Statements, Ecological Impact Assessments, Environmental Impact Assessment Reports and supporting documents for an IROPI designated project. Aisling's project history includes working on aquaculture licencing, renewable energy projects (solar farms and onshore and offshore wind) and water quality projects.

Alanna is a marine consultant ecologist with +2 years of experience in marine environmental consultancy. She holds a First-Class Honours degree in Marine Science (B.Sc.) from the National University of Ireland, Galway, where she contributed to intertidal shore studies in Galway. These studies aimed to establish baseline data for future monitoring, focusing on species assemblages, biodiversity, and habitat types (JNCC). Alanna also earned a First-Class Honours Master's degree in Marine Biology (M.Sc.) from University College Cork, where she was involved in a research project supported by the Marine Institute. Alanna's professional background emphasises environmental impact assessment and management within marine ecosystems, with particular expertise in aquaculture and offshore renewables. Her extensive experience includes working on Environmental Impact Assessments (EIAs), Appropriate Assessments (AAs), Marine Usage Licences, and Sanitary Surveys. She has led and managed complex multidisciplinary projects across sectors, including fisheries and environmental monitoring, leveraging her advanced skills in Geographical Information Systems (GIS).

2. Stage 1: Screening for Appropriate Assessment

Stage I AA Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

- i. whether a plan or project is directly connected to or necessary for the management of European site, and
- ii. whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The

greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

2.1. Description of the Project

There are currently 10 applications for aquaculture granted by the Minister for Agriculture, Food and the Marine that are being appealed which are covered under this NIS. In the sites covered by this NIS, there are 7 licence granted sites being appealed for Pacific oyster production using the bag and trestle method only, with an additional 2 applications to culture oysters (on bags and trestles) in addition to clams under netting on the seabed in the intertidal zone. There is a single application to culture clams (only). This assessment focuses on the sites specified in **Table 1-1**. There were two operators in the 1990's that held licences for oyster farming, but these operations are now ceased and these licences are no longer valid.

Information provided by the applicants indicates that, following the original grant of the licences, three adjacent sites on the western side of the bay became briefly operational prior to the quashing of the licences. These sites were subsequently restored to their previous condition and all aquaculture structures were removed. No aquaculture activity is currently taking place. The operations that took place are further described below.

In August 2024, metal trestles were installed at sites T12-407B and T12-515A for oyster culture and at site T12-441A, metal trestles and wooden frames were installed for oyster and clam aquaculture, respectively. In September 2024, seed was placed on site. The access route used for equipment transport and routine operations followed routes as permitted under the granted licences (*i.e.*, including partial access over Annex I habitat mudflats and sandflats not covered by seawater at low tide [1140] and did not involve access over any dune habitat). In March 2025, it was anticipated that the granted licences may be subject to quashing and all oyster and clam seed was removed during March and April 2025. All movements of stock were undertaken in accordance with the Fish Health Unit of the Marine Institute. Following confirmation that the licences had been quashed, all trestles, wooden frames, and pole markers were removed from the shore. The sites were restored to their original condition, which represents their current state.

Methods used for both oyster and clam cultivation and a description of the proposed access route to the sites are outlined below.

Intertidal clam cultivation

It is proposed to culture the Manila Clam (*Ruditapes philippinarum*) on-bottom at three sites in intertidal areas. The seed is usually obtained in April, during spring season. The seed is likely to be sourced from hatcheries in France or Lissadell hatchery Co. Sligo, at size 8 mm – 12 mm and grown in trays and bags for one year after which time they are sown on intertidal ground under mesh. The netting is buried in the ground down around

10 cm and is kept in place with rope that is stapled around the edges with steel hooks. The netting is usually changed once in the cycle when the mesh size is also increased. They reach harvestable market size around 3 years. Harvesting is carried out by tractors with modified dredges (to which sieves are attached). They are sold onto the local and regional retail marketplace, as well as to retail in France.

Oyster farming

All applicants will use bag and trestle as the method of cultivation and all have identified that they will grow triploid seed in the bay which will be sourced from one of the following:

1. Grain Ocean
2. Satmar
3. Guernsey Hatchery and
4. France Nissan

Oyster trestles vary in height however typically, they do not exceed 0.5 m height and their height above the sediment is often less as they sink into the sediment. The trestles are usually arranged in single or paired rows with a separation of around 4 m between rows and with wider (10-20 m) access lanes. Where the trestles occur on open sandflats the rows are usually orientated more or less perpendicularly to the tideline.

Oyster spat is supplied by hatcheries and is placed in mesh bags. Generally, only a proportion of the trestles hold oyster bags at any one time. The bags are placed on top of the trestles, where they are on-grown until they are ready for harvesting. The function of the trestles is to keep the animals off the seabed, preventing grit getting inside the oysters, providing increased water flow and allowing suitable shell growth. The mesh bags facilitate stock handling and prevent predation.

Oyster husbandry activities mainly take place during spring at low tides. Workers usually access the trestles by driving tractors across the beach and will often drive through shallow water on the receding tide to make the most use of the time available. Husbandry activities involve turning the mesh bags every spring tide to rid the bags of any settled silt, stop the growth of oyster shell into the mesh and destroy fouling organisms (Gittings & O'Donoghue, 2012).

Access routes

There are a number of access routes for the operators in the area to the applied licensed sites. Tractors and trailers are used by all applicants. One access route is proposed from Ballyness Pier to the east (via tractor and boat). For sites in the centre of the bay, access will be from a public road near Ranaghmore Island. The initially suggested access route for sites on the western side of the bay was from Magheraroarty Pier along an established sand track that runs through the QI Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130), with a number of points of access to the intertidal sites. Calculation of area of the access routes in the SAC is linear length (in metres) by a putative route width of 10 m, which is considered a sufficiently

precautionary estimate, gives a total spatial overlap of 6.81 ha. An access route, suggested by the DAFM, is proposed with access from the south of the bay to avoid the areas covered by the QI Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]. The route proposed by DAFM is the route presented in this application. This route represents an addition of approximately 1 km of access track (or 0.85 ha) on the QI 1140 (Mudflats and sandflats not covered by seawater at low tide) and on the community type Mobile Sand Community Complex. This represents total aquaculture access related coverage of 0.81% of the QI 1140 and 0.74% of the Mobile Sand Community Complex.

2.2. Receiving Environment

The location for the proposed aquaculture sites is within the Ballyness Bay SAC (Site code: 001090) in Co. Donegal. This SAC is situated in north-west Donegal adjacent to the towns of Gortahork and Falcarragh, and between Tramore Bay and Inishbofin Bay. It is a large and shallow estuarine complex, with extensive areas of sandflats which are exposed at low tide. The SAC is designated for the marine habitats Estuaries (1130) and Mudflats and sand flats not covered by seawater at low tide (1140) which support a variety of soft sedimentary communities and community complexes. The site is also designated for a variety of coastal sand dune habitats. Conservation Objectives for marine habitats and constituent communities within Ballyness Bay SAC were identified by NPWS (2014a) and relate primarily to the requirement to maintain habitat distribution, structure and function, as defined by characterising (dominant) species.

Ballyness Bay SAC - Conservation Objectives

The Conservation Objectives for the QIs for the SAC were prepared by NPWS (NPWS, 2014a). The natural condition of the designated features should be preserved with respect to their area, distribution, and extent and community distribution. Habitat availability should be maintained for designated species and human disturbance should not adversely affect such species.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. The site-specific conservation objectives for the receiving site of Ballyness Bay SAC are outlined in this section.

To maintain/restore the favourable conservation condition of the QIs in Ballyness Bay SAC listed below:

- 1013 Geyer's Whorl Snail *Vertigo geyeri*
- 1130 Estuaries
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 2110 Embryonic shifting dunes
- 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
- 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)

- 2190 Humid dune slacks

For the practical purpose of management of sedimentary habitats, a 15% threshold of overlap between a disturbing activity and a habitat is given in the NPWS guidance (NPWS, 2014b). Below this threshold disturbance is deemed to be non-significant. Disturbance is defined as that which leads to a change in the characterising species of the habitat (which may also indicate change in structure and function). This guidance is scaled relative to the anticipated sensitivity of habitats and species to disturbance by the proposed activities. Some activities are deemed to be wholly inconsistent with long term maintenance of certain sensitive habitats while other habitats can tolerate a range of activities.

Such disturbance may be temporary or persistent in the sense that change in characterising species may recover to pre-disturbed state or may persist and accumulate over time.

Activities in the bay

As described in detail in **section 2.1** above, three sites became briefly operational following the granting of the licences prior to their subsequent quashing. All aquaculture activities have since ceased, and all associated aquaculture infrastructure has been removed from the sites. There were two operators in 1990's that held licences for oyster farming, but these operations are now ceased and these licences no longer valid.

Cloughaneely Angling Association outline the fishing season for sea trout in Ballyness Bay as 2nd February - 12th October. Guidance on its website suggests the east side of the bay is the best location for fishing; however, this shares very little overlap with the sites granted by the Minister for Agriculture, Food and the Marine.⁶ Anglers fishing for sea trout in Ballyness Bay must carry the appropriate Inland Fisheries Ireland (IFI) licence.

Ballyness Bay is on the Wild Atlantic Way and walkers and dog walkers avail of walkways around the area. Other activities such as wind surfing, kayaking and swimming are known to occur in the bay.

2.3. Assessment Methodology: Source-Pathway-Receptor

The assessment of impact mechanisms considers all relevant aspects of the Project that have potential direct or indirect effects on conservation features. In order to establish the Zone of Influence (Zoi) of the Project, the assessment of likely significant effects will be based on the Source-Pathway-Receptor (S-P-R) model (OPR, 2021):

- **Source** - Identification of the characteristics of the Project based on the nature, size, location and type of impacts.
- **Pathway** – Identification of pathways that could link European sites and their conservation features to the Project.
- **Receptor** – Identification of the location, nature, and sensitivities of the conservation features and the ecological conditions supporting their survival and the conservation objectives specified to maintain or restore favourable conservation status.

In order to establish the Zoi of the Project, the assessment of connectivity between impact mechanisms (or source) and a conservation feature (*i.e.*, Qualifying Interests (QIs) of SACs and Special Conservation Interests (SCIs) of SPAs) considers the location of the Project relative to habitats and non-mobile species, species foraging distances and migration routes, and the proximity of the Project to foraging and breeding areas, and potential changes in species behaviour, potential hydrological connectivity between the Project and conservation features, effects on prey species resulting in alteration in interactions and associated impacts.

To inform the screening exercise, available data on protected habitats and species were mapped using a Geographic Information System (GIS) and interrogated to identify for S-P-R connectivity. The source (potential impact mechanisms), pathways (hydrological, physical or ecological connectivity) and receptors (conservation features) were identified based on a review of ecological surveys undertaken in the area, using QGIS software. If there is no ecological pathway or functional link between the Project and the conservation feature of the European site, there is no potential for an impact to be realised, and the conservation feature can be screened out.

Section 2.6 considers the likely significant effects from the impact mechanisms from the Project alone, while **Section 2.7** considers potential in combination effects with other plans or projects.

2.4. Potential Impact Mechanisms

A detailed description of the Project is provided above; given the nature of the proposed activities associated with the Project, the potential impact mechanisms (or sources of impact) are:

2.4.1. Potential Impact Mechanism 1: Physical disturbance and habitat loss

Physical disturbance and habitat loss can be caused by aquaculture structures and activities. Trestles and bags used in oyster cultivation and wooden trays used in clam cultivation have the ability to disturb the benthic habitats. Activities such as harvesting associated with the Project also have the ability to disturb the benthic habitats. Secondary activities such as servicing, vehicles on shore, traffic and access routes, can cause an increased risk of sediment compaction resulting in sediment changes and associated community (infaunal and epifaunal) changes. These activities can cause burrowing organisms to die due to crushing impacts, smothering from the sedimentation or the inability of siphons being able to reach the surface.

Shading may also be an issue as a consequence of the structures associated with intertidal oyster culture. The trestles and bags are held relatively close to the seabed and as a consequence may shade sensitive species (*e.g.*, seagrasses) present on the seabed.

2.4.2. Potential Impact Mechanism 2: Visual disturbance and above water noise disturbance

Aquaculture activities have the potential to cause visual disturbance and above-water noise disturbance to marine mammals, otters and seabirds in the area due to the location of the activities associated with cultivation of the shellfish such as installing the structures and harvesting. Secondary activities such as servicing, vehicles on shore, human traffic and traffic on access routes has the potential to cause a disturbance to these species. Interactions between the proposed aquaculture activities and the following Annex II species that are listed as conservation features in nearby European sites, grey seal (*Halichoerus grypus*) and otter (*Lutra lutra*), are considered to have potential to be affected. The wider objectives for these species focus upon maintaining the good conservation status of populations. Interactions between species of seabirds associated with coasts that are listed as SCIs in nearby European sites are also possible. The sites have the potential to cause a reduction of feeding areas for intertidal bird species.

2.4.3. Potential Impact Mechanism 3: Organic enrichment/sedimentation & current alteration

Filter feeding organisms, for the most part, feed at the lowest trophic level, usually relying predominantly on the assimilation of phytoplankton. The process is extractive in that it does not rely on the input of feedstuffs in order to produce growth. Suspension feeding bivalves such as oysters and clams can modify their filtration to account for increasing loads of suspended matter in the water and can increase the production of faeces and pseudofaeces (non-ingested material) which result in the transfer of both organic and inorganic particles

to the seafloor. This process is a component of 'benthic-pelagic coupling'. Faeces and pseudofaeces can collect on the seafloor beneath aquaculture sites and can alter the local sedimentary habitat type in terms of organic content and particle size which has, in certain circumstances, been shown to alter their resident faunal communities.

The physical presence of the trestles and bags may reduce water flow and allowing suspended material (silt, clay, as well as faeces and pseudo-faeces) to fall out of suspension to the seafloor. The build-up of material will typically occur directly beneath the trestle structures and can result in accumulation of fine, organically rich sediments. These sediments may result in the development of infaunal communities distinct from the surrounding areas. Uptake of seston by the shellfish and expulsion of waste are intimately entwined with the flow and circulation in and around the canopy.

2.4.4. Potential Impact Mechanism 4: Pest and disease risk

As a generalisation, marine farmed organisms are affected by a range of disease, much as other domesticated agriculture stock. As with any aquaculture operation, the relatively high density associated with shellfish culture methods can present a potential risk for the transmission of disease within the cultured stock, and between the stock and wild populations. For example, the introduction of the parasitic protozoan *Bonamia ostreae* has caused mass mortality within Irish native oyster (*Ostrea edulis*) beds.

2.4.5. Potential Impact Mechanism 5: Introduction of non-native species

The species of shellfish being cultivated are Pacific oysters (*C. gigas*) and clams (*R. philippinarum*). Both of these species are not native to Irish waters and pose a risk of introduction beyond the designated aquaculture sites. In some instances, species have been known to proliferate quickly, competing with native species and in some cases, replacing them. In addition to having large number of oysters in culture, Kochmann *et al.* (2013) identified short residence times and large intertidal areas as factors likely contributing to the successful recruitment of oysters in Irish bays. The use of triploid oysters reduces the potential for proliferation, as they are partially sterile and exhibit significantly reduced gametogenesis and reproductive output.

2.4.6. Potential Impact Mechanism 6: Physical disturbance

An indirect impact pathway has been identified whereby an increase in shellfish biomass could lead to elevated levels of organic enrichment/biodeposition (faeces and pseudofaeces) and associated nutrient release (*e.g.*, ammonium) within the receiving environment. Under certain conditions, this may contribute to localised nutrient enrichment and the stimulation of opportunistic macroalgae growth (*e.g.*, *Ulva* spp.) in areas suitable for macroalgal growth. While the proposal does not include the intentional cultivation of macroalgae, any such increase may result in changes to hydrodynamic conditions, eutrophication, and indirect impacts on certain species.

2.5. European sites in the Zone of Influence

2.5.1. Special Areas of Conservation

The Project itself lies within the Ballyness Bay SAC. Qualifying Interests and conservation objectives for the site are listed in **Table 2-1** and are shown in **Figure 2-1**. Individual QIs and community types are presented in **Figure 2-2**, **Figure 2-3**, **Figure 2-4** and **Figure 2-5**. A further analysis of all *ex situ* SACs within the ZOI of the Project was carried out; the sites identified are shown in **Figure 2-6** and listed in **Table 2-2** along with their conservation objectives and distance of the European sites from Ballyness Bay (the Project area). All site synopses and conservation objectives for the European sites can be accessed through the NPWS website⁷.

2.5.1.1. Conservation features and objectives for Ballyness Bay SAC

The Conservation Objectives for the QIs for the SAC were prepared by NPWS (NPWS, 2014a). The natural condition of the designated features should be preserved with respect to their area, distribution, and extent and community distribution. Habitat availability should be maintained for designated species and human disturbance should not adversely affect such species. The features, objectives and targets of each of the QIs within the SAC are listed in **Table 2-1** below.

Table 2-1: Conservation Objectives for Ballyness Bay SAC.

Feature (Community Type)	Objective	Target(s)
Estuaries (1130)	Maintain favourable conservation condition	15.96 ha: Targets are identified that focus on a wide range of attributes with the ultimate goal of maintaining function and diversity of favourable species and managing levels of negative species
Estuaries (1130) (Coarse sediment to sandy mud with oligochaetes and polychaetes community complex)	Maintain favourable conservation condition	12 ha; Likely area derived from Intertidal Surveys undertaken in 2006 and 2011. Along with a subtidal survey undertaken in 2011.
Estuaries (1130) (Mobile sand community complex)	Maintain favourable conservation condition	3 ha; Likely area derived from Intertidal Surveys undertaken in 2006 and 2011. Along with a subtidal survey undertaken in 2011.
Mudflats and sandflats not covered by seawater at low tide (1140)	Maintain favourable conservation condition	691.81 ha: Targets are identified that focus on a wide range of attributes with the ultimate goal of maintaining function and diversity of favourable species and managing levels of negative species.
Mudflats and sandflats not covered by seawater at low tide (1140) (Coarse sediment to sandy mud with oligochaetes and polychaetes community complex)	Maintain favourable conservation condition	120 ha; Likely area derived from Intertidal Surveys undertaken in 2006 and 2011. Along with a subtidal survey undertaken in 2011.
Mudflats and sandflats not covered by seawater at low tide (1140) (Mobile sand community complex)	Maintain favourable conservation condition	570 ha; Likely area derived from Intertidal Surveys undertaken in 2006 and 2011. Along with a subtidal survey undertaken in 2011.

Feature (Community Type)	Objective	Target(s)
Embryonic shifting dunes (2110)	Maintain favourable conservation condition	7.07 ha; Targets are identified that focus on a wide range of attributes with the ultimate goal of maintaining function and diversity of favourable species and managing levels of negative species.
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) (2120)	Maintain favourable conservation condition	23.13 ha; Targets are identified that focus on a wide range of attributes with the ultimate goal of maintaining function and diversity of favourable species and managing levels of negative species.
Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)	Restore favourable conservation condition	187.99 ha; Targets are identified that focus on a wide range of attributes with the ultimate goal of maintaining function and diversity of favourable species and managing levels of negative species.
Humid dune slacks (2190)	Maintain favourable conservation condition	13.87 ha; Targets are identified that focus on a wide range of attributes with the ultimate goal of maintaining function and diversity of favourable species and managing levels of negative species
<i>Vertigo geyeri</i> (Geyer's Whorl Snail) (1013)	Maintain favourable conservation condition	Targets include: No decline in numbers. There is one known site for this species in this SAC, Adult or sub-adult snails are present in at least two of the four samples taken from optimal or suboptimal habitat on the transect, At least two samples on the transect should have more than 20 individuals, 17 m of habitat along the first 45 m of the transect is classed as optimal and at least 34 m is classed as optimal or suboptimal habitat, Soils, at time of sampling, are saturated (optimal wetness) for at least 24 m of the first 45 m of the transect and 0.4- 0.5 ha of the site optimal and suboptimal habitat mosaic

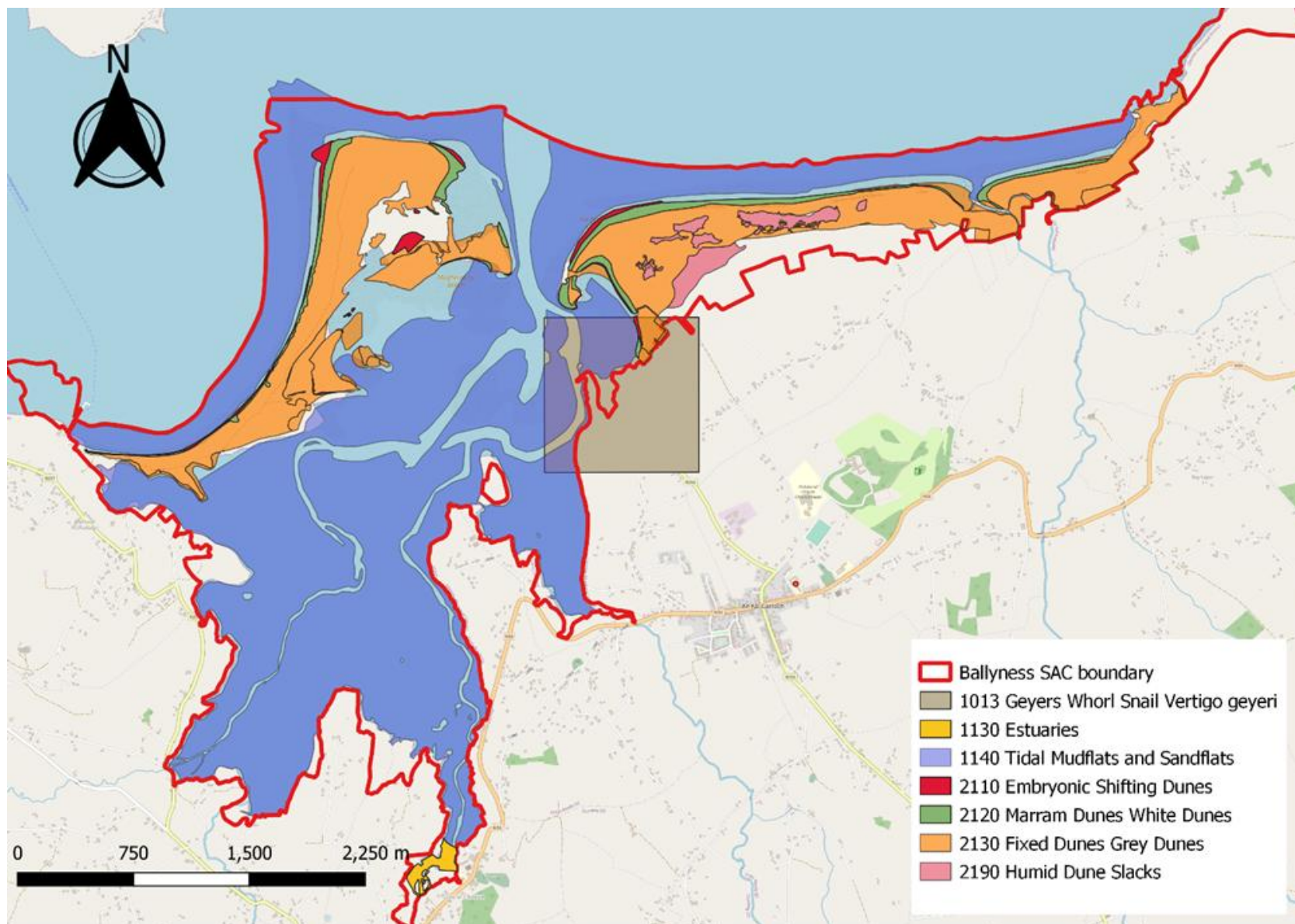


Figure 2-1: Conservation features within Ballyness Bay SAC.

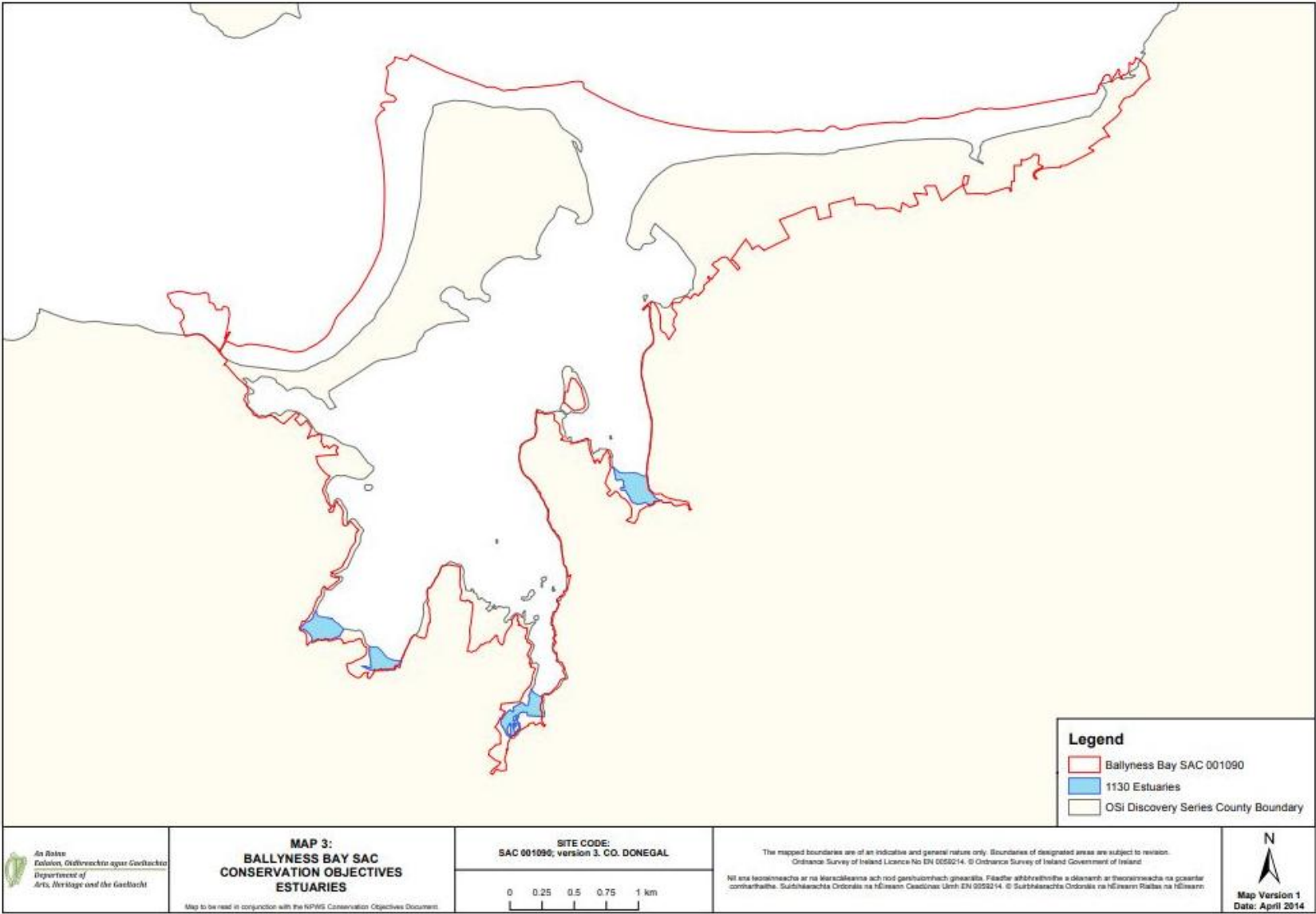


Figure 2-2: Conservation features for Ballyness Bay SAC; Estuaries (1130) (NPWS, 2014a).

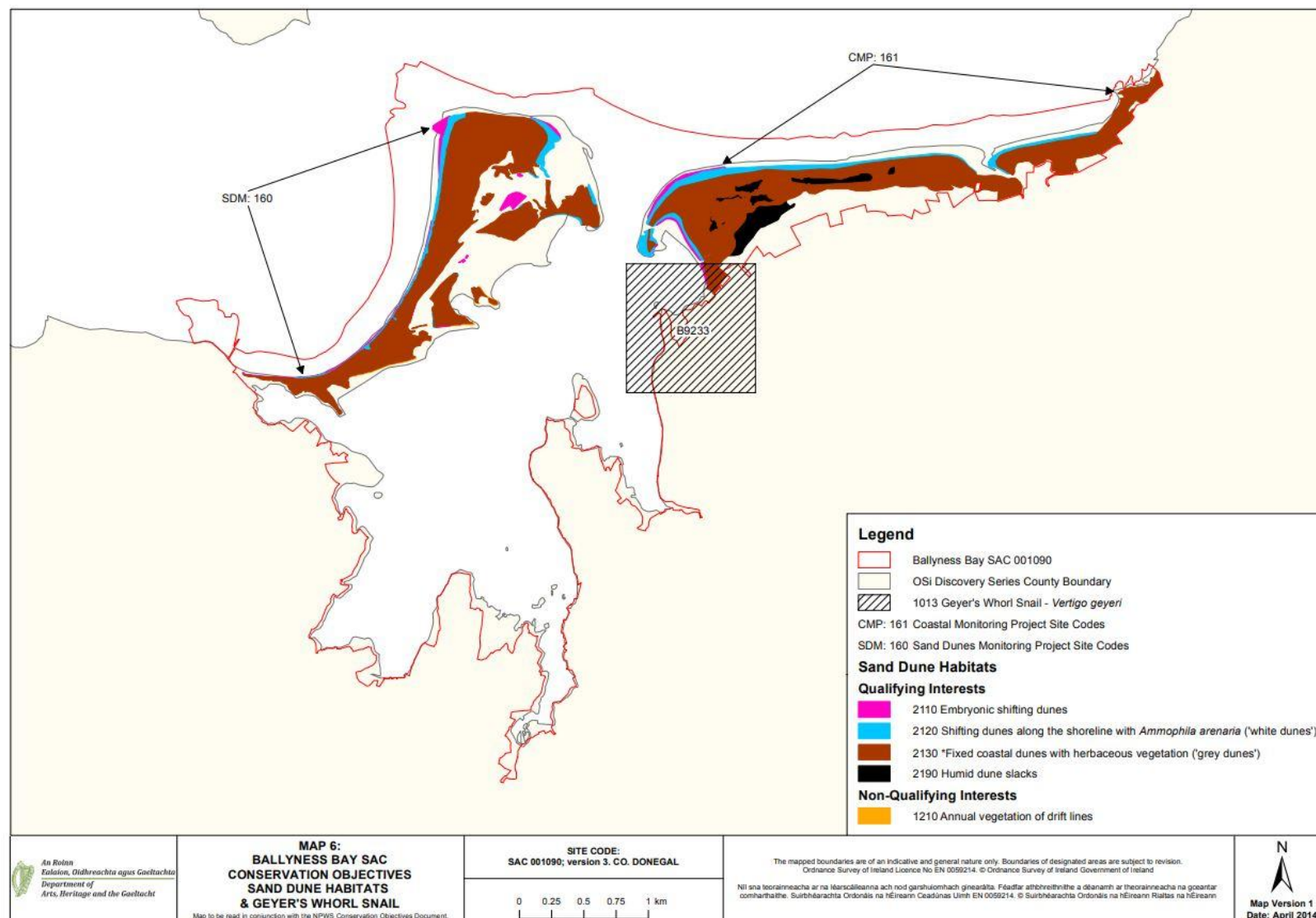


Figure 2-3: Conservation features for Ballyness Bay SAC; Geyer's Whorl Snail (1013) and sand dune habitats (NPWS, 2014a).

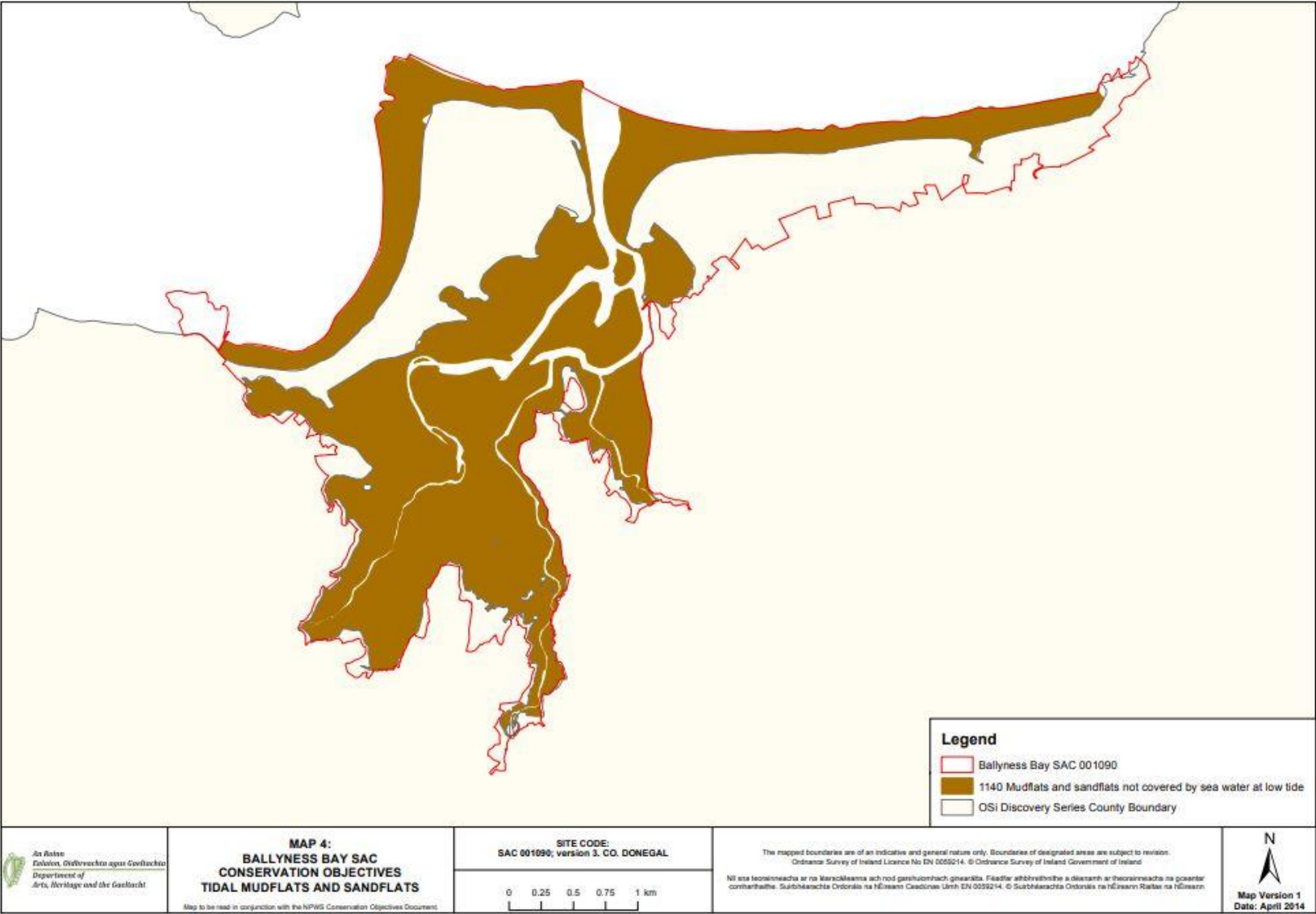


Figure 2-4: Conservation features for Ballyness Bay SAC; Tidal mudflats and sandflats (1140) (NPWS, 2014a).

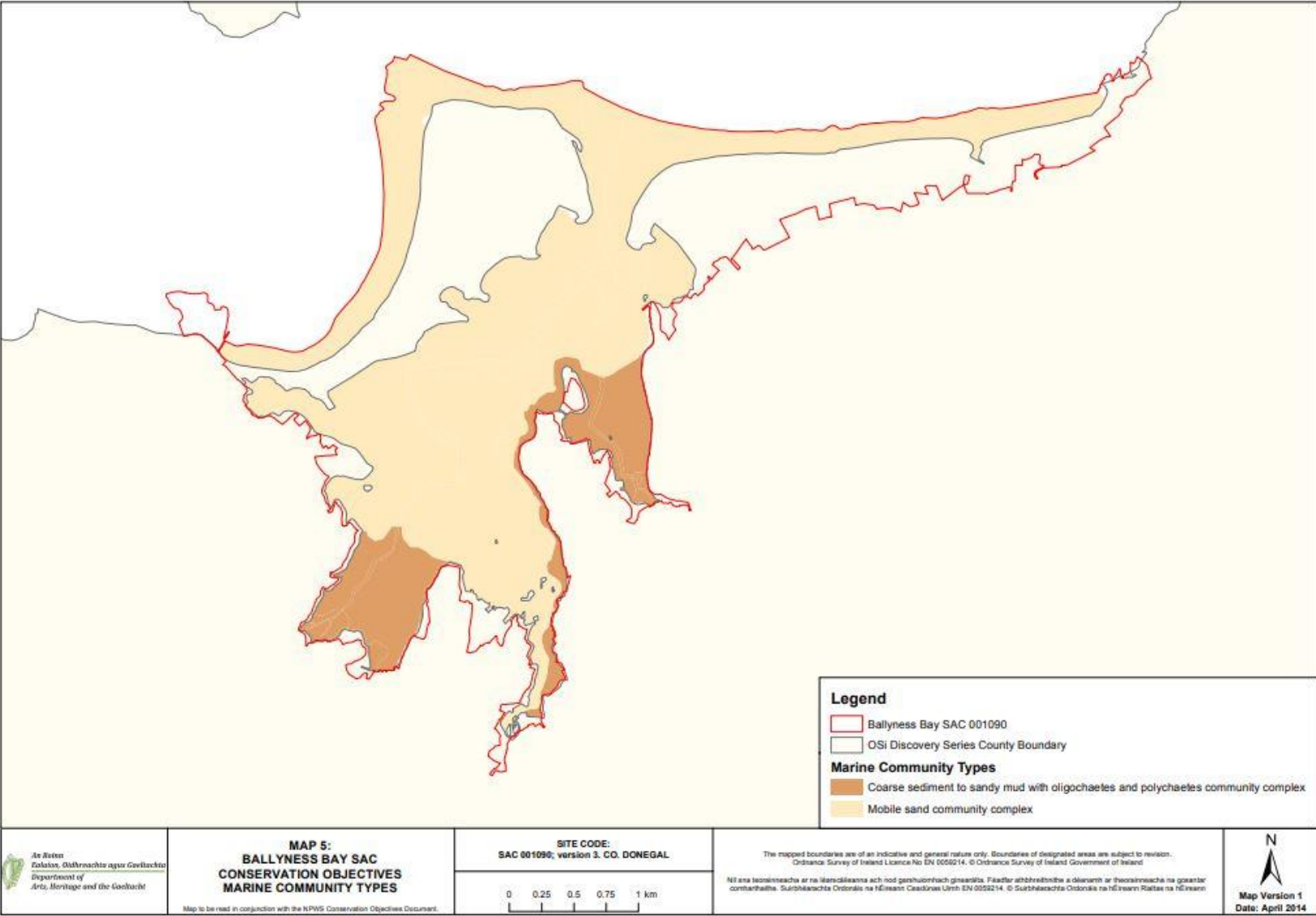


Figure 2-5: Conservation features for Ballyness Bay SAC; marine community types (NPWS, 2014a).

2.5.1.2. Conservation features and objectives for ex-situ SACs within the ZOI

Table 2-2: Qualifying Interests (QIs) of SACs within the Zone of Influence.

Site	Qualifying Interest (QIs)	Ecological Group	Conservation Objective	Distance ⁸
Horn Head and Rinclevan SAC (000147)	Geyer's Whorl Snail (<i>Vertigo geyeri</i>) [1013]	Annex I/II habitat or species	To maintain or restore favourable conservation condition	Adjacent to Ballyness SAC
	Grey seal (<i>Halichoerus grypus</i>) [1364]			
	Petalwort (<i>Petalophyllum ralfsii</i>) [1395]			
	Slender Naiad (<i>Najas flexilis</i>) [1833]			
	Embryonic shifting dunes [2110]			
	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]			
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]			
	Dunes with <i>Salix repens ssp. argentea</i> (<i>Salicion arenariae</i>) [2170]			
	Humid dune slacks [2190]			
	Machairs (* in Ireland) [21A0]			
Cloghernagore Bog and Glenveagh National Park SAC (02047)	Oligotrophic Waters containing very few minerals [3110]	Annex I/II habitat or species	To maintain or restore favourable conservation condition	4.9 km
	Floating River Vegetation [3260]			
	Wet Heath [4010]			
	Dry Heath [4030]			
	Alpine and Subalpine Heaths [4060]			
	<i>Molinia</i> Meadows [6410]			
	Blanket Bogs (Active)* [7130]			
	<i>Rhynchosporion</i> Vegetation [7150]			
	Old Oak Woodlands [91A0]			
	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029]			
	Atlantic Salmon (<i>Salmo salar</i>) [1106]			
	Otter (<i>Lutra lutra</i>) [1355]			
	Killarney Fern (<i>Trichomanes speciosum</i>) [1421]			

Site	Qualifying Interest (QIs)	Ecological Group	Conservation Objective	Distance ⁸
Gweedore Bay and Islands SAC (001141)	Coastal Lagoons (1150)*	Annex I/II habitat or species	To maintain or restore favourable conservation condition	2 km
	Reefs [1170]			
	Perennial Vegetation of Stony Banks [1220]			
	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]			
	Mediterranean Salt Meadows [1410]			
	Embryonic Shifting Dunes [2110]			
	Marram Dunes (White Dunes) [2120]			
	Fixed Dunes (Grey Dunes)* [2130]			
	Decalcified Empetrum Dunes* [2140]			
	Decalcified Dune Heath* [2150]			
	Dunes with Creeping Willow [2170]			
	Humid Dune Slacks [2190]			
	Machairs* [21A0]			
	Oligotrophic to Mesotrophic Standing Waters [3130]			
	Dry Heath [4030]			
	Alpine and Subalpine Heaths [4060]			
	Juniper Scrub [5130]			
	Marsh Fritillary (<i>Euphydryas aurinia</i>) [1065]			
	Otter (<i>Lutra lutra</i>) [1355]			
	Petalwort (<i>Petalophyllum ralfsii</i>) [1395]			
	Slender Naiad (<i>Najas flexilis</i>) [1833]			
Tory Island Coast SAC (002259)	Coastal Lagoons* [1150]	Annex I/II habitat or species	To maintain or restore favourable conservation condition	9.2 km
	Reefs [1170]			
	Perennial Vegetation of Stony Banks [1220]			
	Vegetated Sea Cliffs [1230]			
	Sea Caves [8330]			
Muckish Mountain SAC (001179)	Alpine and Subalpine Heaths [4060]	Annex I/II habitat or species	To maintain or restore favourable conservation condition	6.1 km
	Siliceous Rocky Slopes [8220]			

Site	Qualifying Interest (QIs)	Ecological Group	Conservation Objective	Distance ⁸
Sheephaven SAC (001190)	Tidal Mudflats and Sandflats [1140]	Annex I/II habitat or species	To maintain or restore favourable conservation condition	9.3 km
	Annual Vegetation of Drift Lines [1210]			
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]			
	<i>Salicornia</i> Mud			
	Atlantic Salt Meadows [1330]			
	Mediterranean Salt Meadows [1410]			
	Embryonic Shifting Dunes [2110]			
	Marram Dunes (White Dunes) [2120]			
	Fixed Dunes (Grey Dunes)* [2130]			
	Humid Dune Slacks [2190]			
	Machairs* [21A0]			
	Old Oak Woodlands [91A0]			
	Petalwort (<i>Petalophyllum ralfsii</i>) [1395]			
	Marsh Fritillary (<i>Euphydryas aurinia</i>)[1065]			
Tranarossan and Melmore Lough SAC (000194)	Mudflats and sandflats not covered by seawater at low tide [1140]	Annex I/II habitat or species	To maintain or restore favourable conservation condition	13 km
	Annual vegetation of drift lines [1210]			
	Perennial vegetation of stony banks [1220]			
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]			
	Embryonic shifting dunes [2110]			
	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]			
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]			
	Decalcified fixed dunes with <i>Empetrum nigrum</i> [2140]			
	Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170]			
	Humid dune slacks [2190]			
	Machairs (* in Ireland) [21A0]			
	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]			
	European dry heaths [4030]			
	Alpine and Boreal heaths [4060]			

Site	Qualifying Interest (QIs)	Ecological Group	Conservation Objective	Distance ⁸
	<i>Petalophyllum ralfsii</i> (Petalwort) [1395]			
Sessiagh Lough SAC (000185)	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	Annex I/II habitat or species	To restore favourable conservation condition	7.6 km
	<i>Najas flexilis</i> (Slender Naiad) [1833]			
Fawnboy Bog/Lough Nacung SAC (000140)	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	Annex I/II habitat or species	To restore favourable conservation condition	6.1 km
	Blanket bogs (* if active bog) [7130]			
	Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]			
	<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]			

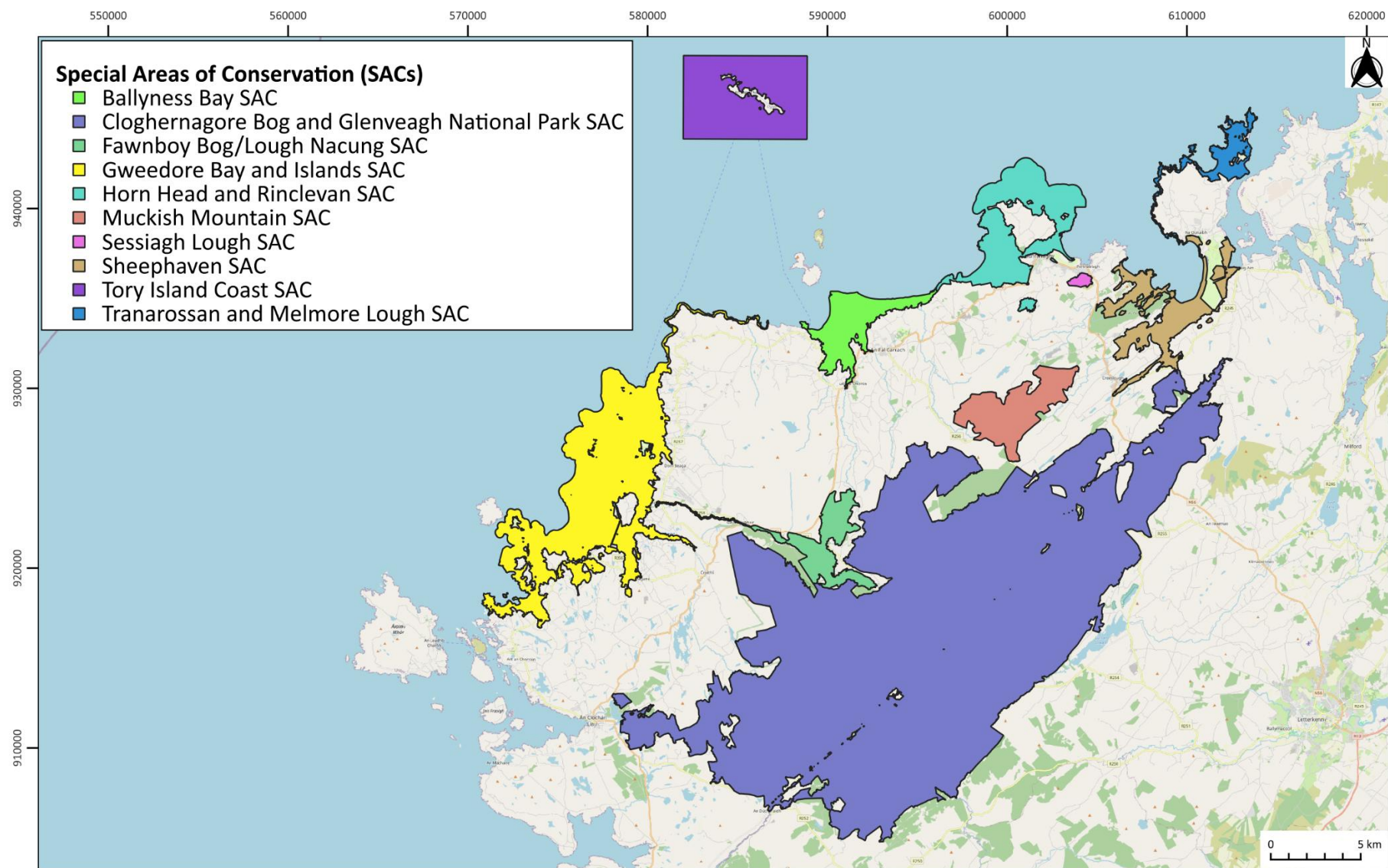


Figure 2-6: SACs within the Zone of Influence of the aquaculture sites located in Ballyness Bay SAC.

2.5.2. Annex II marine mammal species

There is potential that wide ranging species such as Annex II marine mammals protected under other European sites could occur within the Project zone of influence and thereby be affected by the proposed aquaculture operations. Common porpoise (also known as harbour porpoise) (*Phocoena phocoena*), common bottlenose dolphin (*Tursiops truncatus*), grey seal (*Halichoerus grypus*), and common seal (also known as harbour seal) (*Phoca vitulina*) are all listed under Annex II of the EU Habitats Directive (92/43/EEC), which requires the designation of Special Areas of Conservation (SACs) where appropriate for their protection and conservation. In Ireland, these species are considered of high conservation importance due to their ecological roles and sensitivities to anthropogenic pressures in the marine environment. In accordance with the requirements of screening for Appropriate Assessment, Annex II species are the focus of this report. To date, 26 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 in the south and southwest coast of Ireland. Marine mammals listed as QIs that have the potential to be affected are described below. **Table 2-3** presents the SACs in Ireland designated for marine mammals and provides their distances from Ballyness Bay.

Table 2-3:- SACs designated for marine mammal species in Ireland (distance measured as straight-line distances).

SAC (Site code)	Harbour seal (<i>Phoca vitulina</i>) (1365)	Grey seal (<i>Halichoerus grypus</i>) (1364)	Harbour porpoise (<i>Phocoena phocoena</i>) (1351)	Bottlenose dolphin (<i>Tursiops truncatus</i>) (1349)	Distance from Site
Ballysadare Bay SAC [000622]	✓				99Km
Belgica Mound Province SAC [002327]			✓	✓	464Km
Blackwater Bank SAC [002953]			✓		317Km
Basket Islands SAC [002172]		✓	✓		364Km
Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]			✓		74Km
Carnsore Point SAC [002269]			✓		343Km
Clew Bay Complex SAC [001482]	✓				161Km
Codling Fault Zone SAC [003015]			✓		257Km
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627]	✓				89Km
Donegal Bay (Murvagh) SAC [000133]	✓				51Km
Duvillaun Islands SAC [000495]		✓		✓	171Km
Galway Bay Complex SAC [000268]	✓				210Km
Glengarriff Harbour and Woodland SAC [000090]	✓				384Km
Gweedore Bay and Islands SAC [001141]			✓		3.3Km
Hook Head SAC [000764]			✓	✓	339Km
Horn Head and Rinclevan SAC [000147]		✓			<1Km
Inishbofin and Inishshark SAC [000278]		✓			209Km
Inishkea Islands SAC [000507]		✓			168Km
Inishmore Island SAC [000213]			✓		241Km
Kenmare River SAC [002158]	✓		✓		373Km
Kilkieran Bay and Islands SAC [002111]	✓		✓		213Km
Killala Bay/Moy Estuary SAC [000458]	✓				118Km
Lambay Island SAC [000204]	✓	✓	✓		227Km
Lough Swilly SAC [002287]			✓		32Km

Lower River Shannon SAC [002165]				✓	256Km
Porcupine Bank Canyon SAC [003001]				✓	546Km
Roaringwater Bay and Islands SAC [000101]		✓	✓		405Km
Rockabill to Dalkey Island SAC [003000]			✓		215Km
Rutland Island and Sound SA [002283]	✓				22Km
Saltee Islands SAC [000707]		✓			342Km
Slaney River Valley SAC [000781]	✓				286Km
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC [000190]		✓			44Km
Slyne Head Islands SAC [000328]		✓		✓	226Km
Slyne Head Peninsula SAC [002074]				✓	221Km
South-West Porcupine Bank SAC [002329]				✓	574Km
St. John's Point SAC [000191]				✓	61Km
West Connacht Coast SAC [002998]			✓	✓	148Km
West of Ardara/Maas Road SAC [000197]	✓				24Km

Bottle-nosed Dolphin (*Tursiops truncatus*)

Bottle-nosed dolphins are found off all Irish coasts with inshore animals moving around the entire Irish coastline and between the UK and Ireland (Wall *et al.*, 2013). There are records of the species occurring outside of the Ballyness Bay SAC reported in the NBDC database.

This species is strictly protected under Annex II and IV of the Habitats Directive, thus requires Member States to designate SACs for their protection. In Ireland, ten SACs have been designated for the species.

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 north-west coast of Ireland was by Ingram *et al.* (2009) which estimated a total of 171 ± 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 calculated a total of 56 for bottlenose dolphins in Connemara during the summer months of 2013 and 86 for the summer months in 2014 (Nykänen *et al.*, 2015).

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 (**Table 2-3**).

Broadhaven Bay, located in the northwest of Ireland, was also identified as a site of high diversity for cetacean species, including harbour porpoises, with 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 the east, south and west coast of Ireland and calculated density, abundance and group size for this species. One of the sites was located in Galway Bay which recorded a total of 402 (297-605) of abundance and a total of 2.15 (1.63-3.53) of mean group size. There was only one sighting record during the ObSERVE aerial survey in 2016.

Harbour seal (*Phoca vitulina*)

Common seals (also referred to as harbour seals) are a 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 resident 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.

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. The closest ground-truthing site to the Project area was Dungloe Bay, which summarised a total of 266 individuals (for aerial count) and 180 (for ground count). Morris and Duck (2019) carried out thermal-imaging surveys along the coastline of Ireland in August 2017 and August 2018. The nearby Inishbofin region had a total of 12 counts of harbour seals from surveys in 2003, 19 counts in 2011/2012 and 18 in 2017/2018. Additionally, Sharples *et al.*, (2012) assessed the foraging behaviour of harbour seals at seven locations around the coast of Britain and stated a large degree of variation in seal movements with the longest foraging trip reaching 200 km of distance.

Grey seal (*Halichoerus grypus*)

Grey seal is 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 and thus requires Member States to designate SACs for their protection. There are 10 SACs designated for this species in Ireland.

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. The closest ground-truthing site to the Project area was Dungloe Bay, which summarised a total of 0 individuals (for aerial count) and 0 (for ground count). Morris and Duck (2019) carried out thermal imaging surveys along the coastline of Ireland in August 2017 and August 2018, in the nearby Inishbofin region which calculated a total of 27 counts of grey seals from surveys in 2003, 45 counts in 2011/2012 and 77 counts in 2017/2018. Additionally, Cronin *et al.* (2011) investigated grey seal movement on Ireland's continental shelf and assessed that the longest foraging trip was 511 km of distance. Given their wide-ranging behaviour and sightings in the bay, this species is known to occur in the Proposed Project area.

Summary

Local observations of the grey and common seal in Ballyness Bay have indicated a specific area as a haul-out zone for seals. The displayed data shows sightings of individuals on the sandbank in the middle of the bay where the haul out site has been identified. Individuals are denoted by the purple and orange squares in **Figure 2-7**. The smaller squares show a higher accuracy of location (within 100 m) and all occur on this sandbank. The larger purple squares show a lesser degree of certainty of the locations of the seals (within 1 km). The top left large square was reported in 1995 and is of the lesser degree of certainty, so it is difficult to interpret where this sighting occurred specifically, but the area also covers the beaches at the mouth of the bay. However, given that the range is so large, it cannot be deduced where exactly this sighting occurred and therefore no inferences should be made. (the large purple squares include fairly extensive sections of terrestrial habitat that

obviously cannot be used by seals as haul out sites). Licencing was refused by the Minister for Agriculture, Food and the Marine for a proposed site on the same sandbank as this observed haul-out site. The sites which are covered under this report, listed in **Table 1-1**, are all separated from this sandbank by a tidal channel.



Figure 2-7: Seal haul out site and sighted species.

Ballyness Bay is a shallow, largely intertidal system which drains at low tide, and provides limited suitable habitat for species such as harbour porpoise and bottlenose dolphin. These species are associated with deeper coastal and offshore waters and are unlikely to occur in Ballyness Bay. A review of records from the NBDC shows harbour porpoise at the mouth of the bay, however these records relate to stranding events. While SACs for these species have been considered, the bathymetric characteristics of Ballyness Bay mean there is no realistic pathway for sustained interaction between the proposed aquaculture sites and these species. As such, cetacean species are screened out from further assessment. See the screening exercise in **Section 2.6**.

2.5.3. Other mobile Annex II species with the potential to interact with Ballyness Bay

Otter (*Lutra lutra*)

The Eurasian otter is a top predator in freshwater systems and its presence therefore has a significant role in the wellbeing 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 its protection. Otters have also been designated as species of conservation concern and high priority due to major decline in numbers as a result 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). There are two SACs with otter as a QI within 15 km of the Proposed Project site and these are Gweedore Bay and Islands SAC and Cloghernagore Bog and Glenveagh National Park SAC.

Atlantic salmon (*Salmo salar*)

Atlantic salmon is listed under Annex II and V of the Habitats Directive, requiring the designation of Special Areas of Conservation (SACs) and the implementation of management measures to ensure its favourable conservation status. Populations have experienced declines due to a range of pressures including barriers to migration, deterioration in water quality, hydromorphological alterations, overfishing, and climate change impacts on both freshwater and marine survival. As a result, the species is considered of high conservation concern in Ireland. SACs designated for Atlantic salmon aim to protect critical habitats such as spawning and nursery areas, as well as migratory corridors within river systems.

2.5.4. Special Protection Areas

This section includes an analysis of all SPAs within the ZOI of the Project. For examining ecological pathways in terms of seabird species, this element of the screening process was informed by published data on species-specific foraging ranges available in **Table 2-4** below (Thaxter *et al.*, 2012; Jovani *et al.*, 2016; Wakefield *et al.*, 2017; Woodward *et al.*, 2019; Woodward *et al.*, 2024). Due to the coastal nature of the site, seabirds are most likely to be present and have potential to be impacted by impact mechanisms. Only seabird SCIs from SPAs with direct or functional connectivity to the proposed sites are taken forward for assessment of likely significant effects (Stage 2).

The sites identified are shown in **Figure 2-8** and listed in **Table 2-5** along with their conservation objectives and distance of the European sites from Ballyness Bay, the site of the Project. All site synopsis and conservation objectives for the European sites can be accessed through the NPWS website.^{ix}

Table 2-4: Review of seabird foraging ranges during breeding season (summarised from Thaxter *et al.* (2012), Jovani *et al.* (2015), Wakefield *et al.* (2017), and Woodward *et al.* (2019)). Maximum foraging range are often an extreme value that is not representative of the wider population.

Species	Thaxter <i>et al.</i> , 2012		Jovani <i>et al.</i> , 2016	Wakefield <i>et al.</i> , 2017		Woodward <i>et al.</i> , 2019		Woodward <i>et al.</i> , 2024
	Maximum foraging range (km)	Mean foraging range (km)	Foraging range (km)	Maximum foraging range (km)	Mean foraging range (km)	Maximum foraging range (km)	Mean foraging range (km)	Mean site maximum (km)
Arctic tern (<i>Sterna paradisaea</i>) [A194]	30	7.1				46	6.1	40.5 (25.7 ±14.8)
Black-headed Gull (<i>Larus ridibundus</i>) [A179]	40	11.4				18.5	7	18.5
Common Gull (<i>Larus canus</i>) [A182]	50	25				50	N/A	50
Common Tern (<i>Sterna hirundo</i>) [A193]	30	7.1				30	6.4	26.9 (18 ± 8.9)
Cormorant (<i>Phalacrocorax carbo</i>) [A017]	35	5.2				35	7.1	33.9 (25.6 ± 8.3)
Eider (<i>Somateria mollissima</i>) [A063]	80	2.4				22.5	3.2	21.5
Fulmar (<i>Fulmarus glacialis</i>) [A009]	580	47.5				2736	134.6	1200.2 (542.3 ± 657.9)
Gannet (<i>Morus bassanus</i>) [A016]	590	92.5	709			709	120.4	509.4 (315.2 ± 194.2)
Great Black-backed Gull (<i>Larus marinus</i>) [A183]			60			73	16.7	73
Guillemot (<i>Uria aalge</i>) [A199]	135	37.8		340	10.5	338	33.1	153.7 (73.2 ± 80.5)
Herring Gull (<i>Larus argentatus</i>) [A184]	92	10.5				92	14.9	85.6 (58.8 ± 26.8)
Kittiwake (<i>Rissa tridactyla</i>) [A188]	120	24.8	231	300	11.9	770	54.7	300.6 (156.1 ± 144.5)
Leach's Storm Petrel (<i>Oceanodroma leucorhoa</i>) [A191]	< 120					N/A	657	N/A

Species	Thaxter <i>et al.</i> , 2012		Jovani <i>et al.</i> , 2016	Wakefield <i>et al.</i> , 2017		Woodward <i>et al.</i> , 2019		Woodward <i>et al.</i> , 2024
	Maximum foraging range (km)	Mean foraging range (km)	Foraging range (km)	Maximum foraging range (km)	Mean foraging range (km)	Maximum foraging range (km)	Mean foraging range (km)	Mean site maximum (km)
Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]	181	71.9				533	43.3	236 (127 ± 109)
Little Tern (<i>Sterna albifrons</i>) [A195]	11	2.1				5	3.5	5
Manx Shearwater (<i>Puffinus puffinus</i>) [1351] [A013]	330	2.3				2890	136.1	2365.5 (1346.8 ± 1018.7)
Mediterranean Gull (<i>Larus melanocephalus</i>) [A180]	20	11.5				20	11.5	20
Puffin (<i>Fratercula arctica</i>) [A204]	200	4				383	62.4	265.4 (137.1 ± 128.3)
Razorbill (<i>Alca torda</i>) [A200]	95	23.7	312	305	13.2	313	61.3	164.6 (88.7 ± 75.9)
Red-throated Diver (<i>Gavia stellata</i>) [A001]	9	4.5				9	4.5	9
Roseate Tern (<i>Sterna dougallii</i>) [A192]	30	12.2				24	4.1	23.2 (12.6 ± 10.6)
Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]	54	11.5				80	9	57.5 (34.3 ± 23.2)
Shag (<i>Gulosus aristotelis</i>) [A018]	17	5.9		35	3.4	46	9.2	23.7 (13.2 ± 10.5)
Storm-petrel (<i>Hydrobates pelagicus</i>) [A014]	65					336 (468*)	N/A	400.6

*Woodward *et al.*, (2024) reviewed seabird foraging ranges as a tool for investigating interactions with wind farms and the foraging range for Storm-petrel was updated. This is the only foraging range that was updated since 2019 for relevant seabird species.

Table 2-5 : Special Conservation Interests (SCIs) of SPAs within the Zone of Influence.

Site	Special Conservation Interest (SCI)	Ecological Group	Conservation Objective	Distance ⁸
Donegal Bay SPA (004151)	Great Northern Diver (<i>Gavia immer</i>) [A003]	Annex I/II/III bird species	To maintain favourable conservation condition	56.2 km
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]			
	Common Scoter (<i>Melanitta nigra</i>) [A065]			
	Sanderling (<i>Calidris alba</i>) [A144]			
	Wetland and Waterbirds [A999]			
Horn Head to Fanad Head SPA (04194)	Fulmar (<i>Fulmarus glacialis</i>) [A009]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	7 km
	Cormorant (<i>Phalacrocorax carbo</i>) [A017]			
	Shag (<i>Phalacrocorax aristotelis</i>) [A018]			
	Barnacle Goose (<i>Branta leucopsis</i>) [A045]			
	Peregrine (<i>Falco peregrinus</i>) [A103]			
	Kittiwake (<i>Rissa tridactyla</i>) [A188]			
	Guillemot (<i>Uria aalge</i>) [A199]			
	Razorbill (<i>Alca torda</i>) [A200]			
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]			
	Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]			
Falcarragh to Meenlaragh (04149)	Corncrake (<i>Crex crex</i>) [A122]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	<100 m
Derryveagh and Glendowan Mountains SPA (04039)	Red-throated Diver (<i>Gavia stellata</i>) [A001]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	7 km
	Merlin (<i>Falco columbarius</i>) [A098]			
	Peregrine (<i>Falco peregrinus</i>) [A103]			
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]			
	Dunlin (<i>Calidris alpina schinzii</i>) [A466]			
Greers Isle SPA (004082)	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	Annex I/II/III bird species	To restore favourable conservation condition	27.8 km
	Common Gull (<i>Larus canus</i>) [A182]			
	Sandwich Tern (<i>Thalasseus sandvicensis</i>) [A863]			

Site	Special Conservation Interest (SCI)	Ecological Group	Conservation Objective	Distance ⁸
Illancrone and Inishkeeragh SPA (004132)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	29 km
	Common Tern (<i>Sterna hirundo</i>) [A193]			
	Arctic Tern (<i>Sterna paradisaea</i>) [A194]			
	Little Tern (<i>Sterna albifrons</i>) [A195]			
Inishbofin, Inishdooley and Inishbeg SPA (04083)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	3.3 km
	Corncrake (<i>Crex crex</i>) [A122]			
	Common Gull (<i>Larus canus</i>) [A182]			
	Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]			
	Arctic Tern (<i>Sterna paradisaea</i>) [A194]			
Inishkeel SPA (004116)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Annex I/II/III bird species	To restore favourable conservation condition	37.5 km
Lough Fern SPA (004060)	Pochard (<i>Aythya ferina</i>) [A059]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	27 km
	Wetland and Waterbirds [A999]			
Lough Foyle SPA (004087)	Red-throated Diver (<i>Gavia stellata</i>) [A001]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	54.2 km
	Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]			
	Bewick's Swan (<i>Cygnus columbianus bewickii</i>) [A037]			
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]			
	Greylag Goose (<i>Anser anser</i>) [A043]			
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]			
	Shelduck (<i>Tadorna tadorna</i>) [A048]			
	Teal (<i>Anas crecca</i>) [A052]			
	Mallard (<i>Anas platyrhynchos</i>) [A053]			
	Eider (<i>Somateria mollissima</i>) [A063]			
	Red-breasted Merganser (<i>Mergus serrator</i>) [A069]			
	Oystercatcher (<i>Haematopus ostralegus</i>) [A130]			
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]			

Site	Special Conservation Interest (SCI)	Ecological Group	Conservation Objective	Distance ⁸
	Lapwing (<i>Vanellus vanellus</i>) [A142]			
	Knot (<i>Calidris canutus</i>) [A143]			
	Dunlin (<i>Calidris alpina</i>) [A149]			
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]			
	Curlew (<i>Numenius arquata</i>) [A160]			
	Redshank (<i>Tringa totanus</i>) [A162]			
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]			
	Wigeon (<i>Mareca penelope</i>) [A855]			
	Wetland and Waterbirds [A999]			
	Common Gull (<i>Larus canus</i>) [A182]			
	Herring Gull (<i>Larus argentatus</i>) [A184]			
Lough Nillan Bog SPA (004110)	Merlin (<i>Falco columbarius</i>) [A098]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	40 km
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]			
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]			
	Dunlin (<i>Calidris alpina schinzii</i>) [A466]			
Lough Swilly SPA (004075)	Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	34 km
	Grey Heron (<i>Ardea cinerea</i>) [A028]			
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]			
	Greylag Goose (<i>Anser anser</i>) [A043]			
	Shelduck (<i>Tadorna tadorna</i>) [A048]			
	Teal (<i>Anas crecca</i>) [A052]			
	Mallard (<i>Anas platyrhynchos</i>) [A053]			
	Scaup (<i>Aythya marila</i>) [A062]			
	Goldeneye (<i>Bucephala clangula</i>) [A067]			
	Red-breasted Merganser (<i>Mergus serrator</i>) [A069]			

Site	Special Conservation Interest (SCI)	Ecological Group	Conservation Objective	Distance ⁸
	Coot (<i>Fulica atra</i>) [A125]			
	Oystercatcher (<i>Haematopus ostralegus</i>) [A130]			
	Knot (<i>Calidris canutus</i>) [A143]			
	Dunlin (<i>Calidris alpina</i>) [A149]			
	Curlew (<i>Numenius arquata</i>) [A160]			
	Redshank (<i>Tringa totanus</i>) [A162]			
	Greenshank (<i>Tringa nebularia</i>) [A164]			
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]			
	Common Gull (<i>Larus canus</i>) [A182]			
	Common Tern (<i>Sterna hirundo</i>) [A193]			
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]			
	Wigeon (<i>Mareca penelope</i>) [A855]			
	Shoveler (<i>Spatula clypeata</i>) [A857]			
	Sandwich Tern (<i>Thalasseus sandvicensis</i>) [A863]			
	Wetland and Waterbirds [A999]			
Roaninish SPA (site code 004121)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Annex I/II/III bird species	To restore favourable conservation condition	38 km
	Herring Gull (<i>Larus argentatus</i>) [A184]			
Sheskinmore Lough SPA (site code 004090)	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	Annex I/II/III bird species	To restore favourable conservation condition	41.5 km
Tory Island SPA (04073)	Fulmar (<i>Fulmarus glacialis</i>) [A009]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	13.3 km
	Corncrake (<i>Crex crex</i>) [A122]			
	Razorbill (<i>Alca torda</i>) [A200]			
	Puffin (<i>Fratercula arctica</i>) [A204]			
West Donegal SPA (04150)	Fulmar (<i>Fulmarus glacialis</i>) [A009]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	9.8 km
	Cormorant (<i>Phalacrocorax carbo</i>) [A017]			

Site	Special Conservation Interest (SCI)	Ecological Group	Conservation Objective	Distance ⁸
	Shag (<i>Phalacrocorax aristotelis</i>) [A018]			
	Peregrine (<i>Falco peregrinus</i>) [A103]			
	Herring Gull (<i>Larus argentatus</i>) [A184]			
	Kittiwake (<i>Rissa tridactyla</i>) [A188]			
	Razorbill (<i>Alca torda</i>) [A200]			
	Chough (<i>Pyrrhonorax pyrrhonorax</i>) [A346]			
Trawbreaga Bay SPA (site code 004034)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Annex I/II/III bird species	To maintain favourable conservation condition	50.9 km
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]			
	Chough (<i>Pyrrhonorax pyrrhonorax</i>) [A346]			
	Wetland and Waterbirds [A999]			
West Donegal Islands SPA (04230)	Shag (<i>Phalacrocorax aristotelis</i>) [A018]	Annex I/II/III bird species	To maintain or restore favourable conservation condition	10.5 km
	Barnacle Goose (<i>Branta leucopsis</i>) [A045]			
	Corncrake (<i>Crex crex</i>) [A122]			
	Common Gull (<i>Larus canus</i>) [A182]			
	Herring Gull (<i>Larus argentatus</i>) [A184]			

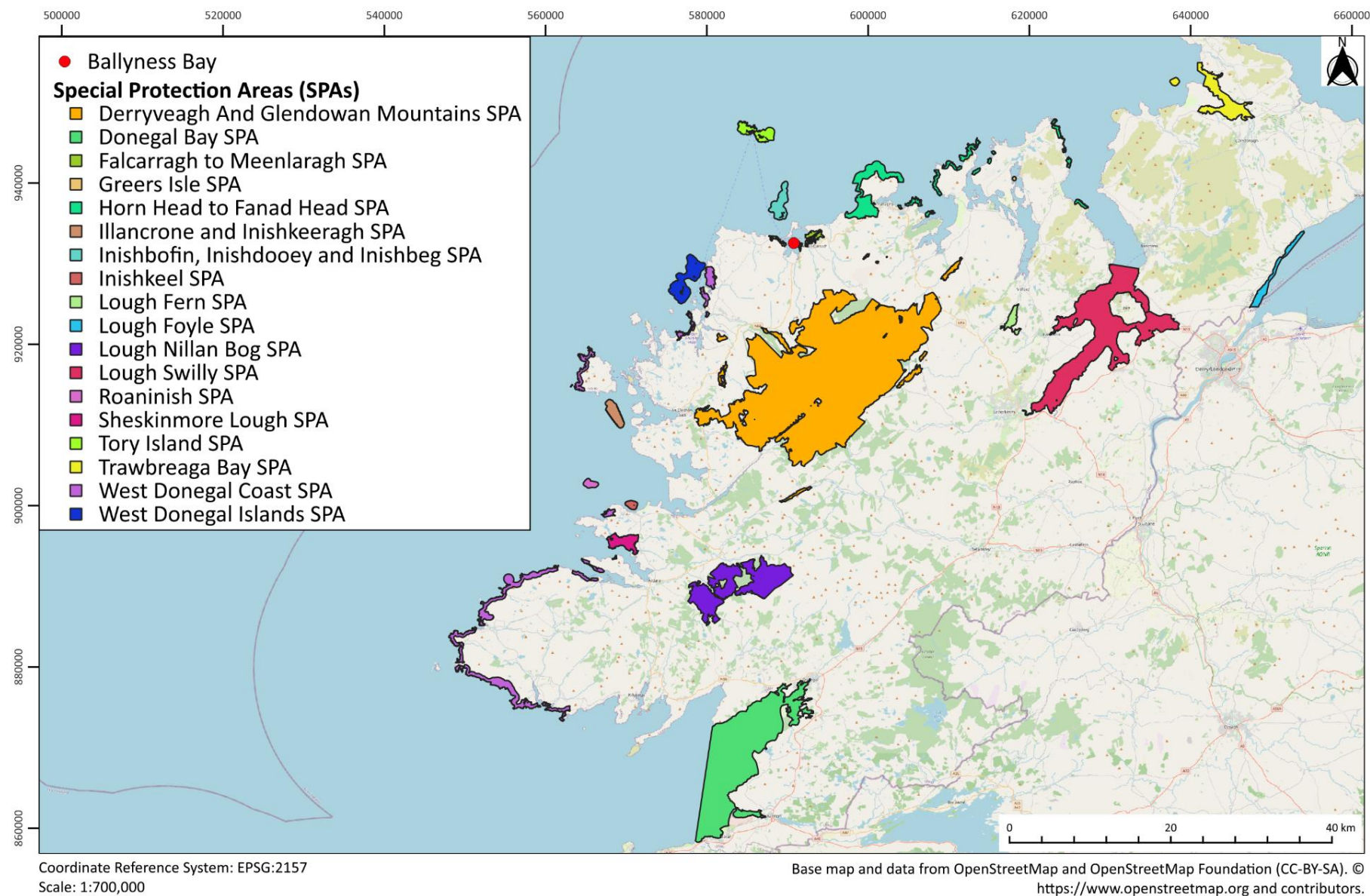


Figure 2-8: SPAs within the Zone of Influence of the aquaculture sites located in Ballyness Bay SAC.

2.6. Screening of Potential Significant Effects

A screening assessment is an initial evaluation of the possible impacts that activities may have on the conservation features. The screening process is a filter, which may lead to exclusion of certain activities or conservation features from further assessment, thereby simplifying the process. Screening is a conservative filter that minimises the risk of false negatives.

2.6.1. Screening for Special Areas of Conservation

In this section potential significant effects to the QIs (habitats and species) of SACs are assessed, as based on the ZOI of the proposed project and the distance from the proposed project from the SAC, to see if a potential pathway for interaction exists between project impact mechanisms and the conservation features (*i.e.*, connectivity).

2.6.1.1. Screening for Ballyness SAC

As the Project is taking place within the Ballyness Bay SAC each of the QIs outlined by the NPWS must be assessed to determine if they will be affected directly or indirectly by the potential impact mechanisms identified in **Section 2.4**. Ballyness Bay SAC is designated for a range of coastal and marine habitats including estuaries, mudflats and sandflats and sand dunes. The following four coastal habitats are included in the qualifying interests for the site (* denotes a priority habitat):

- Embryonic shifting dunes (2110)
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) (2120)
- Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)*
- Humid dune slacks (2190)

The fixed dune habitat comprises 91.1 ha (approximately 75%) of the total sand dune habitat at Ballyness Bay SAC (NPWS 2014a). There is a deteriorating trend in this habitat type because the negative impacts have resulted in increasing pressure on the habitat and this pressure is likely to become increasingly intense in the absence of mitigating management (Delaney *et al.*, 2013). Further published literature has reported significant impacts to intertidal communities at routes used to access oyster cultivations (de Grave *et al.*, 1998; Forde *et al.*, 2015; O'Carroll *et al.*, 2016). The impact is attributed to the persistent compaction of the sedimentary habitats by heavy vehicles accessing the sites. Where access routes overlap with sensitive habitats, such pressures have the potential to result in persistent and damaging effects, necessitating mitigation.

In this context, the fixed dune habitat has been avoided during the planning process. There is no proposed spatial overlap between the proposed aquaculture activities, including associated access routes, and the habitat/community types described above; therefore, no pathway for interaction is identified. Fixed coastal

dunes with herbaceous vegetation (grey dunes) (2130) is screened in based on the originally proposed Project and associated access routes. However, following recommendations from the DAFM, the revised application avoids any overlap with this habitat and accepts the route proposed. None-the-less, fixed coastal dunes with herbaceous vegetation (grey dunes) (2130) is carried forward to Stage 2 of the AA (NIS) under the precautionary principle due to the original proposed Project scope, while all other Annex I habitats listed above are screened out.

Geyer's Whorl Snail (*Vertigo geyeri*) [1013] is a designated Annex II species that is listed as a QI for Ballyness Bay SAC. Its distribution is shown in **Figure 2-3**. There is no overlap between the proposed sites and the distribution of the QI and therefore it is not being considered for further assessment.

Ballyness Bay SAC is also designated for the marine Annex I QIs of Mudflats and sandflats not covered by seawater at low tide and Estuaries (**Figure 2-2 & Figure 2-4**). At this site, the Annex I habitat mudflats and sandflats partially overlaps with the Annex I habitats Estuaries within the area however the Annex I habitat Estuaries does not overlap the proposed aquaculture activities.

NPWS (2014c) provides guidance on interpretation of the Conservation Objectives that are, in effect, management targets for habitats and species in the SAC. This guidance is scaled relative to the anticipated sensitivity of habitats and species to disturbance by the proposed activities. In this guidance, an allowable 15% overlap threshold for the interaction between a disturbing activity and a habitat is set out for the management of broad sedimentary communities. Anything under this is not deemed to be significant and therefore does not breach the conservation objective. Disturbance is defined as that which leads to a change in the characterising species of the habitat (which may also indicate change in structure and function). Such disturbance may be temporary or persistent in the sense that change in characterising species may recover to pre-disturbed state or may persist and accumulate over time.

A previous Appropriate Assessment for aquaculture activities in Ballyness Bay carried out in 2019 by the Marine Institute¹⁰ showed the spatial overlap of the QIs, Estuaries (1130) and Mudflats and sandflats not covered by seawater at low tide (1140) with the original 20 proposed aquaculture sites. There is no longer overlap with the QI Estuaries (1130) and therefore, this QI is screened out from further assessment. Due to overlap with Mudflats and sandflats not covered by seawater at low tide (1140) and its community types, this QI is being considered for further assessment in Stage 2 of the Appropriate Assessment (**Figure 2-5**). Due to overlap with fixed dunes (grey dunes) under the original proposed Project scope, this QI is also being considered for further assessment in Stage 2.

2.6.1.2. Screening for *ex situ* SACs

Table 2-6 below shows a summary of the above conclusion of the screening of Ballyness Bay SAC QIs, along with a screening of *ex situ* sites and their QIs.

Table 2-6: Screening for Qualifying Interests within SACs

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
Ballyness Bay SAC (001090)	Tidal Mudflats and Sandflats [1140]	Physical disturbance and habitat loss Organic enrichment/sedimentation and current alteration Introduction of non-native species	Overlap of project with QI Habitat and there is potential for physical disturbance and habitat loss	Yes, due to overlap with aquaculture activities the QI tidal mudflats and sandflats [1140] is screened in.
	Estuaries [1130]		All of the QIs have been considered in greater detail in the section above. Aquaculture activities have no overlap or pathway to affect this QIs	No, due to lack of connection through SPR assessment
	Fixed Dunes (Grey Dunes) [2130]	Physical disturbance and habitat loss	Based on the suite of access routes suggested in the original Project, there is potential overlap with fixed dunes (2130). As such, potential for significant effects is assessed further	Yes, due to potential for interaction, the QI fixed dunes (grey dunes) [2130] is screened in
	Marram Dunes (White Dunes) [2120]		All of the QIs have been considered in greater detail in the section above. Aquaculture activities have no overlap or pathway to affect these QIs	No, due to lack of connection through SPR assessment
	Embryonic Shifting Dunes [2110]			
	Humid Dune Slacks [2190]			
	Geyer's Whorl Snail (<i>Vertigo geyeri</i>) [1013]			
Horn Head and Rinclevan SAC (000147)	Grey seal (<i>Halichoerus grypus</i>) [1364]	Visual disturbance and above water noise disturbance Pest and disease risk	This SAC is adjacent to the site. Grey seals may migrate into Ballyness Bay SAC and interact with aquaculture activities	Yes, due to proximity to the Project and the mobile nature of grey seals, this QI will be screened in for further assessment
	Petalwort (<i>Petalophyllum ralfsii</i>) [1395]	Physical disturbance and habitat loss	Aquaculture activities have no overlap or pathway to affect these QIs	
	Geyer's Whorl Snail (<i>Vertigo geyeri</i>) [1013]			

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Slender Naiad (<i>Najas flexilis</i>) [1833]			No, due to lack of connection through SPR assessment
	Embryonic shifting dunes [2110]			
	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]			
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]			
	Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170]			
	Humid dune slacks [2190]			
	Machairs (* in Ireland) [21A0]			
Gweedore Bay and Islands SAC (001141)	Coastal Lagoons (1150)*	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the QIs listed and they are therefore screened out.	No, due to lack of connection through SPR assessment
	Reefs [1170]	Organic enrichment/ sedimentation & current alteration		
	Perennial Vegetation of Stony Banks [1220]	Introduction of non-native species		
	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]			
	Mediterranean Salt Meadows [1410]			
	Embryonic Shifting Dunes [2110]	Physical disturbance and habitat loss		
	Marram Dunes (White Dunes) [2120]			
	Fixed Dunes (Grey Dunes)* [2130]			
	Decalcified Empetrum Dunes* [2140]			
	Decalcified Dune Heath* [2150]			
	Dunes with Creeping Willow [2170]			
	Humid Dune Slacks [2190]			
	Machairs* [21A0]			
	Oligotrophic to Mesotrophic Standing Waters [3130]			
	Dry Heath [4030]			
	Alpine and Subalpine Heaths [4060]			
	Juniper Scrub [5130]			
	Marsh Fritillary (<i>Euphydryas aurinia</i>) [1065]			
	Slender Naiad (<i>Najas flexilis</i>) [1833]			
	Petalwort (<i>Petalophyllum ralfsii</i>) [1395]			

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	Visual disturbance and above water noise disturbance Pest and disease risk	Harbour porpoise is highly unlikely to utilise Ballyness Bay due to its shallow and tidal nature. Due to the lack of impact mechanism pathways from the site to the QI in this SAC there will be no likely interaction and are therefore screened out	No, due to lack of connection through SPR assessment
	Otter (<i>Lutra lutra</i>) [1355]		Gweedore Bay & Islands SAC at its shortest distance is c. 3 km from the Ballyness Bay SAC. Otters may migrate into the Ballyness Bay SAC and could interact with aquaculture activities.	Yes, due to proximity to the Project and mobile nature of the Otter, this QI will be subject to further assessment
Tory Island Coast SAC (002259)	Coastal Lagoons* [1150]	Physical disturbance and habitat loss Organic enrichment/ sedimentation & current alteration	Due to the hydrological distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction and are therefore screened out	No, due to lack of connection in SPR assessment
	Reefs [1170]			
	Perennial Vegetation of Stony Banks [1220]	Physical disturbance and habitat loss		
	Vegetated Sea Cliffs [1230]			
	Sea Caves [8330]			
Cloghernagore Bog and Glenveagh National Park SAC (02047)	Oligotrophic Waters containing very few minerals [3110]	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the other QIs listed and they are therefore screened out.	No, due to lack of connection in SPR assessment
	Floating River Vegetation [3260]			
	Wet Heath [4010]			
	Dry Heath [4030]			
	Alpine and Subalpine Heaths [4060]			
	<i>Molinia</i> Meadows [6410]			

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Blanket Bogs (Active)* [7130]			
	Rhynchosporion Vegetation [7150]			
	Old Oak Woodlands [91A0]			
	Killarney Fern (<i>Trichomanes speciosum</i>) [1421]			
	Atlantic Salmon (<i>Salmo salar</i>) [1106]	Physical disturbance Pest and disease risk	Due to the location of salmon upstream these QIs are screened in. The foraging range of <i>Lutra lutra</i> is potentially within the distance of this SAC to the site and therefore must be screened in.	Yes, due to proximity to the Project and mobile nature of otter, and upstream location of salmon these QIs will be subject to further assessment.
	Otter (<i>Lutra lutra</i>) [1355]	Visual disturbance and above water noise disturbance Pest and disease risk		
	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029]	Pest and disease risk	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the other QIs listed and they are therefore screened out.	No, due to lack of connection in SPR assessment
Sheephaven SAC (001190)	Tidal Mudflats and Sandflats [1140]	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the QIs listed and they are therefore screened out.	No, due to lack of connection in SPR assessment
	Annual Vegetation of Drift Lines [1210]	Physical disturbance and habitat loss		
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]			
	<i>Salicornia</i> Mud [1310]			
	Atlantic Salt Meadows [1330]			
	Mediterranean Salt Meadows [1410]			
	Embryonic Shifting Dunes [2110]			
	Marram Dunes (White Dunes) [2120]			
	Fixed Dunes (Grey Dunes)* [2130]			
	Humid Dune Slacks [2190]			

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Machairs* [21A0]			
	Old Oak Woodlands [91A0]			
	Petalwort (<i>Petalophyllum ralfsii</i>) [1395]			
	Marsh Fritillary (<i>Euphydryas aurinia</i>) [1065]			
Muckish Mountain SAC (001179)	Alpine and Subalpine Heaths [4060]	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the QIs listed and they are therefore screened out.	No due to lack of connection in SPR assessment
	Siliceous Rocky Slopes [8220]			
Sessiagh Lough SAC (000185)	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the QIs listed and they are therefore screened out.	No, due to lack of connection through SPR assessment
	<i>Najas flexilis</i> (Slender Naiad) [1833]			

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
Fawnboy Bog/Lough Nacung SAC (000140)	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the other QIs listed and they are therefore screened out. Due to the location of the freshwater pearl mussel upstream this QI is screened out.	No, due to lack of connection through SPR assessment
	Blanket bogs (* if active bog) [7130]			
	Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]			
	<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	Pest and disease risk		
Tranarossan and Melmore Lough SAC (000194)	Mudflats and sandflats not covered by seawater at low tide [1140]	Physical disturbance and habitat loss	Due to the distance and lack of impact mechanism pathways from the site to the QIs in this SAC there will be no likely interaction with any of the QIs listed and they are therefore screened out.	No, due to lack of connection through SPR assessment
	Annual vegetation of drift lines [1210]			
	Perennial vegetation of stony banks [1220]			
	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]			
	Embryonic shifting dunes [2110]			
	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]			
	Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]			
	Decalcified fixed dunes with <i>Empetrum nigrum</i> [2140]			
	Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170]			
	Humid dune slacks [2190]			

Site (code)	Qualifying Interest (QIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Machairs (* in Ireland) [21A0]			
	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]			
	European dry heaths [4030]			
	Alpine and Boreal heaths [4060]			
	<i>Petalophyllum ralfsii</i> (Petalwort) [1395]			

2.6.2. Screening for Special Protection Areas

In this section, potential significant effects to the SCIs (bird species) of SPAs are assessed, as based on the ZOI of the proposed project and the distance from the proposed project from the SPA, to see if a potential pathway for interaction exists between project impact mechanisms and the conservation features (*i.e.*, connectivity).

Table 2-7 below presents this assessment.

Table 2-7: Screening for Special Conservation Interests within SPAs.

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
Donegal Bay SPA (004151)	Great Northern Diver (<i>Gavia immer</i>) [A003]	Visual disturbance and above water noise disturbance	Proposed site is outside species foraging range.	No, due to no interaction
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]		Proposed site is outside species foraging range.	
	Common Scoter (<i>Melanitta nigra</i>) [A065]		Proposed site is outside species foraging range.	
	Sanderling (<i>Calidris alba</i>) [A144]		Proposed site is outside species foraging range.	
	Wetland and Waterbirds [A999]		No likely significant interaction predicted due to distance and lack of ecological connectivity.	
Horn Head to Fanad Head SPA (04194)	Fulmar (<i>Fulmarus glacialis</i>) [A009]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	No, due to no interaction
	Cormorant (<i>Phalacrocorax carbo</i>) [A017]		Potential interaction due to being a coastal bird	Yes, due to potential interaction
	Shag (<i>Phalacrocorax aristotelis</i>) [A018]		Potential interaction due to being a coastal bird	
	Barnacle Goose (<i>Branta leucopsis</i>) [A045]		No likely interaction with Ballyness Bay as this is a primarily terrestrial bird and primarily grazes on pastureland	No, due to no interaction
	Peregrine (<i>Falco peregrinus</i>) [A103]		Potential presence due to hunting prey over site but likely no interaction with aquaculture sites	
	Kittiwake (<i>Rissa tridactyla</i>) [A188]		No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	
	Guillemot (<i>Uria aalge</i>) [A199]		No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	
	Razorbill (<i>Alca torda</i>) [A200]		No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]		No likely interaction with Ballyness Bay as this is a terrestrial bird and primarily grazes on pastureland	
	Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]		Potential presence due to being a coastal bird but no interaction with aquaculture site due to being a terrestrial feeder.	
Falcarragh to Meenlaragh SPA (04149)	Corncrake (<i>Crex crex</i>) [A122]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a terrestrial bird.	No, due to no interaction

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
Derryveagh and Glendowan Mountains SPA (04039)	Red-throated Diver (<i>Gavia stellata</i>) [A001]	Visual disturbance and above water noise disturbance	Potential interaction with Ballyness Bay as this bird breeds on freshwater lakes but can forage on the coast.	Yes, due to potential interaction
	Merlin (<i>Falco columbarius</i>) [A098]		Potential presence due to hunting prey over site but likely no interaction with aquaculture sites.	No, due to no interaction
	Peregrine (<i>Falco peregrinus</i>) [A103]		Potential presence due to hunting prey over site but likely no interaction with aquaculture sites.	
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]		This bird breeds on uplands but could potentially visit coastal and estuary areas.	Yes, due to potential interaction
	Dunlin (<i>Calidris alpina schinzii</i>) [A466]		Potential interaction due to intertidal foraging.	
Greers Isle SPA (004082)	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	Visual disturbance and above water noise disturbance	Proposed site is outside species foraging range.	No, due to no interaction
	Common Gull (<i>Larus canus</i>) [A182]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
	Sandwich Tern (<i>Thalasseus sandvicensis</i>) [A863]		Proposed site is outside species foraging range.	No, due to no interaction
Illancrone and Inishkeeragh SPA (004132)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a primarily terrestrial bird and primarily grazes on pastureland	No, due to no interaction
	Common Tern (<i>Sterna hirundo</i>) [A193]		Proposed site is outside species foraging range.	No, due to no interaction
	Arctic Tern (<i>Sterna paradisaea</i>) [A194]		Proposed site is outside species foraging range.	Yes, due to potential interaction
	Little Tern (<i>Sterna albifrons</i>) [A195]		Proposed site is outside species foraging range.	No, due to no interaction
Inishbofin, Inishdooley and Inishbeg SPA (04083)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a primarily terrestrial bird and primarily grazes on pastureland	No, due to no interaction
	Corncrake (<i>Crex crex</i>) [A122]		No likely interaction with Ballyness Bay aquaculture sites as this is a terrestrial bird	

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Common Gull (<i>Larus canus</i>) [A182]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
	Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	
	Arctic Tern (<i>Sterna paradisaea</i>) [A194]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	
Inishkeel SPA (004116)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a primarily terrestrial bird and primarily grazes on pastureland	No, due to no interaction
Lough Fern SPA (004060)	Pochard (<i>Aythya ferina</i>) [A059]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay aquaculture sites as this diving duck primarily grazes freshwater habitats.	No, due to no interaction
	Wetland and Waterbirds [A999]		Proposed site is outside species foraging range.	
Lough Foyle SPA (004087)	Red-throated Diver (<i>Gavia stellata</i>) [A001]	Visual disturbance and above water noise disturbance	Proposed site is outside species foraging range.	No, due to no interaction
	Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]		Proposed site is outside species foraging range.	
	Bewick's Swan (<i>Cygnus columbianus bewickii</i>) [A037]		Proposed site is outside species foraging range.	
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]		Proposed site is outside species foraging range.	
	Greylag Goose (<i>Anser anser</i>) [A043]		Proposed site is outside species foraging range.	
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]		Proposed site is outside species foraging range.	
	Shelduck (<i>Tadorna tadorna</i>) [A048]		Proposed site is outside species foraging range.	
	Teal (<i>Anas crecca</i>) [A052]		Proposed site is outside species foraging range.	
	Mallard (<i>Anas platyrhynchos</i>) [A053]		Proposed site is outside species foraging range.	
	Eider (<i>Somateria mollissima</i>) [A063]		Proposed site is outside species foraging range.	
	Red-breasted Merganser (<i>Mergus serrator</i>) [A069]		Proposed site is outside species foraging range.	
	Oystercatcher (<i>Haematopus ostralegus</i>) [A130]		Proposed site is outside species foraging range.	

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]		Proposed site is outside species foraging range.	
	Lapwing (<i>Vanellus vanellus</i>) [A142]		Proposed site is outside species foraging range.	
	Knot (<i>Calidris canutus</i>) [A143]		Proposed site is outside species foraging range.	
	Dunlin (<i>Calidris alpina</i>) [A149]		Proposed site is outside species foraging range.	
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]		Proposed site is outside species foraging range.	
	Curlew (<i>Numenius arquata</i>) [A160]		Proposed site is outside species foraging range.	
	Redshank (<i>Tringa totanus</i>) [A162]		Proposed site is outside species foraging range.	
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]		Proposed site is outside species foraging range.	
	Common Gull (<i>Larus canus</i>) [A182]		Potential interaction due to being a coastal bird whose foraging range overlaps the proposed project	Yes, due to potential interaction
	Herring Gull (<i>Larus argentatus</i>) [A184]		Potential interaction due to being a coastal bird whose foraging range overlaps the proposed project	
	Wigeon (<i>Mareca penelope</i>) [A855]		Proposed site is outside species foraging range.	No, due to no interaction
	Wetland and Waterbirds [A999]		Proposed site is outside species foraging range.	
Lough Nillan Bog SPA (004110)	Merlin (<i>Falco columbarius</i>) [A098]	Visual disturbance and above water noise disturbance	Proposed site is outside species foraging range.	No, due to no interaction
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]		Proposed site is outside species foraging range.	
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]		Proposed site is outside species foraging range.	
	Dunlin (<i>Calidris alpina schinzii</i>) [A466]		Proposed site is outside species foraging range.	
Lough Swilly SPA (004075)	Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]	Visual disturbance and above water noise disturbance	Proposed site is outside species foraging range.	No, due to no interaction
	Grey Heron (<i>Ardea cinerea</i>) [A028]		Proposed site is outside species foraging range.	
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]		Proposed site is outside species foraging range.	
	Greylag Goose (<i>Anser anser</i>) [A043]		Proposed site is outside species foraging range.	
	Shelduck (<i>Tadorna tadorna</i>) [A048]		No likely interaction with Ballyness Bay as this is a primarily terrestrial bird and primarily grazes on pastureland	
	Teal (<i>Anas crecca</i>) [A052]		Proposed site is outside species foraging range.	
	Mallard (<i>Anas platyrhynchos</i>) [A053]		Proposed site is outside species foraging range.	

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Scaup (<i>Aythya marila</i>) [A062]		Proposed site is outside species foraging range.	
	Goldeneye (<i>Bucephala clangula</i>) [A067]		Proposed site is outside species foraging range.	
	Red-breasted Merganser (<i>Mergus serrator</i>) [A069]		Proposed site is outside species foraging range.	
	Coot (<i>Fulica atra</i>) [A125]		Proposed site is outside species foraging range.	
	Oystercatcher (<i>Haematopus ostralegus</i>) [A130]		Proposed site is outside species foraging range.	
	Knot (<i>Calidris canutus</i>) [A143]		Proposed site is outside species foraging range.	
	Dunlin (<i>Calidris alpina</i>) [A149]		Proposed site is outside species foraging range.	
	Curlew (<i>Numenius arquata</i>) [A160]		Proposed site is outside species foraging range.	
	Redshank (<i>Tringa totanus</i>) [A162]		Proposed site is outside species foraging range.	
	Greenshank (<i>Tringa nebularia</i>) [A164]		Proposed site is outside species foraging range.	
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]		Proposed site is outside species foraging range.	
	Common Gull (<i>Larus canus</i>) [A182]		Potential interaction due to being a coastal bird whose foraging range overlaps the proposed project	Yes, due to potential interaction
	Common Tern (<i>Sterna hirundo</i>) [A193]		Proposed site is outside species foraging range.	No, due to no interaction
	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]		No likely interaction with Ballyness Bay as this is a terrestrial bird and primarily grazes on pastureland	
	Wigeon (<i>Mareca penelope</i>) [A855]		Proposed site is outside species foraging range.	
	Shoveler (<i>Spatula clypeata</i>) [A857]		Proposed site is outside species foraging range.	
	Sandwich Tern (<i>Thalasseus sandvicensis</i>) [A863]		Proposed site is outside species foraging range.	
	Wetland and Waterbirds [A999]		Proposed site is outside species foraging range.	
Roaninish SPA (004121)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a terrestrial bird and primarily grazes on pastureland	No, due to no interaction
	Herring Gull (<i>Larus argentatus</i>) [A184]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
Sheskinmore Lough SPA	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a terrestrial bird and primarily grazes on pastureland	No, due to no interaction

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
(004090)				
Tory Island SPA (04073)	Fulmar (<i>Fulmarus glacialis</i>) [A009]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	No due to no interaction
	Corncrake (<i>Crex crex</i>) [A122]		No likely interaction with Ballyness Bay aquaculture sites as this is a terrestrial bird.	
	Razorbill (<i>Alca torda</i>) [A200]		No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	
	Puffin (<i>Fratercula arctica</i>) [A204]		No likely interaction with Ballyness Bay aquaculture sites as this is an oceanic bird	
Trawbreaga Bay SPA (004034)	Barnacle Goose (<i>Branta leucopsis</i>) [A045]	Visual disturbance and above water noise disturbance	Proposed site is outside species foraging range.	No due to no interaction
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]		Proposed site is outside species foraging range.	
	Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]		Proposed site is outside species foraging range.	
	Wetland and Waterbirds [A999]		Proposed site is outside species foraging range.	
West Donegal SPA (04150)	Shag (<i>Phalacrocorax aristotelis</i>) [A018]	Visual disturbance and above water noise disturbance	Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
	Peregrine (<i>Falco peregrinus</i>) [A103]		Potential presence due to hunting prey over site but likely no interaction with aquaculture sites	No due to no interaction
	Herring Gull (<i>Larus argentatus</i>) [A184]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
	Kittiwake (<i>Rissa tridactyla</i>) [A188]		No likely interaction with Ballyness Bay as this is an oceanic bird	No due to no interaction
	Razorbill (<i>Alca torda</i>) [A200]		No likely interaction with Ballyness Bay as this is an oceanic bird	No due to no interaction
	Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]		Potential presence due to being a coastal bird but no interaction with aquaculture site due to being a terrestrial feeder.	No due to no interaction

Site (code)	Special Conservation Interests (SCIs)	Impact Mechanisms	S-P-R Assessment	Brought to Stage 2 (Y/N)
	Cormorant (<i>Phalacrocorax carbo</i>) [A017]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
	Fulmar (<i>Fulmarus glacialis</i>) [A009]		No likely interaction with Ballyness Bay as this is an oceanic bird	No due to no interaction
West Donegal Islands SPA (04230)	Corncrake (<i>Crex crex</i>) [A122]	Visual disturbance and above water noise disturbance	No likely interaction with Ballyness Bay as this is a terrestrial bird.	No due to no interaction
	Common Gull (<i>Larus canus</i>) [A182]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	Yes, due to potential interaction
	Herring Gull (<i>Larus argentatus</i>) [A184]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	
	Shag (<i>Phalacrocorax aristotelis</i>) [A018]		Potential interaction due to being a coastal bird whose maximum foraging range overlaps the proposed project	
	Barnacle Goose (<i>Branta leucopsis</i>) [A045]		No likely interaction with Ballyness Bay as this is a terrestrial bird and primarily grazes on pastureland	No due to no interaction

2.7. Plans or projects that might act in combination

As outlined above, the obligation to undertake AA under the 2011 Birds and Natural Habitats Regulations derives from the Habitats Directive. Regulation 42(1) of the 2011 Regulations requires that:

*A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or **in combination with other plans or projects** is likely to have a significant effect on the European site.*

It is therefore required that the potential impacts of the proposed Project be considered in combination with other relevant plans or projects. Given the nature of the proposed activities associated with the Project, the potential project impact mechanisms (or sources of impact) are:

1. Physical disturbance and habitat loss
2. Visual disturbance and above water noise disturbance
3. Organic enrichment/sedimentation
4. Pest and disease risk
5. Introduction of non-native species
6. Physical disturbance

The assessment of potential in combination effects considers other plans and projects that may result in significant effects to QIs and SCIs of SACs and SPAs. To inform the assessment of potential in combination effects a review of consent applications for projects in the vicinity of the proposed Project included on the following websites was completed in November 2023 and reviewed in March 2026:

- DHPLG - EIA Portal¹¹
- Donegal County Council - Planning System¹²
- DHLGH – Foreshore Applications¹³
- Aquaculture Information Management System (AQUAMIS) by DAFM¹⁴
- Irelands Marine Atlas¹⁵ & Local angling association¹⁶
- ALAB – Aquaculture Licences Appeals Board¹⁷
- MARA – Maritime Area Regulatory Authority¹⁸

Screening assessments of potential in combination effects from current and proposed projects listed on above websites are summarised in **Table 2-8**.

Plans

A review of national plans within the maritime environment that may interact with the proposed aquaculture operations was investigated. These are listed below and assessed in Stage 2 of the AA (NIS).

- The Climate Action Plan 2025
- River Basin Management Plans 2022-2027
- Donegal County Development Plan 2024-2030
- National Biodiversity Action Plan 2023-2030

Pollution

The previous appropriate assessment carried out for Ballyness Bay noted that there are a number of activities which are terrestrial in origin that might result in effects on the conservation features of the Ballyness Bay SAC. Primary among these are point source discharges from domestic sewage outfalls distributed along the harbour and municipal urban waste-water treatment plants. The pressure derived from these point sources may impact upon levels of dissolved nutrients, suspended solids and some elemental components *e.g.*, aluminium in the case of water treatment facilities. Pressures resulting from aquaculture activities are primarily a disturbance to sediments because of compaction of sediment along access routes and preparation of sites and harvest of clam sites. The report concluded that therefore, given the pressure resulting from point discharge locations such as, the urban waste-water treatment and/or combined sewer outfalls would likely impact on physico-chemical parameters in the water column, any in combination effects with aquaculture activities are considered to be minimal and not-significant.

In summary, the assessments presented in **Table 2-8** conclude that there is potential likelihood for significant effects caused by in combination effects due to the other proposed aquaculture sites within Ballyness Bay SAC. Therefore, these projects will be brought in for Stage 2 of this report.

Table 2-8: Assessment of potential in combination effects.

Website	Project Details	File Reference	Date Application Received	Assessment of Potential In-Combination Effects	Conclusion
DHPLG - EIA Portal	A search of the DHPLG EIA Portal was undertaken to examine projects with potential for in combination effects.	2021034	19/2/2021	Though a 25-year permission for extraction and blasting of rock and screening plant occurs near the vicinity of Falcarragh, due to the distance and mitigation in place for the rock works it was determined that there was no potential for significant cumulative or in combination effects to occur with the proposed Project.	No potential significant in-combination effects
Donegal County Council - Planning System	A search of the Donegal planning databases was undertaken to examine projects with potential for in combination effects.	-	-	Applications made typically to Donegal County Council and published on the planning database for the areas of Falcarragh and Magheraroarty for the past 3 years, consisted of extensions and renovations to existing houses, and retention of existing developments. These are small-scale terrestrial developments which do not have the potential to result in cumulative effects in combination with the proposed Project.	No potential significant in combination effects
DHLGH – Foreshore Applications	A search of the DHLGH Foreshore applications was undertaken to examine projects with potential for in combination effects.	-	-	No foreshore applications were noted within a ZOI for the Ballyness Bay project sites.	No potential significant in combination effects.
AQUAMIS & Irelands Marine Atlas	Fisheries or other aquaculture activities	T12-093-3	-	A review of Irelands Marine Atlas shows are no known current inshore fisheries or applications for fisheries in Ballyness Bay SAC. One licenced fishery for Atlantic salmon was noted approx. 7km upstream from Ballyness Bay SAC in the Tullaghobegly river near Lough Altan. Due to the distance upstream, there is unlikely to be any in combination effects from this activity.	No potential significant in combination effects.
Local Angling website	Local fishing activities	-	-	There is a local angling association that promotes solely the fishing of sea trout in Ballyness Bay during 2nd Feb - 12th Oct. Guidance on their website suggests the east side of the bay for the best location for fishing, this shares very little overlap with the sites granted by the Minister for Agriculture, Food and the Marine. On this basis, there are not likely to be any in combination impacts between the fishing activity and aquaculture activities.	No potential significant in combination effects.

Website	Project Details	File Reference	Date Application Received	Assessment of Potential In-Combination Effects	Conclusion
Aquaculture Licences Appeals Board	A search of the ALAB website was conducted to examine any projects in the appeals system with potential for in combination effects.	-	-	The original application for shellfish aquaculture in Ballyness Bay was for 20 sites with only 18 subsequently sent forward for planning. Only the 10 remitted appeal sites listed in Table 1-1 are included in the in-combination aquaculture assessment. Other previously identified aquaculture sites have had their determinations/licence decisions quashed and are not authorised or operational; they are therefore not existing or reasonably foreseeable projects capable of acting in combination with the proposed development. Future proposals for those sites would require separate Article 6(3) assessment. The 10 remitted appeal sites are assessed together because, if licensed, they may act cumulatively through shared habitat, enrichment and disturbance pathways within Ballyness Bay.	As a result of the potential licencing of multiple aquaculture sites in Ballyness Bay, these projects will have to be taken to stage 2 for further assessment of in combination effects.
Maritime Area Regulatory Authority	A search of the MARA website was conducted to examine any projects in the application system with potential for in combination effects.	MUL230038	24/01/2025	Survey works related to this application are undertaken at high tide. The works are temporary and will not result in continuous effects due to the brief duration specified in the application. On this basis, there are not likely to be any in combination impacts between the MARA application and aquaculture activities.	No potential significant in combination effects.

2.8. Screening Outcome

The assessment has determined, in light of best available scientific data, that there is potential for significant effects on conservation features of SACs and SPAs resulting from the Project, *i.e.*, the likelihood of significant effects on the screened in conservation features in the absence of mitigation has not been ruled out. Therefore, it is recommended that this Project be brought forward to Stage 2 (Natura Impact Statement). The assessment also determined that there is a potential likelihood for significant effects from the Project in combination with other plans or projects. The findings of the assessment are summarised in **Table 2-9**.

Table 2-9: Summary of Screening for AA Outcome.

AA Screening outcome	
Brief description of the Project.	The objective of the Project is to establish several aquaculture sites within Ballyness Bay, Co. Donegal, see Figure 1-1 and Table 1-1 . These aim to cultivate Pacific oysters (<i>Crassostrea gigas</i>) using bags and trestles on the inter-tidal foreshore for 9 of the 10 sites and Manila clams (<i>Ruditapes philippinarum</i>) on wooden trays under mesh on the inter-tidal/sub-tidal foreshore for 3 of the 10 sites. The licences have a duration of 10 years.
European site(s)	
List of the European site(s) in the Zone of Influence.	The conservation features of the following SACs and SPAs are listed in Table 2-2 and Table 2-5 alongside conservation objectives. SACs • Ballyness Bay SAC (001090) • Horn Head and Rinclevan SAC (000147) • Gweedore Bay and Islands SAC (001141) • Tory Island Coast SAC (002259) • Cloghernagore Bog and Glenveagh National Park SAC (02047) • Sheephaven SAC (001190) • Muckish Mountain SAC (001179) • Sessiagh Lough SAC (000185) • Fawnboy Bog/Lough Nacung SAC (000140) • Tranarossan and Melmore Lough SAC (000194) SPAs • Donegal Bay SPA (004151) • Horn Head to Fanad Head SPA (04194) • Falcarragh to Meenlaragh SPA Site code: (04149) • Derryveagh and Glendowan Mountains SPA (04039) • Greers Isle SPA (004082) • Illancrone and Inishkeeragh SPA (004132)

	• Inishbofin, Inishdooley and Inishbeg SPA (04083) • Inishkeel SPA (004116) • Lough Fern SPA (004060) • Lough Foyle SPA (004087) • Lough Nillan Bog SPA (004110) • Lough Swilly SPA (004075) • Roaninish SPA (site code 004121) • Sheskinmore Lough SPA (site code 004090) • Tory Island SPA (04073) • West Donegal SPA (04150) • Trawbreaga Bay SPA (site code 004034) • West Donegal Islands SPA (04230)
Assessment summary	
Description of the potential impact mechanisms from the Project that have likely significant effects on the conservation features.	All potential impact mechanisms are detailed in Section 2.4. Here follows the impact mechanisms for which likely significant effects have been identified: 1. Physical disturbance and habitat loss 2. Visual disturbance and above-water noise disturbance 3. Organic enrichment/sedimentation & current alteration 4. Pest and disease risk 5. Introduction of non-native species 6. Physical disturbance
Conservation features with the potential to be impacted by the Project.	• Tidal Mudflats and Sandflats [1140] • Fixed Dunes (Grey Dunes) [2130] • Grey seal (<i>Halichoerus grypus</i>) [1364] • Otter (<i>Lutra lutra</i>) [1355] • Cormorant (<i>Phalacrocorax carbo</i>) [A017] • Shag (<i>Phalacrocorax aristotelis</i>) [A018] • Common Gull (<i>Larus canus</i>) [A182] • Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] • Arctic Tern (<i>Sterna paradisaea</i>) [A194] • Herring Gull (<i>Larus argentatus</i>) [A184] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Dunlin (<i>Calidris alpina schinzii</i>) [A466] • Red-throated Diver (<i>Gavia stellata</i>) [A001] • Atlantic Salmon (<i>Salmo salar</i>) [1106]

Description of the potential direct or indirect impacts of the Project in combination with other plans or projects on the European sites.	A search of several planning websites was conducted to assess for any potential in combination or cumulative effects on any European sites, this can be seen in Section 2.7 . As a result of the potential licencing of multiple aquaculture sites in Ballyness Bay SAC, these projects will have to be taken to stage 2 for further assessment of in combination effects.
Conservation features with the potential to be impacted by the Project in combination with other plans or projects.	• Tidal Mudflats and Sandflats [1140] • Fixed Dunes (Grey Dunes) [2130] • Grey seal (<i>Halichoerus grypus</i>) [1364] • Otter (<i>Lutra lutra</i>) [1355] • Cormorant (<i>Phalacrocorax carbo</i>) [A017] • Shag (<i>Phalacrocorax aristotelis</i>) [A018] • Common Gull (<i>Larus canus</i>) [A182] • Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] • Arctic Tern (<i>Sterna paradisaea</i>) [A194] • Herring Gull (<i>Larus argentatus</i>) [A184] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Dunlin (<i>Calidris alpina schinzii</i>) [A466] • Red-throated Diver (<i>Gavia stellata</i>) [A001] • Atlantic Salmon (<i>Salmo salar</i>) [1106]
Concluding statement.	It is concluded that there is a potential pathway between the Project potential impact mechanisms, alone or in combination with other plans or projects, and the conservation features of European sites. The assessment is presented in full in section 2.6 and section 2.7 .

3. Stage 2: Natura Impact Statement

3.1. Overview

Stage 2 of the Appropriate Assessment process considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project will be required to submit a Natura Impact Statement (NIS), that examines the plan or project and the relevant European sites, to identify and characterise any possible implications for the site in view of the site's conservation objectives, taking account of in combination effects. This should provide information to enable the competent authority to carry out the appropriate assessment. If the assessment is negative, *i.e.*, adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 3, or the plan or project should be abandoned.

Regarding the European sites and their associated conservation features identified in the Zol of the Project, which were not excluded in Stage 1, an AA is required to identify the impacts associated with the Project that may have a significant adverse impact. A summary of the screening outcome from the Stage 1 AA Screening can be found in **Table 2-9**.

A full description of the project and the receiving environment can be found in **Section 2**.

This NIS gives a more detailed ecological assessment of European sites and their associated conservation features, considering *inter alia* site-specific or activity-specific data. In preparation of this NIS, the NPWS-DELGH (2009; revised 2010)/NPWS-DAHG (2012) guidance document on marine NIS in SACs was used as described below:

The assessment of impacts for **Annex I Habitats** needs to:

- consider the principle ecological components or broad community types of Annex I Habitats.
- consider the extent to which Annex I Habitats vary under natural conditions when assessing the likely significance of impact mechanisms.
- consider the degree to which Annex I Habitats are impacted by specific impact mechanisms (consider habitat attributes and their resident species) in terms of degree of change and recoverability.
- understand the likely resistance and resilience of Annex I Habitats to the impact mechanisms.
- carefully consider the physical, chemical, and biological nature of Annex I Habitats.

The assessment of impacts on **Annex II Species** needs to:

- consider many aspects of the likely impact and its effects on individuals and or population of Annex II species at sites and to their likely habitats.
- ensure that the assessment approach focuses on direct effects (*e.g.*, physical harm, detrimental changes to or interference with natural behaviour) and indirect effects (*e.g.*, changes in prey distribution and habitat use) to ensure a comprehensive approach.

In line with NPWS-DEHLG (2009; revised 2010) guidance, the Stage 2 AA consists of three main steps:

1. **Impact Prediction** - where the likely impacts of the Project are examined. A source-pathway-receptor model has been used to assess potential for impact.
2. **Assessment of Effects** – where the effects of the Project are assessed as to whether they have any adverse effects on the integrity of European Sites as defined by conservation objectives.
3. **Mitigation Measures** – where mitigation measures are identified to ameliorate any adverse effects on the integrity of any European Site.

3.2. Impact prediction

As described in **Section 1.1**, the impact mechanisms associated with the proposed project that may result in effects to Qualifying Interests of SACs, and to Special Conservation Interests of SPAs are:

1. Physical disturbance and habitat loss
2. Visual disturbance and above-water noise disturbance
3. Organic enrichment/sedimentation & current alteration
4. Pest and disease risk
5. Introduction of non-native species
6. Physical disturbance

The following sections considers the risk of potential effects to associated with Impact Mechanism 1 through 6. The prediction of potential impact to QI and to SCI from project impact mechanisms took into account the negative impacting threats and pressures and positive impacting activities/management affecting the sites as listed in Natura 2000 Forms compiled for the sites.

Table 3-1 below summarises the conservation features screened in for Stage 2 assessment. These features are assessed further below in relation to the relevant impact mechanisms and, where applicable, the conservation objectives of the European sites for which they are QIs or SCIs.

Table 3-1: Conservation features screened in for Stage 2 assessment.

Ecological Group	Conservation Feature	Impact Mechanism					6. Physical disturbance
		1. Physical disturbance and Habitat loss	2. Visual disturbance and above water noise disturbance	3. Organic enrichment/ sedimentation & Current alteration	4. Pest and disease risk	5. Introduction of non-native species	
Annex I marine habitats	Tidal Mudflats and Sandflats [1140]	Potential Direct Effect		Potential Direct effect		Potential Indirect effect	
Annex I coastal habitats	Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)	Potential Direct Effect					
Annex II marine mammals and other species	Grey Seal (<i>Halichoerus grypus</i>) [1364]		Potential Direct Effect		Potential Indirect Effect		
Other Annex II species	Otter (<i>Lutra lutra</i>) [1355]		Potential Direct Effect		Potential Indirect Effect		
	Atlantic Salmon (<i>Salmo salar</i>) [1106]				Potential Indirect Effect		Potential Direct Effects
Annex I/II & III seabird species	Cormorant (<i>Phalacrocorax carbo</i>) [A017]		Potential Direct Effect				
	Shag (<i>Phalacrocorax aristotelis</i>) [A018]		Potential Direct Effect				

Ecological Group	Conservation Feature	Impact Mechanism					6. Physical disturbance
		1. Physical disturbance and Habitat loss	2. Visual disturbance and above water noise disturbance	3. Organic enrichment/ sedimentation & Current alteration	4. Pest and disease risk	5. Introduction of non-native species	
	Common Gull (<i>Larus canus</i>) [A182]		Potential Direct Effect				
	Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]		Potential Direct Effect				
	Arctic Tern (<i>Sterna paradisaea</i>) [A194]		Potential Direct Effect				
	Herring Gull (<i>Larus argentatus</i>) [A184]		Potential Direct Effect				
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]		Potential Direct Effect				
	Dunlin (<i>Calidris alpina schinzii</i>) [A466]		Potential Direct Effect				
	Red-throated Diver (<i>Gavia stellata</i>) [A001]		Potential Direct Effect				

3.2.1. Impact Mechanism 1 – Physical disturbance and habitat loss

3.2.1.1. Potential impacts – Qualifying Interests of Annex I Habitats

Physical disturbance and habitat loss can be caused by aquaculture structures and activities. Trestles and bags used in oyster cultivation and wooden trays used in clam cultivation have the ability to disturb the benthic habitats. Activities such as harvesting associated with the Project also have the ability to disturb the benthic habitats. Secondary activities such as servicing, vehicles on shore, human traffic and access routes, can cause an increased risk of sediment compaction resulting in sediment changes and associated community (infaunal and epifaunal) changes. These activities can cause burrowing organisms to die due to crushing impacts, smothering from the sedimentation or the inability of siphons being able to reach the surface.

Also shading may be an issue as a consequence of the structures associated with intertidal oyster culture. The trestles and bags are held relatively close to the seabed and as a consequence may shade sensitive species (*e.g.*, seagrasses) found underneath.

3.2.1.2. Assessment

The screening exercise highlighted two Annex I habitats listed as conservation features in Ballyness Bay SAC that would be required for further assessment in Stage 2 due to their overlap with aquaculture activities and potential to be impacted by physical disturbance and habitat loss. These are 'Mudflats and sandflats not covered by seawater at low tide (1140)' and 'Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)'.

The revised access route, as recommended by the DAFM, has been incorporated into the proposed Project and is the route intended to be used if the licences are granted. As a result, there is no spatial overlap with Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130). In the absence of any direct or indirect pathways for impact, no adverse effects on the integrity of this Annex I habitat are predicted.

NPWS (2014c) provides guidance on interpretation of the Conservation Objectives which are, in effect, management targets for habitats and species in the SAC. This guidance is scaled relative to the anticipated sensitivity of habitats and species to disturbance by the proposed activities. In this guidance, an allowable 15% overlap threshold for the interaction between a disturbing activity and a habitat is set out for the management of broad sedimentary communities. Anything under this is not deemed to be significant and therefore does not breach the conservation objective. Disturbance is defined as that which leads to a change in the characterising species of the habitat (which may also indicate change in structure and function). Such disturbance may be temporary or persistent in the sense that change in characterising species may recover to pre-disturbed state or may persist and accumulate over time.

A report carried out by the Marine Institute in 2019¹⁰ looked at the overlap between the two types of communities present in the QI 'Mudflats and sandflats not covered by seawater at low tide' and the original proposed 20 sites. For Coarse sediment to sandy mud with oligochaetes and polychaetes community complex, their findings showed an overlap of 3.77% with oyster sites, a 0.28% overlap oyster and clam sites, no overlap with clam sites and a 1.2% overlap with the proposed access route. Given that activities occurring at trestle culture sites are not considered disturbing according to a study carried out by Forde *et al.* (2015), the overlap with the trestles would not be considered a significant disturbance and therefore the overall figure was estimated to be 1.48%, below the spatial overlap threshold (15%) for significant adverse impacts of on this community type. Also given the reduction of potential sites due to the 2 withdrawals before submission, the 3 sites not granted by the Minister for Agriculture, Food and the Marine and 2 sites changing from oyster and clam cultivation to exclusively oyster cultivation we can expect this percentage to be reduced even further.

For the Mobile sand community complex, the Marine Institute findings showed an overlap of 5.1% with oyster sites, a 1.37% overlap oyster and clam sites, a 1.6% overlap with clam sites and a 0.59% overlap with the proposed access route. Activities occurring at trestle culture sites on this type of habitat are unknown; however, many features are consistent with the community types described by Forde *et al.* (2015), therefore it is unknown if the overlap with the trestles would be considered a significant disturbance. Therefore, if we use a precautionary approach, the overall figure was estimated to be 8.75%, below the spatial overlap threshold (15%) for significant adverse impacts of on this community type. Also again, given the reduction of potential sites we can expect this percentage to be reduced even further. Based upon the scale of spatial overlap of proposed intertidal aquaculture activities, the relatively high tolerance levels of the habitats and associated species, and the fact that the sensitivity threshold of the habitat is not being surpassed, it is concluded that the proposed intertidal culture activities are non-disturbing to the QI Mudflats and sandflats not covered by seawater at low tide and its community types.

Shading is considered not to be an issue at these aquaculture sites, as the species characterising the benthic habitats under the cultivation structures are not shade sensitive species. Therefore, no mitigation is required in this regard.

3.2.2. Impact Mechanism 1 - Mitigation measures

The use of the alternative access route from the south of the site avoids interaction with the fixed dune habitat, which is already in a degraded condition. This approach prevents additional pressures that could otherwise exacerbate existing impacts on the habitat.

The assessment concludes that considering the sensitivity rational threshold set out at 15% overlap between disturbing activity and broad community structures, the QI 'Mudflats and sandflats not covered by seawater at low tide' does not reach this threshold, however best practice measures set out by BIM, IFA and the MI¹⁹

are to be adhered to when harvesting and over servicing activities to minimise any impact to the habitats listed above.

This represents total aquaculture access related coverage of 0.81% of the Qualifying Interest 1140 and 0.74% of the Mobile Sand Community Complex. Taking account of these revised values and habitat utilisation by the aquaculture sites themselves, the total spatial overlap will still be below the threshold for disturbance of 15%.

3.2.3. Impact Mechanism 1 - Conclusion

It is concluded that the impact mechanism of habitat disturbance will not result in significant negative effects on conservation features of European sites with the appropriate mitigation adhered to.

3.2.4. Impact Mechanism 2 – Visual disturbance and above water noise disturbance

3.2.4.1. Potential impacts – Qualifying Interests Annex II marine mammal species

Aquaculture activities have the potential to cause a disturbance to marine mammals, otters and seabirds in the area due to the location of the activities associated with cultivation of the shellfish such as installing the structures and harvesting. Secondary activities such as servicing, vehicles on shore, human and vehicle traffic on access routes have the potential to cause a disturbance to these species.

Interactions between the proposed aquaculture activities and the following Annex II species that are listed as conservation features in nearby European sites, grey seal (*Halichoerus grypus*) and otter (*Lutra lutra*), are considered likely. Interactions between species of seabirds associated with coastal habitats that are listed as SCIs in nearby European sites are also assessed.

3.2.4.2. Assessment

The Horn Head and Rinclevan SAC is designated for the grey seal (*Halichoerus grypus*). Restriction of suitable habitats and levels of disturbance are important pressures that must be considered to ensure the maintenance of favourable conservation status of the grey seal and implies that the seals must be able to move freely within the site and to access locations considered important to the maintenance of a healthy population. The sites covered under this NIS are located to on the west and south-east side of the bay. All of the proposed aquaculture production activities within Ballyness Bay SAC are > 10 km from the documented breeding, moulting and resting sites of the grey seal in the Horn Head and Rinclevan SAC and therefore, are unlikely to impact on the attributes relating to the site. Sightings by locals report a potential haul out area for seal species, given that both the harbour seal and grey seal have both been sighted in Ballyness Bay according to data held by NBDC, both species are known to be present. The observed seal haul out site is towards the northeast of the bay (**Figure 2-7**) and is not the same sandbank as any of the locations of the sites listed in **Table 1-1**. The sites investigated under this NIS are separated by a tidal channel from the haul out site.

To date, little research has been undertaken to assess the impacts of aquaculture operations on seal species (National Research Council, 2009; Marine Institute, 2019); however, a considerable body of research has focused on short-term responses of seal to recreational boaters (Johnson & Acevedo-Gutierrez, 2007; Lelli & Harris, 2001; Lewis & Mathews, 2000) and commercial shipping (Jansen *et al.*, 2006). This research has focused on seals at haul-out locations. Seal responses to disturbance can vary widely depending on the location and nature of the disturbance from increased alertness to movement towards the water and entering the water.

Previous guidance given by the Marine Institute suggests maintaining a buffer of 200 m between aquaculture activities and seals.

Common seals are likely to use the area in a similar manner to grey seals and have also been sighted in the haul out area according to sightings submitted to the NBDC and therefore, are subject to the same assessment and guidance as given here for the grey seal.

Otters are listed as conservation features of both the Cloghernagore Bog and Glenveagh National Park SAC and the Gweedore Bay and Islands SAC. Aquaculture activities are most likely to be carried out in daylight hours. Given that otter foraging is primarily done during early morning and late evening/nighttime, interaction with otter during operations is likely to be minimal. In addition, otters are also quite tolerant of human disturbance and are often recorded in urban areas, so this impact is unlikely to be significant.

3.2.4.3. Potential impacts – Special Conservation Interests bird species

In this assessment nine SCIs from SPAs within the ZOI were screened in for further assessment either due to their foraging, roosting or nesting behaviours. These nine species are Cormorant (*Phalacrocorax carbo*), Shag (*Phalacrocorax aristotelis*), Common Gull (*Larus canus*), Lesser Black-backed Gull (*Larus fuscus*), Arctic Tern (*Sterna paradisaea*), Herring Gull (*Larus argentatus*), Golden Plover (*Pluvialis apricaria*), Dunlin (*Calidris alpina schinzii*) and Red-throated Diver (*Gavia stellata*).

Potential disturbance effects on bird species could arise from the following:

- from avoidance of the farm structures and associated activities, and
- from impacts on foraging.

In general, birds seem to use artificial structures as roosting sites when they prove suitable. Birds will avoid artificial structures when they interfere with specific habitat requirements such as flight paths or maintaining open views to detect predators.

If the licenced area coincides with suitable foraging areas, the farming operation may directly and indirectly effect bird foraging success. For instance, the farm structures may act as a fish aggregation device or artificial reef thereby increasing bird prey availability. Bird foraging success may also be positively affected through the provision of resting/roosting locations and/or the creation of sheltered waters in the lee of structures. In

addition, there is potential that organic enrichment of benthic habitats at the site may indirectly affect the foraging behaviour of bird species by effecting benthic and demersal prey.

In 2001, a study carried out by Hilgerloh *et al.*, suggested that the oyster structures did not affect feeding behaviour of seabirds in a sheltered Irish estuary. The study focused on two nearby sites, one with no aquaculture site and the other with. The six species with most data that utilised the trestle area and the structures did not appear to have an effect on their behaviour. The usage of the areas differed between the species with wader species mostly feeding in both areas, outside and inside the trestle area. In contrast, the gull species were mostly loafing both outside and inside the trestle area. However, the percentage of birds feeding did not differ between the two areas.

The sites may also cause removal of feeding areas for intertidal bird species.

Assessment Methodology

A risk assessment²⁰ to examine the potential impacts on SCIs of SPAs has been carried using criteria for the following:

- species risk of disturbance (**Table 3-2**),
- species population sensitivity (**Table 3-3**),
- licenced area habitat suitability (**Table 3-4**),
- species habitat flexibility (**Table 3-5**), and
- The significance of risk (**Table 3-6**).

Risk of disturbance

The greatest potential impact from human activity will be associated with harvesting and maintenance activities around the sites. The sensitivity of various high conservation value species to such impacts will vary.

A disturbance scale developed by Garthe & Hüppop (2004) and Furness *et al.* (2012, 2013) rated the potential vulnerability of seabirds to disturbance on a scale of 1–5, with 1 representing hardly any escape/avoidance behaviour and/or non/very low fleeing distance and 5 representing strong escape/avoidance behaviour and/or large fleeing distance. Using the disturbance scale, relevant bird species are assigned to disturbance categories in **Table 3-2**.

Table 3-2: Disturbance risk categories of the listed bird species (*sensu* Furness *et al.*, 2013).

Bird species	Disturbance Category
Arctic tern (<i>Sterna paradisaea</i>)	2
Common Gull (<i>Larus canus</i>)	2
Cormorant (<i>Phalacrocorax carbo</i>)	4
Dunlin (<i>Calidris alpina schinzii</i>) ²¹	3
Golden Plover (<i>Pluvialis apricaria</i>) ²¹	5
Herring Gull (<i>Larus argentatus</i>)	2
Lesser Black-backed Gull (<i>Larus fuscus</i>)	2
Red-throated Diver (<i>Gavia stellata</i>)	5
Shag (<i>Phalacrocorax aristotelis</i>)	3

Species Population Sensitivity

The determination of the sensitivity of species population takes into account the following:

- Tolerance to change: the species' ability to accommodate temporary and permanent change.
- Recoverability: the ability of the receptor to return to its natural state following cessation of an effect.
- Adaptability: the ability of a receptor to avoid or adapt to an effect.
- Value: a measure of the receptor's importance, rarity and worth.

In general, populations with very poor conservation status including species on the BoCCI red list have little capacity to tolerate change and recover following an impact. In contrast, populations that are not of conservation concern typically exhibit capacity to absorb impacts (**Table 3-3**).

Table 3-3: Sensitivity criteria.

Sensitivity	Definition
High	Receptor population has a very limited or no tolerance of effect. <i>e.g.</i> , likely to have no capacity to absorb change, a population level effect very likely to occur. Likely to be limited to populations with poor or very poor existing conservation status - BoCCI Red List
Medium	Receptor population has limited tolerance of effect. <i>e.g.</i> , very minor capacity to absorb change, so a population effect possible. Likely to include but not be limited to populations with poor existing conservation status - BoCCI Amber List
Low	Receptor population has some tolerance of effect. <i>e.g.</i> , likely to have minor capacity to absorb additional mortality or reduction in productivity or habitat loss, so a population level effect unlikely - BoCCI Green List
Negligible	Receptor population generally tolerant of effect. <i>e.g.</i> , likely to have moderate capacity to absorb additional mortality or reduction in productivity or habitat loss, so a population effect very unlikely.

Licensed Area Habitat Suitability

The habitat suitability of the licensed sites are coded as follows:

1. habitat conditions include specific features (substrate type, upwellings, *etc.*) identified as being important for the species,
2. habitat conditions generally suitable (*e.g.*, within depth range) but lack specific features identified as being important for the species,

3. habitat conditions include some features identified as unsuitable in some studies, and
4. habitat conditions generally unsuitable.

Habitat preference follows that identified for the species in Furness *et al.* (2012, 2013) (**Table 3-4**).

Table 3-4: Habitat Suitability.

Bird species	Species Habitat Preference	Suitability Score
Arctic tern (<i>Sterna paradisaea</i>)	Found in a range of habitats in coastal areas where it preys on small fish or marine crustaceans. Arctic terns dive to the surface of the water to catch prey close to the surface.	2
Common Gull (<i>Larus canus</i>)	Like most gulls, they are omnivores and will scavenge as well as hunt small prey. Frequently found around ships in inshore areas. Feeds on shoaling fish, in the intertidal.	2
Cormorant (<i>Phalacrocorax carbo</i>)	Feeds in coastal waters on fish caught through diving.	2
Dunlin (<i>Calidris alpina schinzii</i>)	Breeds upland on the ground in sparse, low vegetation, favouring machair habitats. Wintering dunlins are widely distributed throughout the coastlines of Ireland. Feeds mainly on invertebrates and insects may chiefly be eaten during the breeding season and marine invertebrates during the nonbreeding season.	2
Golden Plover (<i>Pluvialis apricaria</i>)	Tends to gather in large flocks and winter in open areas, agricultural plains, ploughed land, and short meadow. Birds forage on fields, beaches and tidal flats. Diet predominately consists of insects and crustaceans.	2
Herring Gull (<i>Larus argentatus</i>)	Forages around ship in inshore areas, on shoaling fish, in the intertidal, in agricultural areas, on refuse and in streets.	2
Lesser Black-backed Gull (<i>Larus fuscus</i>)	Feed in a range of habitats in coastal areas, and in agricultural areas, and extensive use is made of refuse tips and other sources of human waste. This species is an omnivorous, opportunistic feeder that forages extensively at sea.	2
Red-throated Diver (<i>Gavia stellata</i>)	During the winter, they are well distributed around the Irish coastline and are typically associated with shallow sandy bays. They normally breed on small freshwater loughs and the nests are typically a scrape lined with aquatic vegetation and constructed close to or on the water's edge.	2
Shag (<i>Phalacrocorax aristotelis</i>)	Found in open marine waters and feed by diving in the water column. They eat a wide range of fish however their most common prey is the sand eel. Shag is one of the deepest divers among the cormorant family.	3

Species Habitat Flexibility

The habitat use flexibility scores are based on Garthe & Hüppop (2004) and Furness *et al.* (2012, 2013). The score value ranges from 1 to 5 with 1 indicating species is very flexible in habitat use and to 5 indicating the species is reliant on specific habitat characteristics. Species that are coded low occupy large sea areas with no specific habitat preferences while species that are coded high rely on specific habitat features (**Table 3-5**).

Table 3-5: Habitat flexibility scores (*sensu* Furness *et al.*, 2013).

Bird species	Flexibility scores
Arctic tern (<i>Sterna paradisaea</i>)	3
Common Gull (<i>Larus canus</i>)	2
Cormorant (<i>Phalacrocorax carbo</i>)	3
Dunlin (<i>Calidris alpina schinzii</i>)	N/A
Golden Plover (<i>Pluvialis apricaria</i>)	3
Herring Gull (<i>Larus argentatus</i>)	1
Lesser Black-backed Gull (<i>Larus fuscus</i>)	2
Red-throated Diver (<i>Gavia stellata</i>)	4
Shag (<i>Phalacrocorax aristotelis</i>)	3

Assessment of the significance of the effects

Each degree of significance of effect is designated in **Table 3-6**, and it is determined by combining the character of the predicted effect (which includes Disturbance, Licenced Area Habitat Suitability and Habitat Flexibility Scores) and the sensitivity of the receiving environment/species (which includes Species Population Sensitivity).

Table 3-6: Significance of effects.

Significance of effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very significant	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Profound effects	An impact which obliterates sensitive characters.

The assessment of significant effects for the selected bird species can be seen in **Table 3-7**.

Examination of the significance of effects based on assessment criteria resulted in slight effects on the cormorant and red throated diver and not significant effects on the shag. Although they range as medium to high sensitivity to disturbance in **Table 3-2**, these three species are unlikely to be near the aquaculture sites

during low tide when most aquaculture activities take place due to the shallow nature of the bay and their diving foraging behaviour. Also, this metric for disturbance was created using boat and helicopter noise, the noise from vehicles used in aquaculture activities is unlikely to impact them in the same way.

Examination of the significance of effects based on assessment criteria resulted in imperceptible effects to the common gull, herring gull and lesser black-backed gull and not significant effect to the arctic tern. While it is acknowledged that activity at trestle sites may act to disturb the natural foraging behaviour and distribution of these species, it should be noted that shellfish culture operations at intertidal trestles are carried out in daylight hours and typically on the lowest tidal cycle of the month during which time trestles are exposed and accessible by farmers. All four species show low sensitivities to disturbance and medium to high flexibility scores, so while they are likely to disperse from close to the activities during activities, considering the limited spatial extent of the sites relative to the greater intertidal area at Ballyness Bay available to the species for foraging, this will not result in significant negative effects.

The dunlin was assessed under Goodship & Furness (2022), to have a medium sensitivity to disturbance. The dunlin is not assessed in the papers by Garthe & Hüppop (2004) and Furness *et al.* (2012, 2013) so it has been assigned a score of 3 (medium) for sensitivity to disturbance and a score of 2 for habitat suitability based on information gathered from the 2022 study. The golden plover was assigned a medium sensitivity score in the Goodship & Furness (2022) study, but a 5 in the Furness *et al.*, 2013 paper so it was assigned the maximum score to be cautious. Both of these species are SCIs listed for the Derryveagh and Glendowan Mountains SPA, 7 km away from Ballyness Bay, and they are both known to breed in upland areas. So, while they may have the potential to forage in Ballyness Bay and experience slight disturbance if present during aquaculture activities, this will only cause a minor disturbance and is not considered significant on the protected populations.

The significance of effects for the assessed bird species is considered to have imperceptible, not significant or potential slight effects, therefore the likelihood of significant disturbance impacts occurring is remote. Consequently, it is concluded that there will be no likely significant effects on bird species by the proposed project.

Although the sites will cause an overall reduction in foraging habitat for bird species, considering the limited spatial extent of the sites relative to the greater intertidal area at Ballyness Bay available to the species for foraging, this will not result in significant negative effects.

Table 3-7: Assessment of the significance of effects on the selected bird species.

Bird species	Disturbance	Population Sensitivity BoCCI ²²	Licenced Area Habitat Suitability	Habitat Flexibility Scores	Description of effect	Significance of effects
Arctic tern (<i>Sterna paradisaea</i>)	2	Medium – BoCCI Amber List	2	3	Low	Not significant
Common Gull (<i>Larus canus</i>)	2	Medium – BoCCI Amber List	2	2	Negligible	Imperceptible effects
Cormorant (<i>Phalacrocorax carbo</i>)	4	Medium – BoCCI Amber List	2	3	Low	Slight effects
Dunlin (<i>Calidris alpina schinzii</i>)	3	High - BoCCI Red List	2	N/A	N/A	Slight effects (Precautionary score)
Golden Plover (<i>Pluvialis apricaria</i>)	5	High - BoCCI Red List	2	3	Low	Slight effects
Herring Gull (<i>Larus argentatus</i>)	2	Medium – BoCCI Amber List	2	1	Negligible	Imperceptible effects
Lesser Black-backed Gull (<i>Larus fuscus</i>)	2	Medium – BoCCI Amber List	2	2	Negligible	Imperceptible effects
Red-throated Diver (<i>Gavia stellata</i>)	5	Medium – BoCCI Amber List	2	4	Low	Slight effects
Shag (<i>Phalacrocorax aristotelis</i>)	3	Medium – BoCCI Amber List	3	3	Low	Not significant

3.2.5. Impact Mechanism 2 – Mitigation measures

Recommendation on appropriate distance to keep from seals varies but general public guidance recommends a buffer of between 50 m²³ to 150 m²⁴. In light of these figures and previous guidance given by the Marine Institute to aquaculture farms²⁵ a suggested minimum distance buffer of 200 m between aquaculture activities and seals should be strictly adhered to at all times. This will minimise any disturbance to either grey or harbour seal species in the area.

The bird species assessed only showed minor, non-significant disturbance potential as a result of the aquaculture activities. A range of standard mitigation measures will be implemented to minimise potential interactions with seabirds. Aquaculture structures will be maintained at a low profile with sufficient spacing to allow continued access for foraging birds. The use of predictable and consistent activity patterns allows birds to habituate to operations over time. Vehicle and tractor movements will follow established and repeatable routes, thereby minimising disturbance across the wider intertidal area. The design and layout of the sites will ensure that aquaculture structures do not form barriers to movement across the mudflats, with adequate spacing maintained between trestles and bags to allow continued access for foraging and roosting birds. Activities will be limited in duration and frequency where practicable. Good site management practices will be implemented, including the removal of redundant equipment and control of biofouling, to avoid attracting birds.

It is strongly advised as a best practice measure to ensure consistency with aquaculture activities such as no deviations from the access route to the sites so that local fauna can acclimatise to the operations.

3.2.6. Impact Mechanism 2 – Conclusion

It is concluded that the impact mechanism of species disturbance will not result in significant negative effects on conservation features of European sites with the appropriate mitigation adhered to.

3.2.7. Impact Mechanism 3 - Organic enrichment/sedimentation & current alteration

3.2.7.1. Potential impacts – Qualifying Interest Annex I Habitats

Filter feeding organisms, for the most part, feed at the lowest trophic level, usually relying predominantly on the assimilation of phytoplankton. The process is extractive in that it does not rely on the input of feedstuffs in order to produce growth. Suspension feeding bivalves such as oysters and clams can modify their filtration to account for increasing loads of suspended matter in the water and can increase the production of faeces and pseudofaeces (non-ingested material) which result in the transfer of both organic and inorganic particles to the seafloor. This process is a component of 'benthic-pelagic coupling'. Faeces and pseudofaeces can collect on the seafloor beneath aquaculture sites and can alter the local sedimentary habitat type in terms of organic

content and particle size which has, in certain circumstances, been shown to alter the resident faunal communities. The physical presence of the trestles and bags may reduce water flow and allowing suspended material (silt, clay as well as faeces and pseudo-faeces) to fall out of suspension to the seafloor. The build-up of material will typically occur directly beneath the trestle structures and can result in accumulation of fine, organically rich sediments. These sediments may result in the development of infaunal communities distinct from the surrounding areas. Uptake of seston by the shellfish and expulsion of waste are intimately entwined with the flow and circulation in and around the canopy.

3.2.7.2. Assessment

Moderate enrichment due to deposition can lead to increased diversity due to increased food availability; however further enrichment can lead to a change in sediment biogeochemistry (*e.g.*, decrease in oxygen levels and increase in sulphide) that can result in a reduction in species richness and abundance resulting in a community dominated by specialist species. In extreme cases of protracted organic enrichment, anoxic conditions may occur where no fauna survives, and the sediment may become blanketed by bacterial mats. However, this has never been documented for oyster/clam culture sites. Changes to the sedimentary habitat due to deposition are indicated by a decrease in oxygen levels, increased sulphide reduction, decrease in REDOX depth (*i.e.*, the depth of the boundary between oxic and anoxic sediments) and particle size changes.

Oysters are typically cultured in the intertidal zone in plastic mesh bags on trestles. Their specific location in the intertidal is dependent upon the level of exposure of the site, the stage of culture and the accessibility of the site. The physical presence of the trestles and bags may reduce water flow and allowing suspended material (silt, clay as well as faeces and pseudo-faeces) to fall out of suspension to the seafloor. The build-up of material will typically occur directly beneath the trestle structures and can result in accumulation of fine, organically rich sediments. These sediments may result in the development of infaunal communities distinct from the surrounding areas. The accumulation of material beneath oyster trestles is dictated by a number of factors, including:

- Hydrography – low current speeds (or small tidal range) may result in material being deposited directly beneath the trestles. If tidal height is high and large volumes of water moved through the culture area an acceleration of water flow can occur beneath the trestles and bags, resulting in a scouring effect or erosion and no accumulation of material.
- Turbidity of water – oysters have very plastic response to increasing suspended matter in the water column with a consequent increase in faecal or pseudo-faecal production. Oysters can be cultured in estuarine areas (given their polyhaline tolerance) and as a consequence can be exposed to elevated levels of suspended matter. If currents in the vicinity are generally low, elevated suspended matter can result in increased build-up of material beneath culture structures.

- Density of culture – the density of oysters in a bag and the density of bags on a trestle will increase the likelihood of accumulation on the seafloor. In addition, if the trestles are located in close proximity a greater effect can be realised with resultant accumulations. Close proximity may also result in impact on shellfish performance due to competitive interactions.
- Exposure of sites - the degree to which the aquaculture sites are exposed to prevailing oceanographic/weather conditions will also dictate the level of accumulated organic material in the area. As storm surges/weather fronts move through culture areas, increased wave action will re-suspend and disperse material away from the trestles.

Ballyness Bay is moderately exposed and experiences stormy and adverse weather typical of the north of Ireland. While a minor build up of material may occur, any effect to habitats from oyster trestle culture is typically localised to areas directly beneath the culture systems. Per the Irish Farmers Association guidelines, bags and trestles should be cleaned thoroughly between uses, including large scale disinfection (at on-shore facilities). Solutes and solid discharges attenuate with time and distance and no long-term or broad-scale changes to the benthic community structure or function are anticipated.

3.2.8. Impact Mechanism 3 – Mitigation measures

Regular maintenance and cleaning of infrastructure and machinery to ensure no heavy build-up of organic material is recommended. Best practice guidelines set out by the MI, IFA and BIM for oyster farming can be referred to for this²⁶

3.2.9. Impact Mechanism 3 – Conclusion

It is concluded that the impact mechanism of organic enrichment/sedimentation & current alteration will not result in significant negative effects on conservation features of European sites with the appropriate mitigation adhered to.

3.2.10. Impact Mechanism 4 - Pest and disease risk

3.2.10.1. Potential Impact – Special Conservation Interests bird species

As a generalisation, marine farmed organisms are affected by a range of disease, much as other domesticated agriculture stock. Due to the nature of the (high density) of shellfish culture methods there is potential for risk of transmission of disease within the cultured stock and between the stock and wild populations.

3.2.10.2. Assessment

Pests and diseases have the potential to not only damage the species being harvested but also those of the wild local population. For example, the introduction of the parasitic protozoan *Bonamia ostreae* has caused

mass mortality within Irish native oyster beds (*Ostrea edulis*). Pests and diseases also have the ability to travel interspecifically to other wild species in the environment (Bouwmeester *et al.*, 2021).

3.2.11. Impact Mechanism 4 – Mitigation measures

This risk can be limited by compiling a bio-security plan, screening all introduced stock prior to transferring to the on-growing site and also good animal husbandry. Disease risk associated with movement of shellfish is governed by Fish Health legislation on the movement of shellfish stocks into and out of culture areas. In the event of mass mortalities on a Pacific oyster site, it may be advisable to remove the dead animals to eliminate them as a potential source of infection.

3.2.12. Impact Mechanism 4 – Conclusion

It is concluded that the impact mechanism of pest and disease risk will not result in significant negative effects on conservation features of European sites with the appropriate mitigation adhered to.

3.2.13. Impact Mechanism 5 – Introduction of non-native species

3.2.13.1. Potential impacts – Qualifying Interest Annex II species

The species of shellfish being cultivated are Pacific Oysters (*C. gigas*) and clams (*R. philippinarum*). Both species are non-native to Irish waters and pose a risk of introduction beyond the designated aquaculture sites. In some instances, species have been known to proliferate quickly, competing with native species and in some cases, replacing them. In addition to having large number of oysters in culture, Kochmann *et al.* (2013) identified short residence times and large intertidal areas as factors likely contributing to the successful recruitment of oysters (*C. gigas*) in Irish bays.

3.2.13.2. Assessment

As already outlined oyster culture may present a risk in terms of the introduction of non-native species such as the Pacific oyster (*C. gigas*) that is a non-native species. Recruitment of *C. gigas* has been documented in a number of bays in Ireland and appears to have become naturalised (*i.e.*, establishment of a breeding population) in two locations (Kochmann *et al.*, 2012; 2013) and may compete with the native species for space and food. In addition to having large number of oysters in culture, Kochmann *et al.* (2013) identified short residence times and large intertidal areas as factors likely contributing to the successful recruitment of oysters in Irish bays. The risk of Pacific oysters naturalising in Ballyness Bay cannot be discounted. There is minimal risk associated with the introduction of hitchhiker species with hatchery reared oyster seed. A risk of alien species introductions presents if '½-grown' or 'wild' seed originating from another jurisdiction *e.g.*, Britain, France is introduced to the sites. However, it is noted that hatchery seed will only be used in the bay so the risk posed by the transfers of other sources of stock can be discounted. Furthermore, the use of triploid Pacific

oyster seed reduces the likelihood of naturalisation, as triploid individuals are partially sterile, with impaired gametogenesis limiting their potential for reproduction and establishment in the wild (Normand *et al.*, 2008). In relation to the Manila clam (*R. philippinarum*), this species has been in culture in Ireland since 1984 and, to date, no recruitment in the wild has been recorded. The operations are totally reliant on hatchery seed and are fully contained at all stages of the production cycle and given the short residence times calculated for the SAC, the risk of naturalisation of this species is considered low but should be kept under surveillance.

3.2.14. Impact Mechanism 5 – Mitigation measures

Movement of stock in and out of the sites is to adhere to best practice guidelines²⁷ due to the potential risk of introducing non-native species (Kelly and Maguire, 2009 & ICES, 2005). Contingency plan to be approved by DAFM before commencement of operations begin at the sites. This plan should state the methods if removal of any invasive non-natives species in the environment resulting from operations at the site.

Use of the CLAMS (Co-ordinated Local Aquaculture Management Systems) process for the creation and application of invasive species management and control strategies. The CLAMS process is a non-statutory management system, which is anchored in the national marine policy and development programmes, established by the Department of the Marine and Natural Resources and developed at a local level by Bord Iascaigh Mhara (BIM) and the Marine Institute (MI) (BIM, 2003).

The sole use of triploid oysters in the sites cultivating *C. gigas* is recommended as this reduces the risk of reproduction of the non-native species within the environment.

3.2.15. Impact Mechanism 5 – Conclusion

It is concluded that the impact mechanism of non-native species introduction will not result in significant negative effects on conservation features of European sites with the appropriate mitigation adhered to.

3.2.16. Impact Mechanism 6 – Physical Disturbance

3.2.16.1. Potential Impacts – Qualifying Interests Annex II Migratory Fish

A theoretical impact pathway exists whereby nutrient enrichment could promote localised macroalgal growth, which may, in turn, result in minor physical interactions with migrating Atlantic salmon. The assessment is provided below.

3.2.16.2. Assessment

The proposed cultivation of oyster and clam species within Ballyness Bay does not include the intentional culture of macroalgae. Shellfish aquaculture can result in the release of waste products (faeces and pseudofaeces) and dissolved nutrients (*e.g.*, ammonium); however, in well-flushed intertidal environments these inputs are typically rapidly assimilated or dispersed and are more commonly associated with localised benthic enrichment rather than significant water-column eutrophication.

While nutrient enrichment (eutrophication) can, under certain conditions, promote the growth of opportunistic macroalgae such as *Ulva spp.*, the extent of such growth is primarily constrained by substrate availability and hydrodynamic conditions. Ballyness Bay is predominantly composed of sand and mud sediments, which provide limited stable substrate for the attachment of perennial macroalgal species such as fucoids (*e.g.*, *Fucus spp.*). Kelp species (order Laminariales) are generally restricted to subtidal or low intertidal rocky habitats and are therefore unlikely to establish within the largely intertidal and sediment-dominated environment of the bay.

Some opportunistic macroalgal growth may occur on aquaculture structures or shell material due to increased hard substrate in Ballyness Bay for attachment; however, this would be spatially restricted to the footprint of the licensed sites and subject to routine farm management practices, including biofouling control as set out in industry best practice guidelines. Consequently, any increase in macroalgal biomass would be localised, temporary, and limited in extent.

With regard to potential interactions with migratory Atlantic salmon, there is no evidence to indicate that the scale or nature of any macroalgal growth arising from shellfish aquaculture in such environments would result in physical obstruction or disruption to migratory pathways. Macroalgal assemblages, where present, would not form continuous or dense barriers within the water column, particularly given the intertidal nature of the bay and the absence of extensive hard substrata. Furthermore, migratory fish are capable of navigating complex estuarine environments and are not considered sensitive to the presence of sparse or patchy macroalgal cover.

On this basis, there is no credible pathway by which the proposed development would result in significant physical disturbance to migrating salmon via a proliferation of macroalgae.

3.2.17. Impact Mechanism 6 – Mitigation Measures

Regular maintenance and cleaning of infrastructure and machinery to ensure no heavy build-up of organic material is recommended. Best practice guidelines set out by the MI, IFA and BIM for oyster farming can be referred to for this¹⁷.

3.2.18. Impact Mechanism 6 - Conclusion

It is concluded that the impact mechanism of physical disturbance will not result in significant negative effects on conservation features of European sites with the appropriate mitigation adhered to.

3.3. Mitigation Recommendations

A comprehensive suite of mitigation measures are proposed for the avoidance of impacts to European sites in the section above. These measures are summarised here.

1. Best practice measures²⁸ are to be adhered to during primary activities such as husbandry and harvesting and ancillary servicing activities to minimise any impact to the habitats screened in due to potential impacts, Mudflats and sandflats not covered by seawater at low tide. This measure is not required for Fixed coastal dunes with herbaceous vegetation (grey dunes) as there is no overlap.
2. Access to the western sites will be restricted to the DAFM-suggested southern access route shown in this NIS and that no access will occur through Fixed coastal dunes with herbaceous vegetation (grey dunes).
3. A strict 200 m distance buffer to be adhered to between any aquaculture activities and any seal species present in the bay.
4. Avoidance of activities during early morning/evening hours to minimise chance of contact with otter.
5. The use of predictable and consistent activity patterns to allow habituation to operations over time.
6. Adequate spacing between trestles and bags to allow access across mudflats to foraging bird species.
7. It is strongly advised as a best practice measure to ensure consistency with aquaculture activities such as no deviations from the access route to the sites so that local fauna can acclimatise to the operations.
8. Regular maintenance of the sites to ensure no heavy build-up of organic material where possible is recommended.
9. Compilation of a bio-security plan, screening all introduced stock prior to transferring to on growing site and also good animal husbandry.
10. Use of the CLAMS (Co-ordinated Local Aquaculture Management Systems) process for the creation and application of invasive species management and control strategies.
11. The sole use of triploid oysters in the sites cultivating *C. gigas* is recommended as this reduces the risk of reproduction of the non-native species within the environment.

3.4. In combination effects

As outlined in **section 2.7**, the plans or projects that might act in combination with the proposed Project include (proposed or active fisheries, other shellfish aquaculture sites, fishing activity, recreational developments). The potential for interaction with the plans identified in **section 2.7** is assessed below while interactions with specific projects are evaluated in **Table 3-8**. In summary, the assessments conclude that there is no potential likelihood for significant effects caused by in-combination effects with the recommended mitigation measures in **Section 3.3** adhered to.

The Climate Action Plan 2025

The proposed Project has been considered in the context of the Climate Action Plan 2025, which sets out Ireland's pathway to a climate-resilient, low-carbon and environmentally sustainable economy. The plan includes actions relevant to the marine environment, including climate adaptation, protection of marine ecosystems, and sustainable development of the blue economy.

The proposed shellfish aquaculture activities are of a low-intensity nature and do not involve significant energy use or greenhouse gas emissions and therefore do not conflict with national emissions reduction targets. In addition, the Project does not give rise to significant impacts on marine habitats or ecosystem function, as demonstrated through the Appropriate Assessment process.

On this basis, the proposed development is consistent with the objectives of the Climate Action Plan 2025 and does not undermine the achievement of Ireland's climate or environmental commitments.

River Basin Management Plans 2022-2027

The proposed aquaculture sites are within Ballyness Bay WFD coastal water body, which is adjacent to the Gweebarra-Sheephaven hydrometric area. The Water Action Plan 2024 sets out the overarching objective of achieving or maintaining at least 'good' ecological and chemical status for all water bodies through targeted, evidence-based measures at catchment level. Key pressures identified under the plan include agriculture, wastewater discharges, and hydromorphological alterations.

The proposed aquaculture activities are not identified as a significant pressure within the plan (classified within the 'other' pressures category which includes a range of smaller pressures) and are of a nature and scale that would not be expected to influence the quality elements used to determine WFD status (including physico-chemical or biological elements). Any nutrient inputs associated with shellfish cultivation are expected to be localised and minor and would not result in measurable changes at the water body scale. Furthermore, shellfish may contribute to localised improvements in water clarity through their filter-feeding activity. On this basis, there is no pathway by which the proposed Project would lead to a deterioration in WFD status or compromise the achievement of the environmental objectives of the Water Action Plan 2024.

Donegal County Development Plan 2024-2030

Aquaculture activities are promoted by the County Donegal Development Plan in terms of providing opportunities for the development of the Gaeltacht (see GAE-P-5 of the plan; Donegal County Council, 2024). Additionally, under the Marine Resources section of the development plan, sustainable aquaculture is specifically supported (see MRCM-P-5 of the plan; Donegal County Council, 2024), and similarly under the National Marine Planning Framework (Maritime Spatial Planning Directive (2014/89/EU)).

National Biodiversity Action Plan 2023-2030

The proposed development has been considered in the context of Ireland's 4th National Biodiversity Action Plan, which sets out Ireland's strategic framework for halting and reversing biodiversity loss, including within the marine environment. The plan emphasises the protection of habitats and species, the sustainable use of natural resources, and the need to ensure that activities such as aquaculture do not give rise to significant adverse effects on biodiversity, including Natura 2000 sites.

The proposed aquaculture activities are of a nature and scale that would not result in significant impacts on habitats or species, as demonstrated through the AA process. The Project incorporates standard best practice measures, including site management, biosecurity, and monitoring, and does not introduce pathways for significant disturbance, habitat loss, or the spread of invasive species. On this basis, the proposed Project is consistent with the objectives of the National Biodiversity Action Plan and would not undermine the implementation of the plan.

Table 3-8: Assessment of potential in combination effects considered in Stage 2.

Website	Project Details	File Reference	Date Application Received	Assessment of Potential In-Combination Effects	Conclusion
DHPLG - EIA Portal	A search of the DHPLG EIA Portal was undertaken to examine projects with potential for in combination effects.	2021034	19/2/2021	Though a 25-year permission for extraction and blasting of rock and screening plant occurs near the vicinity of Falcarragh, due to the distance and mitigation in place for the rock works it was determined that there was no potential for significant cumulative or in combination effects to occur with the proposed Project.	No potential significant in combination effects
Donegal County Council - Planning System	A search of the Donegal planning databases was undertaken to examine projects with potential for in combination effects.	-	-	Applications made typically to Donegal County Council and published on the planning database for the areas of Falcarragh and Magheraroarty for the past 3 years, consisted of extensions and renovations to existing houses, and retention of existing developments. These are small-scale terrestrial developments which do not have the potential to result in cumulative effects in combination with the proposed Project.	No potential significant in combination effects
DHLGH – Foreshore Applications	A search of the DHLGH Foreshore applications was undertaken to examine projects with potential for in combination effects.	-	-	No foreshore applications were noted within a ZoI for the Ballyness Bay project sites.	No potential significant in combination effects.
AQUAMIS & Irelands Marine Atlas	Fisheries or other aquaculture activities	T12-093-3	-	A review of Irelands Marine Atlas shows are no known current inshore fisheries or applications for fisheries in Ballyness Bay SAC. One licenced fishery for Atlantic salmon was noted approx. 7km upstream from Ballyness Bay SAC in the Tullaghobegly river near Lough Altan. Due to the distance upstream, there is unlikely to be any in combination effects from this activity.	No potential significant in combination effects.

Local Angling website	Local fishing activities	-	-	There is a local angling association that promotes solely the fishing of sea trout in Ballyness Bay during 2nd Feb - 12th Oct. Guidance on their website suggests the east side of the bay for the best location for fishing, this shares very little overlap with the sites granted by the Minister. On this basis, there are not likely to be any in combination impacts between the fishing activity and aquaculture activities.	No potential significant in combination effects.
Aquaculture Licences Appeals Board	A search of the ALAB website was conducted to examine any projects in the appeals system with potential for in combination effects.			All proposed aquaculture sites were considered in the Stage 2 (NIS) portion of this report, especially when considering overlap of habitat types. The original application for shellfish aquaculture in Ballyness Bay was for 20 sites with only 18 subsequently sent forward for planning. Only the 10 remitted appeal sites listed in Table 1 are included in the in-combination aquaculture assessment. Other previously identified aquaculture sites have had their determinations/licence decisions quashed and are not authorised or operational; they are therefore not existing or reasonably foreseeable projects capable of acting in combination with the proposed development. Future proposals for those sites would require separate Article 6(3) assessment. The 10 remitted appeal sites are assessed together because, if licensed, they may act cumulatively through shared habitat, enrichment and disturbance pathways within Ballyness Bay.	With mitigation measures in the above section adhered to, there is no potential significant in combination effects when considering all the sites.
Maritime Area Regulatory Authority	A search of the MARA website was conducted to examine any projects in the application system with potential for in combination effects.	MUL230038	24/01/2025	Survey works related to this application are undertaken at high tide. The works are temporary and will not result in continuous effects due to the brief duration specified in the application. On this basis, there are not likely to be any in combination impacts between the MARA application and aquaculture activities.	No potential significant in combination effects.

3.5. Conclusion

This report has been prepared having regard to the relevant provisions of Council Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

This NIS has been prepared because the Screening for Appropriate Assessment could not exclude, on the basis of objective scientific information, the possibility that the proposed aquaculture operations at the Ballyness Bay sites, either alone or in combination with other plans or projects, may have likely significant effects on SACs and SPAs.

This NIS has examined and analysed, in light of the best scientific knowledge available, how the proposed operations could affect the Qualifying Interests of SACs and the Special Conservation Interests of SPAs, and whether those effects would adversely affect the integrity of any European site having regard to its conservation objectives.

Mitigation measures have been identified to avoid or reduce potential effects on the conservation objectives of the Qualifying Interests and Special Conservation Interests for which the relevant SACs and SPAs are designated, such that no adverse effect on the integrity of any European site is predicted.

Following examination, analysis and evaluation of the relevant information, including the nature of the predicted impacts from the proposed operations and the mitigation measures identified in this NIS, it is objectively concluded that the proposed operations will not adversely affect, either directly or indirectly, the integrity of any European site, either alone or in combination with other plans or projects. There is no reasonable scientific doubt in relation to this conclusion.

4. References

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5. List of endnotes

- ¹ The most recent Article 17 report (2019) is available at <https://www.npws.ie/publications/article-17-reports/article-17-reports-2019>
- ² EPA Geo portal site: <http://gis.epa.ie/>
- ³ NBDC online portal: <http://maps.biodiversityireland.ie>
- ⁴ NPWS - Maps and data folders: <http://www.npws.ie/mapsanddata/>
- ⁵ Birdwatch Ireland website: <https://birdwatchireland.ie/>
- ⁶ <https://cloughaneelyanglingassociation.com/angling-info/#interactive>
- ⁷ <https://www.npws.ie/protected-sites/sac>
- ⁸ Distance relates to shortest linear distance, *i.e.*, 'as the crow flies'.
- ^{ix} <https://www.npws.ie/protected-sites/spa>
- ¹⁰ <https://wayback.archive-it.org/org-1444/20201126170835/https://www.agriculture.gov.ie/media/migration/seafood/aquacultureforeshoremanagement/aquaculturelicensing/appropriateassessments/donegal/ApproAssessBallynessBayReport040319.pdf>
- ¹¹ <https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal>
- ¹² <https://www.eplanning.ie/DonegalCC/SearchTypes>
- ¹³ <https://www.gov.ie/en/collection/d8ea9-aquacultureforeshore-licence-applications/>
- ¹⁴ <https://dafm-maps.marine.ie/aquaculture-viewer/>
- ¹⁵ <https://atlas.marine.ie/>
- ¹⁶ <http://cloughaneelyanglingassociation.com/>
- ¹⁷ <https://alab.ie/>
- ¹⁸ <https://www.maritimeregulator.ie/>
- ¹⁹ https://www.fishhealth.ie/fhu/sites/default/files/FHU_Files/Good%20Practice%20Guidelines_Pacific%20Oysters_2023.pdf
- ²⁰ The methods of impact assessment have been adapted from Atkins (2012).
- ²¹ These species were not assessed in Furness *et al.*, 2013. A conservative (precautionary) score of 3 is assigned to the species.
- ²² <https://birdwatchireland.ie/publications/birds-of-conservation-concern-in-ireland-bocci4-2020-2026/>
- ²³ <https://www.fisheries.noaa.gov/topic/marine-life-viewing-guidelines/guidelines-&-distances>
- ²⁴ <https://www.orcaireland.org/marine-mammal-response>
- ²⁵ <https://assets.gov.ie/206335/4bac7897-909d-4b54-86df-42535db39796.pdf>
- ²⁶ https://www.fishhealth.ie/fhu/sites/default/files/FHU_Files/Good%20Practice%20Guidelines_Pacific%20Oysters_2023.pdf
- ²⁷ <http://invasivespeciesireland.com/cops/aquaculture/>
- ²⁸ https://www.fishhealth.ie/fhu/sites/default/files/FHU_Files/Good%20Practice%20Guidelines_Pacific%20Oysters_2023.pdf