



License Application for Sustainable hand-harvesting of *Ascophyllum nodosum* at Clew Bay (SAC Site Code 1482). In accordance with National Parks & Wildlife Service conservation objectives for marine and coastal habitats and species, and the EU Habitats Directive 92/43/EEC.

Appendix 4:

Code of Practice for *A. nodosum* harvest activities in Clew Bay SAC.

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SECTION 1: Sustainable hand harvest of *A. nodosum*

1.1. Introduction

The following rules and best practice guidelines have been developed on the basis of findings from the peer reviewed literature, best scientific knowledge and previous surveys carried out in the Clew Bay Complex. See Section 3.3.5 of the main text document (BioAtlantis Foreshore Licence Application, 2014) for more details. The guidelines described here must be adhered to by all staff and harvesters supplying *A. nodosum* to BioAtlantis Ltd. and management within the company. The Code of Practice must be followed to ensure that the objectives for protecting the Clew Bay SAC are adhered to in an effective manner.

1.2 Securing the Code of Practice during the operation phase

- **Step 1: On-site survey & schedule** (Start date: Month 1. Duration: 1-2 weeks).

The first step in securing and implementing the hand harvesting system is to verify the accuracy of the production plan. This will involve time spent on the ground for approximately 1-2 weeks, to establish which sites have been harvested recently and which require a fallowing period in order to recover. A schedule will then be agreed between BioAtlantis and the harvesters to meet SAC and production requirements.

- **Step 2: Recruitment of personell** (Completed by end of month 1).

The majority of personnel will be in place by the end of month 1. In parallel with Step 1 above, hand harvesters will be hired. They will initially assist in establishing which sites have most recently been harvested. During this time, the harvesting system and plan will also be explained to harvesters. A Resource Manager and some of the staff/sub-contractors involved in transport will also be hired during this time.

- **Step 3: Training** (Start date: month 1. Duration: 3 months)

On completion of the on-site survey above, figures will be verified and revised accordingly. From here, training of harvesters will begin. This will initially involve theoretical training (1-2 days) to explain the system and requirements of the harvesters on the ground to ensure that the SAC is protected according to the Code of Practice. Training will be carried out by scientific personnel, biologists and engineers in BioAtlantis using detailed training material. Once theoretical training is complete, practical on-site training will take place. This will involve harvesters performing supervised hand harvest tasks according to the harvesting schedule. BioAtlantis staff will monitor and assess the technique employed by staff to verify that the correct technique is in use and that the correct steps are being taken. In the event that hand harvesters encounter any difficulties, BioAtlantis staff will provide further training. Staff will finally receive certification to confirm that they have recieved training and are verified in having a full understanding of the system.

- **Step 4: Verification of systems** (Start date: month 1. Duration 3 months)

During the initial 3 months of the operational phase, all software, communications, transport and quality system will be optimized and verified as being effective. This will ensure that systems are fully operational and in place when commercial harvesting begins.

- **Step 5: Full implementation** (Start date: month 4. Duration: lifetime of the licence)

Once staff are verified as having sufficient training and understanding of the system, commercial hand harvesting will begin in accordance with the schedule. This will be managed by the Resource Manager who will report directly to BioAtlantis management. A key requirement in implementing and securing a functioning system for sustainably hand harvesting of *A. nodosum*, are effective control measures, reporting and monitoring systems. These are set out in this 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 will be a strong and robust auditing system. BioAtlantis will conduct audits covering the items listed below:

(a) Quarterly Audit:

- Audit Part A: Records, Forms & Documents

Step 1: Forms: receipt of training & verification of understanding

Step 2: Completed Training Certs & Permits (obtained through training above.)

Step 3: Records, forms & documents (general)

- Audit Part B: Quality Assessment (documentation)

Step 1. GRNs (Clew Bay)

Step 2. Production Logsheets (Production Facilities)

Step 3. Incident Reports

Step 4. Non-conformance Reports

Step 5. Software Systems

(b) Annual Audit (on-site):

Step 1. Site Quality (inspection of harvested sites)

Step 2. Harvest methods (inspection of techniques)

Step 3. Collection vessel

A draft of the Clew Bay Audit form is attached as Appendix 8. Additionally, please see Tables 10, 11, 12 and 16 of the main text document for details on: control measures, Action Limits/non-conformance, Analytical Procedures, Monitoring Schedule, (Frequency), Corrective Actions and Verification. In addition, the harvesting system will be reviewed annually to assess and verify the control measures and determine areas in need of improvement.

1.3 The Code of Practice for harvesting *A. nodosum* sustainably.

Management

- BioAtlantis Management must ensure that continuous disturbance of each community type does not exceed an approximate area of 15%. This is recommended by NPWS to ensure adherence to the EU commissions' requirements. Working within this limit is critical to ensure compliance with the European Commission Article 17 reporting framework which considers disturbances of >25% of an area in an Annex I habitat to represent an unfavourable conservation status. The area affected by harvest activities/annum is provided in Table 1 below.
- BioAtlantis Management are responsible for all aspects of commercial harvesting.
- To prevent in combination effects from occurring, large-scale unlicensed harvesting will not be tolerated. BioAtlantis staff must document and record any incident of such activities.
- Depending on the severity, these issues will be reported to the Department of the Environment. This is to ensure compliance with the conservation objectives for the site, and to ensure adequate record keeping, monitoring of the resource and access to sensitive sites at particular times of the year.
- Permit low scale removal of <0.5 tonnes, for personal usage. This will be reviewed in the case of abuse.
- Any commercial user having small requirements of >0.5 tonnes per annum (e.g. hotels, health Spas), will be approached by BioAtlantis to discuss their requirements and assess whether there are potential in combination effects. Appropriate action will be taken on a case-by-case basis, to ensure that potential in combination effects are avoided.
- Any large-scale harvesting must be managed by BioAtlantis.

Table 1: list of marine habitat types in the Clew Bay SAC and the area affected by hand harvest activities

Marine community types (Clew Bay SAC)	Total Area in Clew Bay SAC (m ²)	Area affected by harvest activities/annum	
		(m ²)	(%)
Zostera Community	1,423,891	0	0.0%
Shingle	1,855,000	235,549	12.7%
Reef	26,870,000	1,331,699	4.9%
Maerl Dominated community	2,878,607	0	0.0%
Fine Sands Dominated by <i>Nephtys cirrosa</i> community	2,950,308	0	0.0%
Intertidal sandymud with <i>Tubificoides benedii</i> and <i>Pygospio elegans</i> community complex	7,817,100	0	0.0%
Mudflats & sandflats not covered by seawater at low tide	12,541,069	0	0.0%

Resource Database

Clew Bay has in excess of 90 islands and 100Km of coastline that contain harvestable quantities of *A. nodosum*. For the effective management of this area, BioAtlantis will create a database of the islands and coastal areas. This database is required to:

- Determine sites which require a fallowing period to allow for adequate recovery from recent activities.
- Determine rotation requirements (i.e. extrapolation and calculation of the duration or fallowing period required prior to a particular areas being fit for re-harvest).
- Prevent harvest activities that would lead to a decline in yield.
- Record the details of each harvest, how much, by whom & when.

Certificate to harvest

Harvesters cannot supply *A. nodosum* to BioAtlantis Ltd., unless they have been fully trained in methods which ensure *A. nodosum* recovery and regeneration post-harvest. Training will be provided by BioAtlantis Ltd., prior to harvesters gaining certification for engaging in hand harvest activities in Clew Bay.

Navigation to harvest sites

Harvesters must always follow pre-planned harvest schedules. Schedules will be provided by BioAtlantis in advance of harvest. This will ensure no entry into protected areas of the SAC at times which are inappropriate or damaging to species and habitats in the complex. Should any confusion arise, the Resource Manager should be contacted.

Equipment

Several key items should be in the harvesters boat in order to complete duties, both safely and effectively. Each harvester should ensure that the vessel is equipped with the following items before departure:

- An efficient marine outboard engine capable of manoeuvring the vessel safely ahead and astern, and steering the vessel at its maximum speed in the fully loaded condition within the limits of the intended area of operation;
- A suitable pair of oars and rowlocks;
- Adequate seating or thwarts for all persons on board;
- A suitable bailer;
- A suitable anchor with rope of length at least equal to four times the length of the boat;
- A permanently rigged suitable painter which shall not exceed the length of the boat and which may also be used as a tow rope;
- Two approved hand-held distress flares or a portable horn;
- A suitable boat hook;
- A suitable waterproof torch
- Carry an approved lifejacket or approved personal flotation device for each person the vessel is declared to carry and shall be worn at all times when on board
- Communication device(s),

- Navigation maps and Compass,

Harvesting equipment

- Sharp blade cutters.
- Measuring tape
- Binoculars (for assessing presence/absence of harbour seals or mudflats, sandflats or intertidal sandy mud areas in the vicinity of the harvest site).
- Harvest Nets
- Hi visibility Bouys

Harvest Records:

The 'Goods Received Note (GRN)' is a vital form and it must be completed by the Resource Manager prior to receiving goods. Without a completed GRN, harvested *A. nodosum* may not be accepted.

Accident and Incident Reporting:

Sites must be harvested in accordance to the in depth schedule. This ensures that all relevant sensitive sites (e.g. harbour seal and bird sites) are avoided. It also ensures that sensitive sandflats or intertidal sandy mud areas are avoided. However, all accidents, incidents and near misses must be recorded immediately and reported to the Resource Manager. The Resource Manager will record the details in the Incident Report Form (see Appendix 3). Incidents which should be reported include:

- Health and safety accidents or near misses
- Incidents relating to disturbance of seals during navigation (e.g. , e.g. flushing into the water)
- Incidents relating to disturbance or damage to any mudflat, sandflat, intertidal sandy mud fine sand areas during navigation.

Harvest of *A. nodosum*:

Once a site has been approved for harvest according to the schedule, harvest can take place. Harvest can only occur at sites which contain high density of *A. nodosum* and which have been approved by BioAtlantis Ltd. This will be determined initially by the Science and Engineering teams at BioAtlantis Ltd. However, on arrival, the harvesters must determine whether or not the site is suitable for harvest. This may be determined through use of binoculars from the boat but in most cases this will require direct landing, followed by visual inspection. Harvesters will receive training by BioAtlantis as to the criteria required in conducting the assessment. Several important details will be recorded during harvest and will cover the following areas:

- Date & time of harvest, site name and location within the site (i.e. northern shore, etc). This information is required for completing the GRN.
- When cutting *A. nodosum*, work to ensure that at least 200-300mm (8-12 inches) of material is left behind. Cutting less than 200mm above the holdfast is expressly

forbidden. This limit will be inspected by the Resource Manager as it is essential in order to:

- Avoid extensive removal of *A. nodosum* canopy coverage.
 - Avoid dormant or resting species positioned at the base of the *A. nodosum* canopy, e.g. periwinkles.
 - Prevent by-catch of benthic species.
 - Prevent by-catch of slow moving, sessile species and even some mobile species may not leave the rocky shoreline at low tide.
 - Avoid occurrence of overharvesting which could impact on the ecosystem in general, e.g. animals resident in the intertidal zone, coastal habitats, etc.
 - Avoid severe reductions in canopy coverage which could otherwise lead to changes in community structure or biodiversity stasis.
 - Ensure sufficient biomass coverage to allow free living forms of *L. Littorina* and other species settle and establish at the canopy base.
 - Avoid *A. nodosum* plants which contain periwinkle egg masses. This is important to prevent harvest of viable eggs.
- The holdfast of the *A. nodosum*, must be left fully intact and attached to the underlying rock, stone or growth substrate so as to allow for recovery and re-growth in subsequent years. Presence of holdfast will not be accepted by management. Levels exceeding >1% at harvest will represent a severe non-conformance. The Resource Manager will initially assess for evidence of holdfast content on the boat. The Production Manager will also perform spot checks on harvested seaweed for evidence of stones and holdfast as such contaminants may also damage production equipment. Non-conformances may be issued by the Production Manager, depending on the severity of the incident. This limit on holdfast content is essential in order to:
 - Prevent mortality of *A. nodosum*.
 - Prevent injury to *A. nodosum* holdfast.
 - Prevent severe removal of habitat for understory species
 - Avoid physical disturbance of dormant or resting species at the base of the canopy.
 - Avoid occurrence of overharvesting which could impact on the ecosystem in general.
 - Ensure that no other types of seaweed other than *A. nodosum* are harvested and/or placed into harvest nets. Inspections will be carried out at both the pick-up point in Clew Bay and also at production facilities in Kanturk, Co. Cork. The presence of these contaminants may result in potential non-payment, re-training or disciplinary action, depending on the severity of the non-conformance. In particular, harvesters must limit *Fucus* content of harvested *A. nodosum* to <1%, thus preventing removal of an additional canopy source which supports periwinkles, limpets and other species.
 - When cutting the weed and filling the harvest nets, ensure that there is absolutely no sand, shingle, pebbles, stones or *A. nodosum* holdfasts inadvertently included. As indicated above, penalties may be incurred due to such non-conformances.

- Harvest must be limited to 20% of the total available *A. nodosum* biomass per site per annum, in order to allow for sufficient regrowth. The limitation at 20% avoids overharvesting which could impact on the ecosystem in general, and reduces the removal of species such as hemiparasitic *Polysiphonia lanosa* (Linnaeus) Tandy, which commonly grows on *A. nodosum*.
- To reduce the potential for anthropogenic impacts (e.g. intensity of trampling) on the biotope, no more than 2-4 harvesters are permitted on small-medium sized sites. Medium to large islands may require between 4-6, while larger islands will likely require approximately 6-10 harvesters. The Resource Manager and scientific or engineering personnel may inspect sites for brief periods. Other personnel are not permitted. Low numbers of individual working along the foreshore in this way, will ensure that BioAtlantis work within the limit of 15% disturbance limit.
- Harvest must not take place in areas within 50m of sewage outfalls or other source of pollution. This will ensure that stressed *A. nodosum* growth is not exacerbated further by harvest activities.

Completion of harvest and subsequent pick-up:

The following must be recorded on the GRN. :

- Date:
- Harvester Name / No.:
- Pick-up location:
- Harvest Location
 - Site name
 - Region (i.e.. northern shore)

For a copy of the GRN, see Appendix 3 of BioAtlantis Foreshore Licence Application, 2014.

Quality Check:

Is seaweed free of the following:

- Sand, gravel, stones or debris
- *A. nodosum* holdfasts
- Other species (e.g. *Fucus*, <1% max.)

Assessment of harvest operations

Have harvesters worked to ensure:

1. Cutting of *A. nodosum* >200mm above holdfast
2. No more than 20% of the total available biomass per site per annum is harvested
3. Activities only take place at approved sites
4. Health and safety requirements are adhered to

By-catch:

- Seaweed must be harvested in nets with mesh space large enough to allow for Amphipods, isopods or other by-catch to escape. Typically, 2 hours will be available for animals to migrate out of the nets before transfer to the collection vessel.
- Inadvertent co-removal of periwinkles, amphipods, isopods or other Animalia identified on the collection vessel must be collected and returned to the water.

Harvest Quantity

Quantity of harvest (no. bags and weight per bag).

Time and data of harvest

BioAtlantis batch code

Inspection check (pass: Y/N)

Health and safety:

All necessary health and safety equipment must be maintained by harvesters. Adherence to health and safety practices will be checked by the Resource Manager and noted in the GRN.

Communicating with BioAtlantis:

BioAtlantis require harvesters to keep in regular contact and report their activities as required. In most cases reporting to BioAtlantis will be via the Resource Manager and GRN. However, harvest plans will be communicated regularly over the phone or via email or post to designated harvesters by the Resource Manager.

SECTION 2: Protection of the Harbour Seal, Birds & Otters

2.1 Introduction

It is well established that harbour seals are highly sensitive to human behaviour. Therefore, the key objective of the BioAtlantis Code of Practise for hand harvesting of *A. nodosum* is to ensure that “Disturbance events” do not occur. In addition, certain species of breeding and wintering birds can also be disturbed by human presence. Some bird species and otters may also be sensitive to alterations of food source and supply. Therefore, this Code of Practise will also work to ensure that behaviour and food supply to these protected species is also unaffected by harvest activities.

2.2 The Code of Practice

The following rules and guidelines have been developed based on findings from the published peer-reviewed literature, NPWS guidelines and recommendations from organizations such as the Hampshire & Isle of Wight Wildlife Trust (Anon 2013). Furthermore, harvesters will receive in depth training on seal behaviour and requirements of otters and birds by biologists, engineering and QC personnel at BioAtlantis Ltd., prior to being deemed qualified to engage in hand harvest activities in Clew Bay. The code of practise is explained as follows:

Seasons: Harbour seals are present throughout the year on both aquatic and terrestrial habitats of Clew Bay SAC, including intertidal shorelines. As such, equal emphasis will be placed on not disturbing the behaviour throughout the year. Important aspects of the annual life cycle includes:

- Breeding (May-July approx.)
- Moulting (August-September approx.)
- Outside the breeding and moulting seasons (i.e., from October-April, ‘resting sites’).
- In addition, several species of breeding and wintering birds must not be disturbed at established sites during sensitive times. Harvesters will operate on the basis of known locations of established breeding, moulting and resting sites of harbour seals (NPWS, 2011A) and breeding and wintering sites of known relevance to important bird species.

Data Recording: Harvest vessels will not be permitted to land at breeding or moulting sites between May-July and August-September respectively. Harvest location and pick-up points will be recorded on GRNs (see Appendix 3 of BioAtlantis Foreshore Licence Application, 2014). GRNs will be checked by quality personnel by means of regular audits to ensure compliance. Harvesters must report any incidence of seal disturbance to the Resource Manager who will record this on the Incident Report Form (Appendix 3). Similar measures are in place to ensure bird breeding and wintering sites are avoided at sensitive times of the year.

Locations and Sites: The location of each seal haul out site has been identified on the maps. In cases where haul out sites occur together in numbers, they may be distinguished and defined further by their geographical names or grouped together into single units. Bird wintering and breeding sites are also indicated.

Navigation: In order to minimise the effects of boats on the behaviour of seals in Clew Bay, best practice for boating activities will require that harvesters:

- Work in accordance with pre-planned schedules.
- Avoid stalling or slowing down unnecessarily en route to harvest locations or pick up points (pier, etc).

These measures will reduce the risk of being noticed by seals at haul out sites, not subject to harvest activities at a given time.

General Measures:

Sites which are not used by seals during breeding and moulting seasons may be accessed between May-September. Several of these sites lie in close proximity to breeding & moulting sites throughout the north of the complex. Harvest vessels must not enter within 100m of breeding and moulting sites during these sensitive times. Likewise, there are a number of established bird sites which cannot be entered at sensitive times of the year.

Site Specific measures:

➤ **Inisherkin:**

There are a number of breeding/moulting sites (e.g. Inishgowla, Inishnacross and Inishcooa) which lie in close proximity to resting sites at Inisherkin. Between October-April, seals will be resting at Inisherkin. Thus, harvest activities at nearby breeding/moulting sites could potentially impact on resting behaviour. To prevent effects on resting seals, the vessel will not be permitted within less than 100 meters of the resting sites at Inishskerkin.

➤ **Inishcull:**

There are several islands (Inishpult, Inishfeis and Freaghillaun-luggagh) and a number of small seal breeding sites surrounding the resting site at Inishcull. Between October to April navigation will not be permitted within 100 meters of Inishcull.

➤ **Inishturbid-Inishquirk:**

Between these two island lies an important resting site for harbour seals. Navigation between October to April will not be permitted within 100 meters of this resting site.

➤ **Additional sites:**

An important seal breeding site lies between Derrynish, Lanhoney, and Inishbarnagh. Access to the islands surrounding this breeding site will not be permitted within 100 meters during the breeding season. Several islands have been identified as important for sensitive breeding and wintering birds (pers. comm. NPWS). These are listed in Table 2, and similar to harbour seal sites, they will be avoided at sensitive times of the year.

➤ **Avoidance of sensitive locations:**

The Burrishoole Catchment area and mouth of Lough Furnace are out of bounds for harvesters, as are all fresh water habitats. This will ensure that otters are unaffected.

2.3 Working summary of the Code of Practice:

Harbour Seals

- Always follow pre-planned harvest schedules provided by BioAtlantis.
- Avoid stalling or slowing down unnecessarily en route to harvest locations or pick up points (pier, etc), as such actions will lead to alterations in nearby seal behaviour (flushing, etc). This is particularly relevant when operating within 100m of haul out sites.
- When navigating within 100m of haul out sites, a harvester should observe the sites from a distance using binoculars. If avoidance or disturbed behaviour is observed (e.g. rapid or frequent changes in direction away from the vessel), immediately increase distance between the vessel and the site if possible.
- Never approach seals in a 'bow on' manner. When in proximity to their sites approach from the side and maintain a constant speed.
- If a seal is observed in open water, slow down the vessel to less than 5knts or no-wake speed. To minimise disturbance, ensure that movements are steady and in parallel to the animal.
- In the event that a seal is encountered, ensure that an escape route is provided, avoid 'boxing-in' the animal or blocking narrow channels.

Harvest times (See table 2 for details)

- Seals are highly sensitive during moulting. Harvesting activities are prohibited at moulting sites between August-September, while permitted between October-July.
- Harvesting activities are prohibited at breeding sites between May-July, while permitted between August-April.
- Harvesting activities are prohibited at resting sites between October-April, while permitted between May-September.
- However, in cases where sites serve dual functions (e.g. breeding & moulting), avoidance times may be prolonged.
- In cases where sites serve triple functions of breeding, moulting & resting, these sites must be avoided all year around.
- During times in which a site is prohibited due to the presence of seals, navigation will not be permitted within 100 meters of these sites.
- In the event that seal disturbance is observed, the event must be reported in the Resource Manager, who will record the details in the Incident Report Form.
- Noise must be kept to a minimum, for example, avoid revving of engines or shouting.
- On rare occasions, seals can display curiosity towards humans. In the event that seals approach the vessel, maintain the course at constant speed or remain stationary. Do not approach the seal.
- In the rare event that a mother and her pup are encountered, leave the vicinity immediately and slowly.

- In the rare event that you encounter seals on a site not currently recognised as a seal haul-out site, leave the area promptly and quietly and report to the Resource Manager who will record the event in the Incident Report Form.

Birds (Breeding and Wintering)

- Always follow pre-planned harvest schedules provided by BioAtlantis.
- Harvesting activities are prohibited at a number of important breeding sites for certain periods during Spring/Summer (see table 2 for details).
- Harvest activities are prohibited at a number of wintering sites during certain periods of autumn/winter (see table 2 for details).
- Sites which are out of bounds are indicated in Table 2 below.
- To minimise disturbance of birds, ensure that all activities on islands are maintained within the intertidal *Ascophyllum nodosum* zone.

Otters

- Always follow pre-planned harvest schedules provided by BioAtlantis.
- Harvest areas are defined by BioAtlantis (see Table 2 below)
- Harvest activities are prohibited within the Burrishoole Catchment.
- Harvest activities are prohibited at the mouth of Lough Furnace.
- All freshwater areas are prohibited from harvest activities (e.g. east side of InishGowla South).
- To minimise disturbance of interaction with otters, ensure:
 - All activities are maintained within the intertidal *Ascophyllum nodosum* zone.
 - Never interfere with otter couching sites, holts or access paths/routes.

Preventing interactions with tourism & recreation:

Hand harvest activities must not take place at harbour seal and bird sites at sensitive times of the year, thus preventing any in combination effects with tourism and recreation marine based activities from occurring (e.g. Power Boat Trips, Sea Trampoline, Sit-On-Top Kayaking, Sea Kayaking, Dinghy Sailing, Stand Up Paddle Boarding, Keel Boat Sailing).

Island/site No.	Site Name	Harbour seals			Birds		Control measures	
		Breeding Site	Moulting Site	Resting Site	Breeding site	Wintering site	Avoidance	Attendance
3	Roslynagh	Yes					May to July	Aug to April
5	Inishdasky	Yes					May to July	Aug to April
7	Inishtubrid			Yes			Oct to April	May to Sept
13	Moynish More	Yes				Yes	Oct-July	Aug to Sept
14	Moynish Beg (L865938)				Yes		March to Sept	Oct to Feb
17	Inishilra	Yes					May to July	Aug to April
19	Roeillaun (L875930)				Yes		March to Sept	Oct to Feb
20	Inishdeashbeag	Yes	Yes	Yes			Avoid all year round	
20	Inishdeashmore	Yes	Yes				May to Sept	Oct to April
21	Inishcorky	Yes			Yes		March to Sept	Oct to Feb
22	Inishcarrick	Yes					May to July	Aug to April
24	Muckinish	Yes					May to July	Aug to April
25	Inishdaweel	Yes					May to July	Aug to April
27	Illanascrraw	Yes					May to July	Aug to April
28	Freaghillanluggagh	Yes					May to July	Aug to April
38	Inishcuill			Yes			Oct to April	May to Sept
39	Mauherillan (L920919)				Yes		March to Sept	Oct to Feb
50	Inishakillew		Yes				Aug, Sept	Oct to July
63	Forilan		Yes				Aug, Sept	Oct to July
62	Inishgowla South		Yes				Aug, Sept	Oct to July
62	Carrickwee	Yes	Yes				May to Sept	Oct to April
64	Carrickawart Island		Yes	Yes			Aug to April	May to July
66	Dorinish (L9086)				Yes		March to Sept	Oct to Feb
67	Inishimmel (L908857)				Yes		March to Sept	Oct to Feb
71	Inisheeny (L920845)					Yes	Oct to March	April to Sept

Island/site No.	Site Name	Harbour seals			Birds		Control measures	
		Breeding Site	Moulting Site	Resting Site	Breeding site	Wintering site	Avoidance	Attendance
72	Finnaun Island	Yes	Yes				May to Sept	Oct to April
73	Corillan		Yes				Aug, Sept	Oct to July
74	Carricknamore		Yes				Aug, Sept	Oct to July
75	Stony Island		Yes	Yes	Yes		Avoid all year round	
76	Green Islands	Yes	Yes	Yes	Yes		Avoid all year round	
Cz 2.6	Pigeon Pt. (L949850).					Yes	Oct to March	April to Sept
Cz 5.13	Rosturk (L869956),					Yes	Oct to March	April to Sept
Cz 5.17	Rosmurrevagh (L852958)					Yes	Oct to March	April to Sept
-	Mulranny Saltmarsh (L827963)					Yes	Outside of licence application area. No harvest will take place here.	
-	Carrowholly (L956850)					Yes	Oct to March	April to Sept
-	Bertraw (L903834).					Yes	Oct to March	April to Sept
-	Carrickwee (north east Clew Bay)	Yes					May to July	Aug to April
-	Burrishoole Channel						Avoid all year round to ensure no impact on catchment, connected lakes, fish and otters.	

Table 2: Sensitive ecological receptors within the study area and control measures implemented for mitigation.

SECTION 3: Environmentally safe navigation

Introduction:

The following rules and guidelines have been developed on the basis of NPWS objectives for ensuring protection of mudflat, sandflat, intertidal sandy mud, fine-sand and Atlantic Salt Meadow environs of Clew Bay. These guidelines must be adhered to by all harvesters supplying *A. nodosum* to BioAtlantis Ltd.

The Code of Practice for protecting mudflat, sandflat, intertidal sandy mud, fine-sand, Atlantic Salt Meadow, shingle and reef areas.

Harvesting *A. nodosum* along rocky shorelines located beyond mudflat, sandflat, intertidal sandy mud or fine-sand areas requires that work be done exclusively at high tide. Training will be provided to ensure that all harvesters are aware of their obligations towards protecting these areas and species residing within these habitats in the SAC. Important aspects to the code of practice is a follows:

- Advanced preparations will be necessary in advance of work in these locations. Always adhere to clearly defined harvesting schedules provided by BioAtlantis.
- It is essential not to enter into mudflat, sandflat, intertidal sandy mud or fine-sand areas during low tide. Entry into these areas at low tide will cause serious physical damage to these environs and the associated species. These areas will be indicated clearly in the maps provided.
- If mudflat, sandflat, intertidal sandy mud or fine-sand areas are entered into inadvertently, promptly leave and inform the Resource Manager of the incident who in turn, record the incident in the Incident Report Form.
- When approaching coastal areas in small boats, care must be taken in order to ensure that contact with reef or shingle is minimal. This will ensure that no damage is inflicted to either the vessel or reef or shingle habitat.
- In smaller boats, always approach the shore at slow pace so as to avoid intertidal reef (i.e. mixed substrate of pebbles and cobbles) or shingle. Along the western margin of Clew Bay there are small patches of subtidal boulders and cobbles which must be avoided.
- The harvest collection boat will be fitted with a depth sounder to ensure that contact with the reef is avoided. Hard substrate will be encountered between 2-14m and should be avoided. The sonar depth sounder must be in working order during all collection activities. This measure will ensure that displacement or disturbance of reef and species therein does not occur.
- In order to ensure that *A. nodosum* harvest does not negatively impact on the Atlantic Salt Meadow (ASM) habitat in general, *A. nodosum* must not be harvested at the fringes of these areas.

SECTION 4: Working in the vicinity of tourism and recreation facilities

Tourist and recreational activities have potential to cause anthropogenic disturbances and disturb sensitive harbour seals and protected bird species. To prevent hand harvesting from interacting with these activities, the following is required of hand harvesters:

- As a general policy, hand harvesters will avoid sites where tourism and recreation activities are observed to be taking place. This will be determined on a case-by-case basis.
- Hand harvesters must not work within 50m of bases where tourism and recreation-related equipment or vessels are manually introduced in the water (e.g. dingy's kayaks). This ensures that no in combination effects occur, such as exacerbation of anthropogenic disturbance which could give rise to localized reductions in density of intertidal seaweed and the associated biotope.
- Harvest can only occur on Collanmore island between Sept-April. This will prevent in combination effects such as exacerbation of anthropogenic disturbance which may occur during peak tourist season between May to August.
- Harvest will not occur at Mulranny.
- Hand harvesters will not work at Roman Island or Westport harbour between May and August. This prevents any in combination effects from occurring during peak season.

SECTION 5: Working in the vicinity of aquaculture sites

To ensure that hand harvest activities do not exacerbate any negative effects associated with aquaculture in Clew Bay, the following code of practice must be followed.

- Harvest activities cannot take place at breeding, resting or moulting sites during sensitive times of the year. This includes an island identified by the Marine Institute which may be potentially affected by aquaculture activities, namely, Inishcorky. Similar approaches must be taken with islands in close proximity to Inishcorky, namely Inishdeashmore, Inishdeasbeag, unnamed neighbouring island of Inishdeasbeag and Inishnacross (pg. 78, Marine Institute, 2014).
- The Code of Practice for environmentally safe navigation (section 3 above) must be followed to ensure no in combination effects which would damage mudflats and sandflats, i.e. areas where many aquaculture sites are located.

SECTION 6: Working in the vicinity of anglers

There are several sites of relevance to fisheries and sea angling in Clew Bay. Harvesters must work to ensure that angler's space is respected at all times.

SECTION 7: Other harvesting activities

BioAtlantis are responsible for all aspects of commercial harvesting, To assist in ensuring compliance with the conservation objectives for the site, the following is required of the Resource Manager:

- Any instance of large-scale unlicensed harvesting must be recorded as a non-conformance. The corrective action will be determined on a case by case basis, depending on the severity of the unlicensed activity.
- BioAtlantis will allow low scale removal of <0.5 tonnes, for personal usage only. This will be reviewed in the case of abuse.
- Any commercial user having small requirements of >0.5 tonnes per annum (e.g. hotels, health Spas), will be approached by BioAtlantis to discuss their requirements and assess whether there are potential in combination effects. Appropriate action will be taken on a case-by-case basis to ensure that potential in combination effects are avoided.
- All large scale harvesting must be managed by BioAtlantis.
- BioAtlantis will not harvest beyond Rossmurvagh, thus avoiding much of the Mulranny area. This avoids in combination effects which tourism/recreational excursions in the area, which may be focused on seaweed, e.g. "Seaweed harvesting discovery days".

SECTION 8: Preventing the spread of invasive species

To ensure that harvest activities do not act as a vector and lead to the spread of the invasive species, *Didemnum vexillum*, BioAtlantis will ensure the follows:

- The main collection vessel and harvester boats will be painted once a year with appropriate anti-fouling paint.
- The harvesters boats will not leave Clew Bay. In the rare case that they do leave Clew Bay, harvesters are required to implement a cleaning measure on land which will involve cleaning with sodium hypochlorite.
- All nets must be cleaned with sodium hypochlorite on delivery to production facilities and returned to harvesters in a clean condition.

REFERENCES

Anon (2013). Code of Conduct. Hampshire & Isle of Wight Wildlife Trust in partnership with Chichester Harbour Conservancy.
<http://www.conservancy.co.uk/assets/assets/Code%20of%20Conduct.pdf>.
Accessed 19/09/2013