

Joseph Coll, Paul and Edward O'Brien and Anthony McCafferty

Marine Strategy Framework Directive Assessment - Ballyness Bay Oyster and Clam Aquaculture Sites

Neve McCann, BSc, MSc

AQUAFACT REF: P00019963

May 2026

COMMERCIAL IN CONFIDENCE



AQUAFACT
APEM Group

Client: Joseph Coll, Paul and Edward O'Brien and Anthony McCafferty

Reference no: P00019963

Date of issue: May 2026

Version Number: 2

AQUAFACT contact: Aisling Hearty

Position: Principal Ecologist

E-mail: aisling@aquafact.ie

Telephone: +353 91 756812

Website: www.aquafact.ie

Address: AQUAFACT – APEM Group,

9A Liosban Business Park,

Tuam Road,

Galway, Ireland,

H91 K120

Registered in Ireland: No. 493496

Tax Reference Number: 97733840

Tax Clearance Number: 559674

Report Approval Sheet

Client	Joseph Coll, Paul and Edward O'Brien and Anthony McCafferty
Report Title	Marine Strategy Framework Directive Assessment - Ballyness Bay Oyster and Clam Aquaculture Sites
Job Number	P00019963
Report Status	Final
Issue Date	May 2026
Report Type	Marine Strategy Framework Directive Assessment

Rev	Status	Issue Date	File Name	Author(s)	Approved By
1	Draft v1	March 2026	P19963_BallynessBayAquaculture_MSFDAssessment	Neve McCann, BSc, MSc	AL
2	Final	May 2026	P19963_BallynessBayAquaculture_MSFDAssessment	AM	AH

Contents

1. Introduction	1
1.1. Background.....	1
1.2. Legislative Context.....	1
1.3. MSFD Assessment	2
2. Project Overview.....	2
2.1. Licence description.....	2
2.2. Site Context	5
2.3. Cultivation Methods	5
2.3.1. Oyster Cultivation.....	5
2.3.2. Intertidal Clam Cultivation	6
2.3.3. Spatial footprint of proposed aquaculture sites in context of Ballyness Bay.	6
2.3.4. Spatial Overlap with intertidal mudflat and sandflat habitat	7
2.4. Access Routes	8
3. MSFD Assessment Methodology	9
4. Zone of Influence	9
5. MSFD Status in Ireland.....	10
6. MSFD Indicators.....	13
7. Impact of proposed aquaculture activities on relevant MSFD targets within Zol.....	15
8. Statement of Authority	21
9. References	22

List of Tables

Table 2.1: List of appealed aquaculture sites granted by the minister for Agriculture, Food and the Marine included in this MSFD Assessment.....	4
Table 2.2: Estimated annual production tonnages provided by the applicant for the proposed aquaculture sites in Ballyness Bay.	5
Table 2.3: Spatial footprint of proposed aquaculture in Ballyness Bay.....	7
Table 5.1: MSFD Cycle 3 status of descriptors and relevance to maritime usage.....	10
Table 6.1: Indicators used to assess criteria for each MSFD descriptor for the 3rd MSFD cycle.	13
Table 7.1 Assessment of MSFD Targets and the Potential Impact of proposed activities	16

List of Figures

Figure 2-1: Spatial footprint of proposed aquaculture sites within Ballyness Bay.....	8
---	---

1. Introduction

1.1. Background

AQUAFACT, a member of the APEM Group, has been commissioned to prepare a Marine Strategy Framework Directive (MSFD) assessment in relation to the proposed aquaculture licences at Ballyness Bay, Co. Donegal (refer to **Table 2.1**).

This MSFD Assessment identifies relevant marine receptors within the Zone of Influence (Zoi) of the proposed Project and assesses the potential for the proposed Project to impact on the achievement of Good Environmental Status (GES) under the MSFD.

1.2. Legislative Context

The Marine Strategy Framework Directive (Directive 2008/56/EC), as amended by Directive (EU) 2017/845, establishes a framework for the protection and management of the marine environment across European Union Member States, with the overarching objective of achieving or maintaining Good Environmental Status (GES) through the protection of marine ecosystems, the prevention of deterioration, and, where practicable, the restoration of degraded environments. In Ireland, the Directive is transposed through the European Communities (Marine Strategy Framework) Regulations 2011 (S.I. No. 249 of 2011), with its requirements implemented through Ireland's Marine Strategy, which sets out the national programme of measures and assessments to achieve GES in Irish marine waters.

Under the MSFD, Member States are required to develop and implement marine strategies based on an ecosystem-based approach to the management of human activities. These strategies aim to ensure that the collective pressure of human activities is kept within levels compatible with the achievement of GES. GES is assessed across eleven qualitative descriptors, encompassing biodiversity, non-indigenous species, commercial fish and shellfish, food webs, eutrophication, seafloor integrity, hydrographical conditions, contaminants, contaminants in seafood, marine litter, and underwater noise. Ireland's Marine Strategy sets out the targets and indicators used to assess progress towards achieving GES, including those relevant to coastal and transitional waters, which are linked to existing monitoring frameworks established under the Water Framework Directive.

Competent authorities, including the Department of Agriculture, Food and Marine (DAFM) are required to consider the objectives of the MSFD when assessing applications for maritime activities, including aquaculture developments, to ensure that such activities do not compromise the achievement or maintenance of GES.

1.3. MSFD Assessment

To support the relevant competent authority in determining whether the proposed aquaculture activities are consistent with the objectives of the MSFD, an assessment has been undertaken of the potential for the proposed Project to affect the achievement or maintenance of Good Environmental Status (GES).

The assessment considers the eleven MSFD descriptors and evaluates:

- The current status of relevant MSFD descriptors within Ireland's Marine Strategy;
- The potential for interaction between the proposed Project and each descriptor within the Zone of Influence (Zoi); and
- Whether the proposed Project could result in a deterioration of environmental status or hinder the achievement of GES, through assessing relevant targets and indicators for each MSFD descriptor.

2. Project Overview

2.1. Licence description

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 assessment. Seven licence granted sites are being appealed for Pacific oyster (*Magallana gigas* formerly *Crassostrea gigas*) 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 2.1**. 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.

The aquaculture licences were originally granted, or granted with variation, by the Minister for Agriculture, Food and the Marine. These decisions were subsequently appealed to the Aquaculture

Licences Appeals Board (ALAB), which confirmed the Minister's decisions. Following judicial review, the ALAB determinations were quashed and remitted to ALAB for reconsideration. The appeals are currently at Stage 3: Information Gathering.

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.

The proposed aquaculture is extensive in nature, limited spatially to licensed intertidal areas, and does not involve external feed inputs. 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. Overall, the intensity of production is low and constrained by natural environmental conditions and carrying capacity (see **Table 2.1** and **Figure 2-1**).

Table 2.1: List of appealed aquaculture sites granted by the minister for Agriculture, Food and the Marine included in this MSFD Assessment.

Site Ref.	Cultivation licence	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.	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.	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.	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.	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.	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.	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.	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.	Joseph Coll	Grant
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.	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.	Joseph Coll	Grant

Estimated annual production tonnages have been provided by the applicant for each site and represent best estimates of anticipated annual production rather than fixed licensed capacities. (Table 2.2). The total estimated annual production across all sites is approximately 63 tonnes, reflecting the small-scale, extensive nature of the proposed Project relative to the size of the receiving waterbody.

Table 2.2: Estimated annual production tonnages provided by the applicant for the proposed aquaculture sites in Ballyness Bay.

Site Ref.	Applicant	Activity/ Species	Estimated annual production (tonnes)
T12/407B	Joseph Coll	Oysters	3
T12/409A	Edward & Paul O'Brien	Clams	10
T12/409B (1&2)	Edward & Paul O'Brien	Clams (3 t) + Oysters (15 t)	18 (combined)
T12/441A	Anthony McCafferty	Clam seed (<1 t) + Oysters (3 t)	~4*
T12/441B	Anthony McCafferty	Oysters	4
T12/441C	Anthony McCafferty	Oysters	4
T12/500A	Joseph Coll	Oysters	5
T12/502A	Joseph Coll	Oysters	12
T12/515A	Joseph Coll	Oysters	2
T12/516A	Joseph Coll	Oysters	1

Tonnage figures are applicant-provided best estimates of annual production per site and are used as an indication of the likely scale and intensity of the proposed activity. These figures do not represent maximum licensed production and may differ from original licence documentation due to changes in licensed area and operational scaling.*For T12/441A, total production is approximate due to the inclusion of a small-scale clam seed nursery (<1 tonne).

2.2. Site Context

Ballyness Bay is a large, shallow estuarine system in north-west Donegal near Gortahork and Falcarragh. The bay contains extensive sandflats exposed at low tide and is sheltered by the Dooey Peninsula, which leaves only a narrow opening to the sea. The proposed aquaculture sites are located within the bay, primarily along the southwestern and central intertidal areas, in proximity to the low water channels associated with the Gleanna River. The proposed sites lie within the Ballyness Bay SAC and the bay lies approximately 0.8 km from the Falcarragh to Meenlaragh SPA.

2.3. Cultivation Methods

2.3.1. Oyster Cultivation

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).

2.3.2. 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.

2.3.3. Spatial footprint of proposed aquaculture sites in context of Ballyness Bay.

The combined area occupied by all proposed aquaculture sites amount to 14.69 ha representing a small proportion of the overall waterbody area within Ballyness Bay (594.96 ha). In total, the aquaculture footprint equates to approximately 2.47% of Ballyness Bay (**Table 2.3**).

The proposed aquaculture footprint therefore represents a relatively small proportion of the available habitat within Ballyness Bay. The sites are spatially dispersed across the bay and do not form a continuous area of development.

The scale of activity is inherently limited by the licensed area, the extensive low-intensity nature of the proposed cultivation methods, and the estimated annual production levels provided by the applicant. Shellfish aquaculture is extractive and does not require external feed inputs, with production constrained by natural environmental conditions and carrying capacity. As such, the intensity of production is low relative to other forms of aquaculture and is not expected to exert significant pressure on the receiving environment. Given the limited spatial extent and dispersed nature of the sites, any associated environmental interactions are expected to be localised and of low magnitude.

Table 2.3: Spatial footprint of proposed aquaculture in Ballyness Bay.

Parameter	Value
Total Aquaculture Footprint	14.69 Ha
Ballyness Bay Waterbody area	594.96 Ha
Aquaculture footprint as % of waterbody	2.47%

2.3.4. Spatial Overlap with intertidal mudflat and sandflat habitat

Spatial analysis was undertaken to quantify the overlap between the proposed aquaculture sites and intertidal mudflat and sandflat habitat. The habitat layer produced by NPWS was used to identify the extent of Annex I habitat Mudflats and sandflats not covered by seawater at low tide [1140].

The proposed aquaculture licence areas were assessed against the mapped habitat extent to determine the area of direct overlap. The analysis showed that the proposed aquaculture sites overlap with approximately 15.11 ha of intertidal mudflat and sandflat habitat, representing approximately 2.18% of the mapped habitat extent within Ballyness Bay.

This indicates that the proposed aquaculture footprint occupies a small and localised proportion of the available intertidal habitat resource.

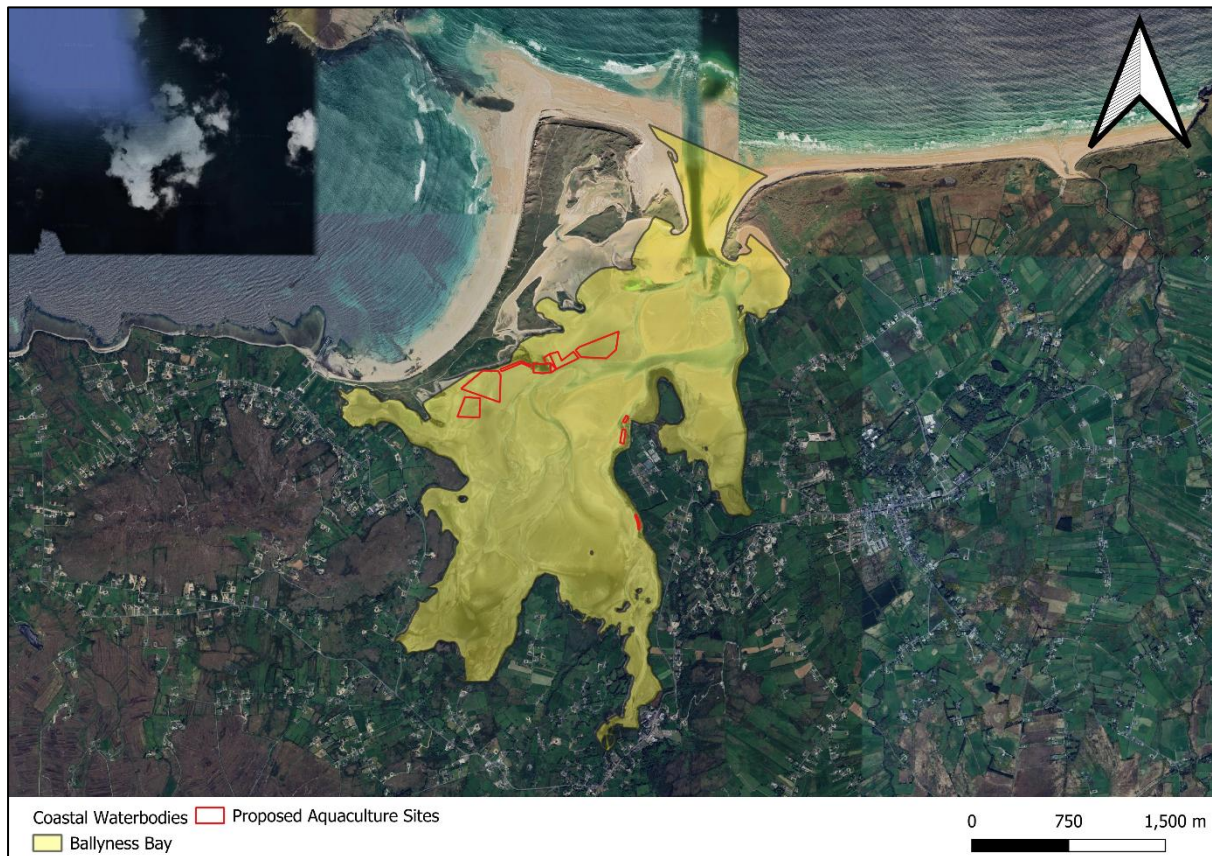


Figure 2-1: Spatial footprint of proposed aquaculture sites within Ballyness Bay.

2.4. 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 Department of Agriculture, Food and the Marien (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.

3. MSFD Assessment Methodology

For the Zone of Influence (the area over which the proposed aquaculture licenses could have had an ecological or other relevant impact), the current status of the 11 MSFD descriptors was assessed with reference to the indicators and targets set out in Ireland's Marine Strategy. The potential effects of the proposed aquaculture activities on the achievement of these targets were then evaluated for each of the 11 MSFD descriptors.

4. Zone of Influence

The Zone of Influence (Zoi) for the proposed aquaculture sites encompasses Ballyness Bay and the immediate surrounding marine environment within which the proposed Project may interact with ecological receptors.

Ballyness Bay is classified as a coastal waterbody under the Water Framework Directive (WFD). While three sites are understood to have briefly operated following the original grant of licences, no aquaculture activity is currently underway within the bay and all structures were removed following quashing of the licences. Under Irish MSFD implementation, transitional and coastal waters are assessed using existing WFD monitoring programmes, in line with Article 11 of the MSFD, which promotes the use of established monitoring frameworks. Accordingly, the ecological and chemical status of the Ballyness Bay waterbody, as presented in the accompanying WFD Assessment, provides an appropriate baseline for assessing the achievement of Good Environmental Status (GES) under relevant MSFD descriptors.

Given the nature of the proposed shellfish aquaculture activities, the Zoi is considered to be highly localised and primarily confined to:

- The licensed cultivation areas;
- The underlying intertidal and shallow subtidal sediments; and
- The immediate surrounding water column.

Potential interactions are limited to small-scale physical disturbance of sediments, localised biodeposition beneath cultivation structures, and minor interactions with plankton and benthic communities.

5. MSFD Status in Ireland

The most recent assessment of Ireland's Marine Strategy (Cycle 3, 2025) indicates variable progress across the eleven MSFD descriptors, with several achieving Good Environmental Status (GES), while others remain partially achieved or unknown.

Biodiversity (D1) and commercial fish and shellfish (D3) continue to present challenges, reflecting pressures on marine ecosystems and the status of fish stocks. Seafloor integrity (D6) is generally in good condition, although some areas remain below target thresholds or are unassessed. Marine litter (D10) remains a key pressure, with targets not yet achieved.

In contrast, non-indigenous species (D2), eutrophication (D5), hydrographical conditions (D7), contaminants in the environment (D8), contaminants in seafood (D9), and underwater noise (D11) have achieved GES at a national level.

The status of food webs (D4) remains uncertain due to data limitations.

Given the nature of the proposed Project, the descriptors of greatest relevance to this assessment include biodiversity (D1), Non-indigenous species (D2), eutrophication (D5), seafloor integrity (D6), contaminants in seafood (D9), marine litter (D10) and underwater noise (D11).

Table 5.1: MSFD Cycle 3 status of descriptors and relevance to maritime usage.

MSFD Descriptor	MSFD Status in Ireland (2025)	Relevance to Proposed Aquaculture license
D1 – Biological Diversity	GES partially achieved. Most marine bird species achieved GES. Most marine mammal GES unknown. GES Not Achieved for most fish species. Incidental bycatch remains a major issue.	Relevant - Shellfish aquaculture is low-impact and does not involve bycatch. Activities may result in temporary, highly localised disturbance of intertidal and benthic habitats during husbandry and harvesting; however, these effects are short-term and reversible. The proposed structures may result in very minor, localised displacement of bird foraging habitat; however, given the small spatial footprint (~2.47% of bay area), the low estimated annual production, the availability of extensive surrounding habitat, and the absence of continuous disturbance, no significant effect on bird populations is anticipated.
D2 – Non-Indigenous Species	GES achieved.	Relevant - The species cultivated are non-native but are already established within Irish waters. The proposed activity does not introduce new species or create novel pathways for their spread. While Pacific oysters have demonstrated the capacity for natural recruitment in some Irish bays (e.g. Kochmann et al., 2013), the proposed Project represents a continuation of existing aquaculture practices at a limited spatial scale. Standard husbandry and biosecurity measures will be

MSFD Descriptor	MSFD Status in Ireland (2025)	Relevance to Proposed Aquaculture license
		implemented, including the use of triploid individuals (oysters), thereby limiting the potential for natural recruitment.
D3 – Commercial Fish & Shellfish	GES partially achieved. 29 stocks achieved GES. 46 stocks not at GES. 99 stocks unknown.	Not relevant - Not considered likely to adversely affect this descriptor. The proposed activity does not involve exploitation of wild commercial stocks and is not expected to influence fishing mortality, spawning stock biomass, or population age/size structure metrics used under D3.
D4 – Food Webs	GES status is unknown.	Not relevant – No significant pathway for alteration of trophic structure is identified at the scale proposed.
D5 – Eutrophication	GES achieved.	Relevant - Shellfish aquaculture does not introduce nutrients. Filter-feeding organisms may contribute to improved water quality and nutrient cycling.
D6 – Seafloor Integrity	74% of seafloor achieved GES. 15% not assessed or unknown. 11% not good status.	Relevant - Aquaculture activities are recognised as a pressure within national MSFD assessments of seafloor integrity; however, the proposed Project is small-scale and occupies a very limited proportion of the available habitat (~2.47% of the bay). Oyster trestles and associated infrastructure may result in minor, localised changes to underlying sediments, while intertidal clam cultivation may cause temporary disturbance during seeding and harvesting. These effects are spatially restricted, short-term, and reversible, with rapid recovery facilitated by natural tidal processes.
D7 – Hydrographical Conditions	GES achieved.	Not relevant - The proposed aquaculture activities do not alter tidal flows, currents, or hydrodynamic processes.
D8 – Contaminants in Environment	GES achieved (most contaminants below thresholds).	Not relevant - No contaminant discharges are associated with the activity. The only credible pathway would be accidental small-scale fuel/oil leakage from vehicles or vessels, which is limited and manageable through standard operational controls.
D9 – Contaminants in Seafood	GES achieved (levels below EU food safety standards).	Relevant - Shellfish cultivation in Ireland is subject to strict food safety and water quality monitoring regimes carried out by the Irish government. No pathway for contamination arising from the proposed activities is identified once the activity adheres to national shellfish safety protocols and contaminant monitoring.

MSFD Descriptor	MSFD Status in Ireland (2025)	Relevance to Proposed Aquaculture license
D10 – Marine Litter	GES not achieved (beach litter). Microplastics unassessed.	Relevant - Aquaculture infrastructure (<i>e.g.</i> trestles, mesh bags, ropes) represents a potential source of marine litter; however, the proposed operations are actively managed to minimise material loss.
D11 – Underwater Noise	GES achieved.	Relevant - Shellfish aquaculture is a low-noise activity, with only occasional tractor movements and limited vessel use associated with site access and maintenance. Any noise or vibration arising from these activities would be temporary, infrequent and highly localised, and would not constitute a significant impulsive or continuous underwater noise source in the context of D11.

6. MSFD Indicators

Forty indicators were used for the third cycle of the MSFD assessment to evaluating progress towards Good Environmental Status across all 11 MSFD descriptors. These indicators allow complex ecological processes and pressures to be measured effectively, allowing comparability across regions and reporting cycles, enabling the identification of trends, and helps distinguish between natural variability and human-induced change. Indicators also serve a practical management function, providing policymakers with clear benchmarks against which the effectiveness of measures can be judged (**Table 6.1**).

Table 6.1: Indicators used to assess criteria for each MSFD descriptor for the 3rd MSFD cycle.

Descriptor	Criterion	Indicator(s)
D1 Biodiversity	D1C1 Mortality from incidental bycatch	Bycatch Mortality Indicator (ACS-IE-BycatchMortality2024)
	D1C2 Population abundance	Abundance of Marine Bird Species (ACS-IE-BirdAbundance2024); Seal Abundance Indicator (ACS-IE-SealAbundance2024); Cetacean Abundance Indicator (ACS-IE-CetaceanAbundance2024); Turtle Abundance Indicator (ACS-IE-TurtleAbundance2024); Fish Abundance Indicator (ACS-IE-FishAbundance2024)
	D1C3 Population demographic characteristics	Population Demographics Indicator (ACS-IE-PopDemographics2024)
	D1C4 Distributional range	Distributional Range Indicator (ACS-IE-Distribution2024)
	D1C5 Habitat for species	Habitat Extent and Condition Indicator (ACS-IE-Habitat2024)
D2 non-indigenous species	D2C1 Newly introduced NIS	Newly Introduced NIS Indicator (ACS-IE-NewNIS2024)
	D2C2 Established NIS	Established NIS Abundance Indicator (ACS-IE-EstablishedNIS2024)
D3 Commercial fish & shellfish	D3C1 Fishing mortality (F)	Fishing Mortality Indicator (ACS-IE-F2024)
	D3C2 Spawning Stock Biomass (SSB)	SSB Indicator (ACS-IE-SSB2024)
	D3C3 Population age/size distribution	Age/Size Distribution Indicator (ACS-IE-AgeSize2024)
D4 Food webs	D4C1 Diversity of trophic guilds	Diversity of the Trophic Guild Indicator (ACS-IE-TrophicGuildDiversity2024)
	D4C2 Balance of abundance among trophic guilds	Abundance Balance Indicator (ACS-IE-TrophicGuildAbundance2024)

Descriptor	Criterion	Indicator(s)
	D4C3 Size distribution within trophic guilds	Size Distribution Indicator (ACS-IE-TrophicGuildSize2024)
	D4C4 Productivity of trophic guilds	Productivity Indicator (ACS-IE-TrophicGuildProductivity2024)
D5 Eutrophication	D5C1 Nutrient concentrations	Nutrient Concentrations Indicator (ACS-IE-Nutrients2024)
	D5C2 Chlorophyll-a concentrations	Chlorophyll-a Indicator (ACS-IE-Chlorophyll2024)
	D5C5 Dissolved oxygen	Dissolved Oxygen Indicator (ACS-IE-DO2024)
D6 Sea-floor integrity	D6C1 Physical loss of seabed	Seabed Loss Indicator (ACS-IE-SeabedLoss2024)
	D6C2 Physical disturbance of seabed	Seabed Disturbance Indicator (ACS-IE-SeabedDisturbance2024)
	D6C3 Adverse effects from disturbance	Benthic Community Condition Indicator (ACS-IE-BenthicCondition2024)
	D6C4 Benthic habitat extent	Habitat Extent Indicator (ACS-IE-BenthicExtent2024)
	D6C5 Benthic habitat condition	Habitat Condition Indicator (ACS-IE-BenthicCondition2024)
D7 Hydrographical changes	D7C1 Permanent alteration of hydrographical conditions	Hydrographical Alteration Indicator (ACS-IE-HydroAlteration2024)
	D7C2 Adverse effects from alteration	Hydrographical Effects Indicator (ACS-IE-HydroEffects2024)
D8 Contaminants	D8C1 Concentrations of contaminants	Contaminant Concentrations Indicator (ACS-IE-Contaminants2024)
	D8C2 Adverse effects of contaminants	Biological Effects of Contaminants Indicator (ACS-IE-ContamEffects2024)
	D8C3 Acute pollution events	Acute Pollution Events Indicator (ACS-IE-AcutePollution2024)
D9 Contaminants in seafood	D9C1 Levels of contaminants in seafood	Contaminants in Seafood Indicator (ACS-IE-SeafoodContam2024)
D10 Marine litter	D10C1 Litter on coast & seafloor	Coastal Litter Indicator (ACS-IE-CoastalLitter2024); Seafloor Litter Indicator (ACS-IE-SeafloorLitter2024)
	D10C2 Micro-litter	Micro-litter Indicator (ACS-IE-MicroLitter2024)
D11 Underwater noise	D11C1 Impulsive noise	Impulsive Noise Indicator (ACS-IE-ImpulsiveNoise2024)
	D11C2 Continuous low-frequency sound	Continuous Noise Indicator (ACS-IE-ContinuousNoise2024)

7. Impact of proposed aquaculture activities on relevant MSFD targets within ZOI

The MSFD descriptors identified as relevant to the proposed aquaculture activities (refer to **Table 5.1**) were further assessed against the specific targets defined under Ireland's Marine Strategy to determine whether the proposed Project has the potential to affect the achievement or maintenance of Good Environmental Status (GES). This assessment considers the nature, scale and intensity of the proposed activities in the context of each relevant target. The outcomes of this assessment are presented in **Table 7.1**.

Table 7.1 Assessment of MSFD Targets and the Potential Impact of proposed activities

Descriptor	Target Code	Description	Assessment
D1	D1T1	The mortality rate per species from incidental by-catch is below levels which threaten the species, such that its long-term viability is ensured.	No impact anticipated. The proposed aquaculture activities do not generate incidental bycatch; therefore, no additional mortality pressure is introduced.
D1	D1T1-1	By 2028, aim to ensure that the mortality rate per seal and small toothed cetacean species from incidental by-catch is below levels which threaten the species, in accordance with current conservation objectives and numerical mortality/removal limits established through coordinated regional indicator assessments (i.e. OSPAR common indicator M6 – marine mammal by-catch).	No impact anticipated. The proposal does not interact with fisheries or introduce mortality risk to seals or small toothed cetaceans.
D1	D1T1-3	By 2026, ensure that Ireland participates in the establishment of an internationally coordinated risk-based monitoring and assessment regime that is focused on incidental mortality of non-target species in commercial fisheries and informing the development of appropriate management measures.	No impact anticipated. The activity does not contribute to bycatch pressures and does not affect Ireland's participation in monitoring or management frameworks.
D1	D1T2	The population abundance of the species is not adversely affected due to anthropogenic pressures.	No deterioration anticipated. The proposed activities are small-scale and localised. Any disturbance to habitats or species is temporary and reversible, with no measurable effect on population abundance.
D1	D1T4	The species distributional range and, where relevant, pattern is in line with prevailing physiographic, geographic and climatic conditions.	No impact anticipated. The activity does not influence large-scale environmental drivers controlling species distribution.
D1	D1T5	The habitat for the species has the necessary extent and condition to support the different stages in the life history of the species.	No adverse effect anticipated. Spatial analysis indicates that the proposed aquaculture footprint overlaps with approximately 2.18% of available intertidal mudflat and sandflat habitat within Ballyness Bay. This represents a very small proportion of the available habitat and does not result in significant or permanent habitat loss. Disturbance associated with operations is localised, temporary and reversible, and sufficient surrounding habitat remains available to support species across all life stages.
D1	D1T5-1	By 2030, ensure that Ireland's network of marine protected areas achieves 30% coverage of the maritime area, is ecological coherent	No impact anticipated. The proposed Project does not constrain the designation or ecological coherence of a potential national MPA network.

Descriptor	Target Code	Description	Assessment
		and representative and contributes to sustaining ecosystem services, including climate change resilience and mitigation.	
D1	D1T5-3	By 2030, ensure that Ireland's marine Natura 2000 sites designated for listed species under the EU Birds and Habitats Directives have a system of management measures developed and in place, in order to ensure that the species' habitat extent and condition at all sites achieve and maintain a favourable status.	No conflict anticipated. This is a national Natura 2000 management target. The proposed aquaculture licences will be subject to Appropriate Assessment, ensuring alignment with site-specific conservation objectives and management measures.
D2	D2T1	The number of non-indigenous species which are newly introduced via human activity into the wild, per assessment period is minimised and where possible reduced to zero.	No impact anticipated. The species cultivated are already established in Irish waters and are not newly introduced.
D2	D2T1-1	By 2026, endeavour to minimise the number of newly introduced non-indigenous species to Ireland through the development of a management plan for NIS and implementation of actions in that plan for coastal and marine areas.	No significant impact anticipated. The species cultivated are non-indigenous but already widely established in Irish waters. The proposed activity does not introduce new species or create novel pathways for spread. Standard aquaculture practices and biosecurity measures limit the risk of further dispersal, including the use of triploid individuals which have significantly reduced ability to recruit or are infertile.
D2	D2T1- 2	Continue to reduce the risk of introduction and spread of non-indigenous species linked to ballast water and hull fouling through the implementation of the Ballast Water Convention.	Not relevant. This target relates to ballast water and hull fouling, which are not associated with the proposed aquaculture activity.
D5	D5T1	Nutrient concentrations are not at levels that indicate adverse eutrophication effects.	No adverse effect anticipated. The proposed shellfish aquaculture is non-fed and does not introduce nutrients to the receiving environment. Filter-feeding shellfish remove phytoplankton and suspended particulate matter from the water column and may contribute to localised improvements in water quality and nutrient cycling. Any biodeposition beneath cultivation structures would be spatially limited and rapidly assimilated or dispersed within this well-flushed, dynamic coastal system. Overall, the proposed activity is not expected to contribute to eutrophication or cause a deterioration in ecosystem health in Ballyness Bay.
D5	D5T1-1	By 2028, in order to address eutrophication Ireland will ensure that effective measures are taken including the implementation of actions under Ireland's Water Action Plan 2024.	No adverse effect anticipated. The proposed aquaculture activities are non-fed and do not introduce nutrients to the receiving environment; therefore, they do not interact with or influence the implementation of measures under Ireland's Water Action Plan 2024. The scale and nature

Descriptor	Target Code	Description	Assessment
			of the activity are not expected to contribute to eutrophication pressures requiring management intervention.
D5	D5T2	Continue to ensure that chlorophyll concentrations are not at levels that indicate adverse effects of nutrient enrichment.	No adverse effect anticipated. The proposed aquaculture activities do not result in nutrient enrichment of the water column. Filter-feeding shellfish remove phytoplankton and suspended particulate matter, which may contribute to localised improvements in water quality. As such, the proposed activity is not expected to result in increased chlorophyll concentrations or contribute to adverse eutrophication effects
D5	D5T3	Continue to ensure that the concentration of dissolved oxygen is not reduced, due to nutrient enrichment.	No adverse effect anticipated. The proposed aquaculture activities do not introduce nutrients or organic loading at a scale that would result in oxygen depletion. While minor, localised biodeposition may occur beneath cultivation structures, this would be spatially limited and rapidly assimilated or dispersed within this well-flushed coastal system. No reduction in dissolved oxygen concentrations is anticipated.
D6	D6T1	The structure and functions of the ecosystems, and benthic ecosystems, in particular, are not adversely affected due to the spatial extent and distribution of physical disturbance or physical loss on the seabed	No significant adverse effect anticipated. Localised and temporary disturbance to intertidal sediments may occur during seeding and harvesting; however, given the limited site footprint, dispersed layout, and low estimated annual production, effects are spatially restricted and reversible.
D6	D6T1-1	Continue to maintain existing low levels of sealed physical loss at less than 2% of the seabed in each benthic broad habitat type.	No significant adverse effect anticipated. The proposed Project occupies a very small proportion of the available habitat and does not result in sealed or permanent seabed loss at a scale that would affect national thresholds.
D6	D6T2	The extent of adverse effects from anthropogenic pressures on the condition of the habitat type, including alteration to its biotic and abiotic structure and its functions, does not exceed a specified proportion of the natural extent of the habitat type in the assessment area.	No significant adverse effect anticipated. Spatial analysis indicates that the proposed aquaculture sites overlap with approximately 2.18% of the available mudflat and sandflat habitat within Ballyness Bay. Any changes to benthic habitat condition will be minor, localised and temporary in nature, with rapid recovery expected due to strong tidal flushing given the coastal nature of the waterbody.
D6	D6T2-1	By 2030, maintain or reduce the extent of adverse effects on the seabed in each benthic broad habitat type to less than 25% of the habitat extent.	No significant adverse effect anticipated. Spatial analysis indicates that the proposed aquaculture sites overlap with approximately 15.11 ha of intertidal mudflat and sandflat habitat within Ballyness Bay.

Descriptor	Target Code	Description	Assessment
			representing approximately 2.18% of the total habitat extent within the SAC. This is substantially below the 25% threshold for adverse effects on benthic habitat extent. Disturbance associated with cultivation and harvesting activities will be localised, temporary and reversible in nature. Therefore, the proposed activity will not adversely affect seafloor integrity or hinder the achievement of GES.
D6	D6T2-3	By 2040, determine the condition of 50% of benthic broad habitat types based on the best available knowledge and techniques.	Not directly relevant. This is a national monitoring target and is not influenced by the proposed aquaculture activities.
D6	D6T2-4	By 2030, determine the condition of 50% of other benthic broad habitat types based on the best available knowledge and techniques.	Not directly relevant. This is a national-scale assessment objective and not affected by site-specific activities.
D6	D6T2-6	By 2028, commence implementation of nature-based solutions for marine habitats in order to restore biodiversity, reduce eutrophication impacts and support the delivery of ecosystem services, including resilience to climate change and restoration of carbon sinks.	Not directly relevant. This is a national restoration target. The proposed activity neither contributes to nor constrains its delivery.
D9	D9T1	Levels of contaminants in fish and shellfish caught or harvested for human consumption comply with maximum limits listed in EU Regulation 1881/2006 (as amended).	No adverse effect anticipated. Shellfish cultivation is subject to strict national regulatory monitoring (e.g. classification, microbiological and biotoxin testing). The proposed activity does not introduce contamination pathways that would affect compliance with food safety standards.
D10	D10T1a	The composition, amount and spatial distribution of litter in the coastline, and on the seabed, are at levels that do not cause harm to the coastal or marine environment.	Potential minor pressure identified; no significant effect anticipated. Aquaculture infrastructure, including galvanised steel trestles and plastic mesh bags and netting (typically high-density polyethylene or polypropylene), may represent a potential source of marine litter if lost or damaged. However, materials are actively managed, secured, and regularly maintained as part of routine husbandry, minimising the likelihood of loss to the environment. Any damaged or redundant materials are removed from the site and disposed of appropriately. As such, the proposed activity is not expected to contribute to marine litter at levels that would cause harm to the coastal or marine environment.
D10	D10T1a-1	By 2030, the marine litter abundance on Irelands coastline will be reduced to 20 litter items per 100 m.	No significant effect anticipated. The limited scale of the proposed activity and implementation of good management practices for litter

Descriptor	Target Code	Description	Assessment
			management ensure this target is not contradicted by the proposed aquaculture activity in Ballyness Bay.
D10	D10T1a-2	By 2026, apply standardised methods for monitoring and assessment of microplastics in sediments and biota to determine marine microplastics hotspots and associated sources.	Not directly relevant. This is a national monitoring target and not influenced by site-specific activities.
D10	D10T1a-3	By 2030, Ireland will reduce from a baseline of 2016 by at least 75% the prevalence of the most commonly found single-use plastic items and of maritime related plastic items on beaches in order to contribute to the achievement of relevant regional and EU threshold values building upon requirements for EU Member States in the EU Single Use Plastics Directive (Directive 2019/904).	Not relevant. This is a national policy and guidance target and is not influenced by the proposed activity.
D11	D11T1	The spatial distribution, temporal extent, and levels of anthropogenic impulsive sound sources do not exceed levels that adversely affect populations of marine animals.	Any noise or vibration associated with intermittent tractor or vessel use would be temporary, infrequent and highly localised and would not constitute a significant impulsive or continuous underwater noise source. The two main sources of continuous noise in Irish waters are from shipping and fishing activity.
D11	D11T1-a	By 2026, ensure guidance to regulate both continuous and impulsive noise from anthropogenic activities is developed and implemented in order to maintain low levels of noise in Irelands marine environment.	Not relevant. This is a national policy and guidance target and is not influenced by the proposed activity.

Having regard to the nature, scale, and location of the proposed aquaculture activities, and the absence of a credible pathway for significant adverse effects on the relevant MSFD descriptors and associated targets, the proposed Project is not expected to result in a deterioration of environmental status or hinder the achievement or maintenance of Good Environmental Status (GES) in Ireland's marine waters.

8. Statement of Authority

This report was authored by Neve McCann.

Neve is a Senior Marine Consultant with AQUAFACT (APEM Group), specialising in Appropriate Assessment (AA), Natura Impact Statements (NIS), and Environmental Impact Assessment Reports (EIAR). She has extensive experience delivering environmental assessments for infrastructure, renewable energy, and marine projects, with a strong focus on regulatory compliance under the Habitats Directive, Water Framework Directive (WFD), and Marine Strategy Framework Directive (MSFD). She has led and contributed to complex multidisciplinary assessments, supporting projects from screening through to detailed impact assessment and mitigation design.

She is technically skilled in data management and spatial analysis, proficient in ArcGIS, R Studio, and SQL, with experience in MSFD Descriptor assessments, ICES data calls, and contributions to MSFD Article 8 reporting. Neve has actively participated in ICES Working Groups and European marine forums, supporting collaborative research and policy development. Her fieldwork experience includes protected species surveys, benthic sampling, freshwater assessments, and sea-going surveys such as Irish Groundfish and Nephrops UWTV. Neve also holds JNCC Marine Mammal Observer certification and has completed specialist training in stock assessment and project management for wildlife conservation.

This report was reviewed by Aidan Long.

Aidan is a Principal Marine Consultant at AQUAFACT with 9 years of demonstrable experience spanning industry, government and academia with a PhD in marine ecology. Aidan will oversee the preparation of the MUL application form and associated attachments including compliance statements for relevant Irish, EU and international legislation (e.g. NMPF, WFD and MSFD). He has expertise in environmental project management, marine ecology, marine legislation, Marine Usage Licences, Dumping at Sea permits, technical writing, monitoring programme design and statistical analysis. He has profitably managed large multidisciplinary environmental projects for high-profile industry clients across Ireland, Australia and Brazil in sectors such as fisheries, aquaculture, offshore renewables, ports, wastewater and mining. He has authored over 40 major technical reports as an environmental consultant/government scientist and has led the authorship of multiple papers in international science journals. He regularly presents research at international conferences and engages regularly with clients, stakeholders, and in business development.

9. References

- Department of Climate, Energy and the Environment. (2025). *Ireland's marine strategy framework directive marine strategy part 1: Assessment (Article 8), determination of good environmental status (Article 9) and environmental targets (Article 10)*. Government of Ireland.
- Department of Climate, Energy and the Environment. (2025). *Ireland's marine strategy part 1: Annex III – indicators*. Government of Ireland.
- Department of Climate, Energy and the Environment. (2025). *Ireland's marine strategy part 1: Annex IV – environmental targets*. Government of Ireland.
- Department of Housing, Local Government and Heritage. (2024). *River basin management plan for Ireland 2022–2027*. Government of Ireland.
- Department of Housing, Local Government and Heritage. (2022). *Marine strategy framework directive 2008/56/EC – Article 17 update to Ireland's marine strategy part 3: Programme of measures (Article 13)*. Government of Ireland.
- Environmental Protection Agency. (2024). *Catchments.ie: Ireland's water quality and catchment data*.
- European Commission. (2008). *Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy*.
- European Commission. (2017). *Commission directive (EU) 2017/845 amending directive 2008/56/EC*.
- European Communities. (2011). *European Communities (Marine Strategy Framework) Regulations 2011 (S.I. No. 249 of 2011)*.
- European Communities. (2017). *European Communities (Marine Strategy Framework) (Amendment) Regulations 2017 (S.I. No. 265 of 2017)*.
- European Commission. (2000). *Directive 2000/60/EC establishing a framework for community action in the field of water policy*.
- Gittings, T. & O'Donoghue, P. (2012). The effects of intertidal oyster culture on the spatial distribution of waterbirds. Report prepared for the Marine Institute. Atkins, Cork.
- Kochmann, J., O'Beirn, F. X., Yearsley, J. M., & Crowe, T. P. (2013). Environmental factors associated with invasion: Modelling occurrence data from a coordinated sampling programme for Pacific oysters. *Biological Invasions*, 15(10), 2267–2279. <https://doi.org/10.1007/s10530-013-0442-7>
- AQUAFAC (APEM Group). (2023). *Ballyness bay oyster and clam aquaculture sites: Screening for appropriate assessment and Natura impact statement*.