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Assessment of Impacts on Maritime Usage for Seaweed Harvesting

ogt
— A ROVENSA COMPANY —

Client	**Oilean Glas Teoranta (OGT)**
Document Ref.	24052-REP-004-02 AIMU
Project Title	Seaweed Support Rovensa OGT
Date	12/09/2024

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Client:	Oilean Glas Teoranta (OGT)
Ultimate Client:	Oilean Glas Teoranta (OGT)
Confidentiality	Non Confidential

REVISION HISTORY

Rev	Date	Reason for Issue	Originator	Checker	Reviewer	Approver
[00]	31/07/2024	Draft for Client Review	[redacted]			
01	13/08/2024	With Client Comments				
02	12/09/2021	Final				

DISCLAIMER

REVISION SUMMARY

Rev	Date	Section(s)	Detail of Change
01	13/08/2024	1.1	Includes historical data

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List of Abbreviations

AA	Appropriate Assessment
AIMU	Assessment of Impacts on Maritime Usage
AQUAMIS	Aquaculture Information Management System
CESS	Cumulative Effects Spatial Scope
CETS	Cumulative Effects Temporal Scope
CO	Conservation Objectives
DAFM	Department of Agriculture, Food, and the Marine
DEHLG	Department of Environment, Heritage and Local Government
EC	European Commission
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
GDG	Gavin and Doherty Geosolutions Ltd.
GES	Good Environmental Status
HABs	Harmful Algal Blooms
ISPA	Inshore Shellfish Production Areas
ITM	Irish Transverse Mercator
MAP	Maritime Area Planning Act 2021
MARA	Maritime Area Regulatory Authority
MI	Marine Institute
MSFD	Marine Strategy Framework Directive
MSP	Marine Spatial Planning
MUL	Maritime Usage Licence
NM	Nautical Mile
NMS	National Monuments Database
NMPF	National Marine Planning Framework
NPWS	National Parks and Wildlife Service
OGT	Oilean Glas Teoranta
OPR	Office of the Planning Regulator
PoMs	Programme of Measures
QI	Qualifying Interests
RAAIVS	Risk Assessment for Annex VI Species
RBMP	River Basin Management Plans
SAC	Special Areas of Conservation
SCA	Seascape Character Area
SCI	Special Conservation Interest
SISAA	Supporting Information for Screening for Appropriate Assessment
SPA	Special Protection Areas
SWDA	Shellfish Waters Directive Areas
UK	United Kingdom
WFD	Water Framework Directive
ZoI	Zone of Influence

1 INTRODUCTION

1.1 OVERVIEW AND BACKGROUND

Gavin and Doherty Geosolutions (GDG) have been commissioned by Oilean Glas Teoranta (OGT) to prepare a Maritime Usage Licence (MUL) for the hand harvesting of seaweed from the intertidal shoreline of the following three bays in Co. Donegal:

- Dungloe Bay,
- Mulroy Bay and
- Trawbreaga Bay

GDG have produced this Assessment of Impacts on Maritime Usage (AIMU) report to provide information on the environment in the area of the proposed hand harvesting of the seaweed *Ascophyllum nodosum* from the intertidal shoreline of the bays.

This document is prepared in support of an application for a Maritime Usage Licence under the Maritime Area Planning Act (2021) to undertake seaweed harvesting activities.

The seaweed is used to produce fertiliser and animal feed. As described in detail in Section 2, the seaweed will be collected from the harvestable area within these areas. The harvesting of seaweed plays an important cultural and socio-economic role for local communities in Co. Donegal, and it has expanded into commercial exploitation of the abundant seaweed resources of the area.

Seaweed harvesting in Ireland has a long tradition. Throughout the centuries seaweed was used as a fertiliser, food and animal feed. It is considered an important part of the social, economic and cultural fabric of many coastal communities [1]. The seaweed harvesting industry in Co. Donegal has operated a sustainable the system of harvesting and management of the resource for hundreds of years. No evidence of disturbance to local habitats or indigenous species associated with this activity has been identified over this time.

The harvesters are typically part-timers also involved in fishing or agriculture. OGT have worked closely with local harvesters for the past 24 years, some of whom have 50 years experience, and have developed a sustainable harvesting and management that ensures a careful and considerate approach to both the conservation of this seaweed resource and the local environment. OGT will continue to work with the harvesters to ensure the traditional techniques, local knowledge and sustainable management continue into the future.

The Maritime Usage Licence (MUL) area is outlined by the red boundary line. The three harvesting bays are shown in Figure 1-1. The individual bay areas are provided for Dungloe Bay in Figure 1-2, Mulroy Bay in Figure 1-3 and Trawbreaga Bay in Figure 1-4.

[1] https://emff.marine.ie/sites/default/files/bluegrowth/PDFs/Socioeconomic%20Study%20of%20Seaweed%20Harvesting%20in%20Ireland.pdf

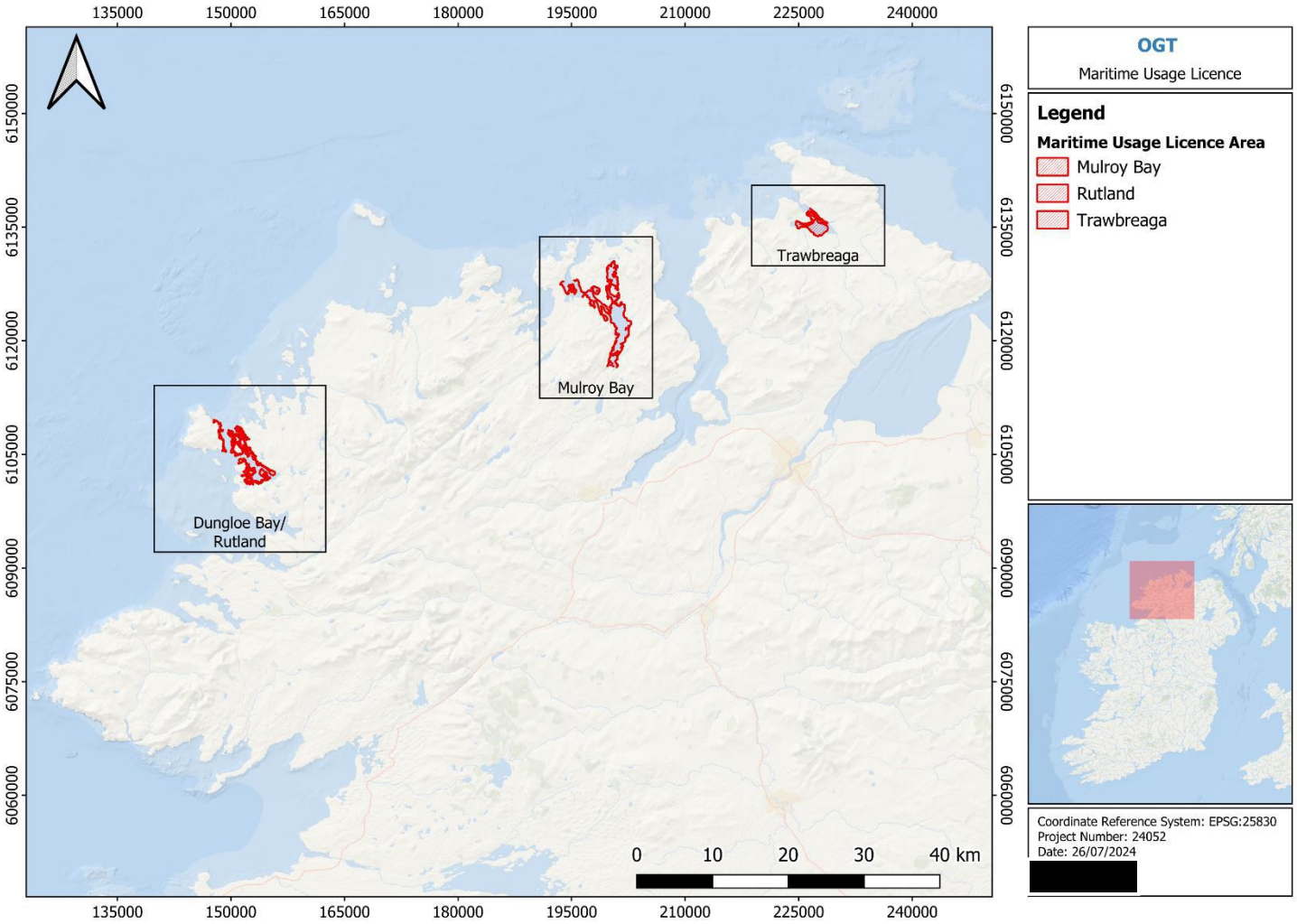

Figure 1-1 Seaweed Harvesting MUL Areas across Dungloe Bay, Mulroy Bay and Trawbreaga Bay (indicated by red boundary outlines)

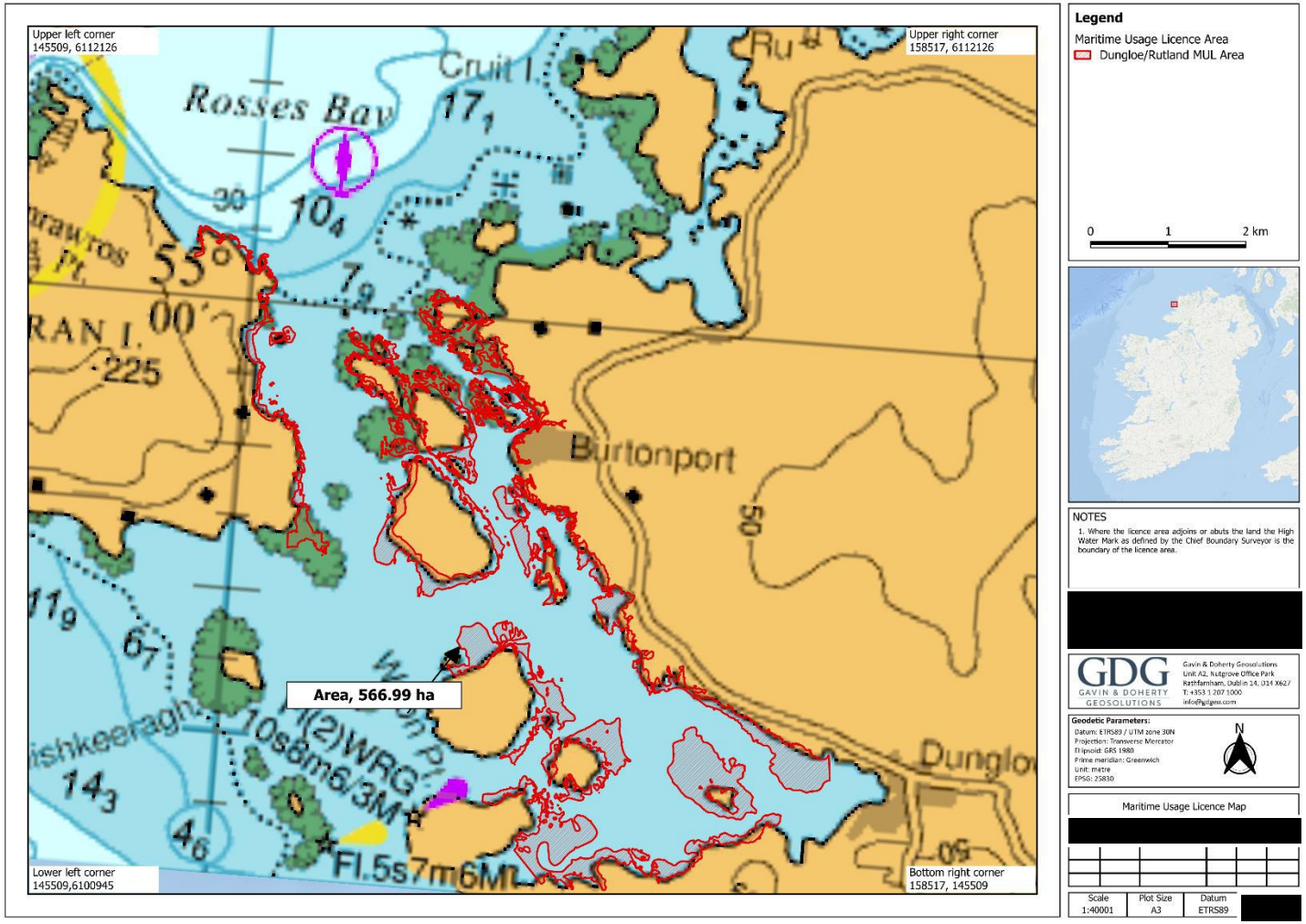

Figure 1-2 Maritime Usage Licence Area Boundary (red line) at Dungloe Bay

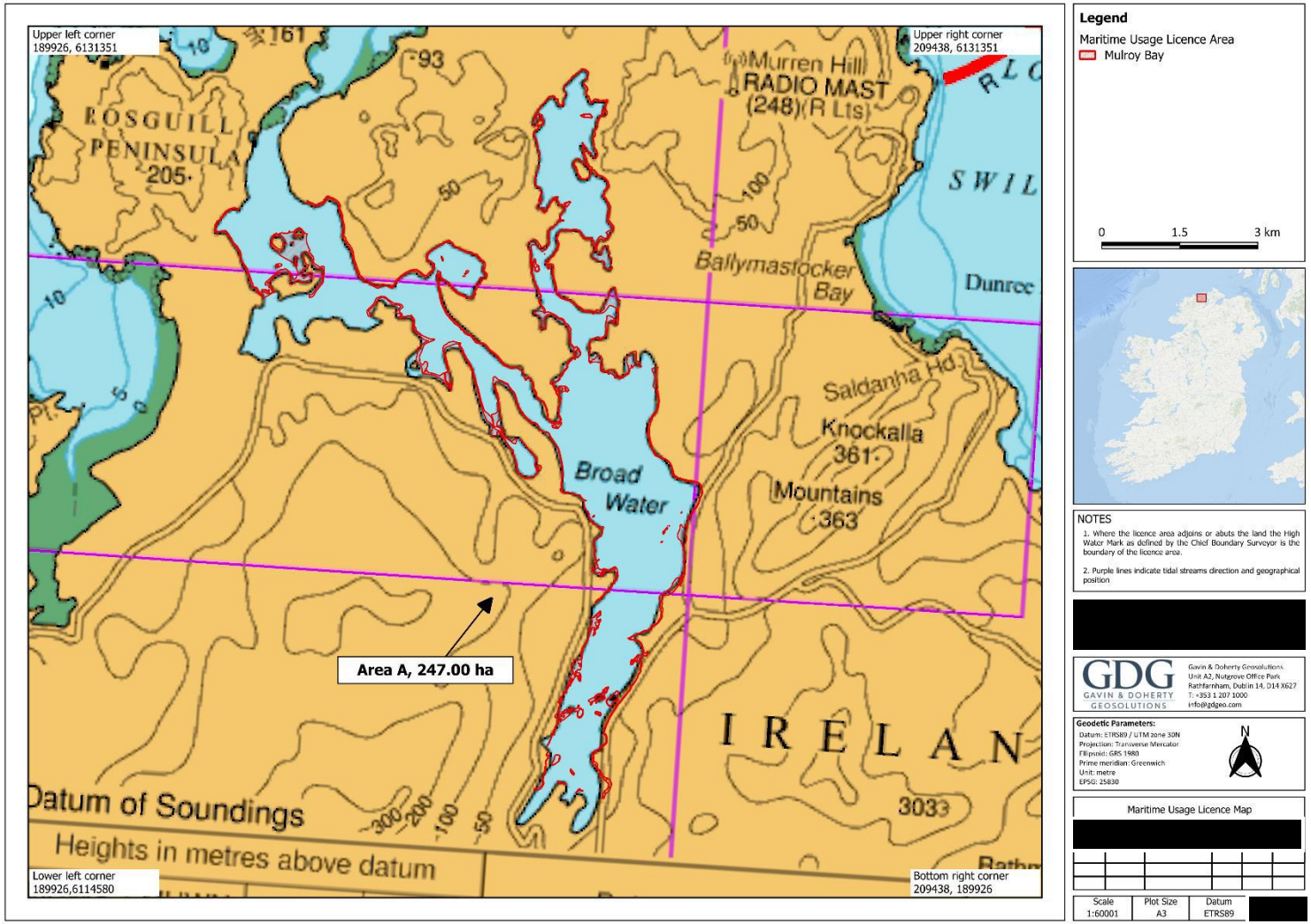

Figure 1-3 Maritime Usage Licence Area Boundary (red line) at Mulroy Bay

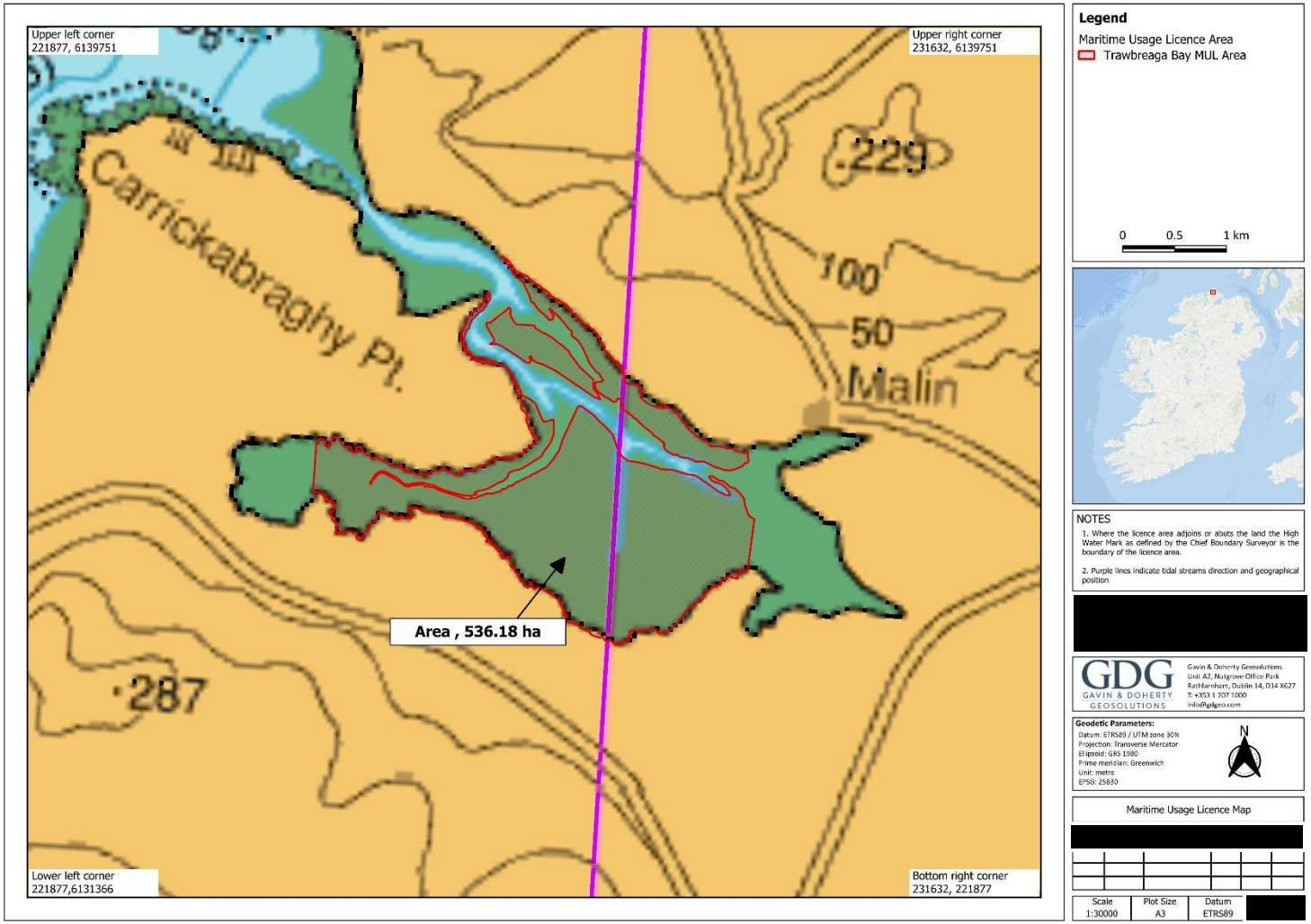

Figure 1-4 Maritime Usage Licence Area Boundary (red line) at Trawbreaga Bay

1.2 AIM OF THIS REPORT

This report is part of the Maritime Usage Licence (MUL) application to the Maritime Area Regulatory Authority (MARA) and aims to provide information documenting the current state of the environment in the vicinity of the proposed hand seaweed harvesting and consideration of the potential effects on the receiving environment.

This report also aims to determine whether any of the proposed seaweed harvesting activities fall within a class of projects listed in Part 2 of Schedule 5 of the Planning Regulations, as amended.

1.3 METHODOLOGY

This report summarises (Section 2) the seaweed harvesting activities. The report considers the need for the proposed activities (Section 3) and how the proposed activities relate to the Environmental Impact Assessment (EIA) Directive, the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD) (Section 4). Planning policy considerations and a statement of consistency with the National Marine Planning Framework (NMPF) are included in Section 5. The current state of the environment in the vicinity of the proposed seaweed harvesting activities is described to help identify potential effects on the environment Section 6

The receiving environment includes the proposed harvesting areas and the route between the harvesting sites and collection pier.

The potential impacts from the seaweed harvesting activities on the immediate environment and other environmental aspects are considered in the assessment. This receiving environment is outlined and described in further detail below.

While the undertaking of this evaluation of effects is not a statutory requirement, the report has been produced to consider the potential effects of the proposed harvesting activities on environmental receptors including population and human health, biodiversity (marine benthos, marine mammals, birds, fish and Natura 2000 sites), water, air & climate, socio-economic activities (commercial fisheries, aquaculture, marine traffic, tourism & recreation, material assets and other proposed developments), archaeology and cultural heritage, landscape and seascape and major accidents and disasters.

This report has been prepared with consideration of the following guidance:

- Applicant Technical Guidance Note for Obtaining a Licence to Carry Out Specified Maritime Usages in the Maritime Area under the Maritime Area Planning Act 2021, from MARA (2024)
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports, from the Environmental Protection Agency (EPA) (May 2022).
- OPR Practice Note PN02 Environmental Impact Assessment Screening, from the Office of the Planning Regulator (June 2021)

This report has been prepared by [redacted] (BSc. Hons Earth Science, MSc Marine and Coastal Environments) and checked by [redacted] (BSc. Hons Geological Science, MSc. Geochemistry). [redacted] is an environmental scientist with experience in offshore marine practices, environments and sampling, GIS applications, and knowledge of monitoring and mapping of coastal environments such as sand dunes. Her current work includes licence application preparation, various report writing, environmental map preparation and database management. [redacted] is a Senior Environmental Scientist with extensive experience as an environmental consultant, undertaking various multi-disciplinary projects within consulting engineering.

This report has been reviewed by [redacted] (BSc. Hons Marine Science, MSc Engineering in the Coastal Environment) and approved by [redacted]. [redacted] is a Marine Ecologist with coastal

engineering expertise and extensive experience of offshore benthic survey and Marine Protected Area monitoring who has undertaken multiple environmental assessments under the Habitats and EIA Directives within consulting engineering and as a statutory adviser to the UK government and its devolved administrations with the Joint Nature Conservation Committee. The report has been approved by [redacted] (BSc. Hons Biology, MSc. Applied Environmental Science, Chartered Environmentalist). [redacted] is Head of the Offshore and Marine Advisory Team at GDG and an experienced environmental professional, who previously held scientific and regulatory roles within the Scottish Government Directorate of Marine Scotland. He has undertaken multiple environmental assessments under both the Habitats and Environmental Impact Assessment Directives for GDG and as a regulator with Marine Scotland.

1.4 STRUCTURE OF THE REPORT

This report is structured into the following chapters, which describe or comprise the following elements:

- Chapter 1 (this chapter): Introduction to the report.
- Chapter 2: Describes the proposed seaweed harvesting activities.
- Chapter 3: Need and Alternatives.
- Chapter 4: Consideration of Directives that includes the Environmental Impact Assessment Screening exercise and reports on its conclusion.
- Chapter 5: Planning and Development.
- Chapter 6: Assessment of Impacts.
- Chapter 7: Presents the summary conclusion from this report.

2 DESCRIPTION OF THE PROPOSED MARITIME USAGE: SEAWEED HARVESTING

2.1 DESCRIPTION

OGT is seeking a Maritime Usage Licence for harvesting *Ascophyllum nodosum* seaweed for processing in its plant at Kilcar, Co. Donegal, which produces fertilisers and animal feeds. The seaweed will be collected from the harvestable area within Trawbreaga Bay, Dungloe Bay and Mulroy Bay.

Ascophyllum nodosum (also known as Knotted Wrack) is a perennial brown intertidal seaweed, which occurs on mid to low intertidal rocky shores at a variety of exposures, except those most exposed to wave action. It is considered the dominant seaweed species on most of the Irish intertidal coastline, in which an *Ascophyllum* bed is dominated by *Ascophyllum* clumps, or the zone on the shore that is recognised by the biomass of Ascophyllum (Kelly et al., 2001). Typically, 8-15cm of growth is produced annually and the sections of shoots between successive vesicles or internodes generally record annual growth increments (Kelly et al., 2001). Ascophyllum regenerates both sexually and asexually. To regenerate sexually, gametes are released in spring into the water column from the conceptacles on the surface of club shaped lateral swellings called receptacles. However, the constant production of shoots from the base of the plant (by asexual regeneration) is clearly more important in maintaining the population of Ascophyllum than the re-growth from fertilised eggs (Stengel & Dring, 1997). Guiry (1997) has reported that if lengths of 10-20cm of A. nodosum are left uncut the plants can recover and re-harvests possible in 3-6 years.

Estimates made of the national biomass of *Ascophyllum nodosum* vary from 159,000 wet tonnes (+ 45,000) by Cullinane (1984) to 75,000 wet tonnes by Hession et al. (1998). Guiry & Morrison (2013) note that between 8,000 – 28,000 wet tonnes of *Ascophyllum nodosum* were harvested annually in Ireland between 1964 and 2013and that “there are sufficient unharvested areas to satisfy any requirement for conservation”.

The seaweed will be harvested by hand in the traditional manner, which involves using local cutters each working within a specific area. The seaweed will be cut at low tide using a knife, leaving approximately 15-20cm attached to the substrate to ensure re-growth of the plant. The seaweed will then be gathered using a fork into bundles (local term cailleach/caillaí) of approximately 1t, that are bound by nets and ropes and left on the intertidal shoreline. These caillaí float at high water and are towed usually by a small boat to a suitable pier for collection by a lorry with a crane. They are lifted directly from the seashore by the crane onto the lorry and driven away. No caillaí are left on the foreshore overnight.

A harvesting plan has been developed to manage the resource in a sustainable way. The bay has been divided into distinct main areas, and each of these areas is further divided into smaller subsections. Each of these small areas has been allocated a tonnage of *Ascophyllum* which represents less than 12% of the total biomass of that area. The cutters will follow the harvesting plan by only collecting the allocated annual tonnages from each harvested area.

A licence duration of 10 years is being sought, however, the seaweed harvesting activities will not be conducted continuously over that period of time and the cutting sites will be rotated. A fallow system will be employed where areas are harvested one year and not returned to until the seaweed has recovered. The way in which the harvesting will be conducted will be dependent on the site and the harvester. Where the coastline allows the seaweed will be harvested in a linear fashion along the

coast. However, some areas that are proposed for harvesting have islands and small pockets of beach that only support a day's harvesting. In these circumstances, the harvesters will move to another section within the intertidal zone when all the seaweed is harvested. Harvesting from each site typically takes approximately 3 days to complete. The number of harvesters will be small, with typically one to two harvesters per site. Small boats will be used for the transport of the harvested seaweed at high tide to a suitable pier for transport to the processing plant.

2.2 DUNGLOE BAY

OGT is planning to harvest up to 8,000 wet tonnes of *Ascophyllum nodosum* at Dungloe Bay annually Figure 2-1.

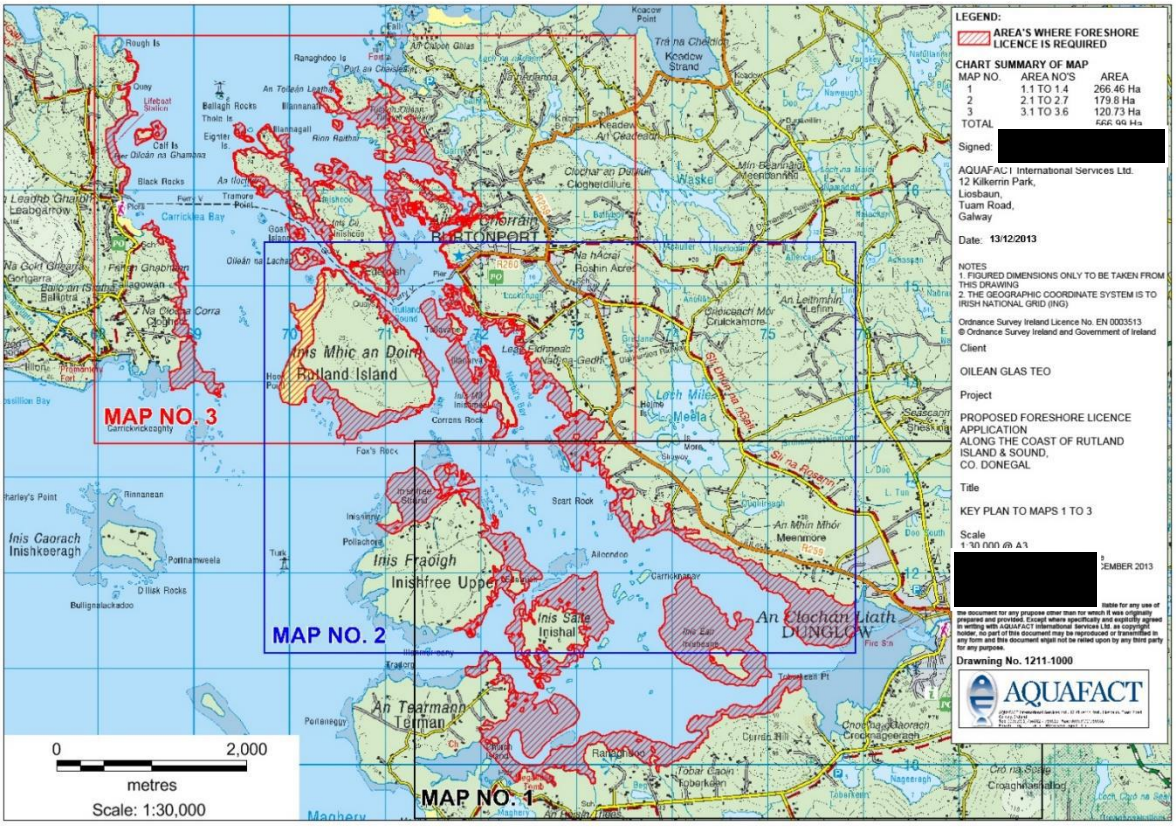

Figure 2-1 Dungloe Harvesting Area Map showing subdivided areas (Aquafact)

2.3 MULROY BAY

OGT is planning to harvest up to 2,000 wet tonnes of *Ascophyllum nodosum* at Mulroy Bay annually, Figure 2-2.

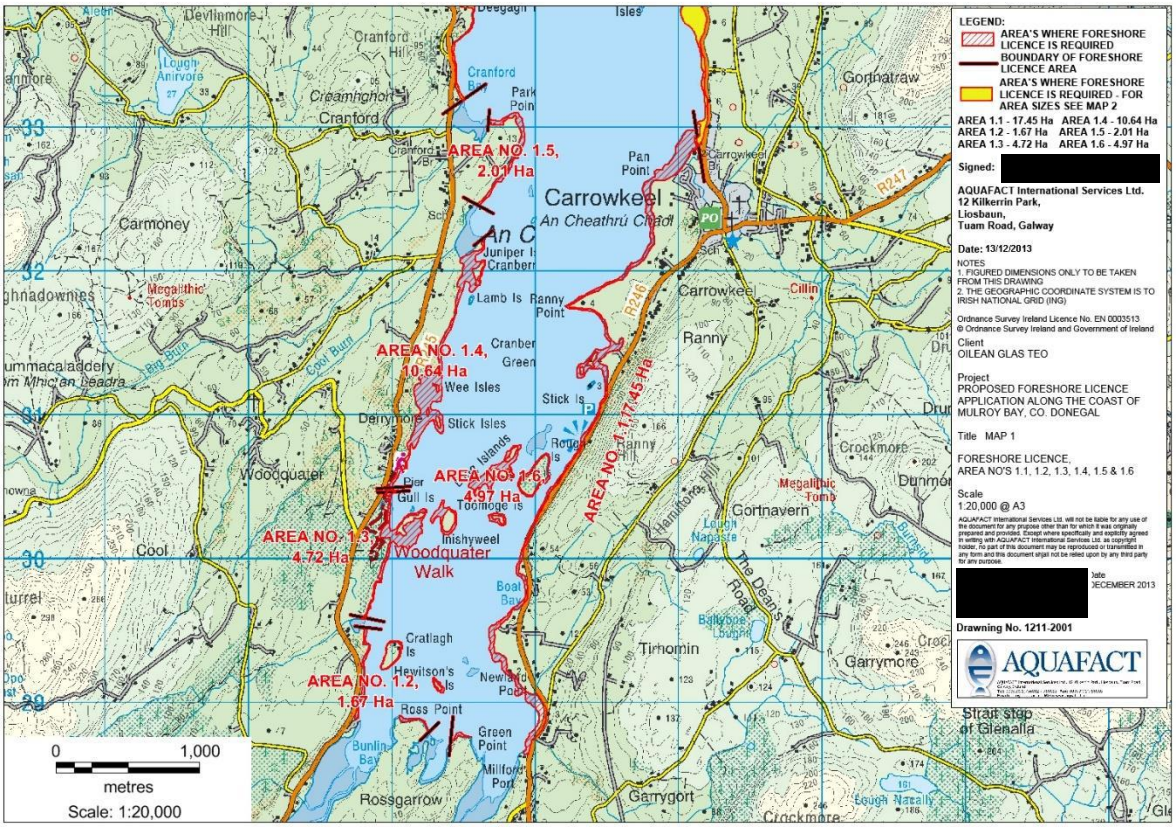

Figure 2-2 Mulroy Bay Harvesting Areas and subdivided areas (Aquafact)

2.4 TRAWBREAGA BAY

OGT is planning to harvest up to 4,000 wet tonnes of *Ascophyllum nodosum* at Trawbreaga Bay annually Figure 2-3 Trawbreaga Bay Harvesting and subdivided areas (Aquafact)Figure 2-3.

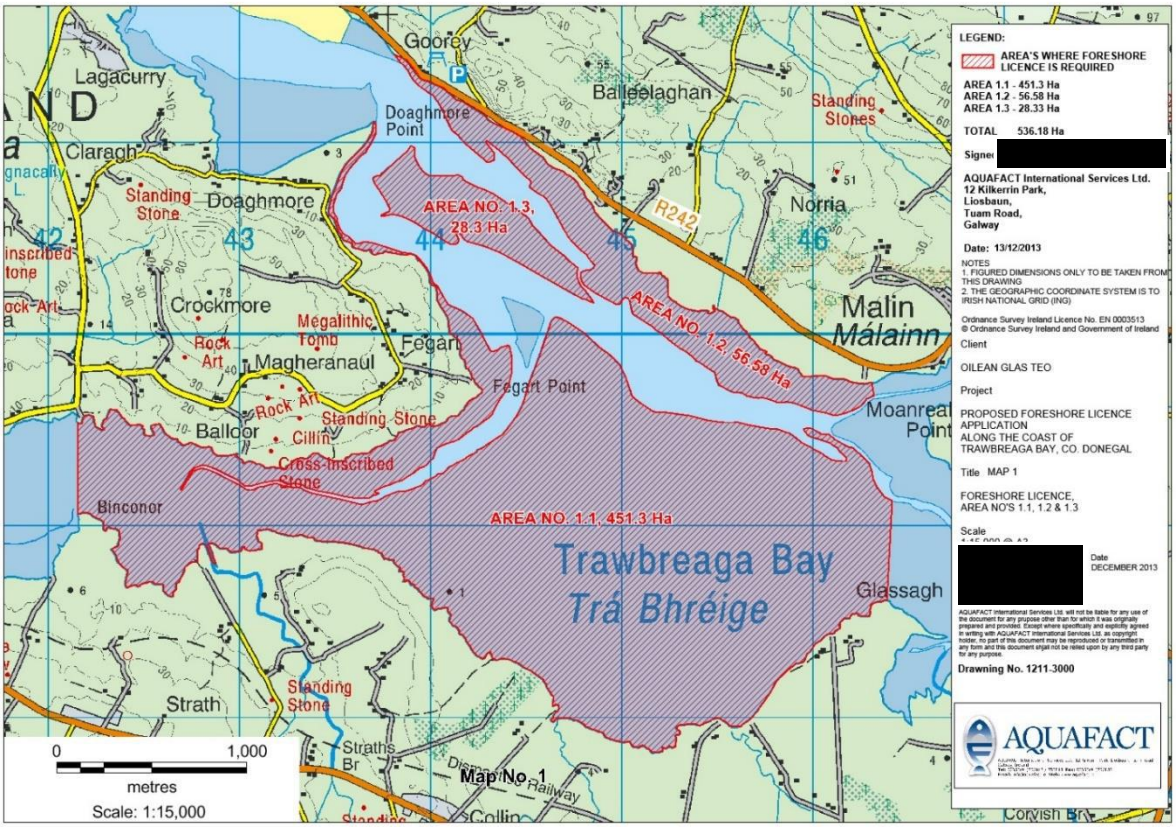

Figure 2-3 Trawbreaga Bay Harvesting and subdivided areas (Aquafact)

3 NEED AND ALTERNATIVE

Seaweed harvesting presently occurs along the shoreline between Trawbreaga Bay and Dungloe Bay. To maintain reliability and sustainability of the supply of seaweed, it is also proposed to harvest at sites within Mulroy Bay and Trawbreaga Bay. Licencing of the proposed seaweed harvesting activities is required to provide and support the supply of high value seaweed products into international markets and for the agricultural and horticulture uses while ensuring the sustainable management of the resource and surrounding environment. The growth of the seaweed industry provides a positive economic contribution to rural communities.

If the seaweed harvesting does not take place the industry would not have a local supply of seaweed to support production of high value seaweed products. Alternative approaches such as machine harvesting from boats would be less sustainable and would have a higher impact on the local environment and environmental receptors. The proposed method of small numbers of individuals harvesting by hand is the most sustainable approach to meeting this need with the lowest environmental impact.

4 CONSIDERATION OF DIRECTIVES

This section considers the implication of the proposed site investigation activities with regard to the following directives:

- Environmental Impact Assessment (EIA) Directive
- Water Framework Directive (WFD)
- Marine Strategy Framework Directive (MSFD).

4.1 EIA Directive Requirements

Article 2(1) of the EIA Directive provides:

"Member States shall adopt all measures necessary to ensure that, before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment. Those projects are defined in Article 4."

Article 4(1) requires that "…projects listed in Annex I shall be made subject to an assessment…". EIA is therefore mandatory for the project types listed in Annex I. Article 4(2) requires that Member States must determine for Annex II project types whether EIA is required, through:

a) a case-by-case assessment, or

b) thresholds or criteria set by the member State.

The MAP Act (2021) transposes the Article 4 requirement through Part 1 Section 4 as follows:

"1.4 Effect or further effect, as the case may be, is given to by this Act to an act specified in the Table to this section, adopted by an institution of the European Union or, where appropriate, to part of such an act:

7. Environmental Impact Assessment Directive."

As is the case under EU law, under national law the requirement to carry out EIA or screening for EIA only arises in relation to projects which come within the scope of one or more classes of project listed in Parts 1 or 2 of Schedule 5.

EIA or screening for EIA is not required where a proposed development does not come within any of the classes of project listed in Schedule 5, interpreted broadly, irrespective of the size or location of the proposed development or whether it is considered likely to have a significant effect on the environment.

Part 1 of Schedule 5 of the Planning and Development Regulations 2001, as amended (Planning Regulations) lists the project types for which EIA is mandatory, transposing Annex I of the EIA Directive.

Part 2 lists project types for which EIA is mandatory if a specified threshold is exceeded. For all other project types listed in Part 2, corresponding to Annex II, which do not exceed a threshold or for which no threshold is set, a screening analysis and determination are required on a case-by-case basis. An EIA is also required for projects which do not exceed the threshold, but where the Minister determines that the proposed project will be likely to have significant effects on the environment.

4.1.1 APPROACH TO EIA SCREENING

The Office of the Planning Regulator issued a practice note, OPR Practice Note PN02, on EIA Screening for development proposals (Office of the Planning Regulator, 2021). While the aim of the Practice

Note is to provide guidance for compliance with the planning legislation, it provides useful guidance for EIA Screening for other consent regimes.

The Practice Note recommends a step-by-step approach to EIA Screening, as follows:

Step 1: Understanding the proposal

The first step comprises the following tests:

a) Is the proposed development a project as per the EIA Directive?

If not, then the proposed development is not subject of EIA Directive, no screening is required, and no EIA is required.

b) Is the project listed in Schedule 5 Part 1 or does it meet or exceed the thresholds in Part 2 of

the Planning and Development Regulations, SI 600 of 2001, as amended?

If it does, no screening is required and EIA is mandatory.

c) Is the project sub threshold?

If it is, then the project must proceed to Step 2, as preliminary examination is required.

Step 2: Preliminary Examination & Conclusion

This step consists of a preliminary examination of, at least, the nature, size, or location of the development, considering:

• Nature of the development including production of wastes and pollutants

• Size of the development

• Location of the development including proximity to ecologically sensitive sites and the potential to affect other environmental sensitivities in the area.

Step 2 will have one of three outcomes:

a) There is no real likelihood of a significant effect on the environment and no further action is required. The reasons for this conclusion will be recorded.

b) There is significant doubt as to the effects on the environment; the project must proceed to Step 3, as a formal screening determination is required.

c) There is a real likelihood of a significant effect on the environment and an EIA is required.

Step 3: Formal Screening Determination

In this step, a Screening exercise must be carried out in order to determine if the proposal is likely to have significant effects on the environment. In making the determination, the planning authority must have regard to Schedule 7 criteria, Schedule 7A information, results of other relevant EU assessments, the location of sensitive ecological sites, or heritage or conservation designations. Mitigation measures may be considered.

The Screening Determination must record the outcome of the Screening exercise and state the main reasons and considerations, with reference to the relevant criteria listed in Schedule 7 of the Regulations and mitigation if relevant.

4.1.2 EIA Screening

Part 1 of Schedule 5

All of the project types in Part 1 have been considered in the preparation of this report. The proposed hand harvesting seaweed activities do not constitute a project type or class listed in Part 1 of Schedule 5 of the Regulations.

Part 2 of Schedule 5

All of the project types in Part 2 have been considered in the preparation of this report. The following class listed in Part 2 of Schedule 5 is the only class that is considered to be relevant to the proposed hand harvesting seaweed is Class 1. Agriculture and aquaculture (d) Intensive fish farming, as it considers aquaculture. However, hand harvesting of seaweed is not intensive fish farming.

In addition, the following sustainable cutting practices and the low number of cutters at any one stretch of coastline (1 or 2 cutters) is considered not to considered to be subject to the EIA Directive.

4.1.3 Conclusion of the EIA Screening

In answering Step 1, question (a): Is the proposed development a project as per the EIA Directive? As per OPR Practice Note 02, the answer is 'No', and the conclusion is that the proposed hand harvesting seaweed activities are not subject of the EIA Directive, and EIA is not required.

4.2 Water Framework Directive

Council Directive 2000/60/EC (the Water Framework Directive [WFD]) on establishing a framework for community action in the field of water policy was adopted by all member states in October 2000. Since 2000, the WFD has been the main law for water protection in Europe. It applies to inland, transitional and coastal surface waters as well as groundwater. It ensures an integrated approach to water management, respecting the integrity of whole ecosystems, including by regulating individual pollutants and setting corresponding regulatory standards. It is based on a river basin district approach to make sure that neighbouring countries cooperate to manage the rivers and other bodies of water they share.

The key objectives of the WFD are set out in Article 4. It requires Member States to use their River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs) to protect and, where necessary, restore water bodies to reach good status, and to prevent deterioration. Good status means both good chemical and good ecological status.

Section 6.3 within the Assessment of Impacts outlines water quality, providing an outline of the WFD status, pollution status and condition (i.e. satisfactory, unsatisfactory) of the surrounding area. The section describes the status of the receiving environment's water quality, the potential effects of the proposed seaweed harvesting and an assessment of those potential effects for the Licence Area.

4.3 Marine Strategy Framework Directive (MSFD)

In 2008, the EU adopted the Marine Strategy Framework Directive (MSFD) to maintain healthy, productive and resilient marine ecosystems while securing a more sustainable use of marine resources. The MSFD Directive requires Member States to develop national marine strategies in order to achieve, or maintain where it exists, 'good environmental status'.

The national marine strategies comprise regular assessments of the marine environment, setting objectives and targets, establishing monitoring programmes and putting in place measures to improve the state of marine waters. All these actions must be done in close coordination with neighbouring countries at regional sea level (European Commission, 2020).

Section 6 Assessment of Impacts describes the marine environment and undertakes an analysis of the likely effects of the proposed site investigation activities on 'good environmental status (GES)'. These are shown in Table 4-1 with reference to sections where they are assessed.

Table 4-1 Marine Strategy Framework Directive GES Descriptors

	GES Descriptors	Details	Section references
1	Biodiversity	The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.	Section 6.4
2	Non-indigenous species	Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.	Section 6.4
3	Populations of commercial species	Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.	Section 6.5
4	Food web structure	All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.	Section 6.4
5	Eutrophication	Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters	Section 6.4 & 6.3
6	Sea floor integrity	Sea floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.	Section 6.4.1
7	Alterations to hydrography	Permanent alteration of hydrographical conditions does not adversely affect marine.	Section 6.3
8	Contaminants	Contaminants are at a level not giving rise to pollution effects.	Section 6.12 & 6.14
9	Sea-food contaminants	Contaminants in fish and other seafood for human consumption do not exceed	Section 6.5

	GES Descriptors	Details	Section references
		levels established by Community legislation or other relevant standards.	
10	Marine litter	Properties and quantities of marine litter do not cause harm to the coastal and marine environment.	Section 6.14
11	Energy and noise	Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.	Section 6.13 & 6.7

5 PLANNING AND DEVELOPMENT

This section has been prepared to demonstrate that the seaweed harvesting works which are proposed to be carried out in the Licence Application Area are consistent with relevant planning policies, including Ireland's National Marine Planning Framework.

5.1 THE NATIONAL MARINE PLANNING FRAMEWORK (2021)

The National Marine Planning Framework (NMPF) "is a national plan for Ireland's seas, setting out, over a 20-year horizon, how Ireland will use, protect, and enjoy its seas. The NMPF sits at the top of the hierarchy of plans and sectoral policies for the marine area."

The NMPF establishes a vision for the future development of the marine planning system towards 2040. It will play an important role in supporting both the short-term recovery and the longer-term planning for Ireland's maritime area, to have a lasting effect on Ireland's most significant natural resource.

The NMPF is Ireland's first comprehensive marine spatial planning framework, as required under Directive 2014/89/EU of the European Parliament and of the Council of July 23rd, 2014, establishing a framework for maritime spatial planning, known as the Maritime Spatial Planning (MSP) Directive. Member States establishing and implementing MSP must consider economic, social and environmental aspects to support the sustainable development and growth of the maritime sector.

The NMPF is also a parallel document to the National Planning Framework (NPF), which guides strategic terrestrial planning and development, and it is important that each is consistent with the other, as well as regional and local plans.

This application relates to hand harvesting of seaweed. The high-level objectives for Seaweed Harvesting in the NMPF are to:

- Support the sustainable harvesting of seaweed having regard to the important economic and social contribution it makes to coastal communities.
- Develop and maintain a fit for purpose regulatory framework that supports sustainable harvesting, ensures that key seaweed species, which support multiple vital ecosystems are safeguarded, and respects existing formal and informal rights to harvest.
- Support ongoing research to build on available data to support sustainable seaweed harvesting.

The Maritime Area Regulatory Authority (MARA) was established on 17th July 2023. MARA's functions are set out in the Maritime Area Planning Acts 2021 and 2022, and include granting marine licencing for specified activities, including 'The harvesting of seaweed'.

In seeking a Maritime Usage Licence to undertaken sustainable harvesting of seaweed which will provide evidence to inform ongoing research to build on available data to support sustainable seaweed harvesting, this application is consistent with the objectives of the NMPF and the provision within the MAP Act for MARA to licence seaweed harvesting activities.

6 ASSESSMENT OF IMPACTS

6.1 ASSESSMENT OF IMPACTS

The following documents, also submitted in support of this MUL Application, provide a description of the known receiving environmental impacts of the proposed activities, and assess these impacts on the receiving environment.

- Supporting Information for Screening of Appropriate Assessment (SISAA)
- Risk Assessment for Annex VI Species (RAAIVS)

Table 6-1 sets out, for each of the documents listed above, the specific sections and sub-sections where relevant information for this AIMU can be found.

Table 6-1 Relevant sections and sub-sections in other reports submitted in support of the Application

Report	Content Description
Supporting Information for Screening of Appropriate Assessment (SISAA)	Describes potential environmental impacts and effects from the proposed site activities on the receiving environment
	Describes the Zone of Influence (ZoI) and the Natura 2000 sites considered relevant to the site investigation activities, i.e. the Special Protected Areas and their Special Conservation Interests and the Special Areas of Conservation, designated Annex I Habitats and designated Annex II Species considered relevant to be included for Appropriate Assessment Stage 1 Screening (and subsequent Stage 2 Appropriate Assessment where necessary)
	Considers the potential and assesses the likelihood of significant effects from the proposed site activities on the integrity of relevant Natura 2000 sites and their Conservation Objectives (COs)
	Defines a Cumulative Effects Spatial Scope and a Cumulative Effects Temporal Scope. Describes other known or proposed plans and projects in the vicinity of the proposed activities. Assesses the likelihood of cumulative effects, from the proposed activities with the described plans, and projects on the integrity relevant Natura 2000 sites and their Conservation Objectives.
Risk Assessment for Annex IV Species (RAAIVS)	Describes the European Protected Species (Annex IV species) which may be found on site
	Describes potential environmental impacts from the proposed site activities on Annex IV species
	Assesses the impacts identified above on Annex IV species in the absence of any mitigation measures
	Proposes measures necessary to avoid, reduce or offset any identified negative effects

Sections 6.2 to 6.17 of this report consider potential impacts from the proposed site investigation survey activities on the following:

6.2) Land and Soils
6.3) Water
6.4) Biodiversity – marine benthos, Natura 2000 Sites, marine mammals, birds and fish ecology
6.5) Commercial Fisheries and aquaculture
6.6) Air Quality
6.7) Noise & Vibration
6.8) Landscape and Seascape
6.9) Marine Traffic
6.10) Archaeology and Cultural Heritage
6.11) Population and Human Health including tourism and recreation
6.12) Major Accidents and Disasters
6.13) Climate
6.14) Waste
6.15) Material Assets
6.16) Interactions
6.17) Other Proposed Developments.

6.2 LAND AND SOILS

For all three harvesting areas the proposed harvesting activities are all within the intertidal zone; there is no potential impact on land and soils.

6.3 WATER

The Environmental Protection Agency (EPA) provides information from river surveys and coastal waters on Water Framework Directive (WFD) status, pollution status and condition of hydrometric areas and river catchments around Ireland's coastline.

The WFD definition for this site is coastal waters:

- "Transitional waters" are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.
- "Coastal water" means surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.

The assessment is included in Table 6-2.

Table 6-2: Assessment Summary

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
Dungloe Bay	Intertidal zone The Northwestern Atlantic Seaboard	Changes in water quality from accidental spills.	There will be no planned release of potentially harmful substances from

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
	coastal waterbody, which is within the proposed harvesting area of the Licence Application, was given a status of 'high' following the WFD status monitoring between 2016-2021 (EPA, 2024).		the boats transporting the harvested seaweed. Strict maritime regulations, normal vessel operating standards and precautions, compliant with all International Maritime Law and National Maritime Legislation, will ensure the risk of a release is low and no significant effects are predicted.
Mulroy Bay	The Mulroy Bay Broadwater coastal waterbody, which is within the proposed harvesting area of the Licence Application area, was given a status of 'good' following the WFD status monitoring between 2016-2021 (EPA, 2024).		
Trawbreaga	The coastal waterbody, which is within the proposed harvesting area of the Licence Application area, was given a status of 'good' following the WFD status monitoring between 2016-2021 (EPA, 2024).		

6.4 BIODIVERSITY

6.4.1 BENTHIC AND INTERTIDAL HABITATS

The benthic and intertidal habitats were identified from the NPWS site synopsis and supporting habitats information documents (NPW 2013).

6.4.1.1 RECEIVING ENVIRONMENT INTERTIDAL REEF COMMUNITIES

DUNGLOE BAY

Dungloe Bay overlaps with the Rutland Island and Sound SAC. It is characterised by a network of small islands (MERC, 2008). The majority of the subtidal area is less than 10m deep, however there are some areas reaching depths of 20m recorded in Rutland sound.

Summary descriptions of the habitat and reef types present in the area are provided below Table 6-3. The intertidal reef habitat is the only areas that overlap with the seaweed harvesting areas. Only the Reef habitat is considered further within this assessment.

Table 6-3 Rutland Island and Sound SAC Habitats and Communities

Habitat/Community	Description/Details	Outcome
Coastal lagoons	No *Ascophyllum nodosum* present at this feature and is located outside the harvesting area.	No source pathway receptor link
Large Shallow Inlets and Bays	Harvesting not conducted in this area.	No source pathway receptor link
Reefs	***Ascophyllum* grows on rocky intertidal reefs. Harvesting will be conducted here, therefore there will be some disturbance. Reef species may be subject to trampling and disturbance during the harvesting process.**	**Source pathway as *Ascophyllum nodosum* is present and within the harvesting area.**
Annual Vegetation of drift lines	No *Ascophyllum* nodosum present at this feature and is located outside the harvesting area.	No source pathway receptor link
Embryonic shifting dunes	No *Ascophyllum* nodosum present at this feature and is located outside the harvesting area.	No source pathway receptor link
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	No *Ascophyllum* nodosum present at this feature and is located outside the harvesting area.	No source pathway receptor link
Fixed coastal dune with herbaceous vegetation (grey dunes)	No *Ascophyllum* nodosum present at this feature and is located outside the harvesting area.	No source pathway receptor link
Humid dune slacks	No *Ascophyllum* nodosum present at this feature and is located outside the harvesting area.	No source pathway receptor link

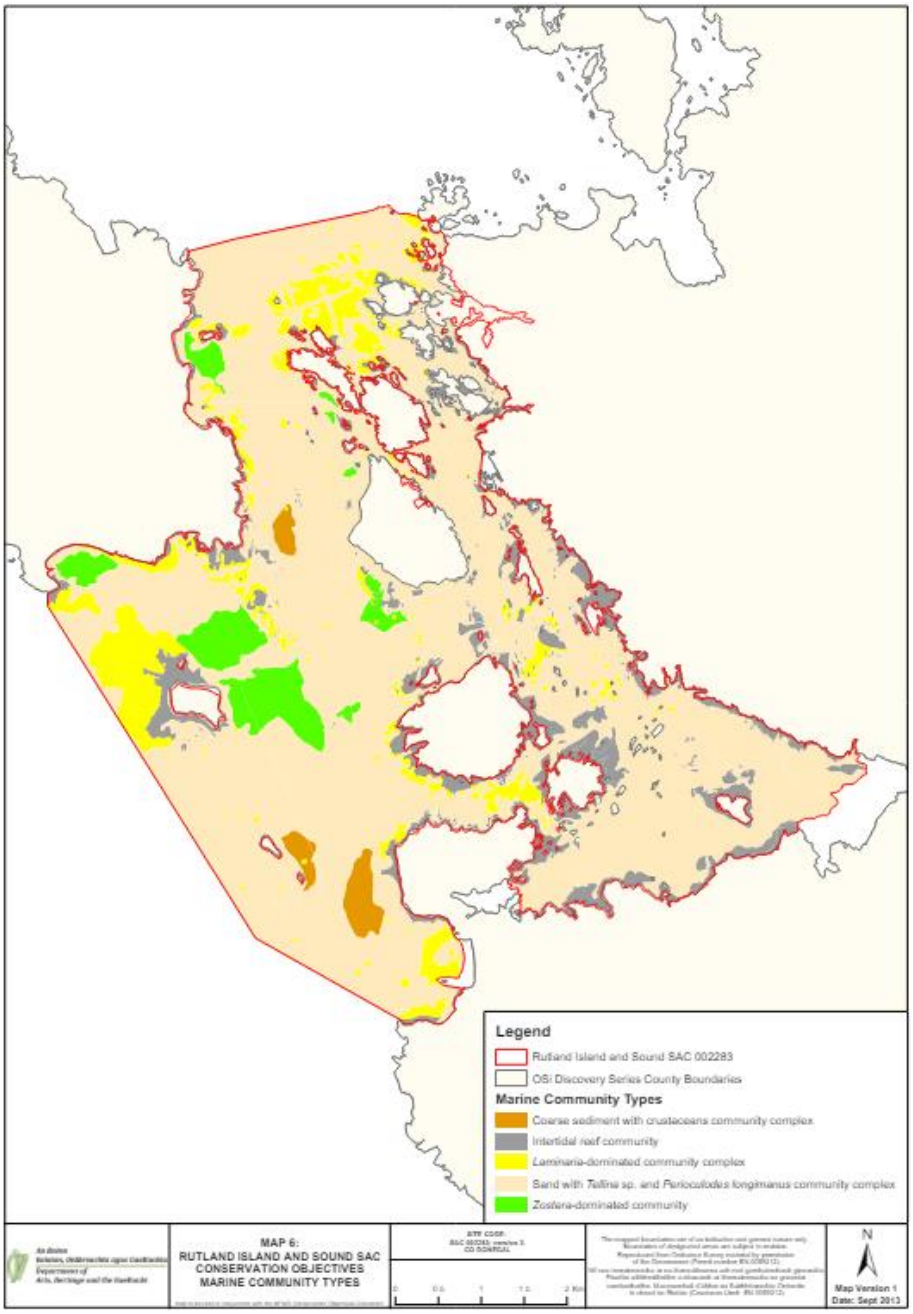

Figure 6-1 Rutland Island and Sound SAC Conservation Objectives Marine Community Types (NPWS, 2013)

MULROY BAY

The habitats within the SACs within and surrounding the Mulroy Bay proposed seaweed harvesting areas are listed below.

- Mulroy Bay SAC (Site code: 002159) (within the Proposed Project area)
- Sheephaven SAC (Site code: 001190) (within the Proposed Project area)
- Kindrum Lough SAC (Site code: 001151) (approximately 100m of the Proposed Project area and therefore not considered further.)

- Lough Nagreany Dunes SAC (Site code: 000164) (approximately 1km north of the Proposed Project area and therefore not considered further.)

Mulroy Bay SAC and Sheephaven SAC are both within the proposed project area for harvesting and are considered further.

Mulroy Bay SAC

Summary descriptions of the habitat and reef types present in the area are provided in Table 6-4 below for Mulroy Bay SAC alongside the presence or not of *Ascophyllum nodosum* for harvesting. Further information on the community complexes relevant to the activities associated with seaweed harvesting are described in the Mulroy Bay SAC Conservation Objectives (NPWS, 2012[2]) and the distribution of all community complexes are provided in Figure 6-2.

Table 6-4 Mulroy Bay SAC Habitats and Communities

Habitat/Community	Description/Details	Outcome
Large Shallow Inlets and Bays	Harvesting not conducted in this area.	No pathway receptor link
Reefs	***Ascophyllum* grows on rocky intertidal reefs. Harvesting will be conducted here, therefore there will be some disturbance. Reef species may be subject to trampling and disturbance during the harvesting process.**	**Source pathway as *Ascophyllum nodosum* is present and within the harvesting area.**
Mudflats and Sandflats not covered by seawater at low tide	**Some *Ascophyllum* present on hard rock and stone substrates**	**Source pathway as *Ascophyllum nodosum* is present and within the harvesting area.**

[2] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002159.pdf

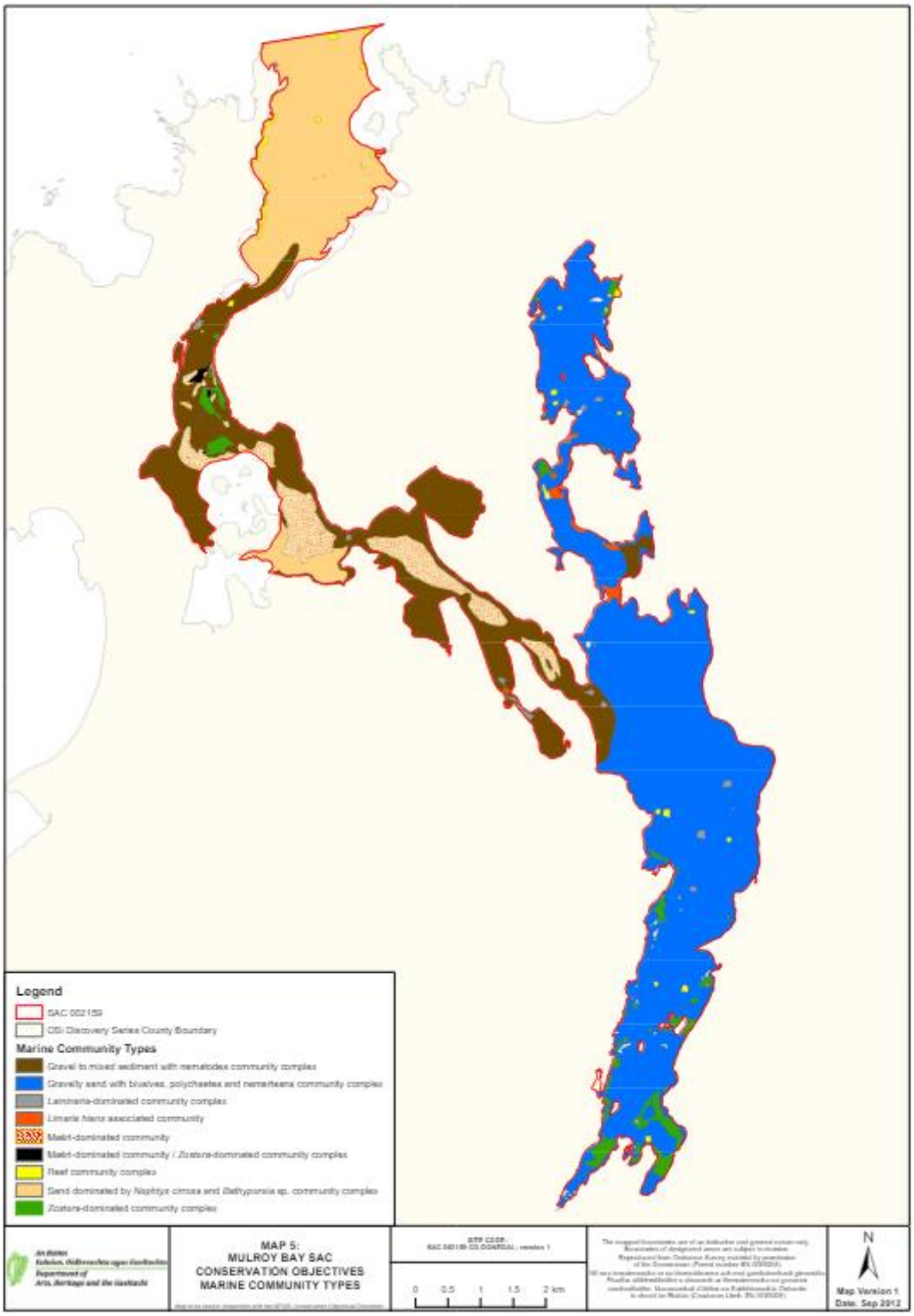

Figure 6-2 Conservation Objectives Marine Community Types for Mulroy Bay SAC (NPWS, 2012)

Sheephaven SAC:

Sheephaven SAC overlaps with Mulroy Bay and some of the proposed harvesting areas. The Sheephaven SAC community types are provided in Figure 6-3. A summary of the habitat/community types are provided in Table 6-5. Further information on the community complexes relevant to the activities associated with seaweed harvesting are described in the Sheephaven SAC Conservation Objectives (NPWS, 2014[3]).

Table 6-5 Sheephaven SAC Habitats and Community Types

Habitat/Community	Description/Details	Outcome
Mudflats and Sandflats not covered by seawater at low tide	**Some *Ascophyllum* present on hard rock and stone substrates**	**Source pathway as *Ascophyllum nodosum* is present and within the harvesting area.**
Annual vegetation of drift lines Vegetated sea cliffs of the Atlantic and Baltic coasts Salicornia and other annuals colonising mud and sand Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Mediterranean salt meadows (Juncetalia maritimi) Embryonic shifting dunes Shifting dunes along the shoreline with Ammophila arenaria (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Humid dune slacks Machairs (* in Ireland) Old sessile oak woods with Ilex and Blechnum in the British Isles	All other QIs located outside of the harvesting area	No receptor pathway link

[3] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001190.pdf

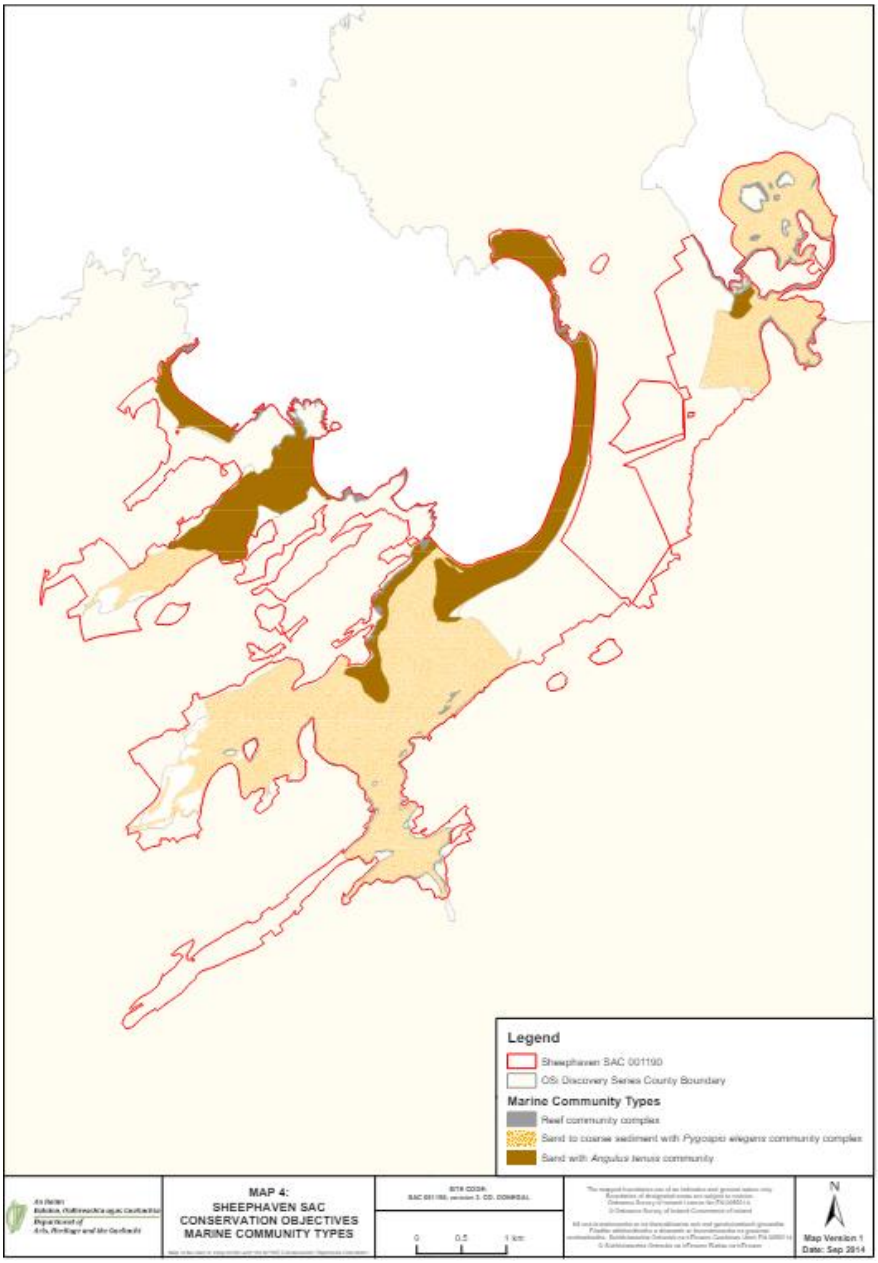

Figure 6-3 Sheephaven SAC Community Types NPWS, 2012

TRAWBREAGA BAY

The benthic communities within Trawbreaga Bay are recorded within the North Inishowen SAC, which also overlaps with the Trawbreaga Bay SPA and wetlands.

The North Inishowen Coast SAC stretches from Crummies Bay in the west, up to Malin Head and down to Inishowen Head to the east. It encompasses a variety of coastal habitats such as rocky cliffs, offshore islands, sand dunes, a large intertidal bay, and rocky, shingle and sand beaches (NPWS, 2014).

Summary descriptions of the habitat and reef types present in the area are provided below.

The main intertidal community types associated with the Trawbreaga Bay are mudflats and sandflats not covered by seawater at low tide. Descriptions are provided Table 6-6, and shown in Figure 6-4.

Table 6-6 North Inishowen Coast SAC Habitats and Community Types (NPWS, 2014)

Community Type	Community description	Outcome
Reef community complex	***Ascophyllum*** **grows on rocky intertidal reefs. Harvesting will be conducted here, therefore there will be some disturbance. Reef species may be subject to trampling and disturbance during the harvesting process..**	**Source pathway as *Ascophyllum nodosum* is present and within the harvesting area.**
Muddy sand to coarse sediment	Some *Ascophyllum* present on hard rock and stone substrates	**Source pathway as *Ascophyllum nodosum* is present and within the harvesting area.**
Zostera-dominated community Fine to medium sand with Sand	All other QIs located outside of the harvesting area	No receptor pathway link

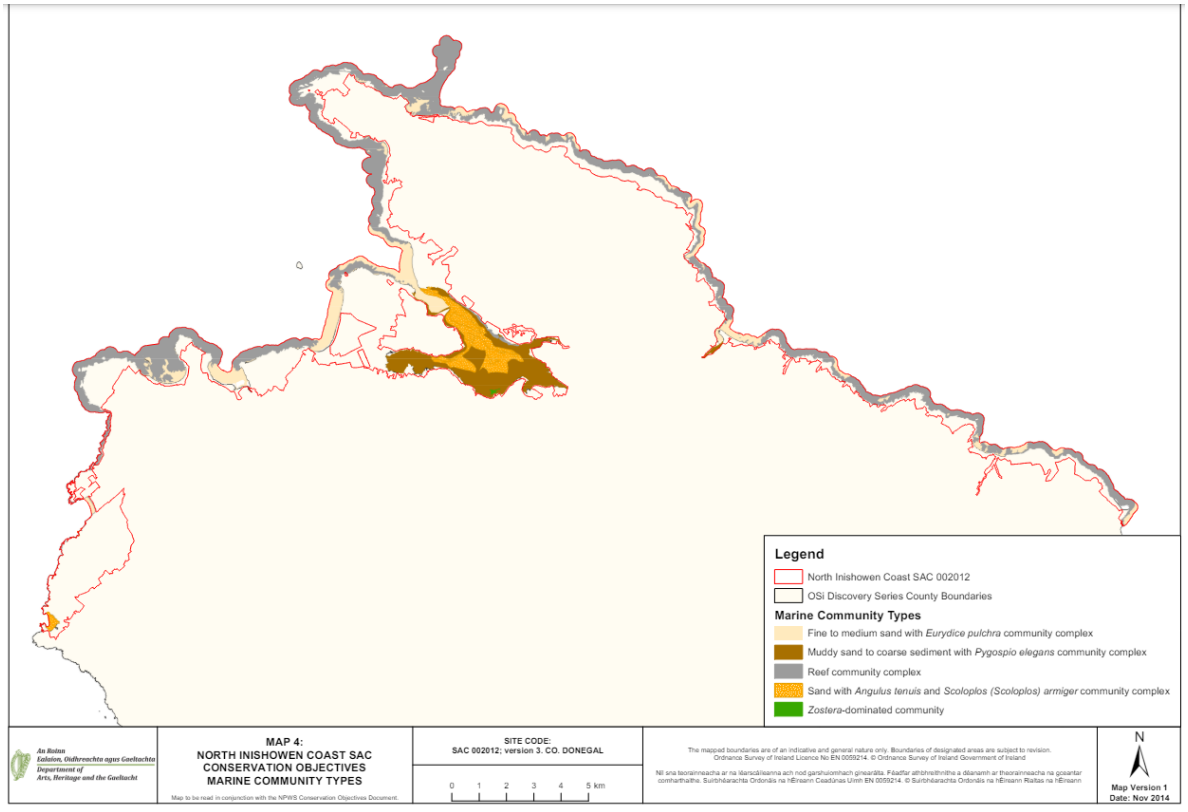

Figure 6-4 North Inishowen Coast SAC Community Types NPWS, 2012

6.4.1.2 POTENTIAL EFFECTS

Intertidal reef communities and Mudflats and Sandflats not covered by seawater at low tide and their associated macrofaunal invertebrate communities may be subject to the following impacts:

Habitat loss - where the removal of *Ascophyllum nodosum* may expose sediment and other species to elements, sunlight and desiccation, removal of shelter and greater exposure to wave action with a reduction in the cover that would be provided by the *Ascophyllum*.

Harvesting reduces the area that epiphytes (non-parasitic plants that grow on other plants) can colonise and grow on the seaweed. Over harvested Ascophyllum nodosum have seen the encroachment of other fucoids such as *Fucus vesiculosus* (MTU, 2022).

The removal of the seaweed canopy can change shading and moisture of the habitat by increasing the temperature under the canopy, affecting mobile invertebrate species. Additionally, the canopy removal can increase the amount of light penetration, and potentially change the composition of the community, for example where increases in light can cause an increase in grazing limpets (Jenkins et al., 1999; Wilding et al., 2020).

Loss of prey biomass – potential reduction of biodiversity due to the removal of biomass as well as uncovering hidden species that would usually be covered by the seaweed.

The removal of seaweed will expose species to predation by birds and fish. This may affect mobile fauna such as grabs or grazing gastropods. Mobile species such as crabs and amphipods may move to other areas. However, slow-moving, or sessile species such as limpets may be subject to increased predation (Marlin, 2020).

Physical disturbance – due to physical trampling.

Trampling and physical disturbance may cause damage to the seaweed and impact the communities living within the understorey.

6.4.1.3 Assessment of Potential Effects

OGT will follow a resource management policy to manage the seaweed harvesting in a sustainable way.

The effect of the proposed seaweed harvesting activities will be localised and temporary in duration. With up to 2 cutters harvesting at anyone time the level of potential disturbance will be low. Cutting back the seaweed to 15-20cm from the holdfast allows for faster recovery of the *A. nodosum*. A rotation in cutting sites allows for the regrowth and maintenance of the *A. nodosum* in each area, alongside a collection of the allocated tonnage only per area.

Therefore, significant effects on intertidal reef habitat and its associated species resulting from the seaweed harvesting activities is considered not likely.

6.4.2 Natura 2000 Sites

Dungloe Bay

The SISAA document submitted as part of this MUL application have considered potential impacts from the proposed seaweed harvesting activities on Natura 2000 sites. The SISAA concluded that there is potential for significant effects on the conservation features namely harbour seals of the Rutland Island and Sound SAC. See also Section 6.4.3 Marine Mammals.

The SISAA concluded that there is no potential for significant effects on the conservation features of the Gweedore Bay and Islands SAC, the Termon Strand SAC, the Aran Island (Donegal) Cliffs SAC, the Illancrone and Inishkeeragh SPA and the West Donegal Coast SPA.

The SACs for Annex I Habitats and Annex II mobile species, and SPAs in the vicinity of the licence area can be seen in Figure 6-5 and Figure 6-6.

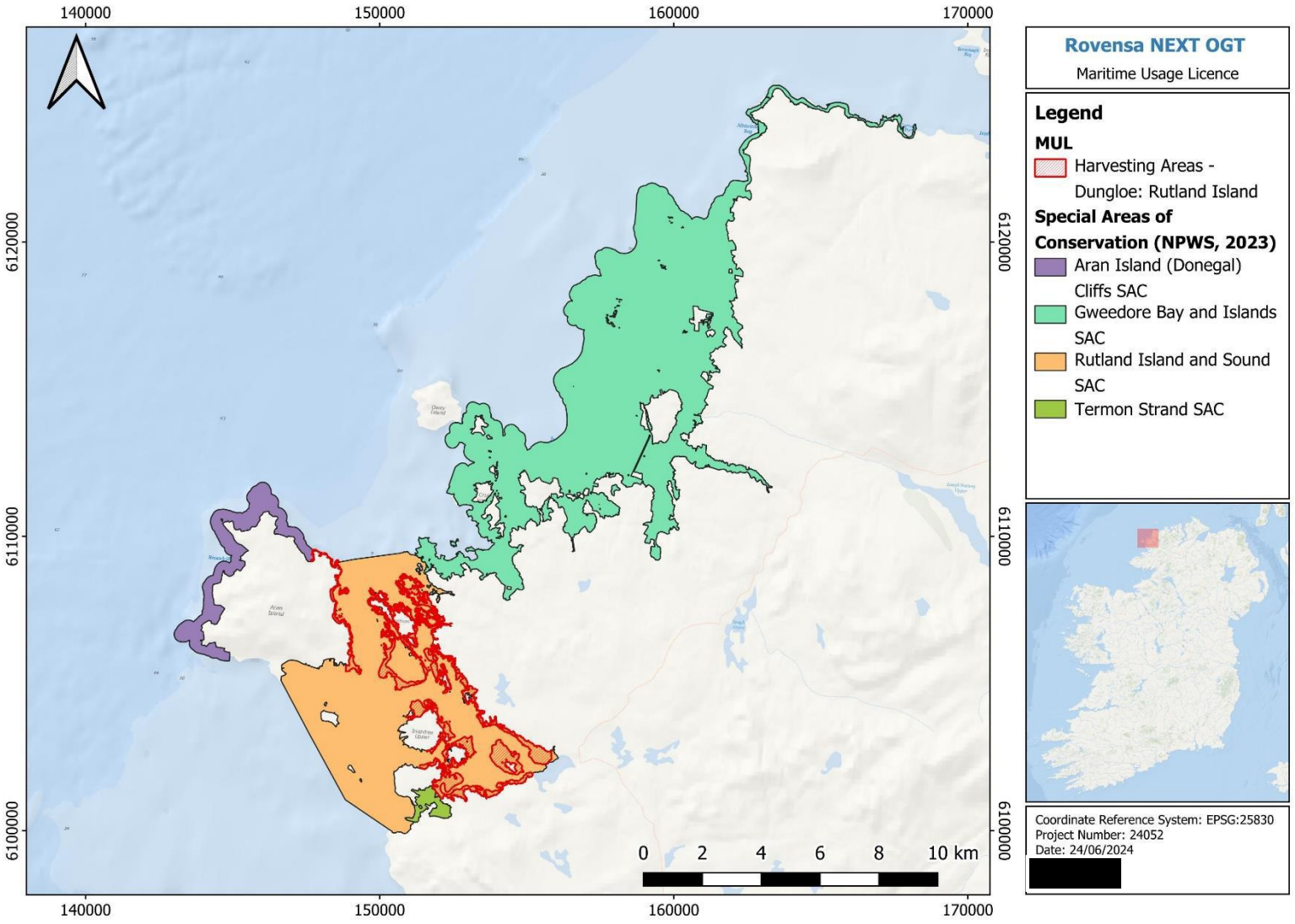

Figure 6-5 SACs in the vicinity of the seaweed harvesting Dungloe Bay

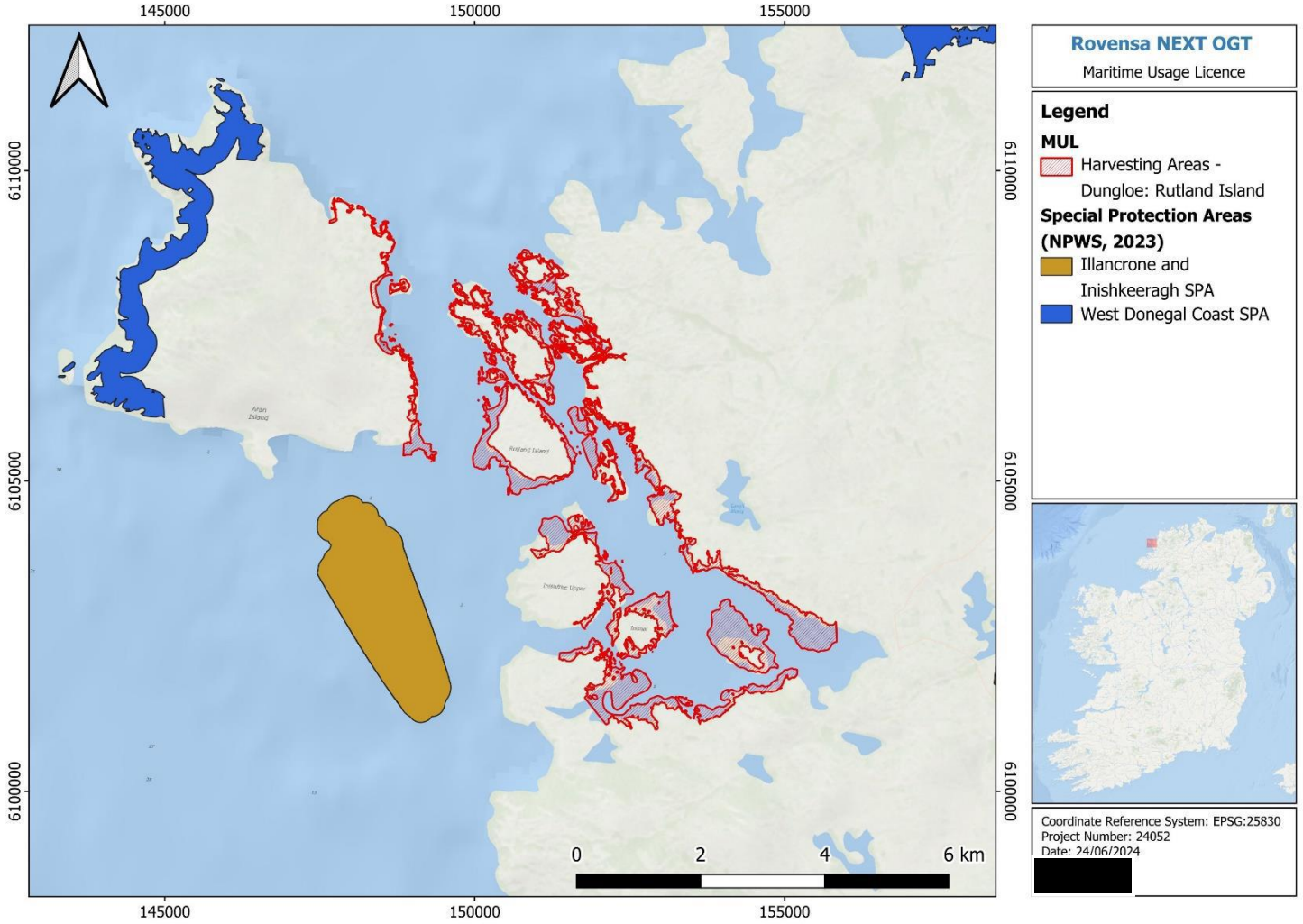

Figure 6-6 SPAs in the vicinity of the Dungloe Bay area

Mulroy Bay

The SISAA document submitted as part of this MUL application have considered potential impacts from the proposed seaweed harvesting activities on Natura 2000 sites. The SISAA concluded that there is no potential for significant effects on the conservation features of the Mulroy Bay SAC, Sheephaven SAC, Kindrum Lough SAC, Nagreany Dunes SAC, the Greers Isles SPA, and the Horn Head to Fanad Head SPA.

The SACs for Annex I Habitats and Annex II mobile species, and SPAs in the vicinity of the licence area can be seen in Figure 6-7 and Figure 6-8.

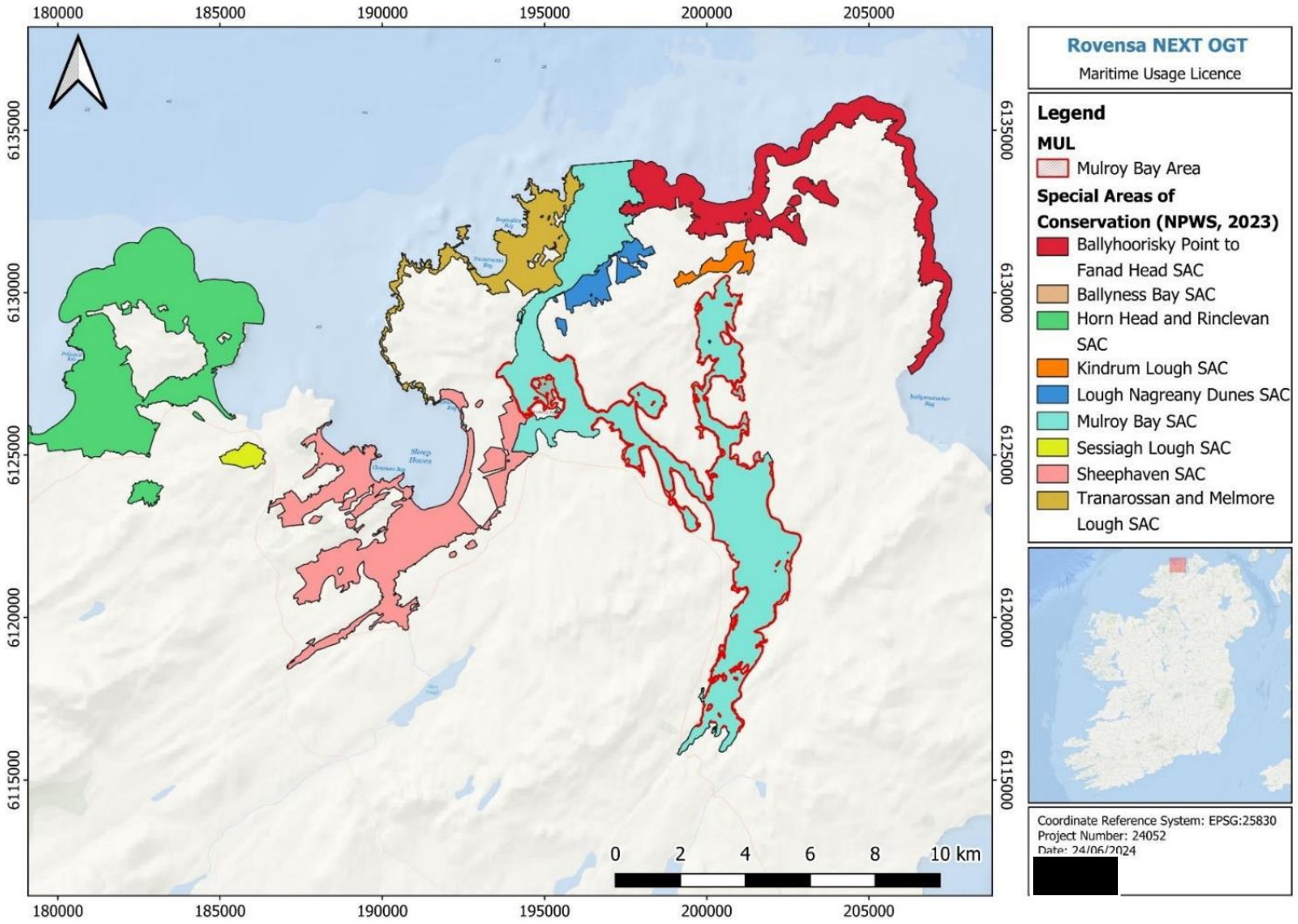

Figure 6-7 SACs in the vicinity of the seaweed harvesting Mulroy Bay area

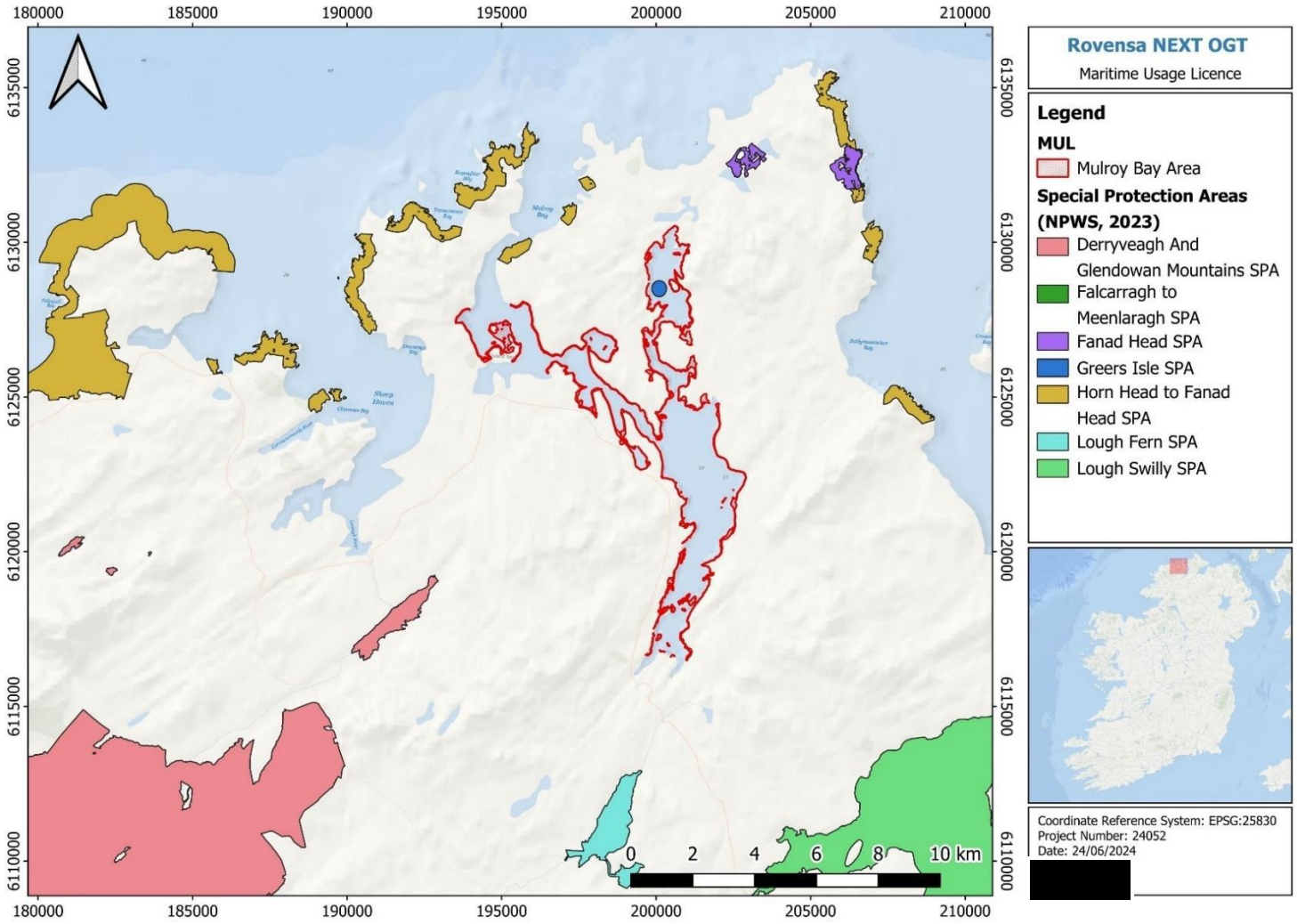

Figure 6-8 SPAs in the vicinity of the Mulroy Bay area

Trawbreaga Bay

The SISAA document submitted as part of this MUL application have considered potential impacts from the proposed seaweed harvesting activities on Natura 2000 sites. The SISAA concluded that there is no potential for significant effects on the conservation features of the North Inishowen Coast SAC, Trawbreaga Bay SPA, and Malin Head SPA. Inishtrahull SAC (Figure 6-9) is considered to far away for this assessment and is not considered further.

The SACs for Annex I Habitats and Annex II mobile species, and SPAs in the vicinity of the licence area can be seen in Figure 6-9 and Figure 6-10.

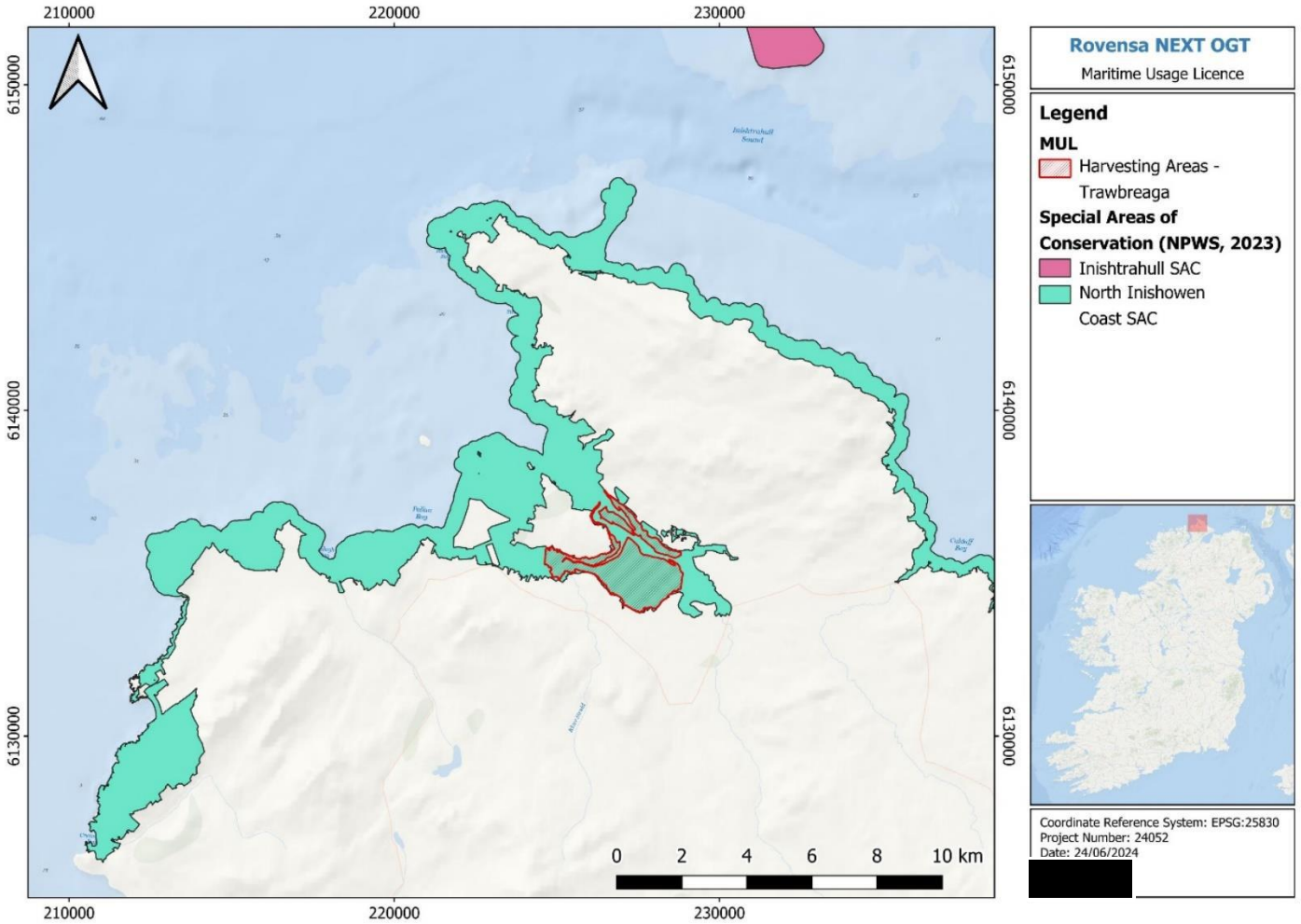

Figure 6-9 SACs in the vicinity of the seaweed harvesting Trawbreaga Bay area

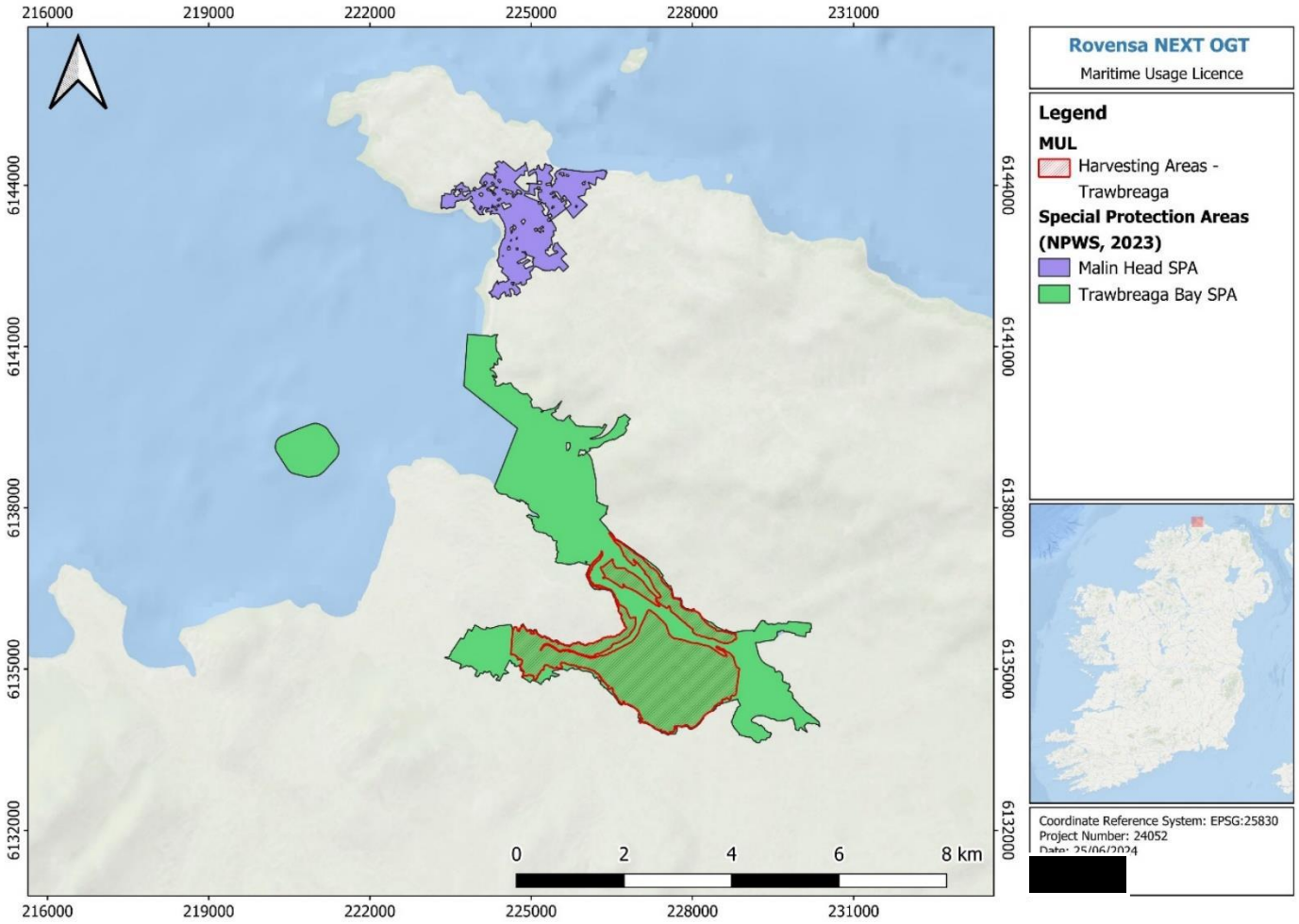

Figure 6-10 SPAs in the vicinity of the Trawbreaga Bay area

6.4.3 MARINE MAMMALS

6.4.3.1 RECEIVING ENVIRONMENT

A review of existing data sources regarding marine mammals was carried out in the SISAA and RAAIVS reports, both submitted in support of this licence application.

Additional information regarding seal populations within Dungloe Bay is described as follows:

Harbour seals are known to have colonies located throughout the northwest and north coast of Ireland including the large bay of Dungloe, Figure 6.11.

Harbour seals stick to familiar resting spots or haulout sites, generally rocky areas (although sand and mud may also be used) where they are protected from adverse weather conditions and predation, near a foraging area. Harbour seals also come to shore to moult (shed their fur) during July to September often forming large groups on sheltered shores that have ready access to the sea (NPWS[4], species information, accessed online 2024). Pups are born on land, usually on sheltered shorelines, islets or skerries and uninhabited islands removed from the risk of predation and human interference. Seals are homing to their birthplace, returning as adults to their birthplace to reproduce. According to the site's Conservation Objectives (NPWS, 2013), harbour seals are present at Dungloe Bay throughout the year during all aspects of its annual life cycle which includes breeding (May to July approx.), moulting and non-breeding foraging and resting phases.

[4] https://www.npws.ie/marine/marine-species/common-seal

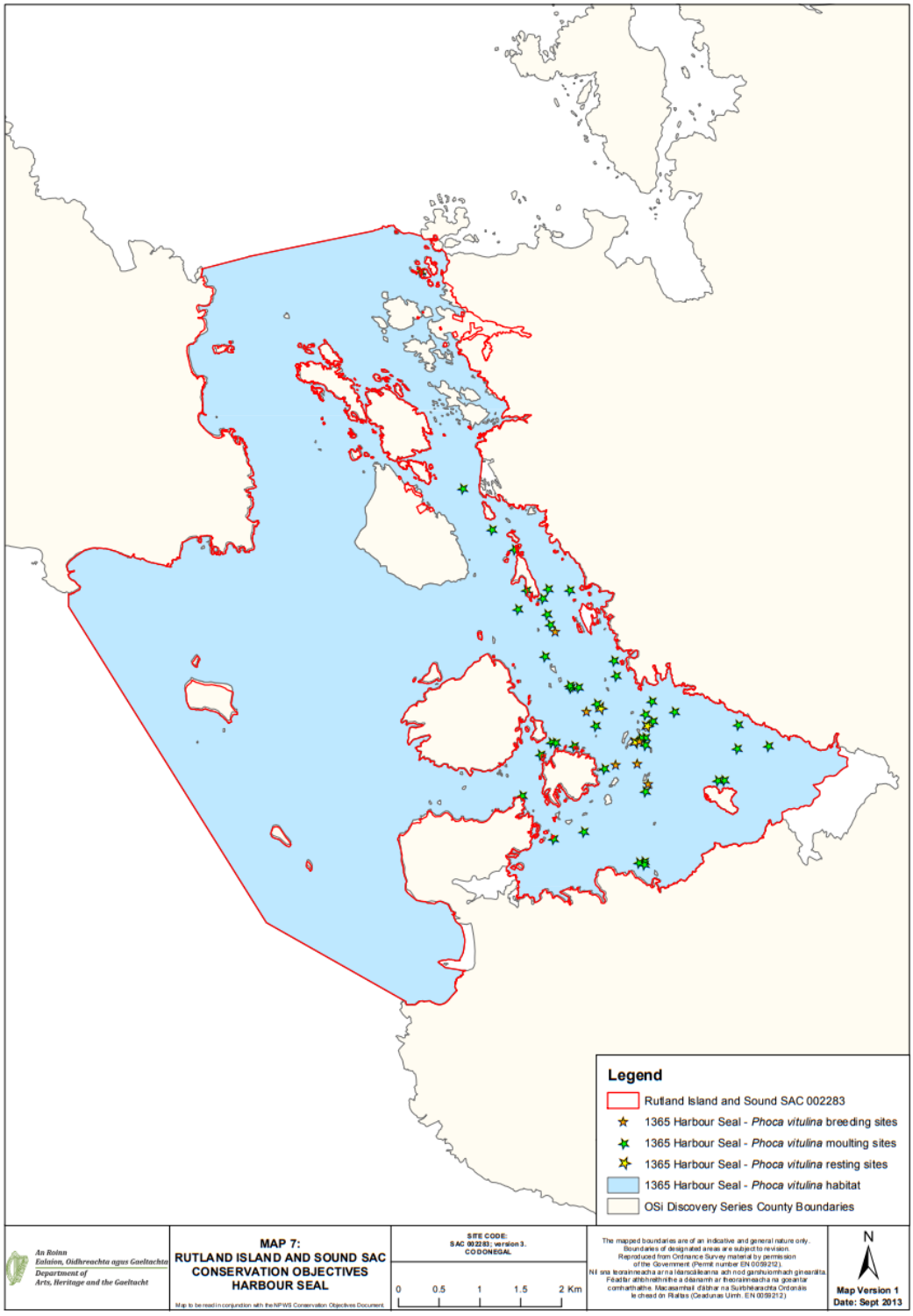

Figure 6.11 Areas of the Rutland Island and Sound SAC used by Harbour Seal as breeding (orange stars), moulting (green stars) and resting (yellow stars) sites (NPWS, Conservations Objectives, 2013).

6.4.3.2 POTENTIAL EFFECTS

The following impacts have been identified for the harvesting activities under this application:

- Noise associated with shipping
- Physical disturbance
- Collision risk
- Indirect impacts on preferred prey
- Potential disturbance to life cycle.

6.4.3.3 ASSESSMENT OF POTENTIAL EFFECTS

The SISAA (Aquafact, 2022) for Dungloe Bay concluded that "Follo*wing a comprehensive screening assessment of the potential impacts of hand harvesting seaweed within the Rutland Island and Sound SAC, it has been determined that significant adverse effects, both alone and in-combination with other activities (i.e. aquaculture), on the life cycle of harbour seals, which are qualifying interests of the SAC, are likely.*

"Following a desk-based screening assessment of the potential impacts of hand harvesting seaweed within the Rutland Island and Sound SAC, it has been determined that there is potential for likely significant effects, both alone and in-combination with other activities (i.e. aquaculture), on the life cycle of harbour seals, which are qualifying interests of the SAC.".

Localised disturbance or displacement of seals and otter may occur in the harvesting area during the harvesting activities. The effects of physical disturbance have the potential for likely significant impacts on seal populations using the site as haul out, breeding and moulting locations.

Harvesters will keep a minimum distance of 200m from potential breeding and moulting sites therefore reducing the risk of disturbance.

For both Mulroy Bay and Trawbreaga the SISAAs concluded that there is no potential likelihood for significant effects caused by the proposed harvesting activities on marine mammal species that are a Qualifying Interest for any of the SACs considered.

6.4.4 BIRDS

6.4.4.1 INTRODUCTION

Ireland is host to several nationally and internationally important bird species which inhabit areas including coastal sea cliffs, estuaries and offshore islands. Coastal habitats provide important breeding sites and foraging grounds for many species of seabirds, several of which are protected under national and European legislation.

At least 45 species of seabird (including divers and grebes) have been recorded during at-sea surveys in Irish waters, of which 23 species regularly breed around Ireland (Pollock et al., 2008, Mackey et al., 2004). In addition, a further 59 species of waterfowl and wader regularly occur at coastal sites such as estuaries around Ireland including 5 grebe species, 2 heron species, 26 species of wildfowl and 26 wader species (Crowe, 2005). Some of these species are migratory and are present only during migration periods in spring and autumn; others come to Ireland to breed or to spend the winter, while some are resident all year round (Lewis et al., 2019; Jessop et al., 2018).

6.4.4.2 RECEIVING ENVIRONMENT

A review of existing ornithological information relevant to the area and proposed site investigation activities seabirds is described in the SISAA report submitted in support of this Licence Application. SPAs in the vicinity of the Licence Area can be seen in Figure 6-6, Figure 6-8and Figure 6-10.

6.4.4.3 POTENTIAL EFFECTS

The following potential effects have been identified for the proposed harvesting activities:

- Physical disturbance

6.4.4.4 ASSESSMENT OF POTENTIAL EFFECTS

Due to the localised nature of the harvesting, low number of harvesters sampling at a given time, and short duration of the proposed activities. Only the allocated annual tonnage of seaweed will be harvested from the bay. Any noise produced or disturbance from the small boat being used during the collection of the harvested seaweed will be low.

Significant effects on all designated bird species features of Natura 2000 sites due to physical disturbance from the proposed activities are considered unlikely.

6.4.5 FISH

6.4.5.1 RECEIVING ENVIRONMENT

The seaweed beds provide habitats for many species, including fish at hightide. The seaweed habitat support fisheries by providing areas for breeding, spawning, nursery grounds, and foraging grounds. Several commercial species which utilise this resource include cod, pollock, herring, lobster, crabs, and bivalves (Clean Technology Centre et al, 2020).

Commercially important fish species within the Dungloe area include Mackerel, Horse Mackerel, Herring, Cod, and Whiting. The range of wild Atlantic Salmon is also surrounding/close to Dungloe Bay.

Fish species within the Mulroy Bay area include Mackerel, Horse Mackerel, Herring, Cod and Whiting.

Commercially important fish species within the Trawbreaga Bay area include Mackerel, Horse Mackerel, Cod, Whiting. The range of wild Atlantic Salmon is also within Trawbreaga Bay.

6.4.5.2 POTENTIAL EFFECTS

Potential impacts on fish species may include disturbance from underwater noise from the boat that collects the harvested seaweed.

6.4.5.3 ASSESSMENT OF POTENTIAL EFFECTS

The boat used for collection is small and will not introduce a significant additional noise to the environment alongside the other marine users in the area. Also, due to short and localised nature of the activities, significant effects are considered not likely.

6.5 COMMERCIAL FISHERIES AND AQUACULTURE

6.5.1 COMMERCIAL FISHERIES

The availability of information on fishery activity specifically related to fishing grounds and areas in Irish waters is dependent on the target species, fishing gear and the size of the vessels engaged in the fisheries.

Commercial fishing effort database on Ireland's Marine Atlas was checked for fishing effort within the vicinity of the MUL area. The fishing effort aspects included:

- Fishing effort
- Beam trawl effort
- Bottom otter trawls
- Dredge fishing

- Pelagic trawls,
- Pots and
- Seines
- Inshore dredge, line, nets and pot fishing

Ireland's Marine Atlas (Ireland's Marine Atlas, 2024) indicates that bottom otter trawls and inshore pot fishing activity areas overlap with the proposed Licence Area activities (Figure 6-12 and Figure 6-13). No other fishing activities overlap with the proposed harvesting area.

Inshore Fishing:

Inshore shrimp fishing and periwinkle harvesting areas that are located within Dungloe Bay, using information available from Ireland's Marine Atlas (2024) database.

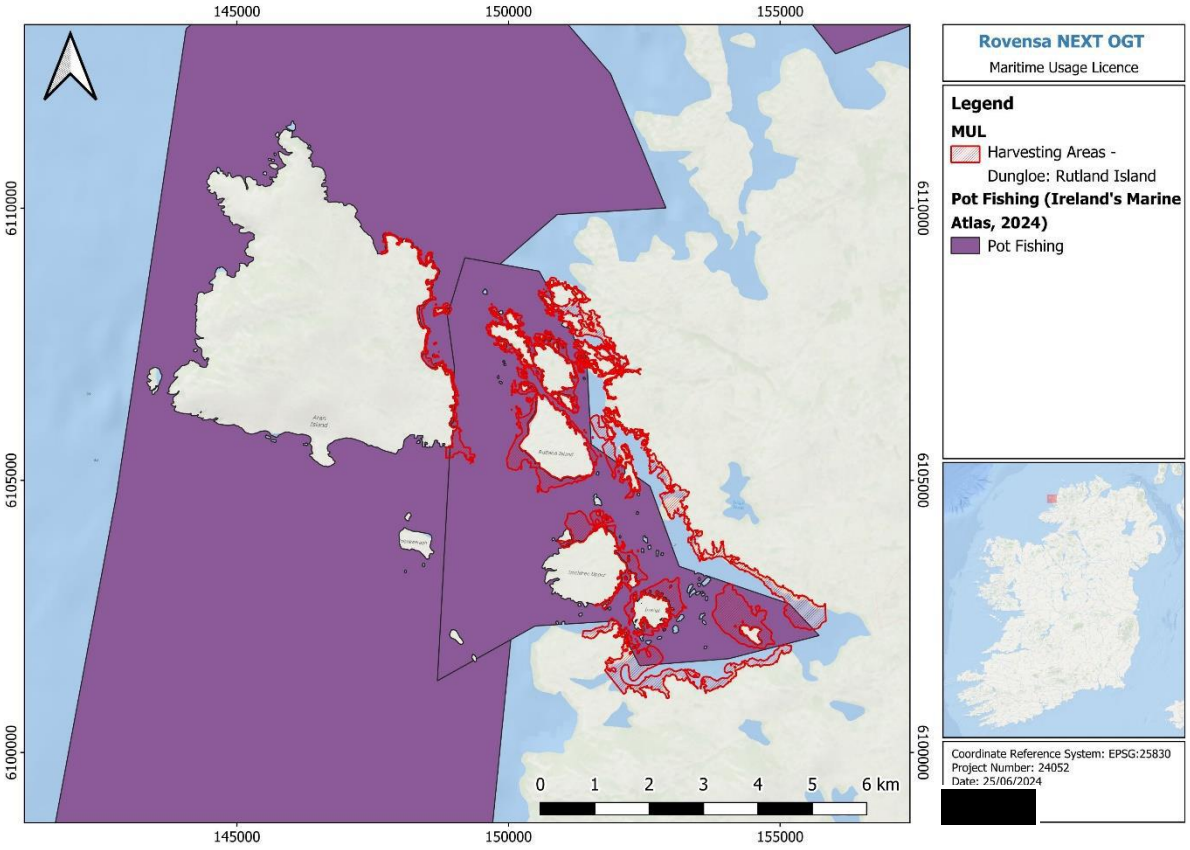

Figure 6-12 Inshore Pot fishing (purple) for shrimp pot, and lobster and crab fishing and Dungloe Bay harvesting areas (red line hashed areas)

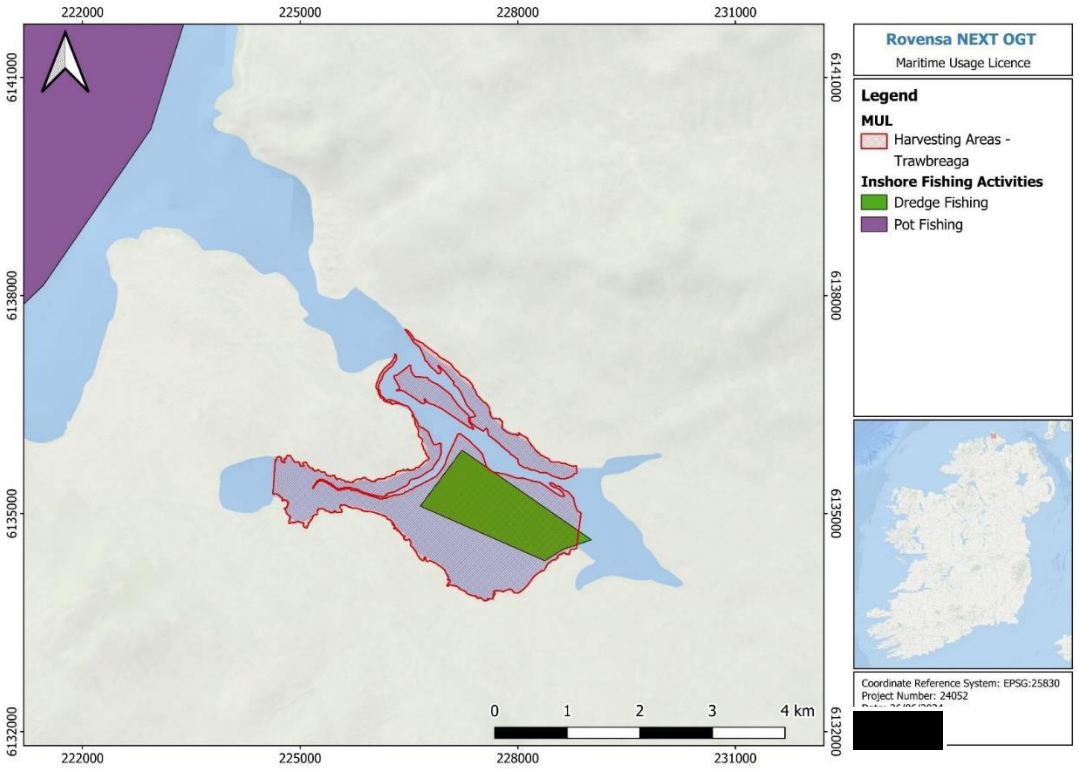

Figure 6-13 Inshore Fishing distribution (Ireland's Marine Atlas, 2024) within Trawbreaga Bay harvesting areas

The assessment is included in Table 6-7.

Table 6-7: Assessment Summary

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
Dungloe Bay	Mackerel nursery ground Horse Mackerel nursery ground Herring nursery ground Cod nursery ground Whiting nursery ground Wild Atlantic Salmon is also found. The pot fishing gear types include shrimp pots and creel gear types.	Noise disturbance Physical disturbance	There is an overlap with the fishing effort and the MUL area. However, foraging for seaweed will occur at low tide and localised within the bay. The number of harvesters will be low, and the proposed activities will be short in duration. Pot fisheries mainly occur in subtidal areas and would not directly interact with seaweed harvesting activities which would be occurring at low tide. Periwinkle harvesting areas are further inshore

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
			and any active areas don't overlap with the proposed seaweed harvesting areas. Any noise produced or disturbance from the small boat being used during the collection of the harvested seaweed will also be low. Therefore, significant effects are considered not likely.
Mulroy Bay	Mackerel, Horse Mackerel, Herring, Cod and Whiting	Noise disturbance Physical disturbance	There is some overlap with the fishing effort and the MUL area. Due to the localised nature of the harvesting at low tide, low number of harvesters sampling at a given time, and short duration of the proposed activities. Any noise produced or disturbance from the small boat being used during the collection of the harvested seaweed will be low. Therefore, significant effects are considered not likely
Trawbreaga Bay	The range of wild Atlantic Salmon is close to Trawbreaga Bay Inshore Dredge fishing for cockles also occurs within Trawbreaga Bay.	Noise disturbance Physical disturbance	There is no overlap with the fishing effort and the MUL area, except for Inshore dredge fishing for cockles. The foraging will occur at low tide, will be of short duration and localised within the bay. Any noise produced or disturbance from the small boat being used during the collection of the harvested seaweed will be low. Therefore, significant effects on fishing activities are considered not likely.

6.5.2 AQUACULTURE AND SHELLFISH

The Department of Agriculture, Food and the Marine (DAFM) has responsibility for the regulation of aquaculture. Under Section 6 of the Fisheries (Amendment) Act, 1997 (as amended), it is illegal to engage in aquaculture without an appropriate Aquaculture Licence. Aquaculture includes the culture or farming of fish, aquatic invertebrates, aquatic plants, or any aquatic form of food suitable for the nutrition of fish.

Designated Harmful Algal Blooms (HABs) Inshore Shellfish Production Areas (ISPA) are administrative units used for reporting purposes in the management, collection and analysis of shellfish and phytoplankton sample data, for aquaculture production activities. Shellfish Waters Directive Areas (SWDA) aim to protect or improve shellfish waters in order to support shellfish life and growth. They are designed to protect the aquatic habitat of bivalve and gastropod molluscs, which include oysters, mussels, cockles, scallops and clams.

6.5.2.1 RECEIVING ENVIRONMENT

Dungloe Bay Aquaculture Activity

Licenced Aquaculture within the Dungloe area includes the Pacific Oyster (shellfish) and manila clam (shellfish) shown in Figure 6-11.

The Shellfish Waters Directive (SWD) shellfish waters include the area located at Dungloe (Figure 6-14). The Harmful Algal Blooms (HABs) Inshore Shellfish Production Area includes Dungloe Bay and Arranmore Production Areas (Figure 6-15).

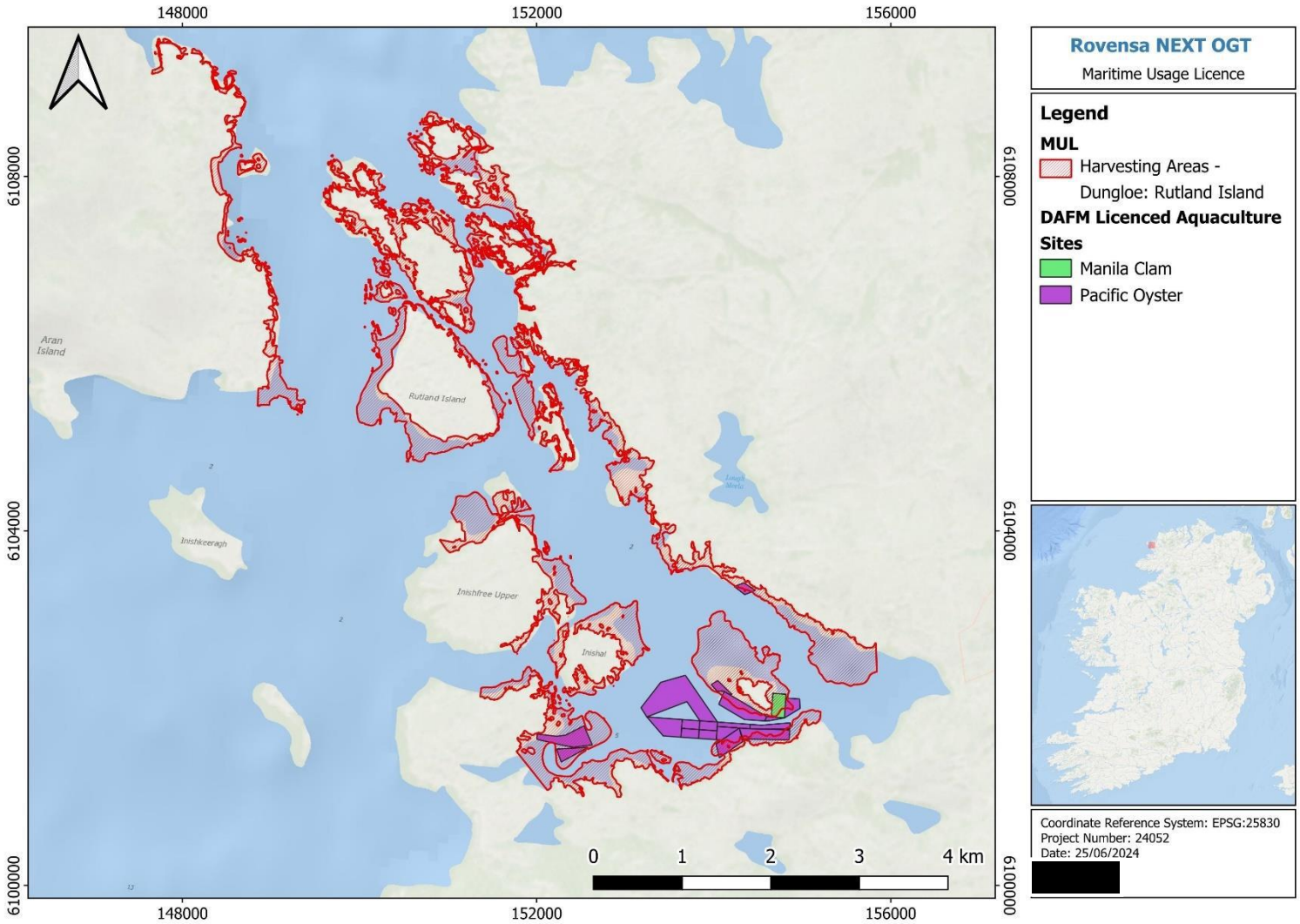

Figure 6-14 Aquaculture Sites within Dungloe Bay (Pacific Oyster - Purple, Manila Clam - Green)

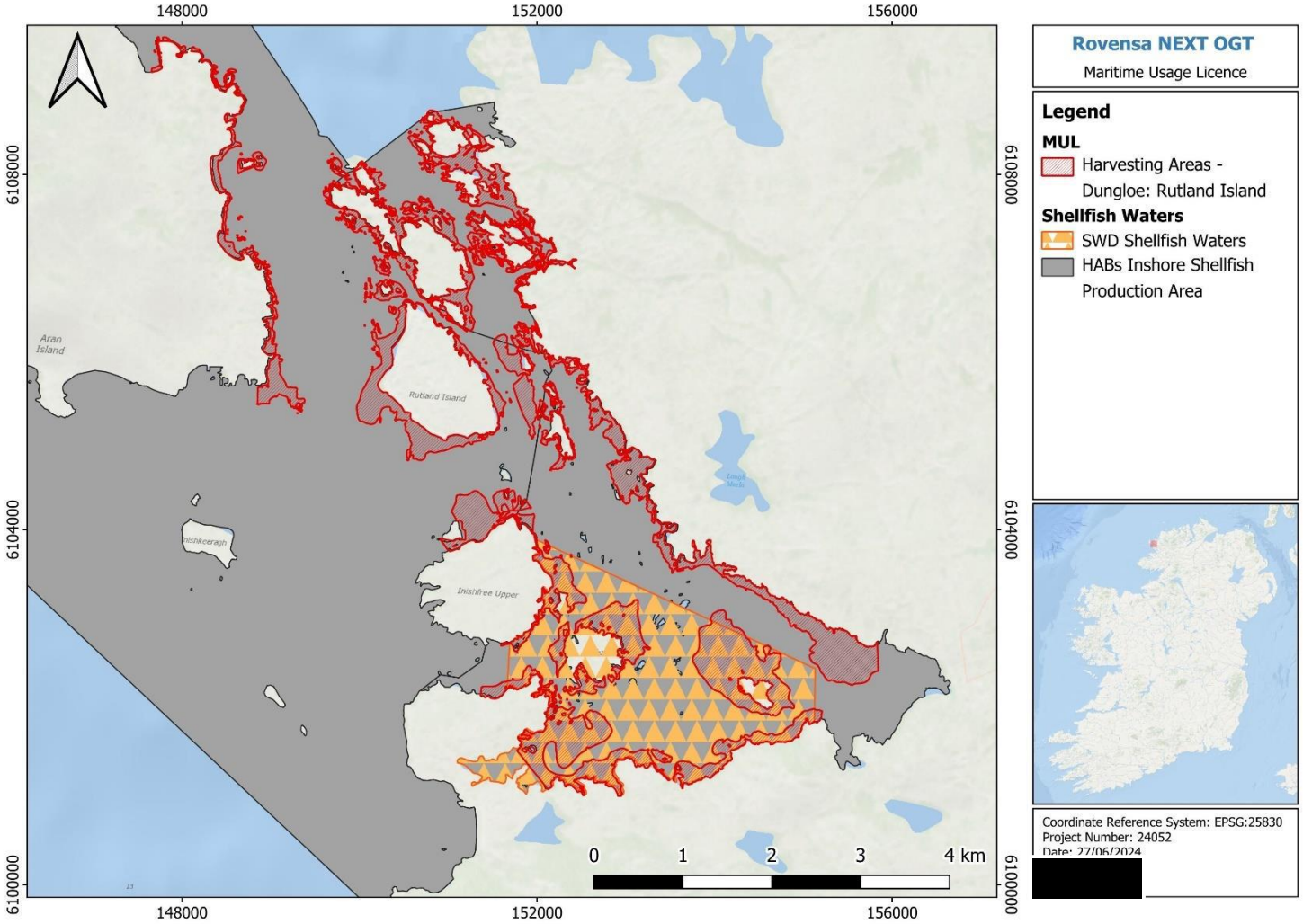

Figure 6-15 Shellfish Waters (Orange) and HABs Inshore Shellfish Production Area (Grey)

The shellfish species recorded at the Dungloe and Arranmore HABs Inshore Production Areas are provided in Table 6-8 below.

Table 6-8 The shellfish species recorded at the Dungloe and Arranmore HABs Inshore Production Areas

HABs Inshore Shellfish Production Area species at Dungloe and Arranmore	
M. edulis	*O. edulis*
G. gigas	*P. maximus*
T. philippinarium	*S. solida*
D. exoleta	*E. arcuatus*
G. glycymeris	*E. silqua*
P. lividus	*C. edule*
A.operacularis	*T. semidecussata*
V. senegalensis	*V. verrucosa*

Mulroy Bay Aquaculture Activity

Licence Aquaculture in the Mulroy Bay area includes the Great Atlantic Scallop, Brown Seaweeds, Atlantic salmon, Blue mussel, Pacific oyster (Figure 6-16).

The Shellfish Waters Directive (SWD) shellfish waters and Harmful Algal Blooms (HABs) Inshore Shellfish Production Area includes Mulroy Bay and Mulroy Production Areas are shown in Figure 6-17.

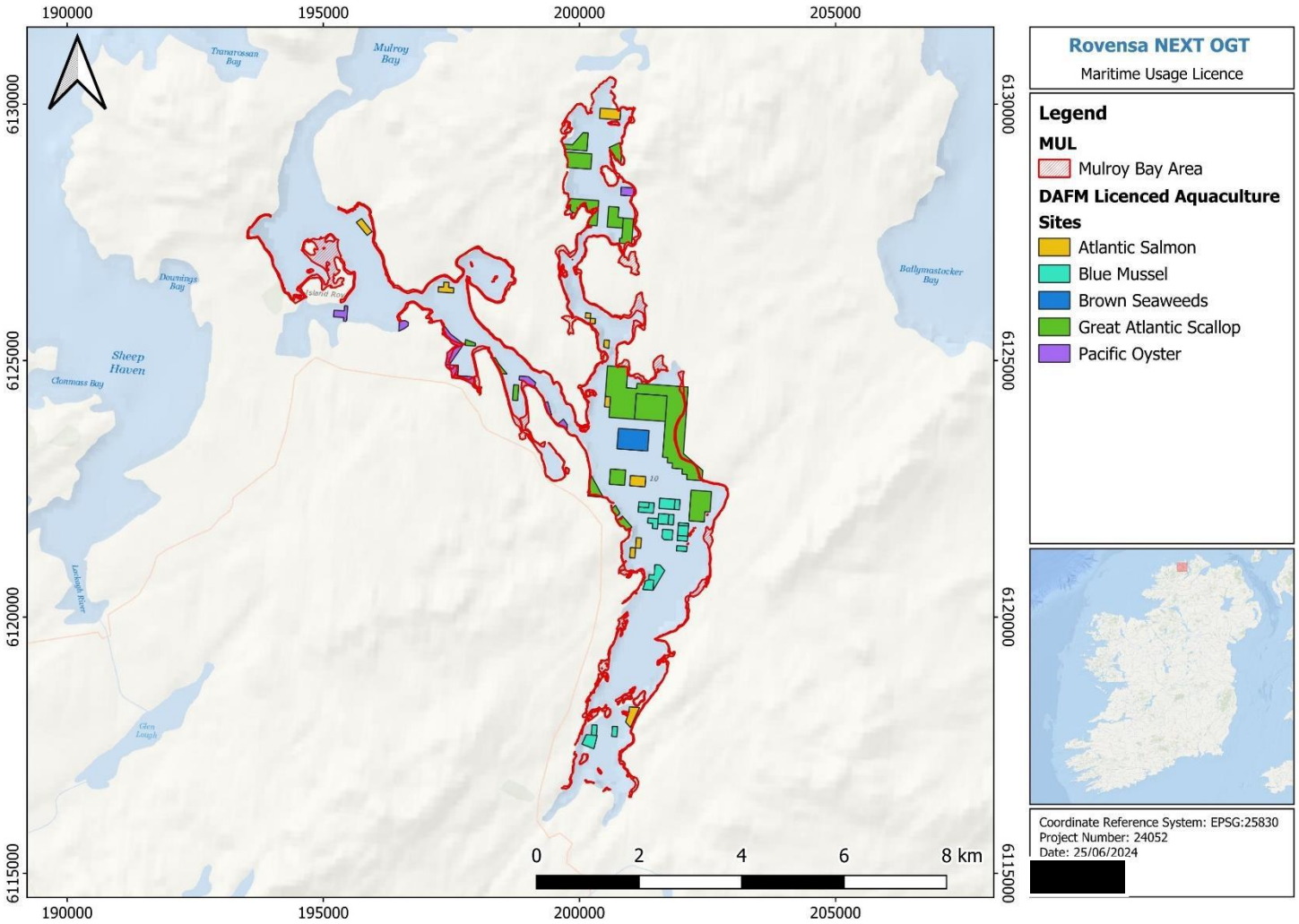

Figure 6-16 Aquaculture Sites within Mulroy Bay

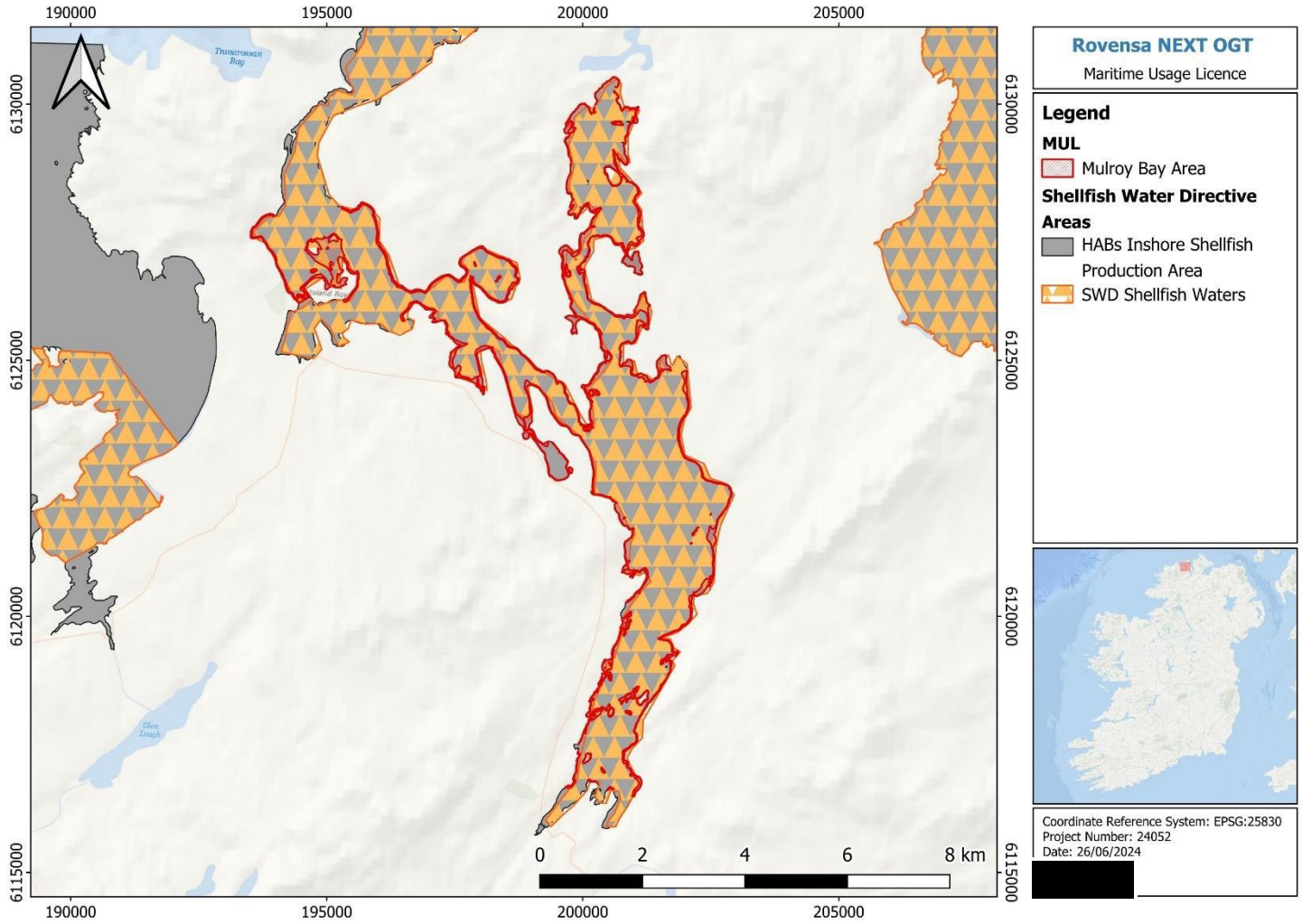

Figure 6-17 Mulroy Bay with SWD shellfish waters (orange) and HABs Inshore Production Areas (Grey)

The shellfish species recorded at the Mulroy Bay HABs Inshore Production areas are provided in Table 6-9 below.

Table 6-9 The shellfish species recorded at the Mulroy Bay HABs Inshore Production Areas

HABs Inshore Shellfish Production Area species at Mulroy Bay	
M. edulis	*O. edulis*
G. gigas	*P. maximus*
T. philippinarium	*S. solida*
D. exoleta	*E. arcuatus*
G. glycymeris	*E. silqua*
P. lividus	*C. edule*
A.operacularis	*T. semidecussata*
V. senegalensis	*V. verrucosa*

Trawbreaga Bay

Licence Aquaculture in the Trawbreaga Bay area include Pacific Oyster (Figure 6-18).

The Shellfish Waters Directive (SWD) shellfish waters and Harmful Algal Blooms (HABs) Inshore Shellfish Production Area includes Trawbreaga Bay area (Figure 6-19).

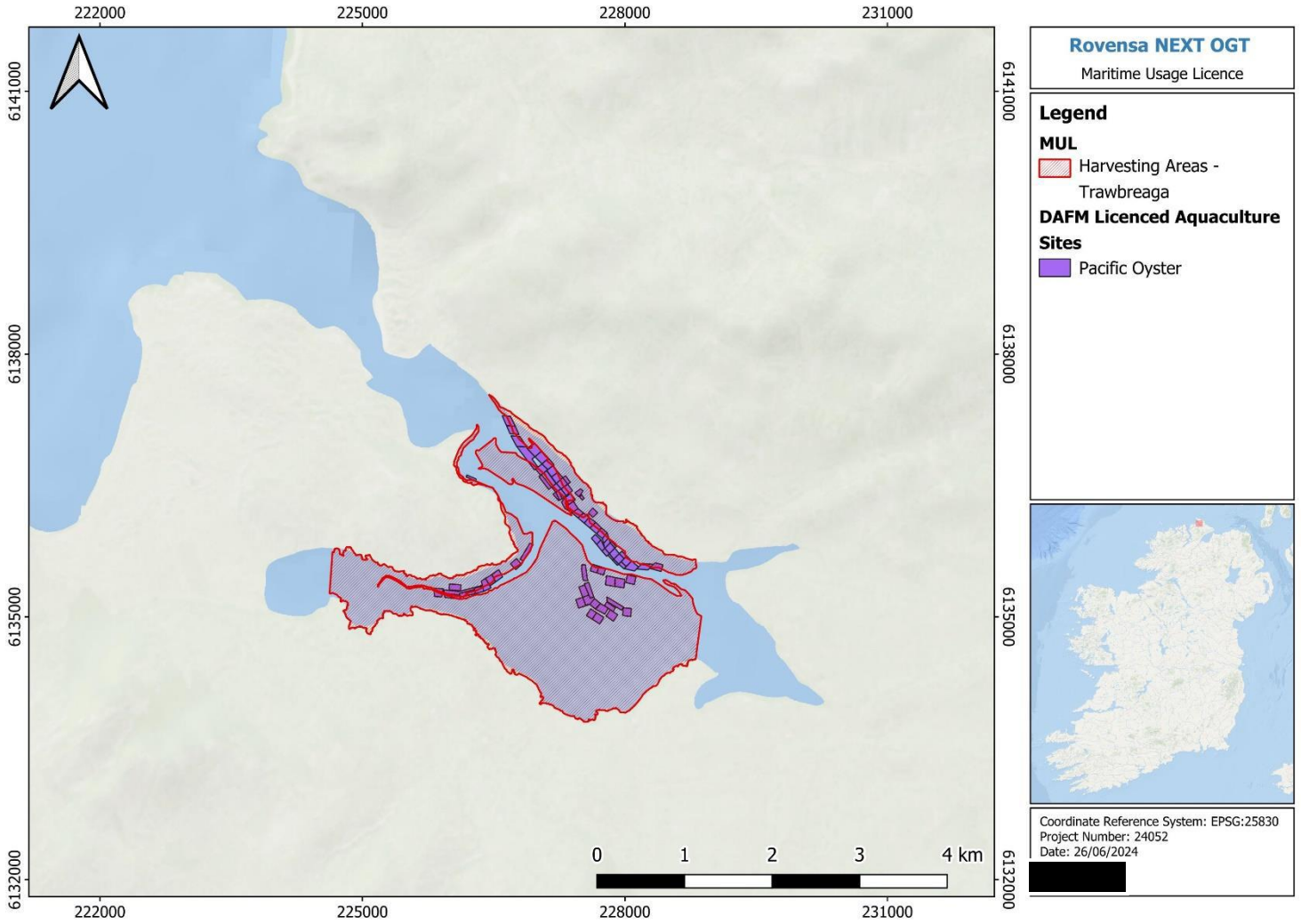

Figure 6-18 Licenced DAFM Aquaculture Sites in Trawbreaga Bay

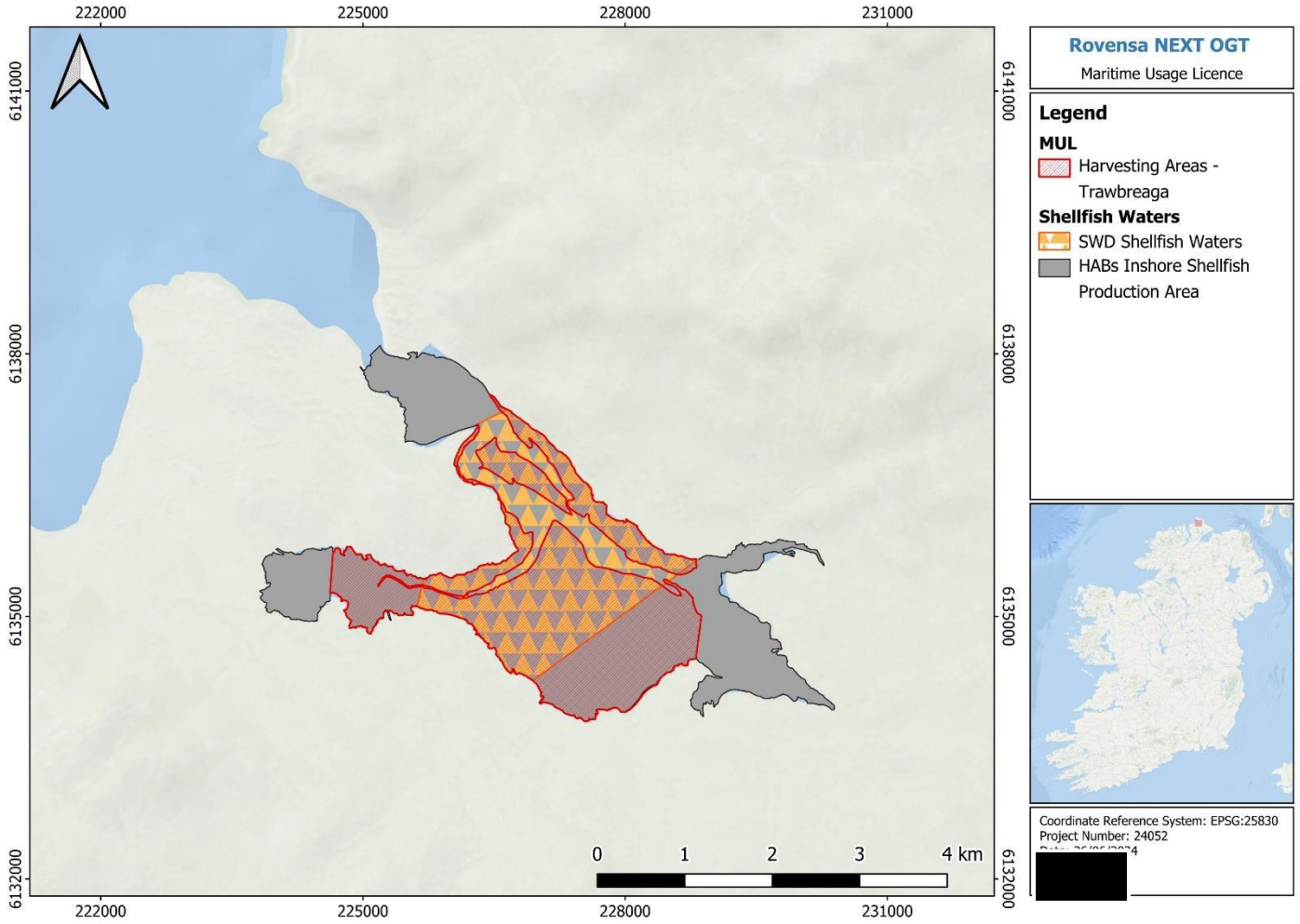

Figure 6-19 HABs inshore Shellfish Production Areas (HABs) and Shellfish Water Directive areas within Trawbreaga Bay

6.5.2.2 Assessment of Potential Effects

The assessment of potential effects between the proposed harvesting activities and aquaculture sites are as follows.

Ascophyllum is unlikely to occur in this area due to its preference for intertidal areas and anchoring on hard substrates. Therefore, there are no potential interactions between *Ascophyllum* harvesting and oyster/clam production areas. Additionally, "harvesting levels are also restricted to *ca* 10% of the standing stock and no reduction in detritus levels is foreseen (Aquafact SISAA)."

6.6 Air Quality

For all three harvesting areas there will be no releases to the air, other than routine boat exhausts. Air quality standards will not be exceeded. There is not likely to be a significant effect on the environment.

6.7 Noise and Vibration

For all three harvesting areas the only potential noise source from the proposed harvesting activities would be the noise produced from the boat in transporting the harvested seaweed to the pier and shore. Due to the size of the boat, temporary nature of the activities, there is not likely to be a significant effect on the environment.

6.8 Landscape and Seascape

The three harvesting areas are not subject to any designation intended to protect landscape quality Table 6-10.

Table 6-10: Assessment Summary

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
Dungloe Bay	Part of North Atlantic Islands, Headlands and Beaches Seascape Character Area (SCA) 3. This SCA and the majority of this coastline is low lying with sea views and indented with several headlands, bays and small islands (Marine Institute, 2020).	Effects on visual amenity	Due to the temporary and localised nature of the proposed harvesting activities, there is not likely to be a significant effect on the landscape and seascape receptors in the area.
Mulroy Bay	Part of North Donegal Atlantic Headlands Bays and Beaches Seascape Character Area (SCA) 2. This SCA and the majority of this coastline quite exposed to the forces of the North Atlantic and is indented with headlands, loughs, raised hinterlands and shallow silted bays, often with long, curved beaches and dune systems (Marine Institute, 2020).		
Trawbreaga	Part of North Donegal Atlantic Headlands and Bays Seascape Character Area (SCA). This SCA and		

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
	the majority of this coastline quite exposed to the forces of the North Atlantic and is indented with headlands, loughs, raised hinterlands and shallow silted bays, often with long, curved beaches and dune systems (Marine Institute, 2020)		

6.9 MARINE TRAFFIC

The proposed seaweed harvesting activities and Licence Area are very localised and restricted to areas along shore and within the intertidal zone. The majority of the activities will be conducted during low tide. A small boat will be used to transport the harvested and floating seaweed to suitable pier location on shore during high tide.

Due to the smaller size of the boat being used and the limited/temporary time needed for the transport of the harvested seaweed to shore, there will be no significant impact to marine traffic as a result of the proposed activities.

6.10 ARCHAEOLOGICAL AND CULTURAL HERITAGE

Shipwreck data available through both the INFOMAR project and National Monuments Database.- INFOMAR is a joint venture between the Geological Survey of Ireland and the Marine Institute surveying Irelands seabed. Part of this involves the identification, mapping, and archiving of shipwrecks in Irish waters.

There is some overlap between one of the NMS shipwrecks and the proposed licence activity area within Dungloe Bay. This is located at Glashbeggan. However, the proposed seaweed harvesting activities will be within the intertidal zone, with the majority of activities occurring at low tide, using handheld materials and equipment for harvesting.

There are no identified shipwrecks at Mulroy Bay and Trawbreaga

Due to the localised and temporary nature of the proposed activities, there is no likely significant impact to the archaeological and cultural heritage receptors.

6.11 POPULATION AND HUMAN HEALTH

The harvesting of seaweed plays an important cultural and socio-economic role for local communities in Co. Donegal, and it has expanded into commercial exploitation of the abundant seaweed resources of the area.

Seaweed harvesting in Ireland has a long tradition. Throughout the centuries seaweed was used as a fertiliser, food and animal feed. It is considered an important part of the social, economic and cultural fabric of many coastal communities [5]. The seaweed harvesting industry in Co. Donegal has operated a sustainable the system of harvesting and management of the resource for hundreds of years. No

5 https://emff.marine.ie/sites/default/files/bluegrowth/PDFs/Socioeconomic%20Study%20of%20Seaweed%20Harvesting%20in%20Ireland.pdf

evidence of disturbance to local habitats or indigenous species associated with this activity has been identified over this time.

The harvesters are typically part-timers also involved in fishing or agriculture. OGT have worked closely with local harvesters for the past 24 years, some of whom have 50 years experience, and have developed a sustainable harvesting and management that ensures a careful and considerate approach to both the conservation of this seaweed resource and the local environment. OGT will continue to work with the harvesters to ensure the traditional techniques, local knowledge and sustainable management continue into the future.

6.11.1 POPULATION

OGT wish to ensure individuals and communities do not experience change in their quality of life from any direct or indirect effects arising from the proposed harvesting activities.

There will be no significant effects on population and health from the proposed seaweed harvesting activities.

6.11.2 TOURISM

The assessment for tourism is shown in Table 6-11Table 6-11: Assessment Summary

Harvesting Area	Receiving Environment	Potential Effects	Assessment of Potential Effects
Dungloe Bay	Valuable tourism in sea-based activities and running along the Wild Atlantic Way coastal route with several inlets and bays providing scenic views and locations for outdoor activities. Arranmore is a popular location for scuba diving, boat trips, ecotourism and kayaking activities (Marine Institute, 2020)	Effects on tourism	The activities on site will be localised along the shoreline and temporary in nature. The harvested seaweed will be floating and collected from the shoreline at high tide from a suitable pier. There will be no significant effects on population and health from the proposed seaweed harvesting activities.
Mulroy Bay			
Trawbreaga			

6.12 MAJOR ACCIDENTS AND DISASTERS

The proposed site investigation activities are not anticipated to exacerbate natural disasters such as earthquakes, subsidence, landslides, erosion or flooding. There will be no significant likely effect.

6.13 CLIMATE

There is little evidence on the negative impacts of the removal of rockweed (*Ascophyllum nodosum*) but has a high growth rate and so can recover after harvesting (Phillippi *et al*., 2014; Sinclair *et al*., 2021). From the experiments conducted by Sinclair (2021), respiration was the main process in the experiments and so it was concluded *Ascophyllum nodosum* would not have the ability to act as a carbon sink. Macroalgal communities that grow on rocky substrates do not have/develop carbon

deposits, unlike mangrove forests, salt marshes and seagrass (Duarte *et al*., 2013; Hill *et al*., 2015; within Sinclair *et al*., 2021).

The activities will be conducted over a short timeframe. The activity will introduce a small boat to the area during the latter stages of the proposed activities. The small boat used in the collection of the harvested seaweed will be in use for a limited period during transport a suitable pier.

The degree of total seaweed harvested will be within 12% of the total biomass of the areas proposed for harvesting. Only the allocated amount of seaweed will be harvested at each location.

There is not likely to be a significant effect on climate from the proposed activities.

6.14 WASTE

There will be no planned release of potentially harmful substances or waste from the boat during transport. Therefore, no effects anticipated from the activities.

6.15 INTERACTIONS

6.15.1 IN-COMBINATION SCREENING FOR CUMULATIVE EFFECTS

Licenced sites which could have potential cumulative impacts with the proposed seaweed harvesting activities are included in Figure 6-14 (Dungloe Bay), Figure 6-16 (Mulroy Bay) and Figure 6-19 (Trawbreaga Bay) above.

The assessment of potential cumulative effects are also considered in the SISAA report accompanying the other documents submitted as part of this application.

In-combination screening for cumulative effects has been undertaken following the approach outlined in the European Commission Notice Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive (EC, 2021).

6.15.2 DEFINING CUMULATIVE EFFECTS SPATIAL SCOPE (CESS)

The location of the aquaculture sites in the harvesting area within the MUL are provided in Figure 6-14 (Dungloe Bay), Figure 6-16 (Mulroy Bay) and Figure 6-19 (Trawbreaga Bay) above. The main licenced aquaculture sites include Pacific oyster and Manila clam. For the proposed activities, physical overlap is considered to be the spatial boundary/limit between the harvesting and other proposed activities in the MUL area in defining the CESS.

6.15.3 IMPACT IDENTIFICATION

Impact types that may affect structure and function of Natura 2000 sites have been identified as:

- Physical disturbance resulting from harvesting activities

6.15.4 PATHWAY IDENTIFICATION

Potential cumulative pathways (effects in time or space) have been considered.

Physical disturbance requires direct spatial overlap. The potential pathway for physical disturbance impact is where there is direct spatial and temporal overlap.

6.15.5 Defining Cumulative Effects Temporal Scope (CETS)

The temporal scope for examination of cumulative effects has been defined as the period over which the licence activities would take place.

A licence period of up to 10 years is being sought for this project to ensure the sustainable management of the seaweed harvesting activities.

6.15.6 Identification of projects that could act in cumulatively

The identification of other projects that could act cumulatively included a search of Donegal County Council projects, Licenced Aquaculture DAFM sites using Ireland's Marine Atlas database and Aquaculture Information Management System (AQUAMIS).

Licenced sites which could have potential cumulative impacts with the proposed seaweed harvesting activities are included in Figure 6-14 (Dungloe Bay), Figure 6-16 (Mulroy Bay) and Figure 6-19 (Trawbreaga Bay) above.

6.15.7 Prediction

The oyster and clam production sites are located in clean sand and/or close to low water level. Therefore, the potential for overlap between these sites and the aquaculture production areas are unlikely. Additionally, *Ascophyllum* is found on harder and rocky substrates, and is unlikely to be found on the cleaner sections along the shoreline or interact with the oyster and clam production sites. Harvesting levels are also restricted to 10% of the area and no reduction in detritus is expected.

There is no potential for significant in-combination/cumulative effects from the proposed project activities and the aquaculture production sites or activities.

7 SUMMARY

The potential impacts on the receiving environment from the activities proposed under this Licence Application were identified above.

The proposed seaweed harvesting activities and Licence Area are localised and restricted to areas along the shore and within the intertidal zone. The majority of the activities will be conducted during low tide. A small boat will be used to transport the harvested and floating seaweed to suitable pier locations during high tide. Due to the size of the boat for transport and the limited/temporary time needed for the harvesting and transport of the harvested seaweed to shore the overall impact of the proposed activities on receptors are concluded to be low.

Harvesters will keep a minimum distance of 200m from potential seal breeding and moulting sites therefore reducing the risk of disturbance to this species.

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