ARTICLE 12 (HABITATS DIRECTIVE) ASSESSMENT SCREENING

Sustainable Hand Harvesting of *Ascophyllum nodosum* at Clew Bay, Co. Mayo

21-02-24

ecofact
Environmental Consultants

[redacted]

EXECUTIVE SUMMARY

Project Name	Proposed Sustainable Hand Harvesting of *Ascophyllum nodosum* at Clew Bay, Co. Mayo
Project Description	BioAtlantis plan to undertake sustainable hand harvesting of *A. nodosum*, by contracting 16 full-time hand harvesters, to harvest up to a maximum of 11,018 tonnes per annum across various sites in Clew Bay.
Annex IV Species occurring in Clew Bay	Otters, Leatherback Turtle, Loggerhead Turtle, Harbour porpoise, Bottlenose dolphin, Common dolphin, Striped dolphin, White-beaked dolphin, Cuvier's beaked Whale
Annex IV Species Likely to be Significantly affected	Otters
Potential Impacts	Disturbance; Reduction in Food Sources. Sustainable hand harvesting activities in Clew Bay have the potential to increase human disturbance . In general Otters frequent the intertidal zone, and along the shorelines of the many islands in Clew Bay. There is the potential for interactions with the species during the harvesting activities – further assessment will be required.
Requirement for further Annex IV species Impact Assessment	Yes – in relation to Otters

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Date	Revision	Status	Author	Reviewed By
21-02-24	1	Final	GW/WOC	WOC

1. INTRODUCTION

Ecofact Environmental Consultants Ltd. have been commissioned to carry out an Article 12 (Habitats Directive) Assessment Screening of proposed hand-harvesting of the seaweed *Ascophyllum nodosum* in a sustainable manner from Clew Bay, Co. Mayo. This screening assesses whether there is the possibility of effects on species listed under Annex IV of the Habitats Directive. Under Article 12, Annex IV species are afforded strict protection throughout their range, both inside and outside of designated protected areas.

1.1 Legislation

Article 12 of the Habitats Directive is aimed at the establishment and implementation of a strict protection regime for species listed in Annex IV within the whole territory of Member States (i.e. in locations outside protected areas as well as inside their boundaries).

Article 12 of the Directive states:

1. *"Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range, prohibiting: (a) all forms of deliberate capture or killing of specimens of these species in the wild; (b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration; (c) deliberate destruction or taking of eggs from the wild; (d) deterioration or destruction of breeding sites or resting places.*

2. For these species, Member States shall prohibit the keeping, transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild, except for those taken legally before this Directive is implemented.

3. The prohibition referred to in paragraph 1 (a) and (b) and paragraph 2 shall apply to all stages of life of the animals to which this Article applies.

4. Member States shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV (a). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned."

Under Article 12 of the Habitats Directive, all species listed in Annex IV are afforded strict protection, prohibiting deliberate capture, disturbance and destruction of all life stages and deterioration or destruction of breeding sites or resting places. In addition, species listed in Annex II are afforded the same protection, even when not present in numbers which result in the designation of a Natura 2000 site.

As required by Article 12 of the Habitats Directive, the potential impact to species listed on Annex IV of the Directive must be assessed prior to a project receiving consent. The Article 12 assessment presented in Section 7 has been prepared with reference to the European Communities (Birds and Natural Habitats) Regulations 2011 and also to the '*Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC'* (EC, 2007b), which states that:

'The interpretation of Article 12 has to take into consideration the objective of Directive 92/43/EEC set out in Article 2, which applies, without distinction, to all Annexes. Consequently, strict protection measures adopted under Article 12 should aim to fulfil the main objective of the Directive by contributing to the maintenance or restoration, at favourable conservation status, of Annex IV (a) species of Community interest, while taking into account economic, social and cultural requirements and regional and local characteristics' (EC, 2007)'.

This report considers whether or not the proposed harvesting of *A. nodosum* will result in the deliberate disturbance or destruction of any of the species listed in Annex IV (a) of the Habitats Directive that may be present in the study area. The assessment takes into account the status and sensitivities of relevant Annex IV species to potential impacts associated with decommissioning activities. Sections 7 and 8 of this report provide information relevant to the screening for potential effects on Annex IV species, in accordance with Article 12 of the Habitats Directive.

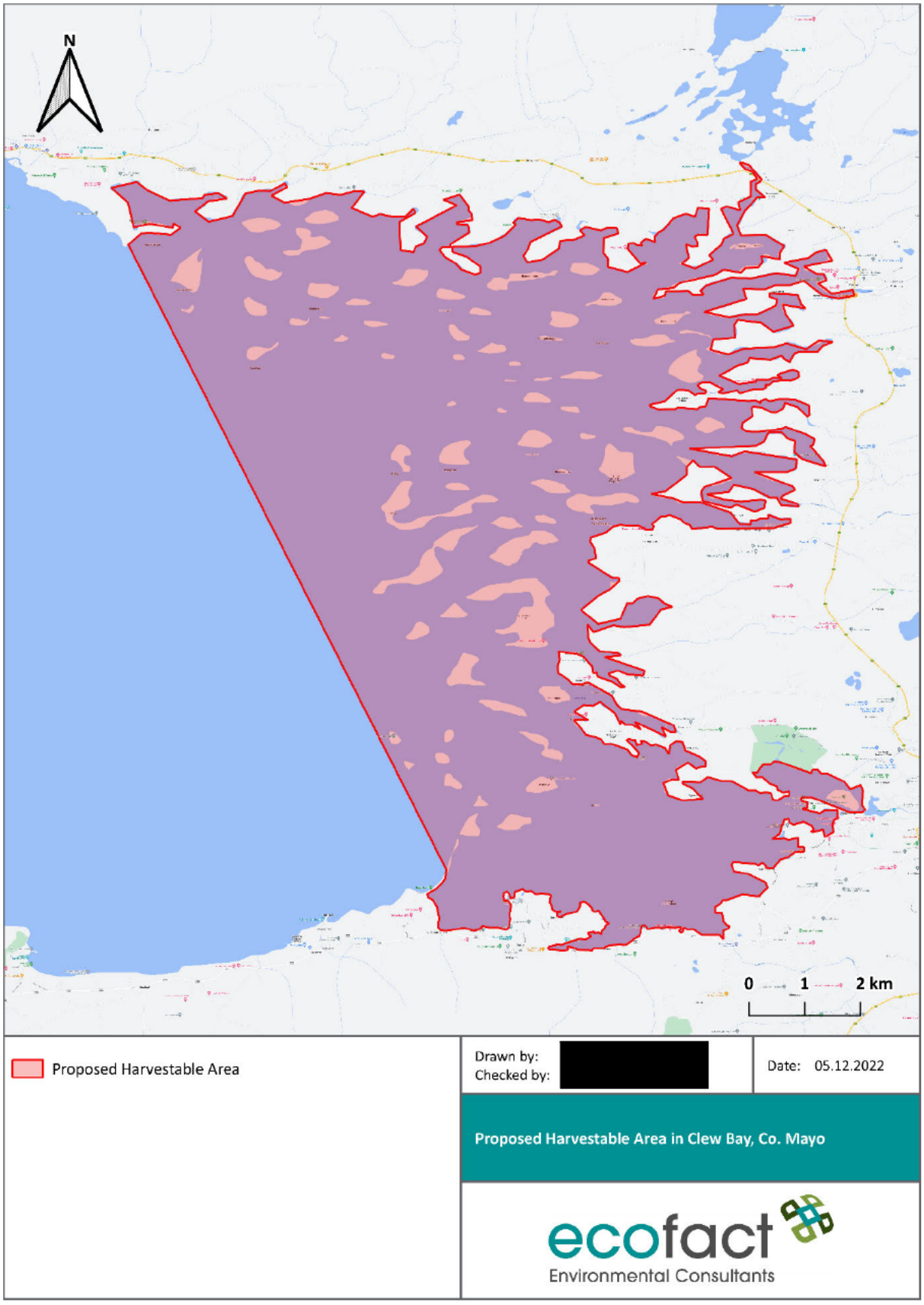

Figure 1 Proposed Harvestable Area in Clew Bay, Co. Mayo.

2. METHODOLOGY

2.1 Guidance

This report has been prepared with regard to:

- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001).
- Communication from the Commission on the Precautionary Principle, Office for Official Publications of the European Communities, Luxembourg (EC, 2000);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010).
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General, 2001);
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC.

2.2 Desk Study

A desktop study was undertaken to identify the extent and scope of the potentially affected Annex IV species. A full bibliography of information sources reviewed is provided in the reference section. Information sources reviewed include:

- National Parks and Wildlife Service (NPWS) site synopses and conservation objectives,
- Protected species data on NPWS/National Biodiversity Data Centre (NBDC) online databases,
- Environmental Sensitivity Mapping (ESM) Tool,
- Irish Whale and Dolphin Group website
- Online aerial imagery (Bing, Google Satellite).

3. DESCRIPTION OF PROJECT

Clew Bay has in excess of 90 islands and 100km of coastline that contain harvestable quantities of A. nodosum. Given the ecological sensitivities identified within the Clew Bay area, harvesting must be carried out in a manner which does not negatively affect the biological environs. Utilising sustainable hand-harvesting technique and extraction (Kelly et al., 2001; Guiry & Morrison, 2013) and incorporating their use within a best practise approach, BioAtlantis have developed a sustainable model of seaweed harvesting in Clew Bay. Subject to obtaining a licence to harvest in Clew Bay, BioAtlantis will contract up to 16 full-time hand harvesters from the region, to harvest up to a maximum of 11,018 tonnes per annum. BioAtlantis will recruit harvesters with previous experience or whose families have farms or fishing interests in the area and will work with the harvesters to apply sustainable methods of harvesting, collection and conservation of the resource. In their proposal, BioAtlantis will explore the applicability of purchasing a boat for the area to collect the harvested *A. nodosum*, whilst also providing the option for harvesters to tow the floating bags/nets directly to pick-up points. In some cases, individuals with existing seaweed harvesting rights may prefer to land seaweed at pick up points. The seaweed will be weighed by BioAtlantis at pick up points and/or on delivery to the processing facility.

BioAtlantis will employ a site-specific management approach throughout the expanse of the Clew Bay SAC and throughout the entire year. This ensures that activities take place at appropriate locations and at appropriate times. Specifically, this allows for robust mitigation measures to be employed to ensure that sites designated as unavailable for harvest at a particular time due to presence of sensitive seal and bird species, are not visited. Thus, while the total area of coastline in Clew Bay is quite large, the approach of selecting environmentally appropriate sites, effectively narrows the focus to a small number of discrete locations at any given time. The use of the collection boat (if deemed applicable to the area) also ensures ease of access to sites in use. It also brings full traceability to the process, as quality of harvest for each location will be monitored and biomass will be weighed on the boat or pick-up point prior to issuing the harvesters with a Goods Received Note (GRN). This technique also frees up harvesters to spend less time, money and effort on hauling cut seaweed ashore, whilst avoiding the otherwise negative consequences associated with bringing cut seaweed ashore at inappropriate locations. Alternatively, harvesters may tow the floating bags/nets from the harvest site directly to the pick-up points. The site ID or GPS location of the harvest area will be recorded. Hand-harvested *A. nodosum* will be transported to production facilities in Tralee, Co. Kerry for further processing.

3.1 Operational Phase

The BioAtlantis proposal for sustainable hand-harvesting of *A. nodosum* from Clew Bay will include an area extending from Rosmurrevagh point on the north of Clew Bay to Leckanvy Pier in the south, including the islands within the Bay. Through use of data obtained from the field studies and evaluations by BioAtlantis Ltd. (BioAtlantis, 2021 and associated appendices) and Hession *et al*. (1998) and maps and aerial photographs of the region, it is calculated that the current maximum yield of *A. nodosum* from Clew Bay to be of the order of 64,759 tonnes. BioAtlantis' original application estimated that there is a maximum annual sustainable harvest of ~12,900 Tonnes in Clew Bay. This figure was updated following assessments of the resource by UCD in 2016 and with the removal of areas from the harvesting plan where existing appurtenant seaweed harvesting rights were identified. The revised estimated annual sustainable harvest is 11,018 Tonnes, based on harvesting a maximum of 20% of the total available *A. nodosum* biomass per site per annum (BioAtlantis, 2021 and associated appendices). BioAtlantis will employ a site-specific management approach to the Clew Bay Complex SAC, throughout the entire year. This ensures that activities take place at appropriate locations and at appropriate times. Specifically, this allows for robust mitigation measures to be employed to ensure that sites designated as unavailable for harvest at a particular time due to presence of sensitive seal and bird species, are not visited. BioAtlantis Ltd. will employ a Resource Manager or Project Manager to operate on site, preferably with relevant environmental qualifications, a marine ecology background and/or experience in the fishing / marine resources industry. This individual will be responsible for managing activities within the harvesting area and in ensuring sustainability of these activities. They will report directly to the company CEO, and work as part of the resource management team. The person tasked with assessing recovery post-harvesting will have a marine ecology background. Thus, while the total area of coastline in Clew Bay is quite large, the approach of selecting environmentally-appropriate sites, effectively narrows the focus to a small number of discrete locations at any given time. The use of a collection boat (if deemed applicable to the area) ensures ease of access to the sites. This brings full traceability to the process, as the quality of harvest from each location is monitored and biomass is weighed on collection and recorded on a Goods Received Note (GRN; or other method), with sites also inspected post-harvest to ensure the sustainability of the methods employed (Site Inspection Form, SIF or other method). The benefits of this approach is that harvester's times is no longer spent hauling seaweed ashore and coastal damage that could be caused by bringing in large quantities of seaweed ashore at inappropriate locations is avoided. Alternatively, harvesters may tow the floating bags/nets from the harvest site

directly to the pick-up points. The site ID or GPS location of the harvestarea will be recorded. Information recorded via GRN, SIF, etc may alternatively be provided in other suitable formats by electronic or other means on site and/or at production facilities.

A key requirement in implementing and securing a functioning system for sustainably hand harvesting *A. nodosum*, are effective control measures, reporting and monitoring systems. These are set out in the Code of Practice document and form a key framework for managing and ensuring that the system is being adhered to in a precise, correct, seamless and traceable manner. A key component to ensuring that the systems are being adhered to, and at the levels set out in the Code of Practice, will be a strong and robust auditing system. BioAtlantis will conduct quarterly and annual audits covering the areas below:

(a) Quarterly Audit:

- Audit Part A: Records, Forms & Documents
  - Step 1: Forms: receipt of training & verification of understanding
  - Step 2: Completed Training Certs (obtained through training above)
  - Step 3: Records, forms & documents (general)
- Audit Part B: Quality Assessment (documentation)
  - Step 1. GRNs (Clew Bay), or other format/method.
  - Step 2. Production Logsheets (Production Facilities).
  - Step 3. Incident Reports
  - Step 4. Non-conformance Reports
  - Step 5. Software Systems
  - Step 6: Site Inspection forms or other format/method.

(b) Annual Audit (on-site):

- Step 1. Site Quality (inspection of harvested sites)
- Step 2. Harvest methods (inspection of techniques)
- Step 3. Delivery and collection methods (e.g. Collection boat; if deemed applicable to the area).

For more information on the auditing system and its contents, please consult Addendum 7 (Clew Bay Audit Forms – Appendix 8) of the main BioAtlantis licence application document. All control measures, action limits/non-conformance, analytical procedures, monitoring schedule, (frequency), corrective actions and verification are detailed in the licence application main text document. In addition, the harvesting system will be reviewed annually to assess and verify the control measures and determine areas in need of improvement.

3.1.1 Overview of Proposed Operational Phase

In carrying out the operational stage of the proposal, harvest will be recorded using BioAtlantis Compliance and Record Forms (see Addendum 4 in the current NIS). BioAtlantis has developed a management plan setout in the 'Code of Practice for *A. nodosum* harvest activities in Clew Bay Complex SAC – Appendix 4',included as Addendum 5 in the current NIS. This includes the development of a database, to take account of the study area of Clew Bay including over 90 islands and 100km of coastline that contain harvestable quantities of *A. nodosum*. This database will be used to:

(a) Determine and manage sites which require a fallowing period to allow for adequate recovery from recent activities;

(b) Determine and manage rotation requirements (i.e. extrapolation and calculation of the duration or fallowing period required prior to a particular areas being fit for re-harvest);
(c) Prevent harvest activities that would lead to a decline in yield;
(d) Record the details of each harvest, how much, by whom and when.

Moreover, this database represents a central, working component of the BioAtlantis best practice guidelines for harvesting *A. nodosum*, requiring:

(a) Development of pre-harvest plans in advance of harvest activities;
(b) A cap of 20% on the level of available biomass which can be harvested from a given site per annum;
(c) Limitations of a 200-300mm (8-12 inches) cutting height of *A. nodosum* stipe / frond.

Table 1 below sets out the islands and shore-line areas identified as being within the proposed harvesting area for the BioAtlantis project, with *A. nodosum* densities and coverage included. There are four main types of activities associated with the operational phase include:

Operation/Activity No. 1: Management & implementation;
Operation/Activity No. 2: Monitoring, recording & reporting;
Operation/Activity No. 3: Verification & analysis.
Operation/Activity No. 4: Long term assessment of biomass and community structure

All operations/activities are described in detail in the Code of Practice prepared by BioAtlantis, included in the Licence Application (BioAtlantis, 2021 and associated appendices) and presented in Addendum 5 of this NIS. When planning future harvests some Islands will be marked as unavailable for certain times of the year, in order to ensure that known seal breeding, moulting and resting and bird breeding and wintering sites are avoided. The resource manager will be responsible for ensuring that these sitesare avoided. The list of restricted sites is set out in the Code of Practice (Addendum 5); this will be updated to reflect ongoing consultation and data available from NPWS into the future; taking account of time of year and the presence of Common seals and breeding and wintering bird populations.

BioAtlantis will be required to verify that each site has fully recovered prior to re-harvesting. This will be done by visiting each site and performing an assessment of the growth and density of *A. nodosum* on each and updating the production plan as necessary with the results of this analysis.

3.1.2 Management and implementation during operations

Management and implementation components include activities relating to:

1. *Planning and scheduling of harvesting activities*: In the initial stages, it is necessary to establish details of when each area was last harvested. This will be done by working closely with the existing local harvesters, and through analysis of derived datasets, the dates and quantities of the most recent harvests for each island and coastal zone can be established. This data can then be used to derive when a region will be next available for harvest. The nominal recovery time is generally accepted to be 3-5 years from a complete harvest; a maximum harvest of 20% of the total availablebiomass of seaweed is permitted per site per annum to ensure sustainability.
2. *Numbers of personnel to be managed and harvest rates:* Approximately 16 full

time people, or 32 part-time, will be contracted to work for an average of 230 days/year, harvesting approximately 3.5tonnes per day (rate of ~10.4Kg/M^2). The amounts harvested will be recorded to ensure adherence to licensing limits. The area harvested will be 26,923m^2 per day per 16 harvesters. This reflects a harvest rate of 20% of *A. nodosum* biomass per site per annum. This corresponds to an area occupied of 1,683m^2 per person/day or 0.4acres per person per day, for approximately 6-8 hours per day. Approximately 2-4 harvesters are permitted on small-medium sized sites. Medium to largeislands may require between 4-6, while larger islands will likely require approximately 6-10 harvesters. Thus, the low number of people over a wide area reduces the potential for anthropogenic impacts (e.g. intensity of trampling) on the biotope. In fact, given that the BioAtlantis plan targets specific areas at specific times of the year, the low levels of trampling events will also be largely episodic in nature. It is unlikely therefore, that any significant change in the structure of *A. nodosum* assemblages will occur. Furthermore, as a policy against holdfast removal will be implemented, the incidence of *A. nodosum* mortality will be reduced considerably (see 'Code of Practice', Addendum 5). As such, the harvest level of 20% of the total available biomass represents a relatively constant figure and will not be exacerbated due to significant levels of A*. nodosum* mortality due to partial or complete holdfast removal.

3. *Exploitation Level*s: As a policy against holdfast removal will be implemented, *A. nodosum* mortality and whole plant removal will therefore be prevented. Hence, the harvest rate figure of 20% of the total available biomass will remain largely constant and will not be breached due to increased mortality rates.
4. Once the re-harvesting date for each island is established, this information will be used to plan the next seasons harvesting. BioAtlantis will be required to verify that each site has fully recovered prior to re-harvesting. This will be done by visiting each site and performing an assessment of the growth and density of *A. nodosum* on each, and updating the production plan as necessary with the results of this analysis;
5. *Data recording and analysis*: BioAtlantis will explore the applicability of purchasing a boat for the area to be used for the collection of harvested *A. nodosum*. The boat will be piloted by the resource manager or other suitably trained employee. The seaweed collected from each point will be weighed and the details of the harvest recorded, at each collection point. The person or transport company in receipt of the harvested seaweed will complete a 'Goods Received Note' to record the harvest from each site. This also includes measurement of amount and quality of the harvested seaweed. Bag/nets will be weighted on the boat (if applicable to the area) or at the pick-up point or processing facility. Alternatively, where harvesters tow the floating bags/nets containing *A. nodosum* from the harvest site directly to the pick-up points. In some cases, individuals with existing seaweed harvesting rights may prefer to land seaweed at pick up points. The seaweed will be weighed by BioAtlantis at pick up points and/or on delivery to the processing facility. The site ID or GPS location of the harvest area will be recorded.
6. The Resource Manager will inspect sites post-harvest to ensure the standards with respect to the sustainability of the methods employed (Site Inspection Form, SIF or other method). A second check will be completed on receipt of the harvested seaweed at BioAtlantis' factory in Tralee, with details recorded

on a GRN or other method. Details from the GRNs will be uploaded into the main database. The quality of the supplied *A. nodosum* will be assessed by the quality control and/or production team and details of any deviations from the specified requirements recorded on the harvest record. Computerised data will be maintained of all harvest records and non-conformances;

7. *Access and Navigation at harvest sites*: The harvesters shall use their own boats to navigate toand from the island sites. In the case of coastal sites, the harvesters shall be responsible for access to and from the sites via existing access routes. The size of the shore area covered by an individualbag or net will be approximately $2m^2$ to $8m^2$. Harvest will occur at islands and shorelines as described in the harvest management plan. Floating nets or bags will then be picked up at each location in which harvest took place. Alternatively, harvesters may tow the floating nets or bags from the harvest site directly to the pick-up points.

   Final pick-up points will be at established piers and harbours, particularly in Westport and Newport.Access to the northern coastal area will be via the roads at Knockmanus road, Roskeen south Road, Carrowsallagh Rd, Keeloges Rd, and via boat. Access to the Milcum harvesting site will bevia the Teevmore Road. The coast roads on Knockeeragh and Rosclave provide good access to the harvesting sites in this area. The harvesting site at Rosanrubble can be accessed by boat andfrom the road to Rosanrubble Point. The harvesting area between Bleanrosdooaun Strand and Monkelly can be accessed by road to Roslaher, Rostoohy Pier, Moyna Strand, Ardkeen Quay, Roscahil Rd, Rosmindle Rd, Castleaffy, Rosmoney, Rusheen, Carrowcally, Bawn Strand, & Monkelly Strand. BioAtlantis will explore the applicability of purchasing a boat for the area, that will be approved by the Marine survey office (MSO) for use on the open waters of Clew Bay and used to collect the harvested *A. nodosum* from the designated sites; alternatively, harvesters may tow the floating bags/nets from the harvest site directly to the pick-up points. The harvesters will be made aware that all harvested *A. nodosum* must be collected by BioAtlantis for weighing and processing, and the seaweed will only be collected from the sites or pick up points identified on the harvesting schedule or at sites which are approved by BioAtlantis. In some cases, individuals with existing seaweed harvesting rights may prefer to land seaweed at pick up points. The seaweed will be weighed by BioAtlantis at pick up points and/or on delivery to the processing facility.
8. *Communication*: The number of harvesters involved in harvesting the requirements of BioAtlantiswill be below ten initially, rising to sixteen over time. Communication of the harvesting plan will be done in advance each month/quarter via email or post. This will include information on sites that are to be harvested and the quantity and dates for each harvest site. Sites will be identified on a map and the anticipated quantities for each site indicated. Communications with the harvesters during harvesting activities will be either via a mobile phone or 2 way radios, as deemedappropriate and will be managed by BioAtlantis and the BioAtlantis Resource Manager;
9. *Hand-harvest methodology*: Training will be provided to harvesters, where necessary, to ensure competence in skills required to harvest *A. nodosum* in an environmentally friendly and sustainable manner. Activities will be carried out in accordance with a clearly defined protocol which will prevent any damage

to the environment or underlying growth substrate, whilst also facilitating sufficient re- growth and re-generation of the vegetation post-harvest. The 'Code of Practice for *A. nodosum* harvest activities in Clew Bay Complex SAC' is set out in the Licence Application (BioAtlantis, 2021) and is included in Addendum 3 of the current report;

10. *Health and safety measures*: All harvesters will be provided with appropriate and certified Health & Safety Training. BioAtlantis will run regular training days for the harvesters where necessary. The seaweed collection boat (if deemed applicable to the area) will be equipped with all necessary safety equipment as required by the marine survey office.

Table 1 Harvesting locations and quantity estimates within the Clew Bay study area.

Island No.	Name / Area	Harvesting Zone ID*	Total Harvestable Area (m^2)	Typical Density (kg / m^2)	§ (% Coverage)	Harvest levels (Tonne)†	
						Available Seaweed	Maximum Annual Harvest
	Bartraw - Westport	CZ 1.1	61074	0	46%	0.0 T	0.0 T
		CZ 1.2	83288	0.7	100%	58.3 T	11.7 T
		CZ 1.3	57560	0.7	98%	39.4 T	7.9 T
		CZ 1.4	46890	0.7	100%	32.8 T	6.6 T
		CZ 1.5	59466	0.7	70%	29.3 T	5.9 T
		CZ 1.6	32360	1.25	100%	40.4 T	8.1 T
		CZ 1.7	47684	0.7	100%	33.4 T	6.7 T
		CZ 1.8	77259	0	54%	0.0 T	0.0 T
		CZ 1.9	7961	0.7	100%	5.6 T	1.1 T
		CZ 1.10	5559	1.25	100%	6.9 T	1.4 T
		CZ 1.11	11271	1.25	100%	14.1 T	2.8 T
		CZ 1.12	4254	1.25	100%	5.3 T	1.1 T
		CZ 1.13	136927	10.5	94%	1354.0 T	270.8 T
		CZ 1.14	76090	10.5	94%	751.9 T	150.4 T
		CZ 1.15	37232	0.5	100%	18.6 T	3.7 T
		CZ 1.16	35400	0.5	100%	17.7 T	3.5 T
		CZ 1.17	35419	0.5	100%	17.7 T	3.5 T
		CZ 1.18	6633	0.5	100%	3.3 T	0.7 T
	Westport - Rosmoney	CZ 2.1	38658	0	82%	0.0 T	0.0 T
		CZ 2.2	5199	0	100%	0.0 T	0.0 T
		CZ 2.3	8889	0	100%	0.0 T	0.0 T
		CZ 2.4	35324	0	94%	0.0 T	0.0 T
		CZ 2.5	74945	0.55	98%	40.4 T	8.1 T
		CZ 2.6	30076	0.8	100%	24.1 T	4.8 T
		CZ 2.7	7831	0	57%	0.0 T	0.0 T
		CZ 2.8	6710	0	100%	0.0 T	0.0 T
		CZ 2.9	125537	0.8	100%	100.4 T	20.1 T
		CZ 2.10	109815	0.8	97%	85.0 T	17.0 T
		CZ 2.11	9303	0	100%	0.0 T	0.0 T
		CZ 2.12	27612	0	91%	0.0 T	0.0 T
		CZ 2.13	328	0	100%	0.0 T	0.0 T
		CZ 2.14	22527	0	100%	0.0 T	0.0 T
		CZ 2.15	3842	0	94%	0.0 T	0.0 T
		CZ 2.16	6082	0	100%	0.0 T	0.0 T
		CZ 2.17	3636	0	0%	0.0 T	0.0 T
	Rosmoney - Moyna Strand	CZ 3.1	18865	0	50%	0.0 T	0.0 T
		CZ 3.2	40641	4.35	100%	176.8 T	35.4 T
		CZ 3.3	97095	4.35	100%	422.4 T	84.5 T
		CZ 3.4	12914	4.35	100%	56.2 T	11.2 T
		CZ 3.5	9650	4.35	100%	42.0 T	8.4 T
		CZ 3.6	78317	4.35	95%	323.9 T	64.8 T

Island No.	Name / Area	Harvesting Zone ID*	Total Harvestable Area (m^2)	Typical Density (kg / m^2)	§ (% Coverage)	Harvest levels (Tonne)†	
						Available Seaweed	Maximum Annual Harvest
		CZ 3.7	117114	4.35	100%	509.4 T	101.9 T
		CZ 3.8	8398	4.35	100%	36.5 T	7.3 T
	Rostoohy Pt - Newport	CZ 4.1	84464	4.35	92%	339.0 T	67.8 T
		CZ 4.2	27181	4.35	100%	118.2 T	23.6 T
		CZ 4.3	150517	4.35	100%	654.8 T	131.0 T
		CZ 4.4	38351	4.35	99%	164.9 T	33.0 T
		CZ 4.5	26354	0	96%	0.0 T	0.0 T
		CZ 4.6	6397	0	83%	0.0 T	0.0 T
		CZ 4.7	5572	0	100%	0.0 T	0.0 T
		CZ 4.8	6703	0	100%	0.0 T	0.0 T
		CZ 4.9	9671	0	100%	0.0 T	0.0 T
		CZ 4.10	24594	0	64%	0.0 T	0.0 T
		CZ 4.11	117165	0.85	81%	80.2 T	16.0 T
		CZ 4.12	77555	0.85	100%	65.9 T	13.2 T
		CZ 4.13	278265	0.85	79%	187.7 T	37.5 T
		CZ 4.14	110969	0.85	100%	94.3 T	18.9 T
	Newport - Mallaranny Pier	CZ 5.1	61157	0	100%	0.0 T	0.0 T
		CZ 5.2	58948	3.5	79%	163.3 T	32.7 T
		CZ 5.3	105121	3.5	84%	310.9 T	62.2 T
		CZ 5.4	258002	3.5	92%	833.8 T	166.8 T
		CZ 5.5	82278	3.5	83%	240.2 T	48.0 T
		CZ 5.6	41272	3.5	100%	144.5 T	28.9 T
		CZ 5.7	145329	3.5	89%	454.2 T	90.8 T
		CZ 5.8	84126	3.5	100%	294.4 T	58.9 T
		CZ 5.9	8260	3.5	100%	28.9 T	5.8 T
		CZ 5.10	17114	3.5	100%	59.9 T	12.0 T
		CZ 5.11	4451	3.5	100%	15.6 T	3.1 T
		CZ 5.12	1689	3.5	100%	5.9 T	1.2 T
		CZ 5.13	29666	3.5	100%	103.8 T	20.8 T
		CZ 5.14	3900	1.75	100%	6.8 T	1.4 T
		CZ 5.15	30450	1.75	100%	53.3 T	10.7 T
		CZ 5.16	11735	1.75	100%	20.5 T	4.1 T
		CZ 5.17	47890	1.75	79%	65.8 T	13.2 T
1	Forillan, Illanavrick	IS 11.1	40653	6	100%	243.9 T	48.8 T
		IS 11.2	13763	10	100%	137.6 T	27.5 T
2	Kid Isd East		3966	14	100%	55.5 T	11.1 T
3	Roslynagh		7990	0	0%	0.0 T	0.0 T
4	Illannambraher		57901	19	96%	1053.2 T	210.6 T
5	Inishdasky		14818	18	100%	266.7 T	53.3 T
6	Inishquirk		25206	15	82%	308.9 T	61.8 T
7	Inishtubrid		45540	18	100%	819.7 T	163.9 T
8	Inishlim		13308	16	100%	212.9 T	42.6 T
9	Beetle Isd North Inishbobunnan		41752	18	100%	75.1 T	15.0 T
10			566589	16	27%	246.1 T	49.2 T
10	Inishgowla						
10	Beetle Isd South						
11	InishKeel	IS 11.1	16036	12.5	100%	200.5 T	40.1 T
		IS 11.2	2083	16.75	100%	34.9 T	7.0 T
		IS 11.3	300	17.5	100%	5.3 T	1.1 T
		IS 11.4	5876	17.5	100%	102.8 T	20.6 T
12	Black Rock		24348	2.5	100%	60.9 T	12.2 T
13	Moynish More		0	0	0%	0.0 T	0.0 T
14	Moynish Beg		0	0	0%	0.0 T	0.0 T
15	Inisherkin		53097	18	41%	387.7 T	77.5 T
16	Inishnacross		46888	18.5	61%	525.0 T	105.0 T

Island No.	Name / Area	Harvesting Zone ID*	Total Harvestable Area (m^2)	Typical Density (kg / m^2)	§ (% Coverage)	Harvest levels (Tonne)†	
						Available Seaweed	Maximum Annual Harvest
17	Inishilra		36300	18	78%	507.0 T	101.4 T
18	Inishcooa		70929	12	57%	486.2 T	97.2 T
19	Roeillaun		77113	5	100%	385.6 T	77.1 T
20	Inishdeashbeag		62555	0	100%	0.0 T	0.0 T
	Inishdeashmore						
21	Inishcorky		17912	18.75	100%	335.8 T	67.2 T
22	Inishcarrick		34846	19	60%	397.3 T	79.5 T
23	Inishcoragh		24041	15	100%	360.6 T	72.1 T
24	Muckinish		33800	19.25	100%	650.6 T	130.1 T
25	Inishdaweel		22175	20	77%	342.8 T	68.6 T
26	Rabbit Isd		52391	8	58%	242.1 T	48.4 T
27	Illanascrraw		10411	18	100%	187.4 T	37.5 T
28	Freaghillanluggagh		23358	20	100%	467.2 T	93.4 T
29	Inishkee		16398	19	100%	311.6 T	62.3 T
30			15889	18	100%	286.0 T	57.2 T
31	Freaghillan West		20456	19	50%	194.8 T	39.0 T
32	Innishcannon		8656	16	100%	138.5 T	27.7 T
33	Carricklahan		0	0	0%	0.0 T	0.0 T
34	Carrickachorra		0	0	0%	0.0 T	0.0 T
35	Illanmaw		74045	0	66%	0.0 T	0.0 T
36	Freaghillan East		6422	18	100%	115.6 T	23.1 T
37			1476	16	100%	23.6 T	4.7 T
38	Inishcuill West		82042	20.75	79%	1348.2 T	269.6 T
39	Mauherillan		14262	16.75	91%	217.5 T	43.5 T
40	Inishfesh		54236	18	70%	685.8 T	137.2 T
41	Inishmolt		23618	18	100%	425.1 T	85.0 T
42	Inishloy		36182	18.5	100%	669.4 T	133.9 T
43	Inishdaff		70875	20.5	100%	1452.9 T	290.6 T
44	Inishbollog		13201	20.75	100%	273.9 T	54.8 T
45	Inishlaughil		55888	0	100%	0.0 T	0.0 T
46	Inishgowla		67983	16	22%	243.7 T	48.7 T
47	Inishoo		23072	0	13%	0.0 T	0.0 T
48	InishTurk	IS 48.1	56134	21	100%	1178.8 T	235.8 T
		IS 48.2	10755	21	100%	225.9 T	45.2 T
49	Illannaconney		17437	15	77%	201.6 T	40.3 T
50	Inishakillew	IS 50.1	69800	21.75	100%	1518.1 T	303.6 T
		IS 50.2	18583	21.75	100%	404.2 T	80.8 T
51	Trawbaun		256815	19.5	89%	4468.7 T	893.7 T
	Carrigeenglass North						
	Moneybeg						
	Inishcottle						
52	Calf Island		30778	19.75	81%	490.3 T	98.1 T
53	Inishbee, Derrinish & Dernish West		200836	17.5	58%	2021.6 T	404.3 T
54	Freaghillan	IS 54.1	27454	19.75	66%	357.1 T	71.4 T
		IS 54.2	55101	20	90%	989.7 T	197.9 T
		IS 54.3	5995	21	100%	125.9 T	25.2 T
55	Clynish		102154	18.5	77%	1463.2 T	292.6 T
56	Ilaunnamona		25370	16	95%	384.3 T	76.9 T
57	Rabbit Island, Island More &Quinnsheen Island	IS 57.1	14757	19.5	100%	287.8 T	57.6 T
		IS 57.2	92903	16	88%	1307.4 T	261.5 T
		IS 57.3	7894	17.5	100%	138.1 T	27.6 T
		IS 57.4	9330	18	100%	167.9 T	33.6 T

Island No.	Name / Area	Harvesting Zone ID*	Total Harvestable Area (m^2)	Typical Density (kg / m^2)	§ (% Coverage)	Harvest levels (Tonne)†	
						Available Seaweed	Maximum Annual Harvest
58	Collan More, Carrigeenglass South & Collan Beg	IS 58.1	501217	16.75	100%	8395.4 T	1679.1 T
		IS 58.2	55220	18.75	100%	1035.4 T	207.1 T
		IS 58.3	29858	19.5	100%	582.2 T	116.4 T
59	Inishgort		64954	15.5	57%	571.7 T	114.3 T
60	Inishlyre		121285	5	57%	347.3 T	69.5 T
61	Illanataggart & Crovinish		442259	14	99%	6133.0 T	1226.6 T
62	Ininhgowla South + Carrickwee		183389	15	100%	2750.8 T	550.2 T
63	Forilan		30569	9.75	100%	298.0 T	59.6 T
64	Carrickawart	IS 64.1	26696	16	100%	427.1 T	85.4 T
64		IS 64.2	1276	14.25	100%	18.2 T	3.6 T
65	Inishlaghan		32314	14.5	83%	388.4 T	77.7 T
66	Dorinish More & Dornish Beag		27107	12.5	100%	338.8 T	67.8 T
67	Inishimmel		0	0	0%	0.0 T	0.0 T
68	Inishleauge		54366	8	77%	334.3 T	66.9 T
69	Inishdaugh		22949	6.5	72%	108.0 T	21.6 T
70	Inishraher		81224	14.7	85%	1014.1 T	202.8 T
71	Inisheeney		53625	16	85%	725.4 T	145.1 T
72	Finnaun Island		0	0	0%	0.0 T	0.0 T
73	Corillan	IS 73.1	6787	6.5	100%	44.1 T	8.8 T
		IS 73.2	1016	6.5	100%	6.6 T	1.3 T
		IS 73.3	1737	6.5	100%	11.3 T	2.3 T
		IS 73.4	3001	6.5	100%	19.5 T	3.9 T
74	Carricknamore	IS 74.1	2436	6.75	100%	16.4 T	3.3 T
		IS 74.2	1393	6.75	100%	9.4 T	1.9 T
		IS 74.3	2640	6.75	100%	17.8 T	3.6 T
75	Stony Island	IS 75.1	0	6.75	100%	43.8 T	0.0 T
		IS 75.2	0	6.75	100%	7.5 T	0.0 T
		IS 75.3	0	6.75	100%	36.9 T	0.0 T
		IS 75.4	0	0	100%	0.0 T	0.0 T
		IS 75.5	0	5	100%	29.1 T	0.0 T
		IS 75.6	0	6.5	100%	69.2 T	0.0 T
		IS 75.7	0	6.5	100%	10.7 T	0.0 T
		IS 75.8	0	6.5	100%	61.7 T	0.0 T
76	Green Islands	IS 76.1	0	0	100%	0.0 T	0.0 T
		IS 76.2	0	0	100%	0.0 T	0.0 T
		IS 76.3	0	0	100%	0.0 T	0.0 T
77	Carricknacally		2860	6.5	100%	18.6 T	3.7 T
78	Monkellys Rock		4425	8.75	100%	38.7 T	7.7 T
79	Inishweela		24604	10	97%	238.7 T	47.7 T
80	Illanroe		28522	14	100%	399.3 T	79.9 T
81	Roeillan		16126	15	100%	241.9 T	48.4 T
Totals							11,018 T**

* Harvesting Zone ID's were assigned by BioAtlantis as part of establishing the management system.

** Revised Total (BioAtlantis, 2021).

† Maximum Annual Harvest (Tonnes) is calculated as 20% of the total available biomass per site. The figure of20% refers to the percentage of the total available *A. nodosum* biomass harvested per site, per annum.

§ Denotes the percentage of coastline which can support *A. nodosum* growth.

3.1.3 Monitoring of the A. nodosum resource

The biomass of *A. nodosum* will be assessed according to standard methods. The general approach to assessing biomass levels is summarized below, and may be subject to change depending on the sites involved, the underlying analytical methodology and the parameters/statistical methods employed:

- Sites located and photographed as required;
- 1m^2 quadrants may provide more robust measures of biomass over a larger area than otherwise smaller 0.25m^2 units used by Kelly *et al*., (2001) and others. Typically, 4 replicates taken per site with a distance of approximately 3 meters between each quadrant, where possible. Where density is deemed relatively homogenous according to visual estimation scales, lower number ofreplicates may be used;
- Harvest *A. nodosum* from each quadrant and measure wet weight per unit area;
- Record all data in the database and ensure that site is not subjected to further harvest activitiesuntil *A. nodosum* density has recovered;
- Statistical analysis: Different regions of Clew Bay will have different rates of *A. nodosum* growth.Therefore, it will be important to calculate the level of variation of *A. nodosum* in as many regions as possible. The datasets will allow for high density mapping of the distribution of the resource within the complex. This will build upon the study by Hession *et al*., (1998) and provide a more detailed analysis of the extent of the resource in the area. Analysis will be performed using geospatial tools and/or by means of One-Way ANOVA, linear regression or similar tests using software such as GraphPad PRISM; Following the assigned fallowing period, repeat the steps outlined above, and where possible, 1m^2 quadrants will be assigned in the same location as previously. Alternatively, replicates may be assigned randomly if required. Harvest *A. nodosum* and record data as described above; Replicate size, type and number and statistical methods may be changed to enhance the accuracy of the assessment.

Immediately following harvest, *A. nodosum* will be bagged and weighed automatically on the navigation boat (if deemed applicable to the area) or at the pickup point or processing facility. Details will be recorded on arrival at the pier (via the GRN or other method), thus allowing for accurate recording of the locations and quantities of *A. nodosum* harvested per unit area. The resource manager will be responsible for uploading the data from the GRN forms to the harvest database. The maintenance of the database will be the responsibility BioAtlantis staff. Other staff (e.g. scientific, production and quality personnel) will have access to the database as required for the correctimplementation of their duties.

Locations and periods of harvest must be planned in a manner which ensures that (a) there is no damage incurred to the environs of this SAC region, (b) there is sufficient *A. nodosum* biomass available for harvest and (c) sufficient time has passed to allow for recovery. The most accurate means of ensuring that each of these goals are met is through the statistical analysis of datasets as they emerge. In this way, staff at BioAtlantis will make decisions which are informed by knowledge of the rates of *A. nodosum* re-growth and regeneration. Data relating to biomass levels, re-growth and re-generation will be incorporated into the harvest management database for use in planning harvest periods.

In terms of quality control, BioAtlantis, as a GMP+ certified company, must ensure full traceability to end users of the origin and location of the raw material used in the products manufactures. Therefore,

the Quality Control system in BioAtlantis will play a key role in the management and monitoring of work relating to harvest of *A. nodosum* in Clew Bay. In brief, this will involve:

- Assessment of quality control checks on harvesting activities in Clew Bay to ensure conformance with quality and other requirements for the SAC.
- Assessment of quality control checks to ensure recording is conducted appropriately (GoodsReceived Notes (GRN), Site Inspection Form (SIF) etc or other methods).
- Implementation of corrective actions where necessary. Liaise with BioAtlantis GMP+ Team on non-conformance issues should they arise;
- Utilisation of this knowledge in the preparation, scheduling and allocation of resources for harvesting;
- Assist in the implementation and training of personnel & contractors involved in hand harvesting activities in the Clew Bay area;
- Liaise with the BioAtlantis R&D Department regarding interpretation of data and on research and development related issues;
- Ensure customers have full traceability from point of harvest to the end product.

The quota for each island is a sustainable harvest of 20% of *A. nodosum.* The figure of 20% refers to the percentage of the total available *A. nodosum* biomass harvested per site per annum. If quota is exceeded, the Resource Manager will issue a Non-Conformance Report (NRC) to BioAtlantis management. Harvesters will be provided with training if necessary. Harvesting will not take place in areas with existing appurtenant rights/burdens in relation to seaweed, without first obtaining permission from the person towhom those rights belong. Where Profit-à-Prendre harvesting rights are successfully registered with the Property Registration Authority of Ireland (PRAI), the harvesting plans must be adjusted to ensure that those individuals can continue to harvest *A. nodosum*. If unlicensed large-scale commercial harvesting is observed to occur, this will be recorded and advice will be sought from the relevant authorities on how to proceed. The Resource Manager will routinely inspect sites post-harvest to ensure compliance of harvesters with sustainable hand harvest methods. Harvest will be recorded using BioAtlantis Compliance and Record Forms (see Addendum 4).

4. IDENTIFICATION OF ANNEX IV SPECIES

The area of Clew Bay is suitable habitat for a range of species that are protected under Annex IV of the Habitats Directive. Habitats Directive Annex IV species that could potentially occur in the study area are listed in Table 1 below.

Table 1 Annex IV Species potentially occurring in the study area.

Group	Species	Habitats Directive Annex (es)
Mammal	Otter *Lutra lutra*	Annex II, IV
Turtles	Leatherback Turtle *Dermochelys coriacea*	Annex II, IV
	Kemp's Ridley Turtle *Lepidochelys kempii*	Annex IV
	Loggerhead Turtle *Caretta caretta*	Annex IV
	Hawksbill Turtle *Eretmochelys imbricata*	Annex IV
Cetaceans	Harbour porpoise *Phocoena phocoena*	Annex II, IV
	Atlantic white-sided Dolphin *Lagenorhhynchus acutus*	Annex IV
	Bottlenose dolphin *Tursiops truncatus*	Annex II, IV
	Common dolphin *Delphinus delphis*	Annex IV
	Striped dolphin *Stenella coeruleoalba*	Annex IV
	White-beaked dolphin *Lagenorhynchus albirostris*	Annex IV
	Cuvier's beaked whale *Ziphius cavirostris*	Annex IV

4.1 Mammals

Otter are the only Annex IV mammal expected to be found in the study area. This species is listed under Annex II of the Habitats Directive as well, and designated as part of the Clew Bay Complex SAC. Otters are known to the area and the conservation objectives document for the Clew Bay Complex SAC show the commuting habitat for the species throughout the bay (NPWS, 2011). According to the online National Biodiversity Data Centre online maps, there are numerous records of Otter throughout Clew Bay, from 1980 to 2017.

4.2 Turtles

A total of 4 Annex IV species of Turtle are expected to occur in Ireland. These are the Leatherback turtle, Kemp's ridley turtle, Loggerhead turtle and the Hawksbill turtle. There is one record of a Leatherback turtle *Dermochelys coriacea* from Clew Bay in 2005. There are no records of the Kemp's ridley turtle *Lepidohchelys* in Clew Bay, but there are records immediately south from 1982. Similarly, there are no records of the Loggerhead Turtle *Caretta caretta* from Clew Bay, but there are records further west near the entrance to the bay, one from 1990 and one from 2008. There are no records of the Hawksbill turtle in the study area. This species is not commonly observed in Irish waters.

4.3 Cetaceans

According to the Irish Whale and Dolphin group records, the only cetacean recorded in the area is the Harbour porpoise *Phocoena phocoena*. However, according to the National Biodiversity online records, there are also records of Atlantic white-sided Dolphin *Lagenorhhynchus acutus* from 1998, Bottlenose dolphin *Tursiops truncatus* from 2020, Common dolphin *Delphinus delphis* from 2017, Striped dolphin *Stenella coeruleoalba* from 2019 and the White-beaked dolphin *Lagenorhynchus albirostris* from 2010.

Regarding whale species, there are records of Cuvier's beaked whale *Ziphius cavirostris* from 2015 within Clew bay.

5. SCREENING FOR IMPACTS ON ANNEX IV SPECIES

5.1 Direct Impacts

The proposal for sustainable hand harvesting in Clew Bay has the potential to result in disturbance impacts that may affect the Annex IV species present in Clew Bay. It is noted that the sustainable hand harvesting will take place within the intertidal zone of Clew Bay and the islands. Due to this, it is considered that Otter are the most likely to be affected, out of the Annex IV species present in Clew Bay as identified above in section 4. Otters are known to use the entire area of Clew Bay according to records, and will use the many islands (over 90) for commuting and rely closely on the shoreline. Bailey and Rochford (2006) note that Clew Bay supports good numbers of the species. Lough Furnace and the Burrishoole catchment area are noted to have significant importance for Otter populations In Clew Bay (NPWS, 2011). The increase in human disturbance caused by the proposal may result in significant impacts, although it is noted that the number of hand harvesters is relatively small in the context of the large bay. Regarding other Annex IV species and direct disturbance, it is considered less likely that hand harvesters would interact with habitats used by turtles or cetaceans during the harvesting in the intertidal zone, but disturbance may arise while commuting between sites. For turtles, records are not frequent or found throughout the entire bay and thus are not expected to be present in large numbers or all year round. Therefore this is not considered to be a high risk. For cetaceans, similarly, the Harbour porpoise and the Bottlenose dolphin appear to be the most commonly encountered. Again disturbance is likely to arise during commuting between sites, but this is unlikely to be significant in the context of the bay and the low numbers of harvesters.

5.2 Indirect Impacts

Indirect impacts on the Annex IV species present in Clew Bay primarily concern impacts to food sources. As the hand harvesting takes place within the intertidal zone, this is the habitat where many fish species reside, which are the food source for Otter, as well as cetaceans and some turtle species. If impacts on fish species, or molluscs, occur as a result of the hand harvesting this could create a knock on effect on Otters, cetaceans and turtles. In general, hand harvesting at sustainable levels has been found to not alter the species composition of the intertidal community, or fish species using the intertidal habitat, as long as it follows the sustainable practises (Kelly *et al*., 2001). Therefore no significant impacts regarding food sources is expected to arise.

5.3 Cumulative Impacts

Cumulative impacts on Annex IV species in Clew Bay, similar to direct impacts, primarily concerns disturbance. Disturbance impacts may arise through the sustainable hand harvesting of *A. nodosum* within Clew Bay due to the increase in human activity, and transportation between harvesting sites, as well as interactions between habitat types within the bay. These activities can act in-combination with existing plans and proposals within Clew Bay and result in significant effects. In general the existing background pressures within Clew Bay have been identified with regard to marine activities including aquaculture, fishing, tourism and leisure interests, along with a number of other stakeholders. BioAtlantis' proposal is designed to avoid interactions with existing pressures such as aquaculture, fishing, tourism and leisure interests, as well as to avoid sensitive sites and coastal habitats.

Furthermore, harvesting quantities and locations will be planned and recorded and sites will be inspected pre and post harvesting.

There is the potential for interactions with existing harvesting of *A. nodosum* in Clew Bay. It is noted that harvesting of *A. nodosum* in Clew Bay has been relatively low with approximately 500-900 dry weight tonnes (dwt) per annum between 2005 and 2011 (Guiry & Morrison, 2013). Levels have dropped further to less than 400 dwt per annum between 2009 and 2011, while Kilkieran have approached almost 4,000 dwt per annum since 2008. Regardless of this, BioAtlantis aim to harvest in a manner that is sustainable, which does not exceed 20% of the total biomass at any one site. This will be logged in a database of each site and is also noted to exclude any sensitive sites. Undertaking harvesting in this manner will ensure that interactions with other harvesting activities is minimal and each site will be assessed prior to harvesting. Mitigation measures are likely to be required however to ensure that interactions are minimized and interactions with existing marine based recreational activities is kept as low as possible.

6. CONCLUSION

The current Article 12 (Habitats Directive) Assessment screening of proposed hand harvesting of *A. nodosum* has assessed the possibility of effects on species listed under Annex IV of the Habitats Directive. Otters are protected under Annex II and Annex IV of the EU Habitats Directive and are found throughout Clew Bay, using the shorelines of the many islands. Leatherback turtle have been recorded in Clew Bay in 2005. Harbour porpoise, Bottlenose dolphin and Common dolphin have been frequently recorded in the Clew Bay area. As the proposed hand harvesting activities will take place within Clew Bay, there is the potential for direct, indirect and cumulative disturbance impacts to arise. There are multiple other activities taking place in the bay, from aquaculture to fishing and water sports, and the proposed hand harvesting may act in-combination with these existing activities. In general, the risk of impacts is considered significant regarding Otter populations, due to their range and strong presence in the bay. No significant impacts are considered likely to arise in relation to cetaceans or turtles, as the interactions are considered to be minimal and not significant. Therefore, it has been determined that an Annex IV species Impact Assessment is required in relation to Otters.

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