Appeal Ref No. AP 11/2019

Aquaculture Licences Appeals Board

Technical Advisor's Report

Description: Assessment of the appeal against the Minister's decision to refuse an aquaculture and foreshore licence for the intertidal cultivation of pacific oysters and native oysters using trestles and bags and trestles and hanging baskets in Poulnasherry Bay (Lower Shannon Estuary), Co. Clare on sites referenced T08/106 B, C & D.

Licence Application

Department Ref No: T08/106 B, C & D

Applicant: Moyasta Oysters Ltd
Moyasta, Kilrush, Co. Clare

Minister's Decision: Refusal

Appeal

Type of Appeal: To appeal the ministerial decision to refuse to grant an Aquaculture and Foreshore licence for the cultivation of Pacific Oysters and Native Oysters using bags and trestles and trestles and hanging baskets on the sites reference T08/106 B, C & D.

Appellant(s): Moyasta Oysters Ltd

Observers:

Technical Advisor: EcoÉireann Ecological Consultants

Date of site Inspection: Site Inspection Conducted by Ecologist Eoin Cussen on 22nd May 2020.

Document Control

Version	Date	Changes	Confidentiality	Prep	Rev	Auth
V1	07/06/2020	Draft to client	Confidential	EC	CS	JT
V2	31/08/2021	Draft Interim Report	Confidential	EC		

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1. General Matters / Appeal Details

1.1. Appeal Details & Observer Comments / Submissions

Date Appeal Received: 8th November 2019
Location of Site Appealed: Poulnasherry Bay (Lower Shannon Estuary), Co. Clare

1.2. Name of Appellant (s):

Thomas Galvin, Moyasta Oysters Ltd, Moyasta, Kilrush, Co. Clare

1.3. Name of Observer (s)

N/A

1.4. Grounds for Appeal

1. Protected Species. The appellant states that within the SPA Appropriate Assessment it was noted that the majority of Grey Plover recordings were made within the Inner Poulnasherry Bay (NPWS Baseline Waterbird Survey Subsite OH519) and not the Outer Bay area (NPWS BWS subsite OH520) where sites T08/106 B & D are located, therefore the licensing of these sites should have no impact on Grey Plover numbers.

2. Licensing Decision The appellant states that the Departments decision of refusal of his license applications was unjustified as bird survey work in the bay is not yet complete. He believes that the licensing decisions should have been deferred, rather than refused, following the completion of further survey work which will provide sufficient data to inform future licensing decision.

3. Economic The appellant states that there will be a clear economic benefit to the local and regional economy, which has been recorded in the past to have a high unemployment rate. The area is also facing future economic blows due to the impending closure of Moneypoint (coal powered) Power station.

4. Natura 2000 Sites The appellant states that the Lower River Shannon Special Area of Conservation (SAC) has a larger area compared to the River Shannon & River Fergus Estuaries Special Protection Area (SPA) (68,300ha compared to 32,238ha) and that this SAC area total should be used in determining the overlap extent of aquaculture activities, which would therefore allow for further licensing of aquaculture activities.

5. Fishery Order Areas The appellant states that a survey should have been carried out to verify the extent use of these large sites, rather than assuming 100% occupancy. The appellant believes until a complete survey is carried out that this should be grounds for a deferral of licensing decisions rather than refusal.

6. Consultation Phase The appellant states that there were no objections lodged by the public during the mandatory consultation phase.

1.5. Minister's submission

Section 44 of the Fisheries (Amendment) Act 1997 states that:

"The Minister and each other party except the Appellant may make submissions or observations in writing to the Board in relation to the appeal within a period of one month beginning on the day on which a copy of the notice of appeal is sent to that party by the Board and any submissions or observations received by the Board after the expiration of that period shall not be considered by it."

The Minister responded to the application for the aquaculture and foreshore licence as below, as described in the DAFM website: https://www.agriculture.gov.ie/media/migration/seafood/aquaculture foreshoremanagement/aquaculturelicensing/aquaculturelicencedecisions/clare/20T0806BCDDeterminationofAquaculture041019.pdf [Accessed on 30/04/2020].

The following are the reasons and considerations for the Minister's determination to refuse the licences sought:

- This site shall not be permitted as the risk of disturbance to the integrity of the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA cannot be discounted given the conclusions and recommendations of the Appropriate Assessment process.

- The precautionary principle must be evoked in relation to the licensing of certain areas in the Shannon Estuary given that the exact nature and level of existing and proposed activities within the Oyster Fishery Order areas is unknown and subject to change.

- The proposed aquaculture activity at this site is not consistent with the Conservation Objectives for the SPA and could potentially cause substantial disturbance to protected shorebird species, especially Grey Plover in the Poulnasherry / Kilrush area. Particularly when considered in combination with existing and proposed aquaculture, green algal accumulations and oyster trestle cultivation in the Fishery Order Area T08/008, which covers part of Poulnasherry bay.

- Taking account of the issues raised during the public and statutory consultation phase – which are listed below in Section 6.1, Table 7.

1.6. Applicant response

The Applicant made a submission as the Appellant. The appellants response dated 7th November 2019, is addressed within this report.

2. Consideration of Non-Substantive Issues

3. Oral Hearing Assessment

In line with Section 49 of the Fisheries Amendment Act 1997 an oral hearing may be conducted by the ALAB regarding the licence appeals.

At this time an oral hearing has not been called nor requested by the appellant or the applicant.

It is considered, by the advisor, that an Oral Hearing is not required for this application where there is no conflicting technical information on relevant and significant aspects of the appeal.

4. Minister's file

Details of the file received by ALAB from the Minster requested under Section 43 are listed here in chronological order. Copies of the following items were recieved;

- Application form, site map and layout
- Submissions from Statutory and Technical consultations
- Notification of Minister's decision to the applicant
- Location map of the surrounding area including
    - Sites under application
    - Sites lapsed
    - Licensed sites
    - Sites currently under appeal
- Appropriate Assessment reports for aquaculture in the Lower River Shannon SAC and the River Shannon and Fergus Estuaries SPA

5. Context of the Area

5.1. Physical descriptions

5.1.1 Site Location

The River Shannon is the largest river system in Ireland, with a total length of 386km. It is located on the West coast of Ireland with the main estuary forming the border between Counties Kerry and Clare, and Limerick and Clare. The River Shannon and Fergus Estuaries form the largest estuarine complex in Ireland.

The appealed aquaculture site (T8/106B, C & D) are located within the lower Shannon Estuary at Poulnasherry Bay (Inner & Outer Bay), west of the town of Kilrush and south-east of the town of Kilkee, Co. Clare.

5.1.2 Physical Characteristics and Freshwater Influence

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary.

Most of the intertidal habitat within the Lower River Shannon occurs in the Fergus Estuary and in the upper section of the Shannon Estuary. Downstream of Foynes Island, there is generally only a narrow intertidal zone, with more extensive areas of intertidal habitat being restricted to a few bays and inlets such as; Clonderlan Bay and Poulnasherry Bay on the northern shore and Ballylongford/Bunaclugga Bay and Tarbert Bay on the southern shore (Atkins, 2019).

5.1.3 Meteorological Conditions

The River Shannon Estuary is located on the West Coast of Ireland. The Gulf Stream North Atlantic current flows past the West coastline, resulting in generally mild temperatures, while it's mountainous nature, geographical location and the prevailing south westerly winds results in one of the highest rainfall rates in the country. The monthly rainfall average recorded by Met Éireann at the Valentia Observatory off the western coast of the Iveragh Peninsula was 140mm for the last ten years (2009-2019). The lowest average rainfall was 54.4mm and the highest 285mm.

5.1.4 Local Population

The largest nearby population lies in Kilrush town, Co. Clare (2719) with an annual growth of 0.18% (2011 to 2016). Within County Kerry, south of the Shannon Estuary, Ballybunnion town (1413) comprises the larger regional population with an annual growth rate of +0.85% (2011 to 2016). Ballylongford (391) is a smaller town in the local area, which has a declining population of 1.32% (2011 to 2016) (http://census.cso.ie/p2map11/ [accessed on 14/05/2020]).

Figure 1 Poulnasherry Bay in relation to the surrounding landscape

5.2. Resource Users

5.2.1 Aquaculture Activity

Bord Iascaigh Mhara, BIM, (Irish Sea Fisheries Board) was set up over 65 years ago to promote, develop and support the Irish seafood sector by providing technical expertise, business support, funding, training and promoting responsible environmental practice. BIM have developed a Special Unified Marking Scheme, SUMS, for Poulnasherry Bay in conjunction with the Co-Ordinated Local Aquaculture Management System, CLAMS, and the local aquaculture license holders.

Aquaculture within the Lower River Shannon is confined to the production of shellfish (oysters and mussels). The main aquaculture activity is oyster culture, which involves the culture of both the native, *Ostrea edulis,* and Pacific oyster, *Crassostrea gigas*, on trestles in intertidal areas and subtidally on the seabed. Mussel culture includes subtidal suspended (longlines), intertidal/ subtidal Bouchet poles and bottom culture. The production of Scallops is also licensed; however this species is currently not being produced (MI, 2019a).

Within the Lower River Shannon are 3 Oyster Fishery Order, OFO, Areas (T08/004A, T08/004B & T08/008) which are under the remit of the Department of Communications, Climate Action and Environment. Two of these OFOs are the largest licensed aquaculture sites in Europe T08/004A (3515ha) and T08/004B (4548ha), with a large portion of the Lower River Shannon encompassed with the license bounds. The remaining OFO, T08/008, is situated at the entrance to the Inner Poulnasherry Bay and is much smaller than the other two OFOs at 40ha; approximately 25% of this area is currently in use for trestle and bag cultivation (MI, 2019a).

There are five locations currently in operation for oyster culture within the SAC, located in Rinneville, Carrigaholt, Ballylongford, Askeaton/Foynes, Poulnasherry Bays. Oysters are the only species produced in Poulnasherry Bay. Cultivation is by bag and trestle method, with stock primarily sourced (G6/G7) from Seasalter or Guernsey hatcheries (MI, 2019a).

5.2.2 Angling Activity

The Shannon Estuary and the coasts of Co. Clare (and Counties Kerry & Limerick) attract notable numbers of domestic and European anglers, generating significant revenue for the local economy. County Clare has 168km of estuarial coastline with charter fishing boats operating from Carrigaholt, Kilrush and Kilbaha and numerous other small piers for small boats to launch from (CCC, 2017a). The region's scenic and rugged coastline offers exceptional shore angling, with 40 shore angling marks located throughout the estuary.

Shore angling occurs on the east and west side of mouth of Poulnasherry Bay, where Angling Marks are located. Querrin Pier is used as an area for collecting lugworm and soft peeler crab for bait. Angling in this region produces flounder and bass (https://fishinginireland.info/sea/shannon/shannonestn/ [accessed on 15/05/2020].

The River Shannon has a large hydroelectric facility upstream of Limerick City which limits the upstream movement of migratory fish, including Atlantic Salmon and Sea Lamprey. Salmon stocks within the River Shannon above the impoundment of the dam have been assessed as being below their Conservation Limit and so a harvest ban on wild salmon is in place in the Upper River Shannon. The Lower River Shannon is open for catch & release-only salmon fishing (Gargan *et al.,* 2020).

5.2.3 Tourism

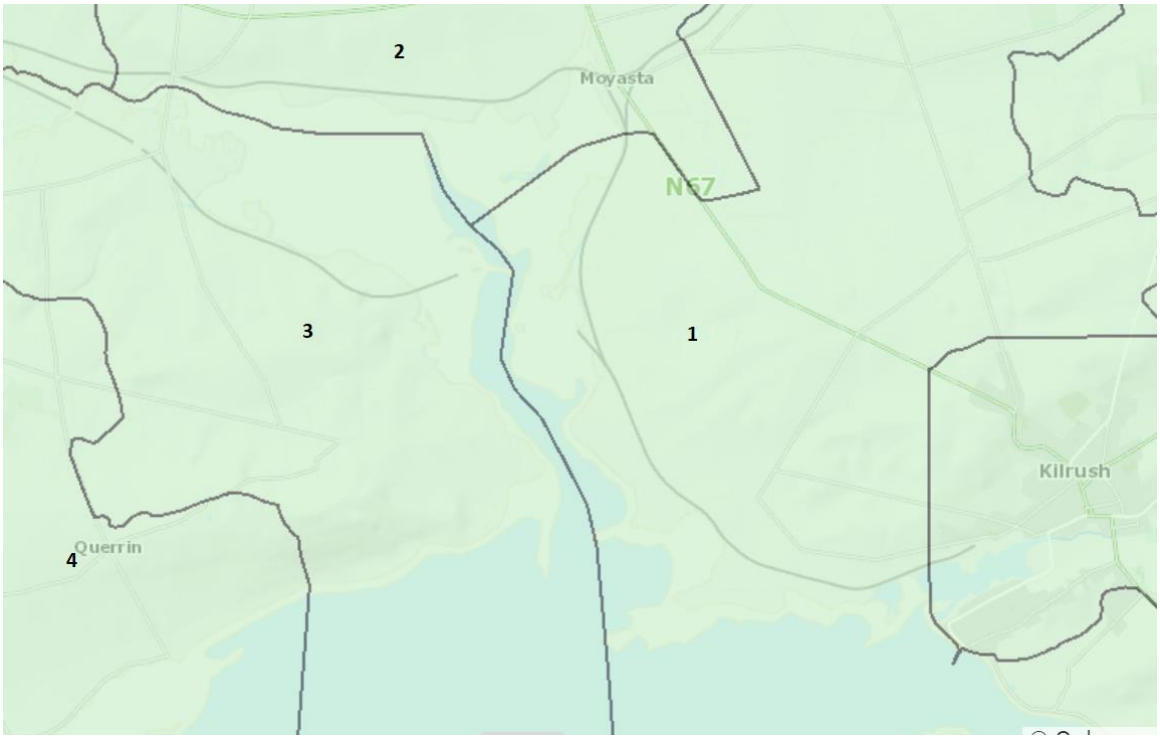
The Midwest region (Counties Clare, Limerick and North County Tipperary) was the third most popular tourist and holiday destination outside of Dublin in 2017 (Fáilte Ireland, 2018a). Approximately 10% (1.4 million) of the total overseas tourists visiting Ireland travelled to the Midwest region in 2017 (with over half of this number visiting County Clare) with approximately 1,500,000 tourists (overseas) travelling to the area in 2018, while c. 11% (1.1 million) of domestic tourists travelled to the area in 2018 (Fáilte Ireland, 2019).

The tourism industry makes a significant contribution to the vitality and sustainability of a wide variety of local enterprises in County Clare, particularly in rural areas (CCC, 2017). Several of Ireland's most popular tourist attractions are located in County Clare, including areas of natural heritage like the Cliffs of Moher, which was the second most popular fee-charging visitor attraction in Ireland in 2017 with over 1.5 million visitors (Fáilte Ireland, 2018b).

5.2.4 Agricultural Activity

Around Poulnasherry Bay there are 4 electoral regions which hold agricultural data (CSO - http://census.cso.ie/agrimap/ [Accessed 12/05/20]). The number of farms in each region are based on latest data (2010):

1. Kilrush Rural (eastern boundary) – 80
2. Einagh (northern boundary) – 42
3. St. Martin's (western boundary) – 20
4. Querrin (adjacent to western boundary) – 23



In total, in 2010 there were 165 farms around the Bay. These farms make up approximately 2.5% of total farms in County Clare.

Total grazing numbers for the area around Donegal Bay based on 2010 figures are outlined in Table 1, below (http://census.cso.ie/agrimap [Accessed 12/05/20]).

Table 1 Grazing Figures per Electoral Area (2010)

Reference	Area	Total Farmed Area (ha)	Pasture (ha)	Total Cattle (head)	Total Horses (Head)
1	Kilrush Rural	2266	1261	3320	67
2	Einagh	1108	599	1327	20
3	St. Martin's	850	457	1303	16
4	Querrin	735	395	1196	34

5.2.5 Inshore Fishing activity

The principal commercial fishing activity in the Shannon Estuary concerns shellfish cultivation, with some limited potting and seasonal trawling also taking place. Charter fishing boats operate from Carrigaholt, Kilrush and Kilbaha (CCC,2017a).

5.2.6 Users of the water body & surrounding area

The Shannon Estuary is multi-functional, as the waters and adjoining lands support a range of functions, uses, communities, activities, and environmental resources/assets, among the most notable functions are (SIFP, 2013):

- Shipping/Port functions
- Marine related Industry/Industry
- Fishing/Aquaculture
- Marine Tourism, Leisure and Recreation
- Energy generation
- Fuel Storage
- Aviation
- Heritage and Landscape
- Valuable Habitats and Species

The Shannon Estuary has a long-established history of facilitating major industries, including Shannon Foynes Port at Foynes and Limerick Docks. The Port has grown to become Ireland second largest port operation, handling the largest vessels entering Irish waters, up to 200,000dwt. Shannon International Airport, ESB Moneypoint, Tarbert Power Station, NORA Fuel Storage, Aughinish Alumina have also grown and become major industrial and employment hubs within the Estuary (SIFP, 2013)

The Estuary has become a major contributor to the energy supply market. ESB Moneypoint has been generating electricity for around 25 years, and with a capacity of 915 MW it is capable of meeting approximately 25% of Irelands demand for electricity. Along with Tarbert Power Station, it has created a strategic energy hub within the Shannon Estuary, facilitating the growth of strategic grid infrastructure and other synergistic industries such as renewable energy and combined heat and power (SIFP, 2013).

There has been an increase in human activities on the land and sea, utilising the Estuary resources, and harnessing its potential, not just shipping and fishing, but the emergence of marine renewable energy opportunities, maritime tourism and recreation/cruise ships (SIFP, 2013).

A passenger ferry runs between Tarbert Co. Kerry across the estuary to Killimer Co. Clare, to the east of Bunaclugga Bay. Bunaclugga Bay was historically used for aquaculture by the local fishing co-op which have since been bought out (as per comms on site visit).

During the site visit subsistence periwinkle harvesting was being carried out in the rocky intertidal foreshore area of Bunaclugga Bay.

5.3. Environmental Data

5.3.1 Water Quality

WFD Status
Water quality in Poulnasherry Bay is monitored as part of the Water Framework Directive (WFD) Monitoring Programme. The latest round of monitoring results (2013-2018) indicate that Poulnasherry Bay (Lower Shannon Estuary, site code IE_SH_060_0300 & Mouth of the Shannon, site code IE_SH_060_0000) demonstrates Good Ecological status for Transitional and Coastal Water Quality Status (EPA.

Bathing Water
Bathing water quality is not monitored within Poulnasherry Bay. The nearest site which is monitored for bathing water is the Cappagh Pier, Kilrush (IESHBWC_060_0000_0100), which for the 2019 period was recorded as being of Excellent Water Quality. Further sites monitored for Bathing Water Quality are located at Carrigaholt (IESHBWC060_0000_050) which is recorded as New (Classification Not Possible) for the 2019 period, and at Ballybunnion North & South (IESHBWC060_0000_0200 & IESHBWC060_0000_0300, respectively) which have been recorded as Good & Excellent Water Quality respectively. (https://gis.epa.ie/EPAMaps/ [accessed on 4/05/2020]).

Transitional and Coastal Waters
In Ireland, transitional and coastal waters cover an area of over 14,000 km2 (transitional 844 km2; coastal 13,325 km2) and represent a wide variety of types such as lagoons, estuaries, large coastal bays and exposed coastal stretches. Transitional water is the term used to describe estuaries and lagoons. The ecological status of these waters has been assessed using data from 2013 to 2018, as many of the biological assessments are undertaken over a six-year period. The saline waters of Ireland are comprised of 304 waterbodies (110 coastal and 194 transitional) and approximately 40% of these are monitored in the national Water Framework Directive monitoring programme.

Of the monitored transitional water bodies, 30 (38%) are in high or good ecological status and 49 (62%) are in moderate or worse ecological status. Six of these water bodies are in bad ecological status (the worst status class) and 14 are in poor ecological status, which include the Shannon Airport Lagoon and the Upper Shannon Estuary. Just over two-fifths (42%) of the surface area of transitional waters are in high or good status.

5.4. Statutory Status

Poulnasherry Bay is statutorily designated under the EU Shellfish Waters Directive (Figures 3 & 4, below) and also designated as a Special Area of Conservation (SAC) and Special Protection Area (SPA) under Article 4 of the EU Habitats Directive (Figures 5 and 6, below).

5.4.1 Shellfish Designated Waters:

Following the European Council Directive 79/923/EEC on the quality required of shellfish waters and the numerous subsequent amendments to this directive, a codified version was produced - Directive 2006/113/EC on the quality required of shellfish waters. This directive sets out physical, chemical and microbiological parameters and regulations for the designation and sampling of Shellfish Designated Waters to protect or improve these waters in order to support shellfish (bi-valve and gastropod molluscs) life and growth; the directive also provides for the establishment of pollution reduction programmes for designated waters and thus, contribute to the high quality of shellfish products directly edible by man.

Within the Lower River Shannon there are 4-no. areas designated under the EU Shellfish Waters Directive which comprise a total area of 21.2km^2 (NPWS, 2012). These include the Ballylongford Shellfish Area (8.6km^2), Poulnasherry Shellfish Area (7.04km^2), Rinevella Shellfish Area (0.6km^2) and the Carrigaholt Shellfish Area (4.9km^2). The West Shannon Ballylongford Shellfish Area extends from Knockfinglas Point, around Carrig Island and encompasses a section of Bunaclugga Bay, Co. Kerry. The Poulnasherry Shellfish Area extends from Querin Point to Baunahard Point, comprising the entirety of Poulnasherry Bay, Co. Clare. The Carrigaholt Shellfish Area incorporates the entire Carrigaholt Bay, while the Rinevella Shellfish Area incorporates the entire Rinevella Bay.

Figure 2 Shannon Estuary Shellfish Designated Waters and Licensed Aquaculture Sites

Figure 3 Poulnasherry Bay Shellfish Designated Waters

Figure 4 Poulnasherry Bay Shellfish Designated Waters & Licensed Aquaculture Sites

5.4.1 *Nature Conservation Designations*

The protected habitats and species focused on in this report are those listed as qualifying interests and special conservation interests of the Lower River Shannon SAC (Table 2) and the Shannon & Fergus Estuaries SPA (Table 3), which may be impacted by aquaculture activities including: Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Large Shallow Inlets and Bays [1160], Reefs [1170], , bottle-nosed dolphin [1349], salmon [1106], lamprey [1095 & 1099] and otter [1355] (Species listed below in Section 5.5). Numerous bird species & Wetland habitats are also cited within the SPA designation.

Lower River Shannon SAC (Site Code: 002165)

The Lower River Shannon SAC is a very large protected site (68,3000 ha) which stretches along the Shannon Valley from Killaloe, Co. Clare to Loop Head, Co. Clare / Kerry Head, Co. Kerry, a distance of c. 120km. The site encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head (NPWS, 2014).

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary (NPWS, 2014).

The marine-influenced area of the Lower River Shannon SAC is designated for the Annex I habitats Sandbanks which are slightly covered by sea water all the time (1110), Estuaries (1130), Mudflats and sandflats not covered by seawater at low tide (1140), Coastal lagoons (1150), Large shallow inlets and bays (1160) and Reefs (1170). The estuary supports a variety of sub-tidal and intertidal sedimentary and reef habitats. The area is also designated for both marine and terrestrial mammals (bottlenose dolphin & otter), fish species (Atlantic salmon, Sea, Brook, and River lamprey) and the freshwater pearl mussel (NPWS, 2014). A full list of Conservation Interest features is available in Table 2, below.

Table 2 Qualifying Interests for the Lower River Shannon SAC

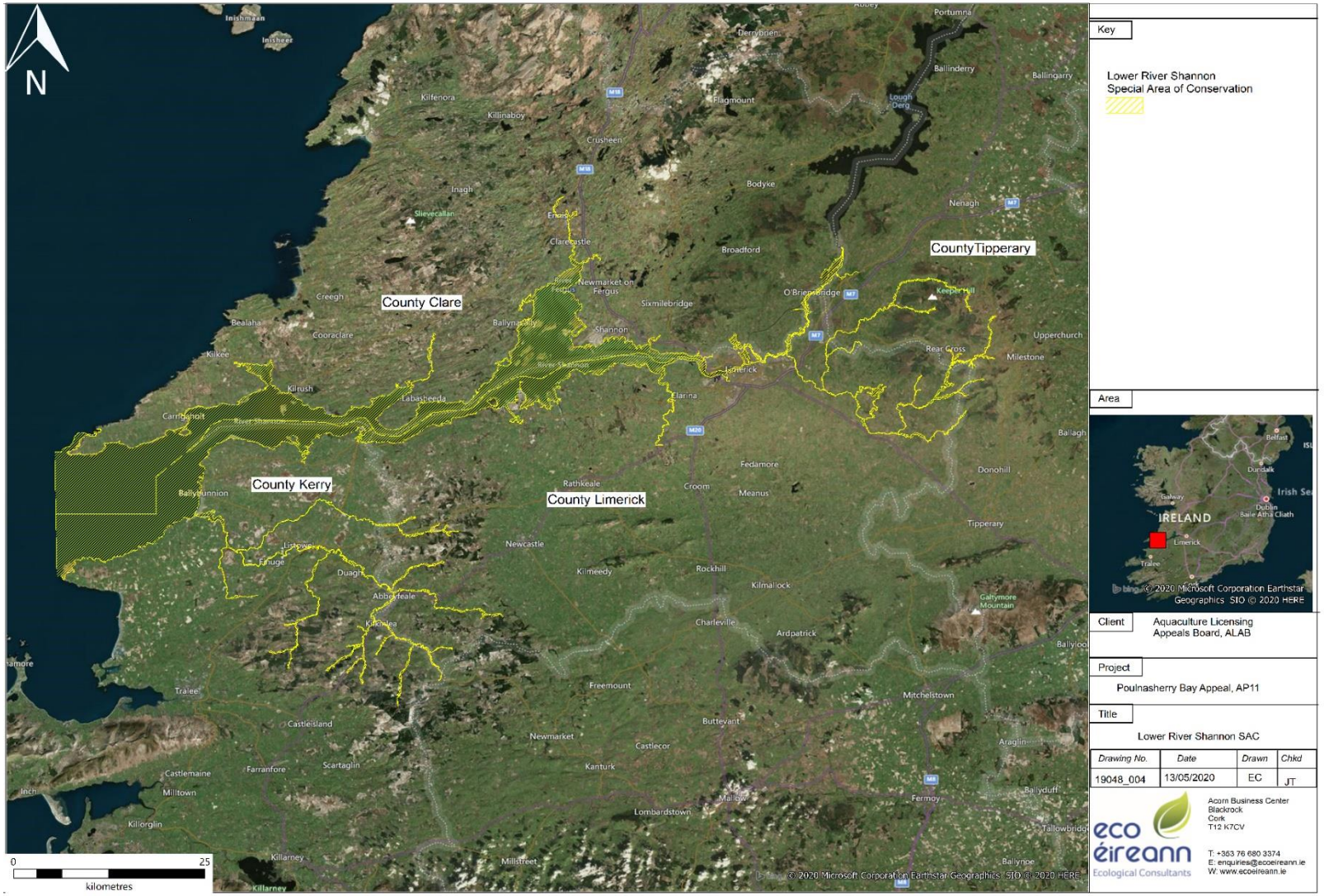
Qualifying Interests	Designation Code
Freshwater Pearl Mussel *Margaritifera margaritifera* (Only in Freshwater)	1029
Sea Lamprey *Petromyzon marinus*	1095
Brook Lamprey *Lampetra planeri*	1096
River lamprey *Lampetra fluviatilis*	1099
Atlantic Salmon *Salmo salar* (Only in Freshwater)	1106
Sandbanks which are slightly covered by seawater all the time	1110
Estuaries	1130
Mudflats and sandflats not covered by seawater at low tide	1140
*Coastal Lagoons	1150
Large shallow inlets and bays	1160
Reefs	1170
Perennial vegetation of stony banks	1220
Vegetated sea cliffs of the Atlantic and Baltic coasts	1230
Salicornia and other annuals colonising mud and sand	1310
Atlantic salt meadows (*Glauco-puccinellietalia maritimae)*	1330
Bottlenose Dolphin *Tursiops truncatus*	1349
Otter *Lutra lutra*	1355
Mediterranean salt meadows (*Juncetalia maritimi)*	1410
Watercourses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	3260
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae)*	6410
*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanae, Salicion albae)*	91E0

*Indicates a Priority Habitat

Conservation Objectives for these habitats and species are focused on restoring favourable conservation condition to these habitats and species, and relate to the requirement to maintain habitat distribution, structure and function, as defined by characterizing (dominant) species in these habitats (NPWS, 2012a). For designated species, the objective is to maintain various attributes of the populations including population size, cohort structure and the distribution of the species in the SAC. The conservation objectives above are defined further alongside key attributes and targets within the Conservation Objectives Series (NPWS, 2012a)

An Appropriate Assessment has been carried out by the Marine Institute (MI, 2019) on aquaculture activities within the Lower River Shannon SAC, this is discussed further in Section 6.3.

Figure 5 Lower River Shannon Special Area of Conservation



River Shannon and River Fergus Estuaries SPA (Site Code:004077)

The site designated as the River Shannon and River Fergus Estuaries SPA (32,237.6 ha) comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The River Shannon and River Fergus estuaries form the largest estuarine complex in Ireland. The SPA is adjacent to the largest port and some of the most extensive areas of industrial development in the west of Ireland (NPWS, 2015).

The Shannon Estuary is subject to permanent marine inundation with a tidal flow in a generally west to east aligned main channel. The estuary is macrotidal, having the largest tidal range (5.44 m at Limerick Docks) on the Irish coast. Mid-channel water depths vary from c.37m at the estuary mouth to less than 5m near Limerick City (NPWS, 2015).

In addition to the Shannon and Fergus, the site has numerous sub-estuaries including Ballylongford Creek (Ballylongford Bay), the Glencorbly River at Glin, the White River at Loghill, Robertstown River and Poulweala Creek at Foynes and Aughinish, the River Deel at Courtbrown Point and the Maigue at Rinekirk Point. Both the Fergus and Inner Shannon estuaries feature vast expanses of intertidal mudflats.

The inner site (Limerick City to the Fergus estuary) has the greatest proportion of intertidal habitat, the proportion of subtidal habitat within the site increasing westwards towards the mouth. West of the Fergus Estuary the northern shoreline of the site becomes rocky, with the exception of Clonderlaw Bay and Poulnasherry Bay. The southern shoreline is lined mostly by mudflats and sandflats punctuated by estuaries of the many rivers and creeks entering the site. In the western section of the site, Bunaclugga Bay has both sandy and muddy sediments and boasts a vegetated shingle spit, a rare habitat in Co. Kerry (Moore & Wilson, 2006).

The River Shannon and River Fergus Estuaries SPA is designated for the presence of 21 waterbird species of Special Conservation Interest, SCI, listed in Table 5.4b, below. It is also of special conservation interest for hosting an assemblage of over 20,000 wintering waterbirds. The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl (57,133 - five year mean for the period 1995/96 to 1999/2000) (NPWS, 2015).

The site holds internationally important populations of four species which are highlighted in Table 3 below - Light-bellied Brent Goose (494), Dunlin (15,131), Black-tailed Godwit (2,035) and Redshank (2,645) (figures are five year mean peak counts for the period 1995/96 to 1999/2000). In addition, there are 17 species that have wintering populations of national importance and are included as qualifying interests of the SPA (NPWS, 2012d). The site also supports a nationally important breeding population of Cormorant (93 pairs in 2010). Of particular note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive - Whooper Swan, Golden Plover and Bar-tailed Godwit (NPWS, 2015).

The Conservation Objectives for the non-breeding SCIs of the River Shannon & River Fergus Estuaries SPA are focused on the

- **Population Trend**, which must be stable or increasing, and on the
- **Distribution**, of which there should be no significant decrease in the range, timing, or intensity of use of areas by the bird species.

Additional Conservation Objectives exist for Cormorant as they are designated for both breeding and wintering populations, these include:

- **Breeding population abundance**, which should have no significant decline
- **Productivity rate**, which should have no significant decline
- **Distribution of breeding colonies**, which should have no significant decline
- **Prey biomass available**, which should have no significant decline, and
- **Barriers to connectivity**, of which there should be no significant increase

The wetland habitats contained within the River Shannon and River Fergus Estuaries SPA are identified to be of conservation importance for non-breeding (wintering) migratory waterbirds. Therefore, the wetland habitats are considered to be an additional Special Conservation Interest.

An Appropriate Assessment has been carried out by Atkins Ecology (Atkins, 2019) on aquaculture activities within the River Shannon and Fergus Estuaries SPA.

Table 3 Waterbird Special Conservation Interest (SCI) Species listed in the River Shannon & River Fergus Estuaries SPA

Common Name	Latin Name	Annex I Species	BoCCI[a]	Baseline Population[b]	Population Status at Baseline
Whooper Swan	Cygnus cygnus	X	A	118	All-Ireland Importance
Light-bellied Brent Goose	*Branta bernicla hrota*		A	494	International Importance
Shelduck	*Tadorna tadorna*		A	1,025	All-Ireland Importance
Wigeon	*Anas penelope*		A	3,761	All-Ireland Importance
Teal	*Anas crecca*		A	2,260	All-Ireland Importance
Pintail	*Anas acuta*		R	62	All-Ireland Importance
Shoveler	*Anas clypeata*		R	107	All-Ireland Importance
Scaup	*Aythya marila*		A	102	All-Ireland Importance
Cormorant	*Phalacrocorax carbo*		A	245	All-Ireland Importance
Ringed Plover	*Charadrius hiaticula*		A	223	All-Ireland Importance
Golden Plover	*Pluvialis apricaria*	X	A	5,664	All-Ireland Importance
Grey Plover	*Pluvialis squatarola*		A	558	All-Ireland Importance
Lapwing	*Vanellus vanellus*		R	15,126	All-Ireland Importance
Knot	*Calidris canutus*		R	2,015	All-Ireland Importance
Dunlin	*Calidris alpina*		A	15,131	International Importance
Black-tailed Godwit	*Limosa limosa*		A	2,035	International Importance
Bar-tailed Godwit	*Limosa lapponica*	X	A	460	All-Ireland Importance
Curlew	*Numenius arquata*		R	2,396	All-Ireland Importance
Greenshank	*Tringa nebularia*		A	61	All-Ireland Importance
Redshank	Tringa totanus		R	2,645	International Importance
Black-headed Gull	*Larus ridibundus*		R	2,681	All-Ireland Importance

[a]BoCCI – Listed on Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013) A=Amber, R=Red
[b]baseline Population – Five year peak mean for the period 1995/96 – 1999/00

The overarching Conservation Objective for the River Shannon and River Fergus Estuaries Special Protection Area is to ensure that waterbird populations and their wetland habitats are maintained at, or restored to, favourable conservation condition. This includes, as an integral part, the need to avoid deterioration of habitats and significant disturbance, thereby ensuring the persistence of site integrity.

The site should contribute to the maintenance and improvement where necessary, of the overall favourable status of the national resource of waterbird species, and the continuation of their long-term survival across their natural range.

Conservation Objectives for the River Shannon and River Fergus Estuaries SPA, based on the principles of favourable conservation status, are described below:

Objective 1: To maintain the favourable conservation condition of the non-breeding waterbird Special Conservation Interest species listed above, for the River Shannon and River Fergus Estuaries SPA.

Objective 2: To maintain the favourable conservation condition of the wetland habitat at the River Shannon and River Fergus Estuaries SPA as a resource for the regularly occurring migratory waterbirds that utilize it.

Objective 1 - Attributes and Targets:

- To be favourable, the long-term population trend for each waterbird SCI species should be stable or increasing. Waterbird populations are deemed to be unfavorable when they have declined by 25% or more, as assessed by the most recent population trend analysis.
- To be favourable, there should be no significant decrease in the range, timing or intensity of use of areas by the SCI waterbird species, other than that occurring from natural patterns of variation.

Factors that may affect the achievement of Objective 1 include:

- Habitat modification: Activities that modify discreet regions or the overall habitats available within the SPA in terms of their use by SCI species (e.g. as a feeding/wintering resource) could result in the displacement of these species from areas within the SPA and/or reduction in overall numbers.
- Disturbance: Anthropogenic disturbance that occurs in or near the site and is either singular or cumulative in nature, could result in the displacement of one or more of the listed waterbird species from areas within the SPA, and a reduction in their numbers.
- Ex-situ Factors: use of habitats situated within the immediate hinterland areas of the SPA by SCI waterbird species, or in areas ecologically connected to it. Reliance on these outlying habitats will vary between species and site. Notable habitat changes or increased levels of disturbance within these outlying areas may result in the displacement of one or more of the SCI waterbird species from areas within the SPA, and/or a reduction in their numbers.

Objective 2 - Attributes and Targets:

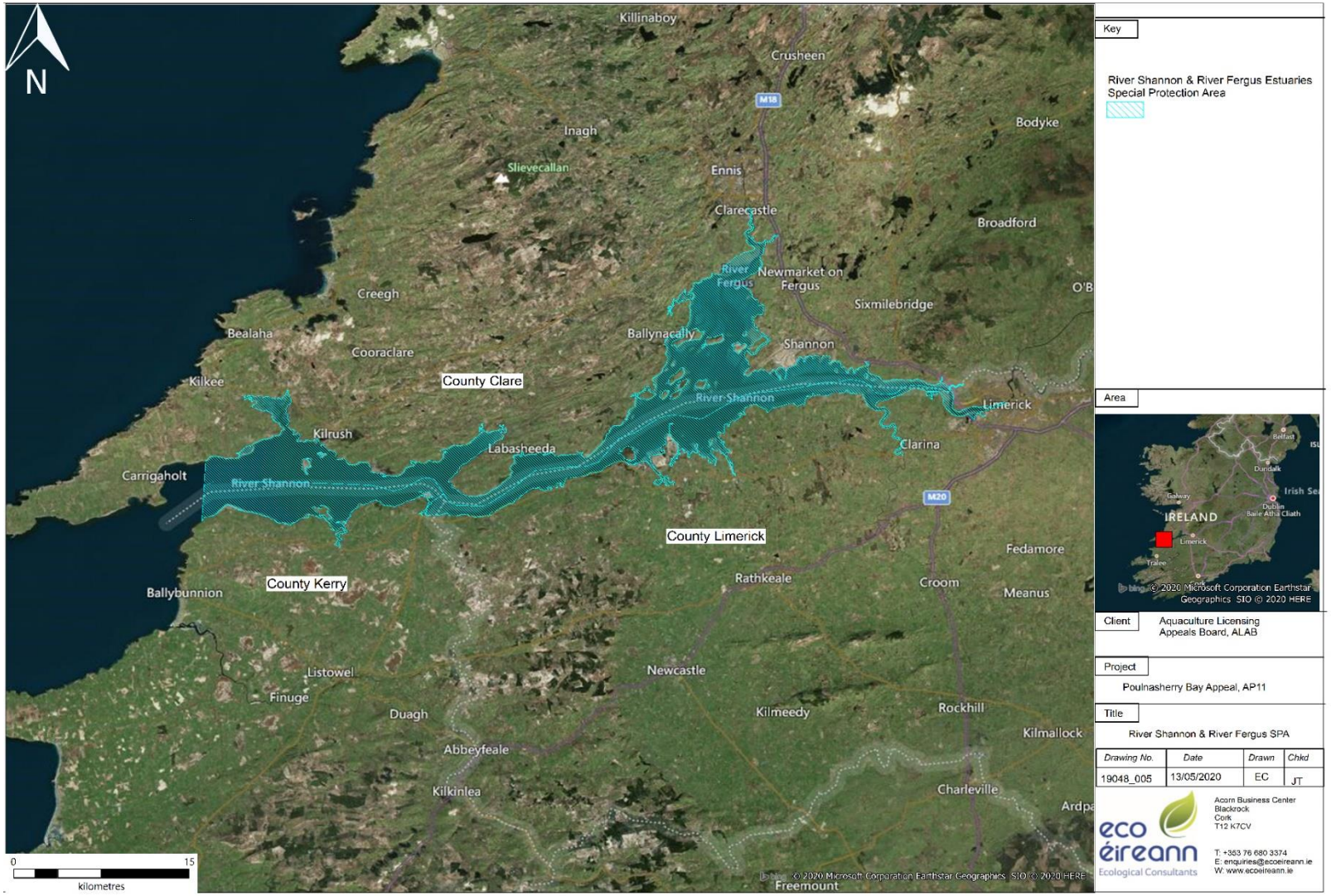
- To be favourable the permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 32,261 ha (other than that occurring from natural patterns of variation).

Conservation condition is assigned using the following criteria:

- Favourable population – population is stable or increasing
- Intermediate (Unfavourable) – Population decline in the range 1 – 24.9%
- Unfavourable population – populations that have declined between 25 – 49.9%
- Highly Unfavourable population – populations have declined > 50% from the baseline reference value.

The NPWS SPA Conservation Objectives Supporting Document (NPWS, 2012c) reports only a single waterbird species is considered as being of Favourable Conservation Condition, the Whooper Swan, which had an overall increase in its population status assessment for the site. One species, the Wigeon, is considered to be in Highly Unfavourable Conservation Condition due to the decline in numbers. For the rest of the SCIs, due to the variation in count coverages over time and the limitations of aerial surveying, the conservation condition is Undetermined (NPWS, 2012c).

Figure 6 River Shannon & River Fergus Estuaries Special Protection Area



5.5. Protected Species

There are a range of protected species recorded in the 10km square (Q95) within which Poulnasherry Bay is located, based on records from the National Biodiversity Data Centre (https://maps.biodiversityireland.ie/Map [accessed on 04/05/2020]), in the last ten years. These include cetaceans, numerous bird records, otter, seals, and a number of terrestrial organisms which would not be affected by the aquaculture development.

A number of these species have been protected under the EU Habitats and Birds Directives, as transposed into Irish law under the European Communities (Birds and Natural Habitats Regulations 2011) (S.I. No. 477 of 2011) as Species of Conservation Interest (SPA designated species) and Qualifying Features (SAC designated species), including numerous bird species, bottlenose dolphins, otter, salmon, lamprey and the freshwater pearl mussel.

5.5.1 Cetaceans

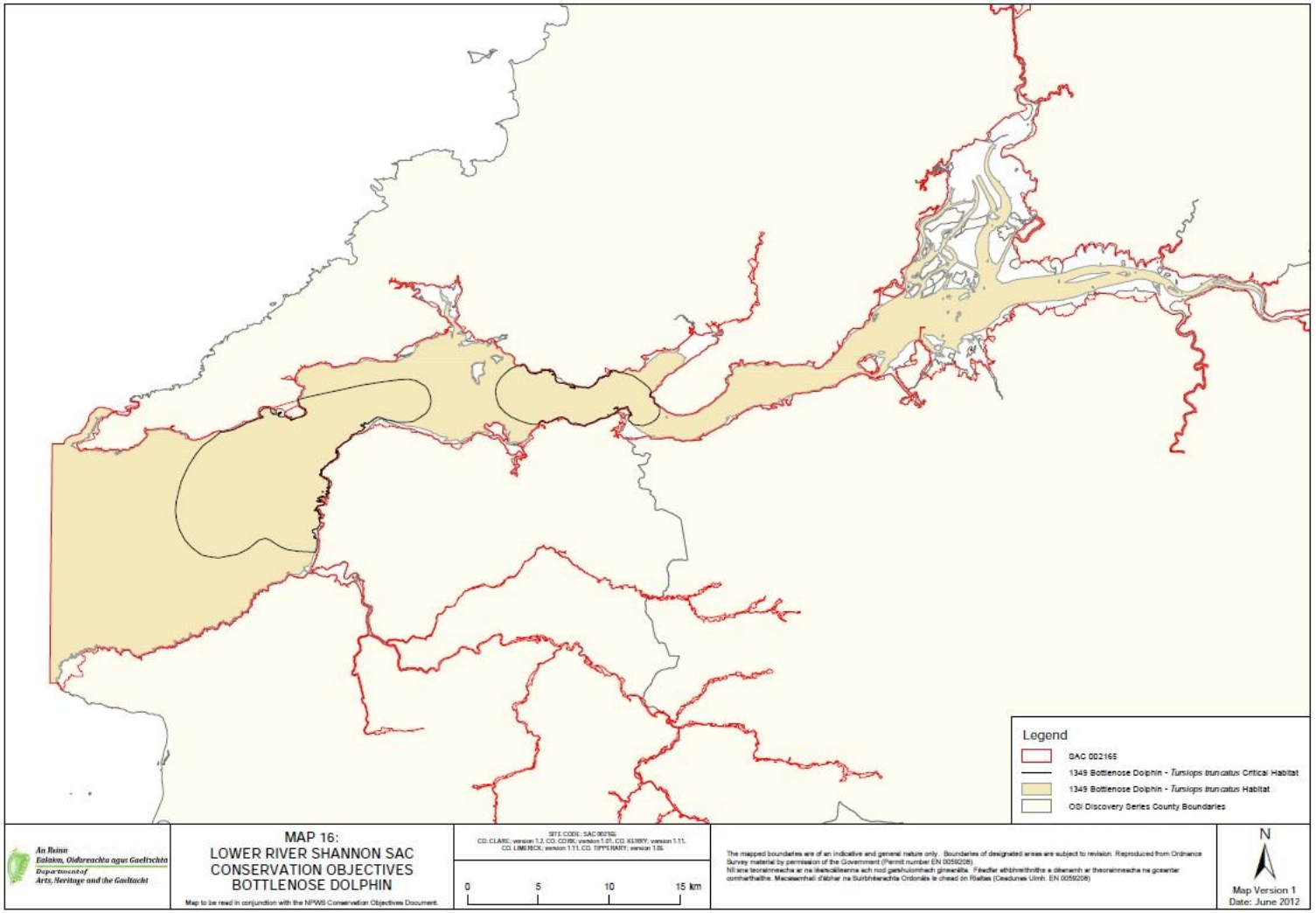
The size, community structure, distribution and habitat use of bottlenose dolphin inhabiting the Lower River Shannon SAC are quite well understood. The population is described as resident within the site, with dolphin groups present in the estuary throughout the year. The Lower River Shannon SAC is one of only two SAC in Ireland designated for the presence of the species. A recent study (Rogan, *et al*., 2018) estimated the total numbers of dolphins using the Lower River Shannon SAC as 139 individuals, which indicated, in line with previous estimates calculated since 1997, a stable population size.

Within the Lower River Shannon SAC, two core locations have been identified within which the majority of dolphin records occur. These 'Critical Areas' represent high value habitats used preferentially by the species within its overall range at the site and they broadly coincide with areas of steep benthic slope, greater depth and stronger currents (NPWS, 2012).

Due to the lack of survey effort, both spatially and temporally, in the upstream area of the LRS SAC it should be noted that all suitable aquatic habitat is considered relevant to the species' range and ecological requirements within the site and therefore of potential use by bottlenose dolphins (NPWS, 2012).

A search of the sightings database from the Irish Whale and Dolphin Group (IWDG - http://www.iwdg.ie [accessed on 04/05/2020]) from the last 10 years indicate there have been no cetacean sightings within Poulnasherry Bay. There have been numerous records of Bottlenose Dolphin within the Lower River Shannon Estuary, 4 recordings of Common Dolphin *Delphinus delphis,* 3 recordings of the Common Porpoise *Phocoena phocoena*, 2 records of the Striped Dolphin *Stenella coeruloealba* and 1 record of a Long-finned Pilot Whale *Globecephala melas*.

Figure 7 Lower River Shannon SAC Potential & Critical Dolphin Habitat



5.5.2 Birds

The River Shannon and River Fergus Estuaries SPA is designated for the presence of 21 waterbird species of Special Conservation Interest. Regularly occurring non-SCI species which have been recorded within the River Shannon SPA are listed in Table 4, below. SCI Waterbird Baseline Population data is presented in Table 3, above, with the species' ecological characteristics, requirements and specialities listed in Table 5 below.

Table 4 Regularly Occurring Non-SCI Species which occur at the River Shannon SPA (NPWS, 2012c)

Common Name	Latin Name	Recent Peak Numbers (2005/06 – 2009/10)
Mute Swan	*Cygnus olor*	135 (i)
Greylag Goose	*Anser anser*	140
Mallard	*Anas platyrhynchos*	289
Pochard	*Aythya ferina*	37
Tufted Duck	*Aythya fuligula*	93
Goldeneye	*Bucephala clangula*	17
Red-breasted Merganser	*Mergus serrator*	7
Great Northern Diver	***Gavia immer***	8
Little Grebe	*Tachybaptus ruficollis*	7
Great Crested Grebe	*Podiceps cristatus*	31
Little Egret	***Egretta garzetta***	29
Grey heron	*Ardea cinerea*	23
Moorhen	*Gallinula chloropus*	33
Coot	*Fulica atra*	51
Oystercatcher	*Haematopus ostralegus*	81
Snipe	*Gallinago gallinago*	115
Turnstone	*Arenaria interpres*	57
Common Gull	*Larus canus*	83
Lesser Black-backed Gull	*Larus fuscus*	16
Herring Gull	*Larus argentatus*	8
Great Black-backed Gull	*Larus marinus*	8

Species in **Bold** are Annex I species.

Given a number of issues, including the achievement of co-ordinated ground-based counts across the River Shannon and Fergus Estuaries SPA being impracticable, partly because on the unfeasibly large number of counters that would be required, and also due to limitations on time, accessibility and visibility, the estimation of accurate waterbird population trends for this site is difficult (NPWS, 2012c).

There was better ground coverage during the earlier years of I-WeBS (baseline years 1995/96 – 1999/00) while in more recent years the counts have focused more on smaller sections, with a recommended focus on the key areas within the site (NPWS, 2012c).

The site is covered once or twice per season by aerial census. This enables complete coverage of the entire site. However, the quality of the counts undertaken during aerial census is limited by many factors, especially at this site which supports large numbers (tens of thousands) of birds of many species. These limitations are summarised below (NPWS, 2012c):

1. Aerial census only allows a limited timeframe and the counts provided of large flocks are estimates;
2. It is often difficult to discern/identify birds that remain on the ground and that are not flushed by the aircraft;
3. Species occurring in low densities (such as Pintail, Teal, Grey Plover) are overlooked. Aerial counts are more suitable for dispersed and distinguishable species such as Lapwing, Golden Plover and Shelduck whereas small, scarce or skulking species are likely underestimated (e.g. Dunlin, Turnstone, Redshank, Greenshank) (Crowe, 2005) and are better covered by ground observations.

Given the differences in count coverage over time described above, the estimation of accurate waterbird population trends for this site is difficult. With the exception of 2004/05, ground-based coverage since 2001/02 has been considerably lower when compared to the baseline period. This factor limits the accuracy of the trends (NPWS, 2012c).

Lewis *et al*. (2016) prepared a review and assessment of waterbird data for the River Shannon SPA, commissioned by the SIFP Environmental Sub Group, based on I-WeBS data and data from the NPWS Waterbird Survey Programme, which revealed that subsite count cover during I-WeBS has dropped considerably since 2010/11 largely due to a lack of willing count volunteers. Given this limitation, the review concluded that site totals generated using I-WeBS data largely underestimate the actual number of waterbirds using the Shannon and Fergus site complex.

However, where adequate data existed, it was possible to examine trends at a smaller (subsite) scale and subsite trends are likely to be more accurate because they are based on the same count areas and calculated using data from years with the best count coverage. It was also noted that the I-WeBS subsite Poulnasherry Bay (OH498) which is an equivalent area to the NPWS Waterbird Survey subsites Poulnasherry outer and inner Bay (OH519 & OH520, respectively) almost exclusively exhibited negative trends for the period examined, with many waterbirds no longer recorded within these subsites (Lewis *et al.,* 2016).

Table 5 - Ecological Characteristics, Requirements & Specialities of Special Conservation Interest Waterbird Selection Species (NPWS, 2012c)

Waterbirds of Special Conservation Interest	Winter Distribution[A]	Trophic Guild[B]	Food/ Prey Requirements[C]	Principle supporting habitat within site[D]	Ability to utilise other/ alternative habitats (in & around the site)[E]	Site Fidelity[F]
Whooper Swan *Cygnus olor*	Widespread	1, 7	Wide	Lagoon and associated habitats, intertidal mudflats and shallow subtidal	2	Moderate/ High
Light-bellied Brent Goose *Branta bernicla hrota*	Highly restricted	1, 5, 7	Highly specialised	Intertidal mud and sand flats	2	High
Shelduck *Tadorna tadorna*	Localised	1, 5	Wide	intertidal mudflats and shallow subtidal	3	High
Wigeon *Anas penelope*	Widespread	1, 5	Narrower	Intertidal mud and sand flats and sheltered and shallow subtidal	2	Weak
Teal *Anas crecca*	Widespread	1	Wide	Sheltered and shallow Subtidal over sand and mud flats	1	Moderate
Pintail *Anas acuta*	Localised	1	Wide	Intertidal mud and sand flats and sheltered and shallow subtidal	2	Weak
Shoveler *Anas clypeata*	Intermediate	1	Wide	Lagoon, brackish and freshwater lakes plus intertidal mud and sand flats	3	Moderate
Scaup *Aythya marila*	Highly Restricted	2	Wide	Subtidal	1	Unknown
Cormorant *Phalacrocorax carbo*	Widespread	3	Highly specialized	Sheltered and shallow subtidal over sand and mud flats	1	Moderate
Ringed Plover *Charadrius hiaticula*	Localised	4	Wide	Intertidal mud and sand flats	3	High
Golden Plover *Pluvialis apricaria*	Intermediate	4	Wide	Intertidal mud and sand flats	2	Moderate
Grey plover *Pluvialis squatarola*	Localised	4	Wide	Intertidal mud and sand flats	3	High
Lapwing *Vanellus vanellus*	Widespread	4	Wide	Intertidal mud and sand flats	2	Moderate
Knot *Calidris canutus*	Localised	4	Narrower	Intertidal mud and sand flats	3	Moderate
Dunlin *Calidris alpina*	Intermediate	4	Wide	Intertidal mud and sand flats	3	High
Black-tailed Godwit *Limosa limosa*	Localised	4	Wide	Intertidal mud and sand flats	2	High
Bar-tailed Godwit *Limosa lapponica*	Localized	4	Wide	Intertidal mud and sand flats	2	Moderate

Waterbirds of Special Conservation Interest	Winter Distribution[A]	Trophic Guild[B]	Food/ Prey Requirements[C]	Principle supporting habitat within site[D]	Ability to utilise other/ alternative habitats (in & around the site)[E]	Site Fidelity[F]
Curlew *Numenius arquata*	Widespread	4	Wide	Intertidal mud and sand flats	2	High
Greenshank *Tringa nebularia*	Intermediate	6	Wide	Intertidal mud and sand flats	3	High
Redshank *Tringa totanus*	Intermediate	4	Wide	Intertidal mud and sand flats	2	High
Black-headed Gull *Larus ridibundus*	N/C	1, 2, 4, 6, 7	Wide	Intertidal flats & sheltered and shallow subtidal	2	Moderate

[A] Winter distribution: Very widespread (>300 sites); Widespread (200 – 300 sites); Intermediate (100 – 200 sites); Localised (50-100 sites); Highly restricted (<50 sites) (based on Crowe (2005).

[B] Waterbird foraging guilds. 1 = Surface swimmer, 2 = water column diver (shallow), 3 = water column diver (deeper), 4/5 = intertidal walker (out of water), 6 = intertidal walker (in water), 7 = terrestrial walker.

[C] Food/prey requirements - species with a wide prey/food range; species with a narrower prey range (e.g. species that forage upon a few species/taxa only), and species with highly specialised foraging requirements (e.g. piscivores).

[D] Principal supporting habitat present within the SPA. Note that this is the main habitat used when foraging with the exception of Whooper Swan that utilise wetland habitats for roosting and forage within terrestrial grasslands outside of the SPA.

[E] Ability to utilise alternative habitats refers to the species ability to utilise other habitats adjacent to the site. 1 = wide-ranging species with requirement to utilise the site as and when required; 2 = reliant on site but highly likely to utilise alternative habitats at certain times (e.g. high tide); 3 = considered totally reliant on wetland habitats due to unsuitable surrounding habitats and/or species limited habitat requirements.

[F] Site fidelity on non-breeding grounds: Unknown; Weak; Moderate; or High (based on published information).

Waterbird surveys have been commissioned by the Marine Institute for Poulnasherry Bay, to provide up to date waterbird distribution and site usage data. The first round of this monitoring data from the 2018/19 winter season has been provided for this Technical Advisors Report.

This monitoring period covered the NPWS Waterbird Survey subsites within and adjacent to Poulnasherry Bay including OH517 & OH518, OH519, OH520, ONO26 and ONO25, see Figure 8, below (INIS, 2019) which covered the entire Poulnasherry Bay Shellfish Designated Waters area as well as some adjacent areas.

Figure 8 Count Subsites used for Poulnasherry Bay during the 2018/19 wintering season

This winter monitoring period (2018/19) highlighted the importance of Poulnasherry inner Bay (OH520) with 18 of the 21 SCI species occurring in their peak numbers within this subsite, 3 of which were recorded in numbers of international importance (Shelduck, Pintail and Little Egret). Poulnasherry outer Bay (OH519) was recorded as the most important subsite on at least one occasion for Cormorant and Ringed Plover, and thereafter second or third most important for 7 waterbird species. The monitoring highlighted that for intertidally foraging species, subsite OH520 (Poulnasherry inner Bay) was the most important subsite for all species (Inis, 2019).

Due to the lack of continuous survey data from the baseline period (1995/96- 1999/00) until now, a thorough assessment of species trends cannot be calculated. However, Inis (2019) conducted a comparison of the latest data (2018/19) with data from the NPWS Waterbird Survey (2010/11)

and I-WeBS data from the baseline period (1995/96-1999/00). This comparison revealed that almost all of the waterbird SCI species have decreased in number in Poulnasherry Bay since the baseline period, with the exception of Teal, Pintail and Shoveler, which appeared to occur in similar or greater numbers.

Table 6 Comparison of Peak Counts of Waterbirds in Poulnasherry Bay from the Baseline Period, NPWS Waterbird Survey Programme and the 2018/2019 season count.

Common Name	Latin Name	Baseline Population 95/96- 99/00	NPWS Waterbird Survey 2010/11	Peak Count 2018/19	General Trend
Whooper Swan	Cygnus cygnus	1	0	0	Decrease
Light-bellied Brent Goose	*Branta bernicla hrota*	539	56	256	Decrease
Shelduck	*Tadorna tadorna*	180	196	115	Decrease
Wigeon	*Anas penelope*	1,125	61	332	Decrease
Teal	*Anas crecca*	176	510	218	Increase
Pintail	*Anas acuta*	57	0	82	Increase
Shoveler	*Anas clypeata*	3	37	6	Increase
Scaup	*Aythya marila*	22	8	0	Decrease
Cormorant	*Phalacrocorax carbo*	58	12	8	Decrease
Ringed Plover	*Charadrius hiaticula*	155	28	53	Decrease
Golden Plover	*Pluvialis apricaria*	1,380	7	80	Decrease
Grey Plover	*Pluvialis squatarola*	66	37	7	Decrease
Lapwing	*Vanellus vanellus*	2,522	155	483	Decrease
Knot	*Calidris canutus*	164	33	0	Decrease
Dunlin	*Calidris alpina*	2,300	457	336	Decrease
Black-tailed Godwit	*Limosa limosa*	16	10	2	Decrease
Bar-tailed Godwit	*Limosa lapponica*	95	16	5	Decrease
Curlew	*Numenius arquata*	654	209	146	Decrease
Greenshank	*Tringa nebularia*	32	13	8	Decrease
Redshank	Tringa totanus	197	153	80	Decrease
Black-headed Gull	*Larus ridibundus*	1,818	42	109	Decrease

5.5.3 Otter

Otter *Lutra lutra* are protected under the Irish Wildlife Acts (1976 and 2000) and are also listed in Annexes II and IV of the Habitats Directive. The species is listed as one of the qualifying features of interest in the Lower River Shannon SAC. Records from the National Biodiversity Data Centre indicate that the last record of otter within the 10km grid square (Q95) encompassing Poulnasherry Bay dates from May 2017.

Otter werescreened out of the Appropriate Assessment process due to the lack of potential overlap and interaction with aquaculture activities; it has been concluded that aquaculture activities (including Oyster Fishery Order areas) do not pose a threat to the conservation status of this species within the LRS SAC (MI, 2018).

5.5.4 Salmon, Lamprey, and the Freshwater Pearl Mussel

The Atlantic Salmon *Salmo salar,* Sea Lamprey *Petromyzon marinus*, River Lamprey *Lampetra fluviatilis* and Brook Lamprey *Lampetra planeri* and the Freshwater Pearl Mussel *Margaritifera margaritifera,* are protected as qualifying features within the Lower River Shannon SAC, only

within the freshwater reaches of the river system, therefore the aquaculture activities are considered non-disturbing to these species due to the lack of spatial overlap and interaction with aquaculture activities located within the estuarine stretch of the SAC system (MI, 2019).

5.6. Statutory Plans

Clare County Development Plan 2017-2023

There are no specific statutory or development plans for Poulnasherry Bay. Aquaculture is, however, considered under the Clare County Development Plan.

Chapter 10 of the CDP Rural Development and Natural Resources highlights the importance of the fishing and aquaculture industries have in diversifying the economy of rural areas and providing employment in production, packaging and ancillary job opportunities. County Clare has an extensive coastline (192km Atlantic seaboard and 168km of estuarial freshwater coastline) and significant potential exists to grow coastal economies through the development of the commercial fishing and aquaculture industries.

Fishing and aquaculture also contribute significantly to the rural economy through marine tourism activities. Charter deep-sea fishing trips operate from Carrigaholt, Kilrush and Kilbaha and potential exists to further expand these industries through the integration of marine leisure/ tourism activities with complementary on-shore hospitality in relevant coastal settlements.

It is an objective of the Development Plan:
"To facilitate, encourage and appropriately manage the development of natural resources of the County and to ensure that this is done in a sensitive way, eliminating any significant adverse effects on the natural environment and in compliance with all relevant legislation"

"To support the expansion of non-commercial fishing activities in coastal communities and the development of complementary on-shore hospitality facilities/services."

Chapter 11 Shannon Estuary references the Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary and outlines a number of objectives in relation to developments:
"To co-operate with the relevant agencies to facilitate, encourage and promote development, economic growth and employment in environmentally suitable areas along the Shannon Estuary, by implementing the SIFP for the Shannon Estuary."

"to support and implement the inter-jurisdictional SIFP for the Shannon Estuary in conjunction with other relevant local authorities and agencies. All proposed developments shall be in accordance with the Habitats and Birds Directives, Water Framework Directive and all other relevant European Directives. All proposed developments shall incorporate the Mitigation Measures as contained in the SIFP for ensuring the integrity of the Natura 2000 network."

Chapter 11 Shannon Estuary also includes objectives for commercial fishing and aquaculture with reference to the SIFP:

"To contribute to the diversification of the local economy, growth in employment and social well-being of coastal communities of County Clare through the facilitation and promotion of environmentally sustainable commercial fishing and aquaculture, within the Areas of Opportunity for commercial fishing/ aquaculture identified in the SIFP, which are at Poulnasherry Bay, Carraigaholt Bay, Rinevella Bay, Killimer and Clonderalaw Bay. All proposed developments shall be in accordance with the Birds and Habitats Directives, the Water Framework Directive and all other relevant EU Directives."

Clare County Biodiversity Action Plan

The main aim of the Clare Biodiversity Action Plan is to conserve the biodiversity of County Clare and is informed by the 7-no. strategic objectives and associated targets of the 3rd National Biodiversity Action Plan, 2017-2021, Ireland's Vision for Biodiversity (CCC, 2017).

The objectives of the Clare County Biodiversity Action Plan include:

- To implement the actions of Ireland's National Biodiversity Action Plan 2017-2021 as they relate to County Clare;
- To inform all biodiversity projects undertaken as part of the County Clare Heritage Plan 2017-2023 and support its full implementation;
- To ensure the CCBAP 2017-2023 fully informs all planning policy within the County, including the biodiversity objectives of the Clare County Development Plan 2017-2023;
- To produce best practice guidelines on biodiversity conservation and management for all sections of Clare County Council;
- And to ensure that all projects carried out under the CCBAP 2017-2023 employ the requirements of the Habitats Directive, and all other legislation as appropriate.

The CCBAP 2017-2023 contains general objectives specific to habitats, including estuaries, which are outlined below (CCC, 2017):

- To raise awareness of the unique nature of estuaries, their habitats and wildlife;
- To promote the Shannon Estuary as an area to watch, learn about and enjoy wildlife;
- To raise awareness of saltmarshes and their importance in County Clare.

The CCBAP 2017-2023 also outlines threats to biodiversity, all of which were considered relevant to this report are outlined below (CCC, 2017):

- Lack of awareness, knowledge and understanding;
- Fragmentation of habitats and loss of wildlife corridors;
- Inappropriate developments;
- Water pollution and changes to hydrology
- Spread of invasive species
- Disturbance to species and
- Changes in land management

The CCBAP 2017-2023 outlines general objectives to combat these threats, which are:

- To raise awareness of threats to biodiversity and promote best practice to avoid or minimise these threats;

- To raise awareness of Alien Invasive Species and promote best practice management for invasive species in County Clare;
- To raise awareness of the importance of water quality for biodiversity conservation;

Strategic Integrated Framework Plan for the River Shannon Estuary

A Strategic Integrated Framework Plan (SIFP) was commissioned in 2011 by Clare County Council, Kerry County Council, Limerick City and County Councils, Shannon Development and Shannon Foynes Port Company. The plan is overseen by a multi-agency Steering Group comprising of the aforementioned, plus other key stakeholders. The plan identifies Strategic Development Locations for Marine Related Industry and Areas of Opportunity for aquaculture and renewable energy generation, within the River Shannon Estuary.

The aim of the Strategic Integrated Framework Plan (SIFP) is to identify the nature and location of future development, economic growth and employment that can be sustainably accommodated within the Shannon Estuary whilst ensuring that the conservation status of the Natura 2000 and other environmentally sensitive sites would not be reduced as a result of the short-term or long-term impact of such developments.

A number of the general policies within the plan have potential for impacts on waterbird SCIs of the River Shannon and River Fergus Estuaries SPA. These include policies supporting the growth of shipping movements (SPN 1.1), promoting the development of marina facilities (MTL 1.6), encouraging the expansion of marine based recreational activities (MTL 1.7), encouraging the development of sustainable commercial fishing and aquaculture activities (CPA 1.2), and supporting the provision of appropriate infrastructure for fishing and aquaculture activities (CPA 1.4).

The plan includes the identification of nine strategic development locations for marine-related industry, four areas of opportunity for tidal energy development and eight areas of opportunity for aquaculture. The areas of opportunity for tidal energy development largely occur in subtidal habitat in the outer part of the estuary. However, the Tarbert Bay area of opportunity includes most of the intertidal habitat within the bay. The areas of opportunity for aquaculture largely reflect the current distribution of the aquaculture sites within the Lower River Shannon. However, the area of opportunity at Clonderlaw Bay would represent an additional area of aquaculture development and could potentially affect a large area of intertidal habitat.

The plan also includes specific policies to ensure compliance with the Habitats Directive and other environmental legislation, and a Habitats Directive Assessment and a Strategic Environmental Assessment (RPS Group, 2013a, b) of the plan have been carried out. Because of the strategic nature of the plan, many of the potential impacts will need to be assessed by project-specific assessments.

5.7. Man-made heritage

A search of the Historic Environment Viewer (Archaeological Survey of Ireland https://webgis.archaeology.ie/historicenvironment/ [accessed on 20/05/2020] identified a number of land based features of historical importance in the immediate area of the bay all of which are located on the north and western sides of the bay, these included:

- 3x ringforts – located on the western side, north-west of Cammoge.
- Earthworks - located on the western side, north-west of Cammoge.
- Carin - located on the western side, north-west of Cammoge.
- Church and Graveyard - located on the western side, north-west of Cammoge.
- Mound barrow – Located on cammoge, to the north of site T08/106B
- Holy well – located on the western shoreline
- Protected structure Blackwater Bridge (Reg No.: 20405629)– located at Garraun, crossing the western edge of the estuary.
- 2x ringforts - located to the north of Blackwater Bridge
- 4x ringforts – located to the north of site T08/106C
- Church and Graveyard – Located to the north of site T08/106C
- Holy well – located to the north of site T08/106C

A search of the WreckViewer application https://www.archaeology.ie/underwater-archaeology/wreck-viewer [accessed on 20/05/2020] found that there was one record of an unknown wreck within Poulnasherry Bay, located at Blackwater Bridge in the north-west corner of the Bay.

6. Section 61 Assessment

6.1. Site Suitability

Poulnasherry Bay forms part of the wider Shannon Estuary which is designated as the River Shannon & River Fergus Estuaries SPA (Site Code: 004077) and the Lower River Shannon SAC (Site Code:002165). Poulnasherry Bay is also designated as the West Shannon Poulnasherry Shellfish Designated Area, which covers 7.04km^2 and extends to Querrin Point and Baunahard Point encompassing the entirety of the bay.

Poulnasherry Bay is an area of existing aquaculture (intertidal oyster trestle cultivation only) which can be seen as part of the intertidal habitats. The trestles are visible at low tide and from elevated positions only, thereby not considered to impact negatively on the aesthetic quality of the bay.

The proposed sites T08/106B (1.42ha) and T08/106D (8.3ha) are located in the outer bay adjacent to Querrin and Cammoge Point, respectively, while T08/106C (3.96ha) is located within the inner bay, see Figure 6.1, below.

A special unified Marking Scheme is in place for the aquaculture activities within Poulnasherry bay, providing for safe navigation at all times and stages of the tide.

A number of comments were raised during the Statutory and Technical Consultations, while no objections or comments were received during the Public Consultation.

Table 7 Technical and Statutory Consultation Observations and Comments

Technical Consultation	
Authority	**Comments**
Marine Engineering Division, MED	No objection to the licensing of the sites. The adjacent aquaculture in Poulnasherry Bay and Cammoge Point has been in place for many years and has embedded itself n the landscape. They note the presence of scenic routes and the heritage landscape surrounding Poulnasherry Bay, they conclude from a visual impact perspective, the views of the sites are obscured and limited from scenic routes.
Marine Survey Office, MSO	No objection to the application from a navigational viewpoint, they note a group navigation scheme is in place within Poulnasherry Bay. They recommend the proposed site is marked in line with the Co-ordinated Local Aquaculture Management System, CLAMS and the Special Unified Marking Scheme SUMS.
Sea Fisheries Protection Authority, SFPA	They noted they have previously made a number of observations regarding the reconfiguration of sites and realigning access routes in Poulnasherry Bay and the surrounding area. They have no specific observations to make in regards to these sites

Statutory Consultation	
Authority	**Comments**
Marine Institute, MI	The MI recommended that the applicant be required to provide details of steps that would be taken to ensure that the risk of the introduction of any invasive non-native species into the proposed sites with seed stock or structures is minimised. The MI advise that the conclusions and recommendations of the Appropriate Assessment process and the mitigation measures set out in the Natura Conclusion Statement, with regards to the impacts on the Conservation Objectives of the Lower River Shannon SAC (MI, 2019) and the River Shannon and River Fergus Estuaries SPA (Atkins, 2019), be fully implemented.
Commissioners of Irish Lights, CIL	No objection to the granting of these licenses and noted the applicant must secure statutory sanction for the relevant navigational aids as required.
Irish Water	Noted the locations of these sites in relation to designated shellfish waters and the proximity of wastewater discharges to proposed aquaculture developments.
Marine Institute Response to Irish Water comments	The MI observed that the Poulnasherry Shellfish Designated Waters has an 'A' Classification status and that the locations of these wastewater discharges would not indicate a significant risk of microbiological contamination of shellfish in the area
An Taisce	Raised several objections regarding the risks of displacement to a number of bird species and to the bottlenose dolphin. 1. <u>Bird Displacement</u> An Taisce note that within the Natura Conclusion Statement it is stated that the AA conclusions are "Highly Precautionary" and state that the findings of the AA must be assessed in light of the Precautionary approach and not given less weight because of it. An Taisce noted that within the AA Conclusion Statement the majority of intertidal culture within the Bunaclugga AQUA is to occur low in the intertidal area, thereby implying it will have less of an impact. However, within the SPA AA it is outlined that the true distribution of intertidal habitat in this area is unknown and it is not possible to quantify the actual impact in terms of the percentage of available habitat that will be impacted under various tidal conditions. Licence renewals in this area have been proposed on these grounds with monitoring of Ringed Plover numbers through I-WeBs. However, in Section 2 of the SPA AA the limited use of I-WeBs data is outlined as sufficient coverage is not always possible to achieve within the I-WeBs scheme. An Taisce believe this will not be an adequate method to survey for potential displacement effects. An Taisce are of the belief that the proposed (currently running) over-wintering monitoring regime within Poulnasherry is a post consent condition. They state that leaving the assessment of the impacts of licensed aquaculture, and the creation of a management plan, to be addressed through the implementation of a post consent condition is impermissible and could not be considered 'point of detail' conditions provided for under S.34(5) of the Planning and Development Act 2000 (as Amended). An Taisce believe that it is essential to categorically predict the impact to waterbird species in order to fully determine the impacts of the proposed aquaculture activities prior to consent. An Taisce highlight the possibility of disturbance of hightide roosts in the Bunaclugga area due to increase vessel activity, which the SPA AA determined could not be excluded due to a lack of information about the usage of hightide roosts in this area. They suggest that licensing the proposed aquaculture projects would be in contravention of Article 6(3) of the habitats Directive. They state that further information should be sought on roosting behaviour prior to licensing. An Taisce also highlight the possibility of disturbance to Scaup in Poulnasherry Bay, in regards to potential significant impacts to the availability of suitable foraging habitat which cannot be excluded due to the lack of knowledge about the effects of oyster trestles on Scaup foraging behaviour. 2. <u>Marine Mammals</u> An Taisce submit that further information should be gathered on the potential impact that the presence of subtidal mussel fixed structures associated with the suspended subtidal culture of shellfish operations will have on the core areas identified for the Bottlenose

Statutory Consultation	
Authority	**Comments**
	dolphin within the LRS SAC and the potential impact of dredging activities in subtidal areas, which may alter the benthic habitats inducing cascade effects on higher trophic levels, they note the licensing authority must be certain, beyond reasonable doubt that no adverse effects will occur. Thus, if adequate mitigation measures cannot be furnished An Taisce hold the opinion that the licensing body should consider refusal of subtidal mussel culture aquaculture where it overlaps with critical habitat. 3. Fishery Order Areas An Taisce raised concerns in relation to cumulative impact of certain aquaculture activities outwith and within the Fishery Order areas and stated that further clarification regarding the extent of current and planned aquaculture activities within these areas should be sought prior to licensing. 4. Water Quality Concerns were raised in relation to the potential impact of aquaculture on water quality in the Shannon Estuary, considering the cumulative impacts of other aquaculture projects, Fishery Order areas and with point source outfalls from wastewater discharges.
MI Response to An Taisce	1. Bird Displacement The output of the AA for the SPA indicated that there is, in a number of areas within the SPA, a risk of significant disturbance to a number of bird species as a consequence of a combination of pressures including, among others, aquaculture (licensed, applications) and green algal accumulations (eutrophication) in intertidal areas. In Poulnasherry Bay, it was advised that (re)licencing of existing aquaculture activities proceed and be subject to ongoing monitoring of bird use in the bay. The monitoring would consider bird use at the site and in light of existing aquaculture activities in-combination with, among others, the pressure caused by the presence of large accumulations of green algae in the inner-Bay. The output of monitoring will present a summary of site-use by the shorebird species while also providing a commentary on the likely interactions with aquaculture activities and other pressures specifically, as it relates to species distribution within the survey area. The outputs and conclusions of monitoring efforts will provide the basis for any subsequent management actions. 2. Marine Mammals It is not clear if bottom dredging will result in damage to dolphin habitat. Due to the unknow nature of activities and their extent within the OFOs meant that full occupancy of the sites and disturbance to this habitat type was assumed. In the MI assessment the activities that may act in-combination with other disturbing activities were identified. The Mi quote a recent study on interactions between dolphin and floating structures used in the culture of shellfish (rafts), to conclude that shellfish farms appeared to have a positive effect on dolphin occurrence. 3. Fishery Orders The AA report for aquaculture activities in the LRS SAC, prepared by the MI, acknowledged the unknown nature and extent of the activities within the Fishery Order Areas. To this end, a precautionary approach was employed such that any aquaculture activities likely to result in disturbance on the seafloor was considered in-combination with those as likely to occur in the OFOs. 4. Water Quality The MI note that An Taisce have used outdated literature as it relates to the interaction of intertidal shellfish culture with sedimentary habitats. They identify more recent publications which support their conclusions with regards to shellfish aquaculture and environmental interactions. The MI note the quote taken from the EPA State of the Environment Report specifically relates to finfish culture and has little or no bearing on shellfish aquaculture which is not a fed aquaculture practice.
Clare County Council	Acknowledged the notification for license applications and noted the role of the Appropriate Assessment process in the preparation of the SIFP for the Shannon Estuary. Provided no specific comment on license applications

Statutory Consultation	
Authority	**Comments**
Bord Iascaigh Mhara BIM	No objection and satisfied the application does not conflict with any other aquaculture or inshore fisheries interests in the area
Inland Fisheries Ireland, IFI	Made a number of observations on proposed licensing conditions but had no objection to this application
Harbour Master of the Shannon Foynes Port Company	Satisfied that the aquaculture activities in Poulnasherry bay and the surrounding area do not impact on commercial shipping activities
Department of Culture, Heritage & the Gaeltacht, DCHG	The DCHG observed that in-combination effects of the aquaculture activities within the Oyster Fishery Order areas for designated habitats and the potential for interactions with the bottlenose dolphin. DCHG have stated that due to the unknown nature and level of current and proposed activity within the Fishery Order areas, that further information is necessary before an Appropriate Assessment can be concluded. They state that data on the extent of the Fishery Order Areas to be utilised by current and proposed activities and the method by which restriction to this area alone will be regulated is a minimum requirement to enable adequate assessment of aquaculture activities within the Natura 2000 sites. Concerns were raised regarding the potential effectiveness of the Adaptive Management Plan to be implemented in the event of deterioration of the conservation status of the designated features, DCHG state that the Natura Directives require a higher standard, where no deterioration is allowed to take place. Furthermore, there is no clear indication or methodology on a monitoring or reporting framework to determine such deterioration. The DCHG also raised concerns over the potential effectiveness of the adaptive management plan in relation to potential significant displacement impacts on several SCI bird species and would like further information on how the precautionary principle will be adhered to.
MI comments on the DCHG observations	The MI's AA report on aquaculture activities within the Lower River Shannon SAC acknowledges the unknown nature and extent of the activities within the OFOs. To this end, a precautionary approach was employed such that any aquaculture activities likely to result in disturbance were considered in-combination with those as likely to occur in the OFOs. On this basis the MI advised caution be applied when considering if certain proposed aquaculture activities including sites T08/106B, C & D were to be licensed. The MI Clarified that there is potential for the development of intertidal aquaculture sites in the Poulnasherry/ Kilrush area to cause substantial displacement of Grey Plover and for significant cumulative impacts on bird species from the development of aquaculture sites in combination with oyster trestle cultivation in the OFO T08/008, which covers part of Poulnasherry Bay. They stated these were conservative conclusions based on an assessment within, what is in relation to the SPA overall, relatively small but important areas for bird conservation features and that the recommended management responses were highly precautionary due to a lack of data surrounding the exact nature and level of current and proposed aquaculture activities within the OFO areas.

An Appropriate Assessment has been carried out on aquaculture activities within the Lower River Shannon SAC (MI, 2019) and within the River Shannon & Fergus Estuaries SPA (Atkins, 2019), the conclusions and recommendations of these are discussed further is Section 6.3, below.

The proposed sites are considered suitable for aquaculture, however, the Appropriate Assessment process has highlighted potential negative impacts on a number of SCI bird species.

Figure 9 Licensed and Appealed Aquaculture Sites in Poulnasherry Bay

6.2. Other uses

Poulnasherry Bay is an existing area of oyster cultivation with 30 existing licensed aquaculture sites covering 49.04ha, as well as 40ha of licensed Oyster Fishery Order area (T08/008). The area of the bay is also used for fishing and marine leisure.

The Wild Atlantic Way tourist route surrounds Poulnasherry Bay with a point of interest at the West Clare Railway and heritage Centre, at Moyasta, the route does not pass by Cammoge. Querrin is within a heritage landscape but is not along a scenic route.

Shore angling marks and bait digging areas are located along the shore between Cammoge point and Querrin where the proposed sites T06/106B & D are located.

The proposed sites are located in an area away from sight lines from notable areas, including the Wild Atlantic Way and continuation of marine leisure activities can be accommodated by this project, however, sites T06/106B & D are located in an area which has been noted for shore angling and bait digging, therefore, could potentially cause a significant negative impact on local angling

6.3. Statutory Status

There are no specific statutory or development plans for Poulnasherry Bay. Aquaculture is, however, considered under the Clare County Development Plan (CCC, 2017a) and the Strategic Integrated Framework Plan for the Shannon Estuary (SIFP, 2013).

Within the Plans it states that a balance must be achieved for the Shannon Estuary, by facilitating and maximising its potential for various forms of development while managing the estuarine and natural environment in full compliance with all relevant EU Directives.

An Appropriate Assessment has been carried out in terms of the impacts of aquaculture on both the River Shannon & Fergus Estuaries SPA (Atkins, 2019) and the Lower River Shannon SAC (MI, 2019)

Lower River Shannon SAC Appropriate Assessment

The Appropriate Assessment screening resulted in a number of the Lower River Shannon SAC qualifying features being excluded from further consideration due to the fact that there was no spatial overlap of the aquaculture activities expected to occur with the known key areas o distribution of the species. Those interest features screened out of Appropriate Assessment are set out in Table 8 below. Where potential for Likely Significant Effects on certain interest features was identified those features are set out in Table 9.

Table 8 Qualifying features of the Lower River Shannon SAC Excluded from Further Assessment in the Appropriate Assessment Process

Qualifying Feature	Designation Code
Freshwater Pearl Mussel *Margaritifera margaritifera* (Only in Freshwater)	1029
Sea Lamprey *Petromyzon marinus*	1095
Brook Lamprey *Lampetra planeri*	1096
River Lamprey *Lampetra fluviatilis*	1099
Salmon *Salmo salar* (Only in Freshwater)	1106
Sandbanks which are slightly covered by seawater all the time	1110
Coastal Lagoons	1150
Perennial vegetation of stony banks	1220
Vegetated sea cliffs of the Atlantic and Baltic coasts	1230
Salicornia and other annuals colonising mud and sand	1310
Atlantic slat meadows	1330
Mediterranean salt meadows	1410
Watercourses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	3260
Molinia meadows on calcareous, peaty and clayey-silt-laden soils	6410
Alluvial forests with Alnus glutinosa and Fraxinus excelsior	91E0

Table 9 Qualifying Features brought forward for Full Appropriate Assessment

Qualifying Feature	Designation Code
Estuaries	1130
Mudflats and sandflats not covered by seawater at low tide	1140
Large shallow inlets and bays	1160
Reefs	1170
Bottlenose Dolphin *Tursiops truncates*	1349
Otter *Lutra lutra*	1355

The Appropriate Assessment of aquaculture activities within the Lower River Shannon SAC (MI, 2019) came to 6 main conclusions in regards these qualifying features. The Appropriate Assessment determined that Adverse Effects on Site Integrity (AESI) could be eliminated in relation to Bottlenose Dolphin, Otter, estuaries, mudflats and sandflats not covered by seawater at low tide and reefs. A risk to a sub feature of large shallow inlets and bays was however identified.

Table 10 Lower River Shannon SAC Appropriate Assessment Conclusions

Conclusion 1	With one exception (Marine Community type – Anemone-dominated subtidal reef community (28.4%) which is above the 15% coverage threshold within the qualifying feature Large Shallow inlets and bays) **intertidal oyster trestle culture activities do not pose a risk of significant disturbance to the qualifying (Habitat) features of the Lower River Shannon SAC**.
Conclusion 2	Given the long residence time in the Shannon Estuary and the fact that recruitment in the wild of the non-native Pacific Oyster is ongoing within the Lower River Shannon, **the risk posed by the culture of diploid Pacific Oyster cannot be discounted**. This risk is further exacerbated by the culture of these oysters unrestricted on the seabed. **It is recommended that all oyster culture be carried out using triploid oysters and that subtidal culture of Pacific Oysters unrestricted on the seabed be reviewed** in light of these findings.

Conclusion 3	It is recommended that acceptable sources of seed (in terms of alien species assessment) are identified for all shellfish culture operations. **The movement of stock in and out of the Lower River Shannon SAC should adhere to relevant fish health legislation and follow best practice guidelines.**
Conclusion 4	It is recommended that there **be strict adherence to the access routes identified** and that **density of culture structures within the sites be maintained at current levels.**
Conclusion 5	The current and proposed levels of aquaculture activities individually and in-combination with activities in the Fishery Order Areas are **considered non-disturbing to Otter** conservation features.
Conclusion 6	The current and proposed subtidal and bottom culture aquaculture activities are not **considered disturbing to the Bottlenose Dolphin** conservation features.

It should be noted that during the Appropriate Assessment the activities which are known to occur within the Oyster Fishery Order Areas (i.e. bottom culture of oysters and mussels) were deemed disturbing to a number of marine community types. The information available regarding the extent of usage and type of culture occurring within the Fishery Order Areas is sparse. Therefore, within the Appropriate Assessment the maximum area the Fishery Orders cover was used to calculate spatial extent, however it is possible that these areas are not fully utilised by the operators (MI, 2019).

River Shannon and River Fergus Estuaries SPA Appropriate Assessment

Aquaculture activities within the River Shannon and Fergus Estuaries SPA are concentrated into three main areas: Poulnasherry Bay and surrounding area, Ballylongford/ Bunaclugga Bay and the Aughinish area. Each of these clusters occurs in discrete areas of intertidal habitat separated from each other, and from other similar areas, by open water and/ or long sections of shoreline with negligible amounts of intertidal habitat. For each of these areas, the Appropriate Assessment, used the distribution of intertidal habitat and the boundaries of waterbird count subsites to define *Aquaculture Areas* or AQUAS: the *Ballylongford/ Bunclugga AQUA,* the *Poulnasherry/ Kilrush AQUA* and the *Aughinish/ Foynes AQUA* (Atkins, 2019).

A number of licensed aquaculture sites are located outwith of the SPA designation but within the Lower River Shannon, therefore, due to the proximity of these sites to the River Shannon SPA these sites were included within the assessment. These sites are clustered within Carrigaholt Bay and the adjacent Rinevella Bay and are collectively referred to as the *Carrigaholt AQUA.*

The AA focused on Attribute 2 (Distribution) of the Conservation Objectives of waterbird SCIs, as impacts on Attribute 1 (Population Trends) are only likely to occur if there are high levels of displacement impacts.

SCIs for three adjacent SPAs, Ballyallia Lough SPA (Site Code: 004041) and Kerry Head SPA (Site Code: 004189) & Loop Head SPA (Site Code: 004119) have been screened in for assessment as the interchange between the SCI populations of these SPAs and the River Shannon SPA is unknown and considered possible. These SCI species were:

- Fulmar *Fulmarus glacialis* SCI of the Kerry Head SPA
- Kittiwake *Rissa tridactyla* and Guillemot *Uria aalgae* SCIs of the Loop Head SPA
- Wigeon, Teal, Mallard, Shoveler and Black-tailed Godwit SCIs of the Ballyallia Lough SPA

The Appropriate Assessment of aquaculture activities within the River Shannon and Fergus Estuaries SPA assessed the potential impacts under three broad categories: ecosystem effects, habitat impacts and disturbance impacts.

Ecosystem Effects
These are potential impacts which are not spatially restricted to the areas in the vicinity of the aquaculture sites but could affect the whole ecosystem, such as reduced recruitment of benthic communities (due to direct consumption of eggs and larvae by the cultured bivalves and/ or through indirect food web effects (over consumption of available organic matter, outcompeting native species) (Atkins, 2019).

The detailed analysis required to assess these effects robustly was outside the scope of the AA, however, the scale of aquaculture activities carried out throughout the Lower River Shannon relative to the size of the overall River Shannon SPA indicated that ecosystem effects from these activities was unlikely to be an issue at the SPA scale (Atkins, 2019).

Habitat and Disturbance Impacts
Potential negative impacts to SCI species were identified where the activities may cause negative impacts to prey resources and/or cause disturbance impacts, where there is evidence of a negative response to the activity by the species from previous detailed studies (including the results of a trestle study in Poulnasherry Bay (Gittings & O'Donoghue, 2012& 2016)) and/or where a negative response is considered possible by analogy to activities that have similar types of impacts on habitat structure and/or by analogy to ecologically similar species (Atkins, 2019).

The extensive AA assessed the potential magnitude of any potential impacts from an aquaculture activity on an SCI species, by analysing the spatial overlap between the distribution of the species and the spatial extent of the activity. This represents the maximum potential displacement if the species has a negative response to aquaculture activity (Atkins, 2019)

The potential displacement impacts were assessed qualitatively rather than quantitatively due to the lack of quality data which would support such an analysis. This was due to poor quality marine community type habitat mapping data, the limited data available on waterbird distribution within the River Shannon SPA and the lack of detailed site visits. Potential displacement impacts were assessed separately in each AQUA.

The AA assessed the potential impacts of oyster trestle cultivation on birds using the intertidal habitats, which are summarized in Table 11, below.

Table 11 Potential Impacts of Intertidal Oyster Trestle Culture on Birds Using the Intertidal Habitats (Atkins, 2019)

Potential Impact	Reasoning
Habitat Structure	Oyster trestle cultivation causes a significant alteration to the structure of the intertidal habitat through the placement of physical structures (oyster trestles) on the intertidal habitat. This alteration may alter the suitability of the habitat for waterbirds by interfering with sightlines and/or creating barriers to movement.
Food Resources (Benthic Fauna)	Oyster trestle cultivation may cause impacts to benthic invertebrates potentially affecting food resources for waterbird species. Variable effects of intertidal oyster cultivation on the benthic fauna have been reported, with studies in England, France and New Zealand showing intertidal oyster cultivation caused increased biodeposition, lower sediment redox potential and reduced diversity and abundance of the benthic fauna. However, studies in Ireland and Canada, found few changes in the benthic fauna, due to high currents preventing accumulation of biodeposits. In a recent study commissioned by the Marine Institute, Ford *et al.* (2015) looked at benthic invertebrates along access tracks, under trestles and in close controls at four sites along the west and south coasts of Ireland. The research indicated that oyster trestle cultivation in typical Irish sites is unlikely to have had major impacts on food resources for waterbirds that feed on benthic fauna.
Disturbance	Oyster trestle cultivation requires intensive husbandry activity and this may cause impacts to waterbirds using intertidal and/or shallow subtidal habitats at low tide through disturbance. Disturbance will not affect high tide roosts, or waterbirds that mainly, or only, use trestle areas when they are covered at high tide (such as Cormorant and Scaup), because no husbandry activity takes place during the high tide period.
Waterbird Responses	Trestle studies (Gittings and O'Donoghue, 2012 & 2016) have been carried out to categorise the nature of the association between oyster trestles and bird distribution patterns. Variable responses were recorded by the SCI species, with a number of species not being classified due to a lack of sufficient numbers recorded including; Shelduck, Teal, Pintail, Shoveler, Golden Plover, Lapwing, Black-tailed Godwit and Greenshank. This reflects that fact that these species tend to occur on muddier sediments, unlike the sandier sediments typically used for intertidal oyster cultivation. However, for Shelduck, Lapwing, Black-tailed Godwit and Greenshank, the trestle study found some weak evidence of negative (Shelduck, Lapwing and Black-tailed Godwit), or positive (Greenshank) association with trestles. Evidence of a negative association with trestles from other work exists for Golden Plover (Gittings and O'Donoghue, 2015). No evidence about the nature of the response of Teal, Mallard, Pintail and Shoveler to trestles exists, therefore a precautionary approach was

Potential Impact	Reasoning
	assumed (i.e. precautionary classification of a negative response due to lack of data).
In-combination impacts - Access	**Boat access** to/from aquaculture sites, and/or husbandry activity in moderately deep, or deep subtidal habitat could potentially cause disturbance impacts to waterbirds roosting in intertidal and shoreline habitats at high tide. Waterbirds using these types of roosts are typically more sensitive to disturbance than waterbirds roosting in subtidal habitat because the availability of suitable habitat in each roost site is usually tightly constrained. This means that if the birds are disturbed, they will often flush and abandon the roost site completely, while birds roosting in subtidal habitat can usually move short distances to a safe distance away from the disturbance source. The potential disturbance impacts of boats travelling to/from aquaculture sites are likely to be very minor, as there are only likely to be two movements (at most) per tidal cycle and birds on adjacent intertidal and shallow subtidal habitat can move a short distance away if disturbed and then return when the boat has passed. Therefore, given the nature and distribution of the associated boat activity, the nature of the bird utilisation of the areas potentially affected by disturbance and the low sensitivity of waterbirds to disturbance impacts from this type of activity, it can be concluded the development of aquaculture sites in moderately deep and deep subtidal habitat will not cause significant disturbance impacts to waterbirds using intertidal and shallow subtidal habitat at low tide and/or on ebb/flood tides.
In-combination impacts - Algae	Grey Plover appears to be completely excluded from oyster trestles. As Grey Plover is a visual feeder it may avoid areas of heavy algal growth increasing the potential displacement impact.
In-combination impacts – Fishery Order Areas	There are three areas within the River Shannon and River Fergus Estuaries SPA covered by Fishery Orders. Fishery Order T8/004A is located in the middle section of the Lower Shannon waterbody and occupies a total area of 3,515 ha. Most of the area covered by this order comprises subtidal habitat with generally narrow hard substrate intertidal zones along both shores with a few small bays containing areas of soft sediment intertidal habitat. Currently one producer is working this Fishery Order. Around 34 ha are being utilised for the relaying of seed and half-grown oysters, which are then harvested once they reach commercial size. Fishery Order T8/004B is located in the outer section of the Lower Shannon waterbody and occupies a total area of 4,548 ha. Most of the area covered by this order comprises subtidal habitat with only very narrow mainly hard substrate intertidal zones along the northern shoreline and around Scattery and Inishbig Islands. This Fishery Order does not include any intertidal habitat along the southern shoreline.

Potential Impact	Reasoning
	One producer has leased the entire area and plans to use different methods of oyster cultivation in various places depending on the suitability of the areas for the cultivation methods. Fishery Order T8/004A only includes one significant area of intertidal habitat (Tarbert Bay), but the current activities within this Fishery Order area do not affect intertidal habitat. Fishery Order T8/004B does not include any significant areas of intertidal habitat. Therefore, the current and planned activities for Fishery Orders T8/004A and T8/004B in combination with development of the aquaculture sites covered by this assessment are not likely to cause significant cumulative impacts to waterbirds using intertidal habitat. Fishery Order T8/008 is located in the lower section of the inner part of Poulnasherry Bay and occupies a total area of 40 ha. The area covered by this Fishery Order is mainly occupied by soft sediment intertidal habitat, around 28 ha, with a permanent tidal channel running through the middle of the area. Full utilisation of the Fishery Order, combined with full development of the proposed aquaculture sites within Poulnasherry Bay, would substantially increase the percentage occupancy of intertidal habitat by oyster trestle cultivation in Poulnasherry Bay. Therefore, the potential cumulative effects of oyster trestle cultivation in Fishery Order T8/008 in combination with oyster trestle cultivation in the aquaculture sites in Poulnasherry Bay is likely to increase the already potentially substantial impacts to Grey Plover and could potentially cause significant impacts to other species. There is also potential for the cumulative effects of oyster trestle cultivation in Fishery Order T8/008 in combination with oyster trestle cultivation in the aquaculture sites in Poulnasherry Bay to cause increased impacts to Scaup.
In-combination impacts – other Activities	Beach recreation, bait digging or hand collection of shellfish, Shooting (Wildfowling), fishery activities, water-based recreational activities and commercial port activities were assessed in-combination with aquaculture activities. The main concentration of recreational activity in the intertidal is likely to be in the beach recreation areas at Beale Strand and Cappa Beach, the sandy areas likely to be favoured for recreational activities at Beale Strand appear to hold relatively few waterbirds. Shellfish gathering and bait digging will also involve activity in the intertidal zone. However, the levels of these activities appear to be low and they are unlikely to cause significant disturbance impacts.

Potential Impact	Reasoning
	Wildfowling causes direct mortality of quarry species, as well as wider disturbance impacts, non-quarry species may also be affected by disturbance impacts. It was not possible to assess the potential cumulative impacts of wildfowling in-combination with aquaculture activity due to the lack of detailed information on the distribution and intensity of wildfowling activity within the SPA. Boat activity will generally not affect waterbirds in intertidal and shallow subtidal habitat. However, some types of recreational watersports activities can occur in very shallow waters and have been observed to cause disturbance to waterbirds. However, given the nature and distribution of the main intertidal areas within the River Shannon and River Fergus Estuaries SPA it seems unlikely that such activities would overlap with significant numbers of waterbirds. Boat traffic to/from quays and marinas may also cause disturbance to waterbirds roosting in shoreline areas or islands at high tide. The locations of the marinas and yacht clubs at Foynes, Kilrush and Limerick City indicate that boat traffic to/from these facilities is unlikely to pass close to sensitive roost sites. However, any additional vessel traffic associated with aquaculture activity from quays in Ballylongford Creek and the River Deel could have significant cumulative impacts on high tide roosts in-combination with the existing vessel traffic generated by aquaculture activity.
In-combination impacts – SIFP for the Shannon Estuary	There is potential for further significant cumulative impacts on a number of SCI species (Light-bellied Brent Goose, Shelduck, Wigeon, Teal, Pintail, Shoveler, Golden Plover, Grey Plover, Lapwing, Ringed Plover, Curlew, Black-tailed Godwit, Bar-tailed Godwit, Knot and Dunlin) from the development of the area of opportunity for tidal energy in Tarbert Bay, and/or development of the area of opportunity for aquaculture in Clonderlaw Bay.

Poulnasherry Bay Assessment

Poulnasherry Bay has extensive areas of soft sediment intertidal habitat within the estuary, although there is extensive algal cover on the upper areas of mudflat. Outside the bay, most of the soft sediment intertidal habitat is only exposed at low tide.

All the soft sediment intertidal habitat in the Poulnasherry/Kilrush AQUA is classified as the *intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex* by NPWS. However, there are clear visual differences between the intertidal habitat within Poulnasherry Bay and the intertidal habitat in the outer parts of the Poulnasherry/Kilrush AQUA. The former is soft intertidal mudflat/muddy sand, while the latter comprises much firmer sandflat type substrate (Atkins, 2019)

There are extensive areas of intertidal habitat within Poulnasherry Bay that are covered by algal growth which has been recorded since 1996, where up to 80% cover of filamentous green algae on the upper 300 m of the intertidal was recorded. This algal cover persists through the winter, as there was still extensive algal growth in the site visits of March 2017 (Atkins, 2019).

The Poulnasherry/Kilrush AQUA held the entire SPA population of Pintail during the NPWS Waterbird Survey Programme 2010/2011 counts, and was also important for Shelduck, Teal and Grey Plover. The occurrence and distribution of waterbirds in the Poulnasherry area during the NPWS Waterbird Survey Programme (WSP) 2010/2011 are shown in Table 12, below.

Table 12 Occurrence and Distribution of Waterbirds in Intertidal Habitats in the Poulnasherry AQUA during the 2010/2011 NPWS WSP Counts (Atkins, 2019)

Species	Mean % of		Mean Count NPWS WBS				
			Poulnasherry Bay		Outer Sections		
	SPA	LS Zone	OH519	OH520	OH507	OH517	OH518
Whooper Swan	25%	30%	4	0	0	0	0
Light-bellied Brent Goose	30%	30%	8	6	0	0	0
Shelduck	25%	41%	115	0	0	0	0
Wigeon	3%	5%	40	0	0	4	0
Teal	21%	36%	402	0	0	94	0
Mallard	11%	19%	56	0	0	1	0
Pintail	99%	99%	47	0	0	0	0
Grey Plover	16%	29%	24	0	0	0	0
Lapwing	2%	5%	46	0	0	12	6
Ringed Plover	5%	5%	46	0	0	12	6
Curlew	7%	10%	124	1	0	7	21
Black-tailed Godwit	0%	1%	5	0	0	0	0
Bar-tailed Godwit	3%	6%	0	10	0	0	0
Knot	2%	12%	11	0	0	0	0
Dunlin	1%	8%	230	0	0	2	3
Black-headed Gull	1%	4%	29	0	3	1	0

This table shows: (1) the mean of each low tide count in the intertidal and subtidal zones across all the subsites in the Poulnasherry AQUA as percentages of the total count across the whole SPA, and across the Lower Shannon zone, respectively; and (2) the mean low tide count in each of the Poulnasherry AQUA subsites.

The aquaculture sites in Poulnasherry Bay overlap areas that are used by relatively large numbers of waterbirds. The aquaculture sites in the outer part of the Poulnasherry/Kilrush AQUA occur in subsites that appear to hold very low numbers of waterbirds and are mainly only exposed on spring low tides. Therefore, any displacement impacts from these sites are likely to be very minor (Atkins, 2019).

Shelduck, Wigeon, Teal, Mallard, Pintail, Golden Plover and Lapwing mainly occur in the upper sections of the estuary and/or in shoreline areas in the lower sections, away from the aquaculture sites. Therefore, development of the aquaculture sites is unlikely to cause measurable

displacement impacts to these species and the potential impact is assessed as negligible (Atkins, 2019).

Grey Plover appears to be completely excluded from oyster trestles. Poulnasherry Bay appears to hold a relatively high proportion of the total River Shannon and River Fergus Estuaries SPA Grey Plover population so the potential displacement impact to this species may be significant. As Grey Plover is a visual feeder it may avoid areas of heavy algal growth increasing the potential cumulative displacement impact. Therefore, the potential impact has been assessed as substantial (Atkins, 2019).

Ringed Plover, Bar-tailed Godwit, Knot and Dunlin also show strong patterns of negative association with oyster trestles, and these species appear to show an association with the middle/lower part of the bay where the aquaculture sites are concentrated. Poulnasherry Bay does not appear to hold significant proportions of the SPA populations of these species (although previous counts indicate the area may have been more important for birds in the early 2000s). Therefore, the potential displacement impact is likely to be minor at the SPA scale but moderate at the Lower Shannon (LS) scale (Atkins, 2019).

The potential impact of intertidal oyster culture on benthic prey resources for Scaup at high tide is not known. However, it is possible that the trestles may impede access to the benthic habitat for diving birds. This could potentially have a significant impact on Scaup, which mainly feeds in the benthic zone. Poulnasherry Bay appears to be a particularly favourable habitat for Scaup. The sites probably occupy around 15-30% of the total area of suitable habitat at high tide in Poulnasherry Bay. Therefore, if oyster trestles impede access to benthic habitat, the development of these sites could cause a significant reduction in the availability of suitable foraging habitat for Scaup in one of the main areas used by the species in the SPA (Atkins, 2019)

Overall, the scale, timing and distribution of husbandry activity associated with the aquaculture activity in the SPA is not likely to cause significant disturbance impacts to Scaup. The potential for intertidal oyster cultivation to cause significant impacts to the availability of suitable foraging habitat for Scaup in the Poulnasherry/Kilrush AQUA cannot be excluded due to lack of knowledge about the effects of oyster trestles on Scaup foraging behaviour. The potential for cumulative impacts from the development of the aquaculture sites in combination with oyster trestle cultivation in Fishery Order T08/008 and/or bottom oyster cultivation in Fishery Orders T08/004A and T08/004B also needs to be considered. (Atkins, 2019).

6.4. Economic effects

Tourism and natural resources are key areas of employment in the region. The fishing and aquaculture industries provide a substantial element of the overall economy of the county and the region around the Shannon Estuary (CCC, 2017a & SIFP, 2013).

These sites have the potential to provide a range of benefits to the local economy, including employment, attraction of investment capital and development of support services.

6.5. Ecological Effects

6.5.1 Particle Suspension / Benthic Communities
Oysters are suspension feeders which means that biodeposition can occur on the seabed beneath the bags and trestles where faeces and pseudofaeces accumulate. This biodeposition can affect the natural local sediment movement and also the natural infaunal community.

Where some enrichment (from biodeposition) in the water can be beneficial, over enrichment can be detrimental and can lead to a change in the natural biogeochemistry reducing natural / native species richness and at times anoxic conditions can occur proving fatal to local organisms.

Oysters can have a "plastic response" to increased sedimentation level, increasing their filtration rate which in turn can increase the amount of biodeposition. The rate of biodeposition in an area is dependent on the density of animals in addition to the hydrology of the site.

Based on the information gathered to inform this report and the fact that the Shannon Estuary is known to have the largest tidal range in Ireland, it can be assumed that the buildup of faeces and pseudofaeces from the development of these sites will not have a detrimental impact on the surrounding benthic habitats or water quality within the Bay.

6.52 Shading
Oysters, as filter feeders, can alter the zooplankton and phytoplankton abundance and communities in the water column and therefore the overall productivity of a site. It may decrease the turbidity of the water, increasing light penetration through the water column. This increase in light penetration may be beneficial to some species such as eel grass (*Zostera* spp.). Conversely, the trestles and bags may cause shading to the seabed, decreasing the light penetration, thereby negatively impacting the growth of vegetation such as eel grass.

These community types are not reported from within Poulnasherry Bay and so negative effects can be discounted.

6.5.3 Non-native Species
The movement of oysters in and out of the water can encourage the transport of non-native and / or invasive species either though the introduction via seed and / or from boats moving between areas. Pacific Oysters have been known to become naturalised in some sites in Ireland, including the Shannon Estuary.

The movement of stock in and out of the River Shannon Estuary should adhere to relevant fish health legislation and follow best practice guidelines (e.g. https://invasivespeciesireland.com/biosecurity/aquaculture/), which are incorporated in the new updated licencing conditions as part of any aquaculture licence.

The use of triploid oysters (sterile) can reduce the potential of the Pacific Oyster expanding further within the Lower Shannon Estuary.

6.6. General Environmental Effects

It is considered that the proposed application will not pose significant environmental effects within the bay and in the wider Lower River Shannon Estuary other than those highlighted in Section 6.3 & 6.5. There are no predicted impacts from pollution sources or changes to hydrological functioning of the site as a whole (including freshwater influences).

6.7. Effect on man-made heritage

There is no predicted impact on man-made heritage sites located around Poulnasherry Bay.

6.8. Section 61 Assessment Conclusions

Site Suitability

*The sites under appeal are **considered suitable** for the intended purpose for the following reasons:*

- The sites are located on firm substrate within an existing area of aquaculture and within the West Shannon Poulnasherry Bay Shellfish Designated Waters, which has an 'A' Classification, meaning the Oysters produced are suitable for direct human consumption, with no prior purification required.

- The intertidal culture of Pacific oysters using trestles and bags is considered non-disturbing to the benthic community type upon which the sites are proposed to be located.

- A Special Unified Marking Scheme is in place, providing safe navigation for the Bay. BIM in consultation with existing license holders, through the CLAMS scheme, have drawn up a provisional new marking scheme should these sites be licensed.

*The sites under appeal are **considered unsuitable** for the intended purpose for the following reasons:*

- The Appropriate Assessment of aquaculture activities within the SPA concluded there was **high potential** for the development of these sites to cause significant displacement impacts to SCI species, Grey Plover and Bar-tailed Godwit, while significant displacement impacts to Light-bellied Brent Goose and Ringed Plover are also possible

Other Uses

*The proposed development will have a **non-significant adverse impact** on the possible other uses or users of the area for the following reasons:*

- A shore angling mark occurs at the Querrin side of Cammoge Point, the entrance to Poulnasherry bay, where bait digging, for lugworm and razorfish also occurs at low tide. The sites T06/106B & D are located in proximity to this established shore angling mark.

Statutory Status

*The proposed development may have a **significant adverse impact** on the statutory status of the area for the following reasons:*

- The proposed development has the potential to cause significant displacement impacts on the SCI species Grey Plover and Bar-tailed Godwit, while significant displacement impacts to Light-bellied Brent Goose and Ringed Plover are also possible, therefore potentially impacting on the Conservation Objectives of the River Shannon & Fergus Estuaries SPA.

Economic effects

*There is a **significant positive effect** on the economy of the area for the following reasons:*

1. Through local employment over the operation of the site
2. Through expansion of a local business providing employment and generating revenue for the local economy
3. Utilising the goods and services of the local area trades to service the operation and maintain the site

Ecological Effects

*There is a **potential significant adverse effect on avifauna (birds)** of the area as a result of the proposed operation for the following reasons:*

- The Appropriate Assessment of aquaculture activities within the River Shannon & Fergus Estuaries SPA highlighted that the proposed developments have the potential to cause significant displacement impacts on the SCI species Grey Plover and Bar-tailed Godwit, while significant displacement impacts to Light-bellied Brent Goose and Ringed Plover are also possible. Ongoing monitoring, commissioned by the Marine Institute, should inform future licensing decisions.

*The proposed development is considered to pose a **non-significant effect** on the habitats of the site, including those which are designated as Features of Conservation Interest for the SAC in which the proposed site is located for the following reasons:*

1. Intertidal oyster trestle culture activities do not pose a risk of significant disturbance to the qualifying (Habitat) features of the Lower River Shannon SAC.
2. The build-up of faeces and pseudofaeces is considered unlikely due to the rate of tidal exchange within the Bay.

3. Habitat Community types sensitive to shading such as *Zostera* beds are not reported from within the proposed areas or Poulnasherry Bay

*The proposed development is considered to pose a **significant effect** on the habitats of the site, including those which are designated as Features of Conservation Interest for the SAC in which the proposed site is located for the following reasons:*

1. The movement of oysters in and out of the water can encourage the transport of non-native and / or invasive species either though the introduction via seed and / or from boats/ equipment moving between areas. The movement of stock in and out of the River Shannon Estuary should adhere to relevant fish health legislation and follow best practice guidelines as per the updated licencing conditions for aquaculture licences.
2. Pacific oysters have been known to become naturalised in some sites in Ireland, including the Shannon Estuary. The use of Triploid Oysters and the cessation of uncontained bottom culture of Pacific Oysters can reduce this risk significantly.

General Environmental Effects

The proposed development is considered **not to pose a significant effect** on the general environment of the site for the following reasons:

1. Pollution of the site is not predicted from the processing of the new site
2. No hydrological effects are predicted from the processing of the new site

Man-made Heritage

There will be **no effect on the man-made heritage** of value in the area as a result of the proposed operation for the following reason:

1. The surrounding features of man-made heritage are terrestrial in nature and so will not be impacted by development within the intertidal zone.

6.9. Confirmation re Section 50 Notices

There are no pertinent matters which arise in the Section 61 assessment which the Board ought to take into account which have not been raised in the appeal documents and it is not necessary to give notice in writing to any parties in accordance with section 50 (2) of the 1997 Act.

7. Screening for Environmental Impact Assessment.

Aquaculture is listed as an Annex II Project under the EU EIA Directive 85/337/EEC, however, where this form of aquaculture depends on natural processes for production and supply of feed (i.e. extensive) an EIA Screening process is deemed not required (Ireland as a Member State Guidance). Therefore, it is the conclusion of the advisor that an EIA Screening (formally EIS) is not required in this instance.

The Minister for Agriculture, Food and the Marine has not produced a EIA report or screening report for aquaculture activities within the Lower River Shannon SAC or the River Shannon & Fergus Estuaries SPA, in accordance with the requirement of Regulation 5(2) of the Aquaculture (License Application) Regulations, 1998, although, the Minister has produced an Appropriate Assessment Conclusion Statement for aquaculture activities within the Lower River Shannon SAC and the River Shannon and Fergus Estuaries SPA

8. Screening for Appropriate Assessment.

Appropriate Assessments have been carried out with respect to the potential impacts of aquaculture activities on the Conservation Objectives of the River Shannon & Fergus Estuaries SPA (Atkins, 2019) and the Lower River Shannon SAC (MI, 2019). The Appropriate Assessment process is designed to assess the potential for a plan or project to cause Adverse Effects on Site Integrity on Natura 2000 sites. The Appropriate Assessments carried out on Aquaculture Activities within the Lower River Shannon acknowledge potential risks of potential impact but do not clearly conclude the potential risk of Adverse Effects on Site Integrity (AESI)

Sites Referenced T08/106B, C & D (Proposed Site Application) lie within and adjacent to Poulnasherry Bay within the Lower River Shannon SAC and River Shannon & Fergus Estuaries SPA. It is considered, from best available data, that there is potential for the establishment of new sites to have a significant impact on the conservation objectives of the SPA in terms of SCI (waterbird) displacement and disturbance (i.e. AESI). Ongoing over-wintering waterbird monitoring, commissioned by the Marine Institute, should provide sufficient data to assess the impact of waterbirds within Poulnasherry Bay with reference to the overall SPA, which may be suitable to inform future licensing decisions.

9. Technical Advisor's Evaluation of the Substantive Issues in Respect of Appeal and Submissions/Observations Received

With respect to the substantive issues raised by the appellant the below comments reflect the considered opinion of the advisor based on best available information:

Issue	Appellant Comments	Advisor Comments
Protected Species	The appellant states that within the SPA Appropriate Assessment it was noted that the majority of Grey Plover recordings were made within the Inner Poulnasherry Bay (NPWS Baseline Waterbird Survey Subsite OH519) and not the Outer Bay area (NPWS BWS subsite OH520) where sites T08/106 B & D are located, therefore the licensing of these sites should have no impact on Grey Plover numbers.	The AA did focus more so on the Inner Poulnasherry Bay where the majority of applications were being considered. The AA concluded that the outer Poulnasherry Bay subsites hold very low numbers of waterbirds and are mainly only exposed on spring low tides. Therefore, any displacement impacts from these sites are likely to be very minor (Atkins, 2019). However, the potential for intertidal oyster

Issue	Appellant Comments	Advisor Comments
		cultivation to cause significant impacts to the availability of suitable foraging habitat for Scaup in the Poulnasherry/Kilrush AQUA cannot be excluded due to lack of knowledge about the effects of oyster trestles on Scaup foraging behaviour. Concluding potential for significant effects is in line with the precautionary principal embedded within the consideration of effects of plans or projects on Natura 2000 sites. An ongoing monitoring scheme has been commissioned by the Marine Institute which can be used to inform future aquaculture licensing decisions
Licensing decision	The appellant states that the Departments decision of refusal of his license applications was unjustified as bird survey work in the bay is not yet complete. He believes that the licensing decisions should have been deferred, rather than refused, following the completion of further survey work which will provide sufficient data to inform future licensing decisions.	Bird survey work has recently (2018) been commissioned by the Marine Institute. The first round (2018/2019) of this wintering monitoring has been completed and data from this has been included within this report. A further 2 years of monitoring have been commissioned by the Marine Institute, 2019/2020 and 2020/2021. It is the considered opinion of the advisor that the licensing decisions could have been deferred by the Department until this monitoring had been completed and up to date data on waterbird distribution was available to inform the licensing decisions.
Economic	The appellant states that there will be a clear economic benefit to the local and regional economy. Which has been recorded in the past to have a high unemployment rate. The area is also facing future economic blows due to the impending closure of Moneypoint (coal powered) Power station.	It is the considered opinion of the technical advisor that there would be a clear benefit to the local economy from the licensing of these sites. Through the provision of direct employment in the locality and the potential for the development of further supporting services such as; processing and packaging and hauliers.

Issue	Appellant Comments	Advisor Comments
Natura 2000 sites	The appellant states that the Lower River Shannon SAC has a larger area compared to the River Shannon & River Fergus Estuaries SPA (68,300ha compared to 32,238ha) and that this SAC area total should be used in determining the overlap extent of aquaculture activities, which would therefore allow for further licensing of aquaculture activities	The Appropriate Assessment process must be carried out for both the Lower River Shannon SAC and the River Shannon & Fergus Estuaries SPA, as it has been. Therefore, the area of both the SAC and SPA must be used for the respective Appropriate Assessments.
Fishery Order Areas	The appellant states that a survey should have been carried out to verify the extent of use of these large sites, rather than assuming 100% occupancy. The appellant believes until a complete survey is carried out that this should be grounds for a deferral of licensing decisions rather than refusal.	The Fishery Order Areas are under the remit of the Department of Communications, Climate Change and the Environment and so outside the remit of the Aquaculture Licensing Appeals Board. Furthermore, the actual extent of activities carried out within these Order Areas is unknown, however, these areas are fully licensed and so the potential exists for full, 100%, usage of these sites.
	The appellant states that there were no objections lodged by the public during the mandatory consultation phase.	It is agreed there were no objections lodged by the public during the consultation phase, however there were a number of comments and objections raised during the Statutory and Technical Consultation phase including from the Marine Institute, An Taisce and the Department of Culture Heritage and the Gaeltacht. The lack of objections during the consultation phase of the license application does not guarantee the license will be granted as this is not the only determining factor.

10. Recommendation of Technical Advisor with Reasons and Considerations.

It is the considered opinion of the advisor that the licenses be refused or postponed, should that be possible, on the grounds that;

- Wintering waterbird population data for the site is outdated and a monitoring programme is ongoing in Poulnasherry Bay, two years of this monitoring have been completed (Report only available for the first year 2018/2019) with one subsequent year to follow (2020/2021). This monitoring data can be used to inform complete consideration of the proposals in relation to potential effects on the conservation objectives of the SPA and therefore future aquaculture licensing decisions.

The Technical Advisor, based on the above information, recommends the Board apply the precautionary principle and either agree with the Ministers decision to refuse the application or postpone the decision until the monitoring programme is complete and sufficient data to conclude a robust assessment is available .

11. Draft Determination Refusal /or Grant

It is recommended to uphold the Ministers decision to refuse the application or to defer the decision until sufficient data is available to conclude a robust assessment based on details outlined in Section 10 and above in Section 6.8.

Technical Advisor: Eoin Cussen, EcoÉireann

Date: 07th Sept 2021

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Appendix A: Site Photographs

View of Existing sites at Cammoge Point, facing Baunahard Point

View from Cammoge over the Proposed site T06/106D, facing south-west

View from Cammoge over the Proposed site T06/106D, facing east.

View from Cammoge over the Proposed site T06/106B, facing west

View from Querrin over the Proposed site T06/106B, facing east

View from Querrin over the Proposed site T06/106B and D, facing east

View of Poulnasherry Bay from the access route to T06/106C, facing north-east

View of proposed site T06/106C from the North, facing previous photo

View of the proposed site T06/106C, from the north of Poulnasherry Bay

View of the proposed site T06/106C from the northern edge of Poulnasherry Bay