

# THE HIGHLAND SEAWEED COMPANY PRE-APPLICATION CONSULTATION (PAC) REPORT JUNE 2020



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Public consultation presentation – April 14<sup>th</sup> 2020

Presentation used for meeting with Scottish natural heritage 7<sup>th</sup> April 2020

Formalised biosecurity policy and habitat regulation appraisal

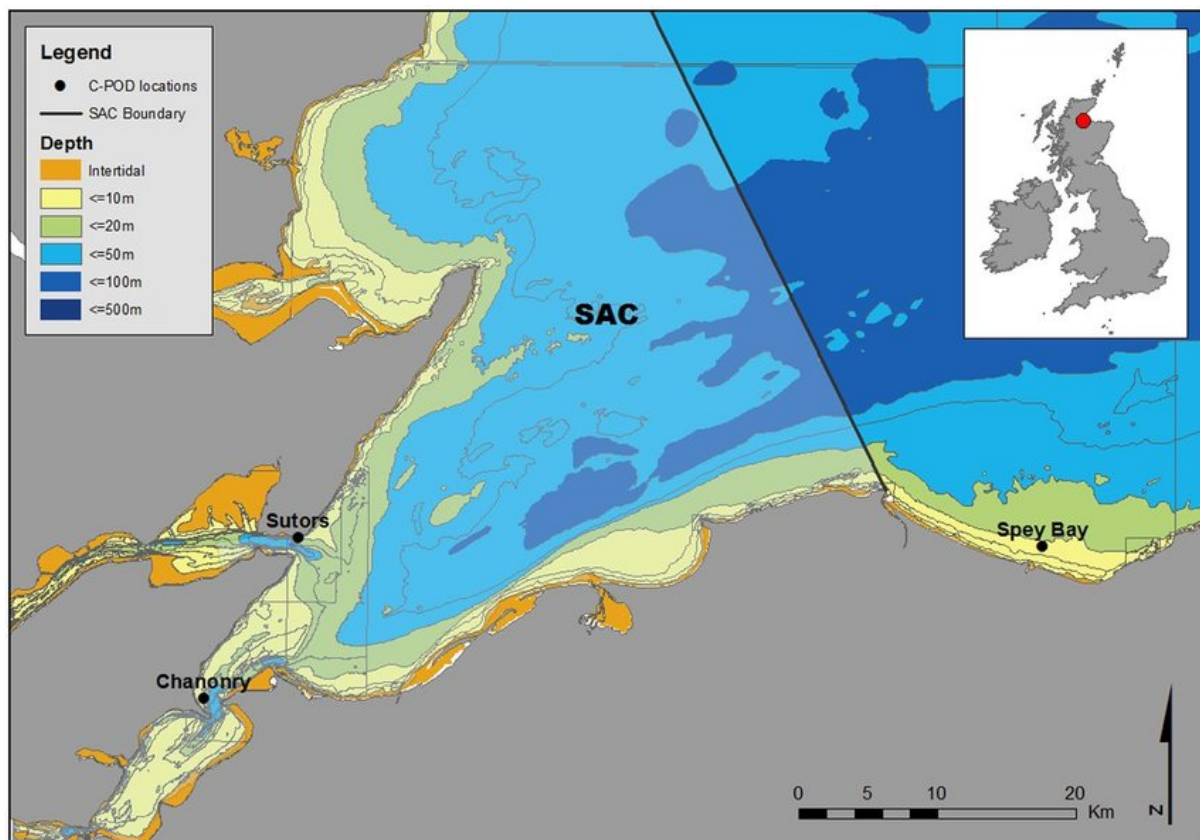
Contacts with stakeholders and feedback

# 1 Project Summary and Information

## 1.1 The Moray Firth

The Moray firth, situated in the North East of Scotland covers an area between Duncansby Head in the North, the Beauly Firth in the West and Fraserburgh in the East.

Within the Firth, lies a designated special area of conservation covering approximately 150,000 square hectares. This area is primarily to protect a number of species, including Bottlenose dolphins and migratory birds. The area is fished by trawlers and worked by creel fishermen as well as sailors and tourists.



## 1.2 Kelp farm project

Our aim is to establish a kelp farm in the Moray Firth. By using three nearby sites, we are able to attain market viability whilst simultaneously reducing our impact on any one location.

We have applied for three sites within the Moray Firth, which we will manage as one farm.

The sites at Culbin and Burghead Bay are approximately 1000x500m or 500,000 square meters, whilst the site at Covesea is smaller, at 500x250m or 125,000 square meters.

Each site is between -6-15m below Chart datum, on a sandy sea bed and selected to minimise disruption to any navigational paths.

We will deploy long lines of industry standard ropes, buoys and moorings at each site, which will provide the framework for the kelp farm. These will be deployed during the lighter summer months and can be added incrementally.

## 2 Consenting Procedures and Requirements

### 2.1 Marine Licence Under the Marine (Scotland) Act 2010

“Construction works (other than for a renewable energy structure) in or over the sea or on or under the seabed where the area of the works exceeds 1000 square metres.”

Our kelp farm sites exceed this size and therefore are subject to a PAC process.

Using this pre-application consultation and the applications themselves, we will provide:

- A plan sufficient to identify the area in which the activity is proposed to take place.
- A description of the nature and purpose of the marine licensable activity and of its possible effects on the environment.
- Any other information or representations that the applicant considers to be relevant.

## 2.2 Environmental Impact Assessment (EIA)

A careful environmental impact assessment has been undertaken and resulted in a presentation which was utilised both for discussions with SNH and also during the public consultation process.

The Moray Firth is of particular importance in Scottish conservation and an EIA was therefore carefully considered.

An EIA was completed using the format of a Habitat regulation appraisal, as recommended by Scottish natural heritage. This has been completed and shared with MS-LOT and SNH. Please see the full document in the appendices.

## 2.3 Marine Pre-Application Consultation (PAC)

The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013, prescribe the marine licensable activities that are subject to pre-application consultation and, in combination with the Marine (Scotland) Act 2010, set out the nature of the pre-application process. The legislation came into force on 1st January 2014 and applies to all relevant marine licence applications submitted to Marine Scotland's Licensing Operations Team (MSLOT) on or after 6 April 2014.

### 3 List of Stakeholders

The below relevant parties were contacted as part of the preapplication process. We have involved the below parties and sought input throughout the process.

- The Commissioners of Northern Lighthouses
- The Maritime and Coastguard Agency
- The Scottish Environment Protection Agency
- Scottish Natural Heritage
- Crown Estate
- Local residents/members of the public
- Local trawl and creel fishermen
- Other local users of the Moray firth, including the local press

### 4 Stakeholder Engagement Methodology

#### 4.1 Statutory Requirements met, media

A public notice was placed in the local newspaper with details of our meeting, where it was to be held, that it was wheelchair accessible and the location of information boards at 2 sites. The notice was placed at least 6 weeks prior to the consultation date, as outlined in the Marine Scotland guidance.

Furthermore, we contacted a number of agencies by email to inform them of our plans and of the public consultation date. Stakeholders contacted in this manner included SNH, MIRO, The Commissioners of Northern Lighthouses, The Maritime and Coastguard Agency, The Scottish Environment Protection Agency, Scottish Natural Heritage, The Crown Estate and North 58 – a local wildlife tourism company who operate on the Moray Firth.

### 5 Additional Stakeholder Engagement

## **5.1Public Notices**

A public notice was placed on 26<sup>th</sup> February 2020 in the Forres Gazette, which is widely read in the area. When it became apparent that lockdown due to the coronavirus pandemic would inhibit a public meeting, advice from MS-LOT was sought and it was agreed that the public consultation would be held online. A further notice of this was circulated in the local newspaper with open access. The meeting time and date was kept so that any member of the public who had planned to attend the meeting, would still be able to do so.

Location and scale of our proposed project, with maps indicating locations and area covered.

Details of when and where the meeting was to be held.

Information outlining the scope and intent of our project, with some introductory information about kelp farming.

## **5.2Direct Stakeholder Contact**

We have had a number of documented phone discussions and email contacts with a number of stakeholders, well over 6 weeks prior to the public consultation dates. These include phone and email discussions with the Crown estate aquaculture manager to indicate our plans and take advice. We have also had verbal discussion with the Scottish entanglement alliance regarding our plans. As outlined below, we have had extensive and very productive conversations and a meeting with Scottish natural heritage. Please see the appendices for further details.

## **6 The Pre-Application Consultation (PAC) Event**

### **6.1Key Points**

Protected areas – Discussion of and considerations of the Moray firth and the Special protection area.

Protected species – Discussion of key species, including Bottlenose dolphin, Minke whale, basking shark, overwintering seabirds, maerl beds and seagrass beds.

Kelp farm plans – The location and scale of our planned project, including detailed maps indicating our proposed sites. We discussed the materials we intended to use and the types of equipment configuration that we are likely to use, with diagrams to illustrate this. We also included photos of actual kelp farm sites in Scotland, to demonstrate the potential visual impact.

Kelp farm activities – We detailed “A year on a kelp farm” to indicate the types of activities and timings of these.

Habitat regulations appraisal – In response to the meeting held with SNH, a detailed HRA assessment was completed and added to the appendices in the form of a powerpoint presentation, to set out the information in a user friendly format. We have summarised this in a table. We have also completed a biosecurity policy, added to the appendices. We have appended the full biosecurity policy and HRA below.

## **6.2 Summary of Event Display Materials**

For 7 weeks prior to the public consultation, notice boards at 2 locations were presented. These summarised our plans and gave details of when and where the public consultation would be held. It also included maps and diagrams demonstrating our proposed sites, the configuration of the equipment and a photo of an existing kelp farm in the Moray firth.

## **6.3 Summary of Stakeholder Feedback**



The Zoom presentation that we gave for the public consultation was well received by attendees. The written feedback from our public consultation is included in the appendices. Some attendees of the meeting gave written feedback via email. This was generally positive, with no concerns raised about our plans.

An initial public consultation, held in April 2019 at the Burghead harbourmaster's office, was well attended by local fishermen. The main concern raised at that point was regarding impeding access to fishing grounds for trawlers and creel fishermen.

## 6.4 Consideration of Stakeholder Feedback

### - Site placement:

In light of the concerns raised by local fishermen regarding access to fishing grounds, we have adapted our site locations, scale and depth. Early on, we adapted our plans to cover 3 smaller sites rather than one large one. This would enable us to reduce any potential environmental, visual or other impact at any one site.

We had previously proposed that our sites lay in deeper waters but the concern raised by trawl fishermen was that this would potentially impede access to fishing grounds. We have therefore moved our sites to be more out of the way. These sites were selected with the direct input from local fishermen.

At Cove sea, we brought our site inshore to be in the lee of a rock reef that trawl fishermen already avoid. We also reduced the size of the site to enable the local creel fishermen more access to the more inshore waters where they drop creels regularly. The site is on a sandy seabed and therefore not used by the creel fishermen, who favour the rocky areas and kelp beds further inshore.

The site at Burghead was brought into shallower waters and is in the lee of a shipwreck that is avoided by trawl fishermen. This area is not used by creel fishermen due to the sandy bottom.

The site at Culbin has also been moved slightly, to avoid entry to the tidal estuary at the Gut – a site within Culbin forest that is important to local wildlife. We have aimed to keep this site as far off-shore as possible, given the constraints, to reduce any disturbance of seal haul out sites and reduce any potential attenuation of wave energy that could alter coastal erosion patterns – something SNH are keen to avoid.

Environmental impact: In light of the feedback regarding environmental protection from SNH, we have completed an environmental impact assessment as per the guidance laid out in the Moray Firth Habitats regulations appraisal, using the help and advice document as per SHN advice. This has been set out in a presentation used for a Zoom meeting with SNH on Monday 6<sup>th</sup> April 2020 with additional information added and shared with SNH via email. This correspondence has been added to the appendices. We have compiled an outline of our environmental mitigation strategies in the form of a summary table:

### **Information provided prior to the public consultation:**

Information regarding the public consultation and our proposed projects were placed at 2 sites with easy public access. These were placed over 6 weeks prior to the public consultation being held and notice of where these could be found was included in a press notice.

## Public consultations:

As part of the PAC process, we held an online open meeting via the Zoom platform on 14<sup>th</sup> April 2020. This modality was selected due to lockdown conditions that made our original plan of meeting in person, impossible. Notice of the meeting and the change to an online format was publicised in the local press, with the knowledge and agreement of Marine licencing Scotland. The meeting was well attended by a number of local interested parties and I have included some of the correspondence in the appendices. I have emailed the full presentation to Marine licencing Scotland.

A separate meeting was held in Burghead harbourmaster's office in May 2019 to engage the local community. At this meeting, we met several local fishermen, sailors and local residents. From this meeting we were able to refine our plans with regards to kelp farm placement, to minimise our impact for other water users and industries by altering our locations.

The presentation used for the public consultation has been included in the appendixes below

## Agency meetings:

On 7<sup>th</sup> April 2020 we held a zoom meeting with a local representative from Scottish natural heritage. In this meeting, we discussed in detail our plans for a Kelp farm. We discussed the size and scope of our plans, the individual sites we have proposed. We also discussed the potential environmental impact, both positive and negative and our plans to mitigate any negative impacts. The Scottish Natural Heritage “Habitats Regulations Appraisal (HRA) on the Moray Firth A Guide for developers and regulators” was referenced during the process. I have emailed the full presentation to Marine licencing Scotland.

Subsequent specialist feedback was sought by SNH from a colleague with a background in environmental protection and ornithology. Individual emails and responses have been forwarded to Marine licencing Scotland.

### **Key areas discussed:**

The Moray firth SPA and it’s implications for seaweed farming.

Protected species – Bottlenose dolphins, cetaceans, overwintering birds, maerl beds, eelgrass, seals, basking sharks

Seaweed farm location, scale, configuration, materials and equipment used and activities both on and off the water. Maps and diagrams were included

Environmental impact considerations – Habitat regulation appraisal, including:

Disturbance, potential impact, and mitigation strategies

Displacement, potential impact, and mitigation strategies

Entanglement, potential impact, and mitigation strategies

Erosion, potential impact, and mitigation strategies

Biosecurity, potential impact, and mitigation strategies

See the appendices for the full presentation and correspondence

## **7 Reporting and Recording**

7.1 Data Collection – Email correspondence has been compiled in the appendices with all updates and correspondence forwarded to MS-LOT throughout this process. Formal feedback has been compiled and included in the appendices. Note has been made where specific resources were used. These include:

- The Scottish natural heritage Habitat regulation appraisal guidance
- Marine Scotland Guidance on Marine Licensable Activities subject to Pre-Application Consultation

These two documents outline the legal and environmental considerations of an aquaculture project such as this.

### **7.3 Recording Feedback**

Feedback has been recorded in the form of email responses from the public consultation and from other relevant stakeholders as previously outlined. These have been included in the appendices.

## **8 Post Application**

### **8.1 Ongoing Engagement**

Our biosecurity policy and summarised HRA will be shared with SNH and MS-LOT.

### **8.2 Ongoing Project Contact**

We have established a working relationship with a local creel fishing enterprise who have provided detailed advice on site location and deployment and enabled us to undertake site assessments from the water. We continue to work closely with them. Photos from our proposed sites have been taken and included in the applications.

We have had a formal meeting with the Highlands and Islands enterprise initiative, who have provided advice and are supportive of our project.

We have completed a habitat regulations appraisal and biosecurity policy and shared these with SNH and MS- LOT and are appended below.

The local SNH branch has suggested a meeting between SNH, MS- LOT, the Crown estate, and the Highland seaweed company. This is something we are open to and I have invited them to arrange this, if they wish.

## Appendices

### Information prior to public consultation

#### PUBLIC CONSULTATION ON PROPOSED SUSTAINABLE KELP FARM IN THE MORAY FIRTH



### Where, when?

Meeting at the **Hive enterprise hub**, the park, Findhorn, IV36 3SH at 18:00 on Tuesday 14/04/2020.

### Background:

We would be pleased to welcome you to a public consultation to discuss the establishing of the first sustainable kelp farm on the Moray Firth. We are presenting our plans for a pilot project of a regenerative ocean farm.

Kelp is a seaweed also known as a macroalgae and is fast becoming the most discussed sustainable resource since bamboo. It is grown sustainably on ropes, thus avoiding the damaging trawling practices that large companies are lobbying the Scottish government for. Our methods can provide an environmentally friendly alternative.

#### Supporting the local economy:

We are collaborating with local fishermen, marine biologists and businesses and will be offering future local employment both on the water and off. This can provide additional employment to fishermen, and other local workers along our coast. We want to make sure that the local economy benefits from this project.

#### Benefits of kelp:

One of the fastest forms of biomass grown today. Kelp can grow more quickly than bamboo or wood.

No fertilisers, irrigation or pesticides needed. This is a truly sustainable harvest

Suited to the area – Kelp beds grow extensively on the Moray coast and underpin the creel fishing industry as crabs, lobsters and squat lobsters live in the kelp.

Kelp is a keystone species – It supports many other forms of life in the firth including crustaceans, schooling fish and predators such as seals, sea birds, porpoises and dolphins.

Kelp farms shelter schooling fish which can help improve fish stocks in the local area. Kelp is also known to absorb nitrogen run off from farming methods and thus improve water quality.

#### The threat from corporate lobbying:



In 2019, the Scottish government narrowly voted to protect the native kelp beds of Scotland from dredging. Dredging is used extensively in countries such as Norway and can decimate local ecosystems. Kelp farming offers an alternative way to access this precious resource without harming the surrounding environment.

### The future of farming:

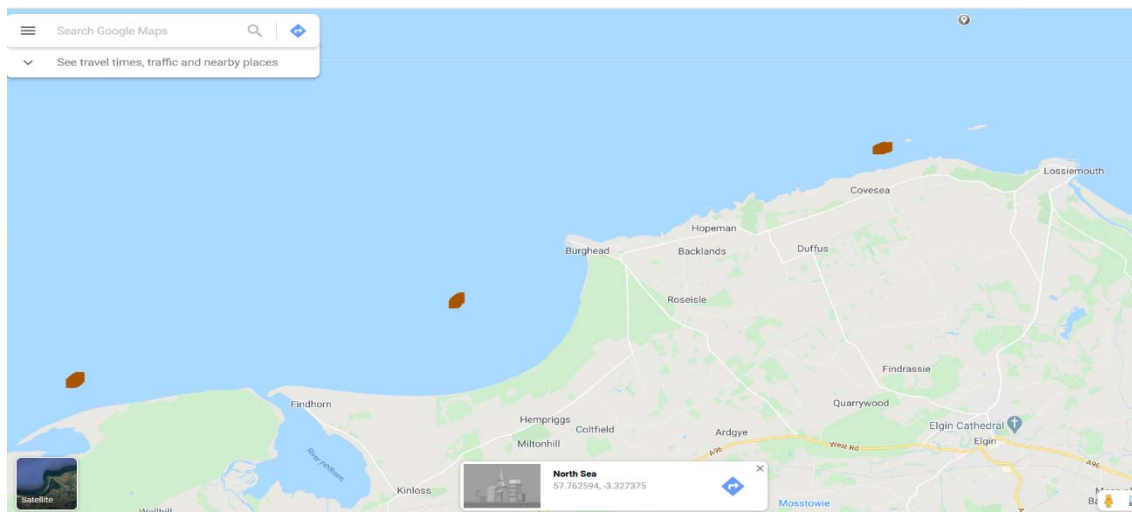
Regenerative ocean farming is tipped to become a key area for sustainable protein and biomass sources and thus food security over the next few decades. We want Moray to be a part of this. Initially we will be creating an edible offering from the harvest, but there is potential for many other applications in the future.



### Possible sites:

we are proposing 3 pilot sites in the firth, as marked below. The visual impact of a kelp farm is very low, all that is visible from the surface is a series of buoys similar to those used by creel fishermen locally.





Information provided at the public consultation April 14<sup>th</sup> 2020:



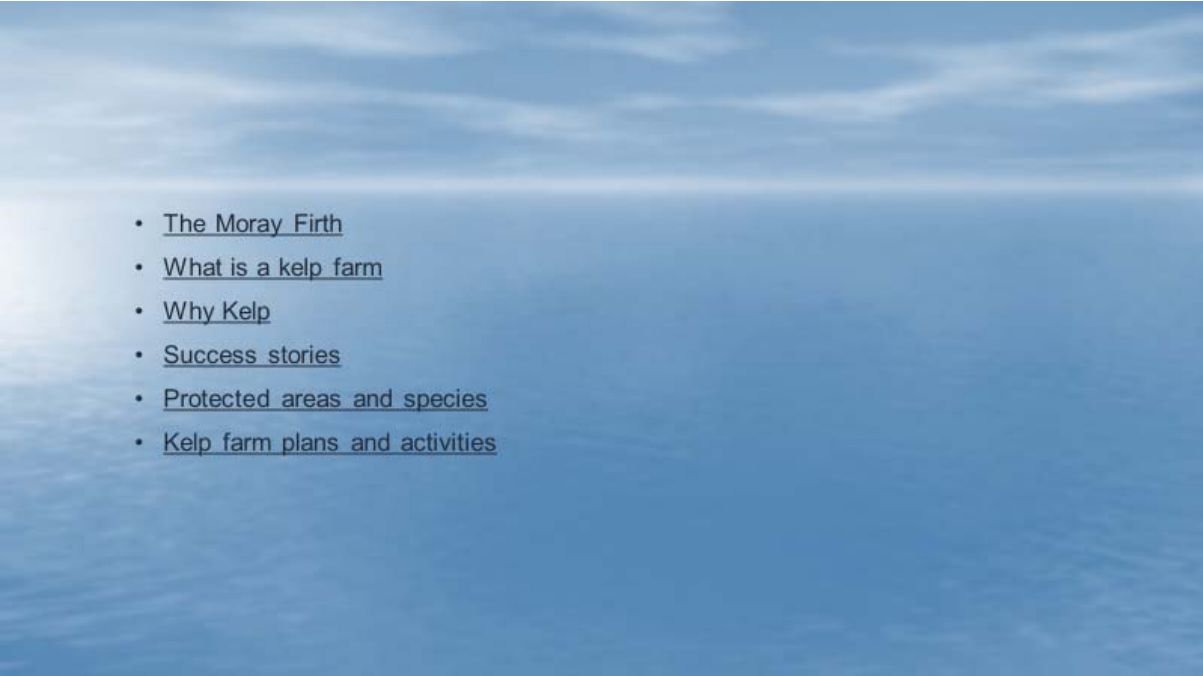


## KELP FARM PROPOSAL - THE HIGHLAND SEAWEED CO.

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Moray firth Kelp farm proposal

April 2020

- 
- [The Moray Firth](#)
  - [What is a kelp farm](#)
  - [Why Kelp](#)
  - [Success stories](#)
  - [Protected areas and species](#)
  - [Kelp farm plans and activities](#)

## MORAY FIRTH

**Largest firth in Scotland – Duncansby head, Fraserburgh, Beaul**  
**500 miles of coastline (6)**

**Special area of consevation** 150,000-hectare important for bottlenose dolphins.

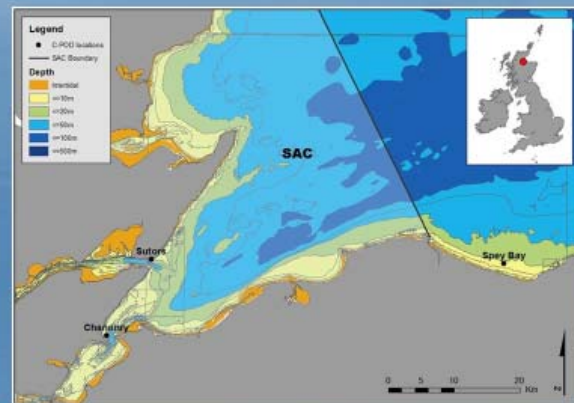
**Bottlenose dolphin, harbour porpoise and Minke whale.**

**Creels, fishing, dredging, salmon, squid, prawns, scallops, Sailing, Rowing Clubs, Sea Kayaking, Surfing, Kiteboarding, Diving, Freight, Oil fields, Wind farm, Military**



## THE MORAY FIRTH

- Moray Firth Special Area of Conservation (SAC)
- Moray Firth proposed Special Protection Area (pSPA) Moray and Nairn Coast Ramsar site and Culbin Sands



## WHY KELP?

- **Organic, Fast growing, biomass**
  - Seaweeds use inorganic nutrients and carbon dioxide to rapidly synthesize biomass.
- **Better than land based crops**
  - Many species can do so more efficiently than land-based crops, so generating larger equivalent yields and biomass than the latter.
  - Seaweeds do not compete with food crops for land, freshwater or other resources.
- **Improve water quality**
  - Seaweeds create cleaner seas by absorbing inorganic wastes from seawater such as ammonia and nitrates.
- **Low maintainance**
  - Once deployed at sea, seaweeds need relatively low maintenance and require little manual labour compared with many terrestrial crops. (3)
- **No fertilisers or pesticides**

## KELP FARMING



Buoys, ropes, lines, anchors  
Cultivate in Autumn, Grow in winter, Harvest in Spring  
Managed with workboat, RIB  
No/low pollution, no fertiliser, no pesticides  
Designated sites  
Space to collaborate

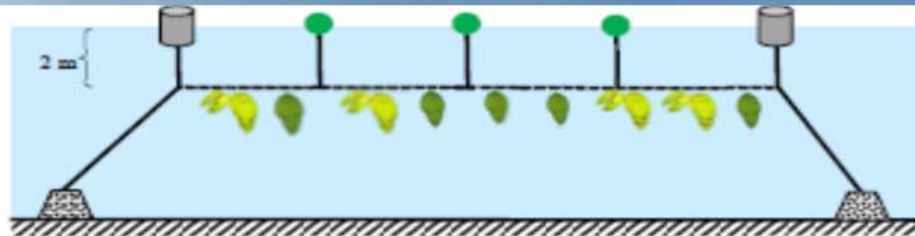


Fig. 14. NAFC Marine Centre's seaweed site (2 x 80m longlines) at Lea of Trondra, Shetland.



## SUCCESS STORIES



**Small community business**  
**Supporting local fishermen**  
**Culinary products**  
**Harvest year round**



## SUCCESS STORIES



**SPRINGTIDE**  
**SEAWEED**

**The largest organic seaweed farm in USA**  
**Based in Maine**  
**Seaweed farm network**  
**Products**  
**Seaweed farmer support**



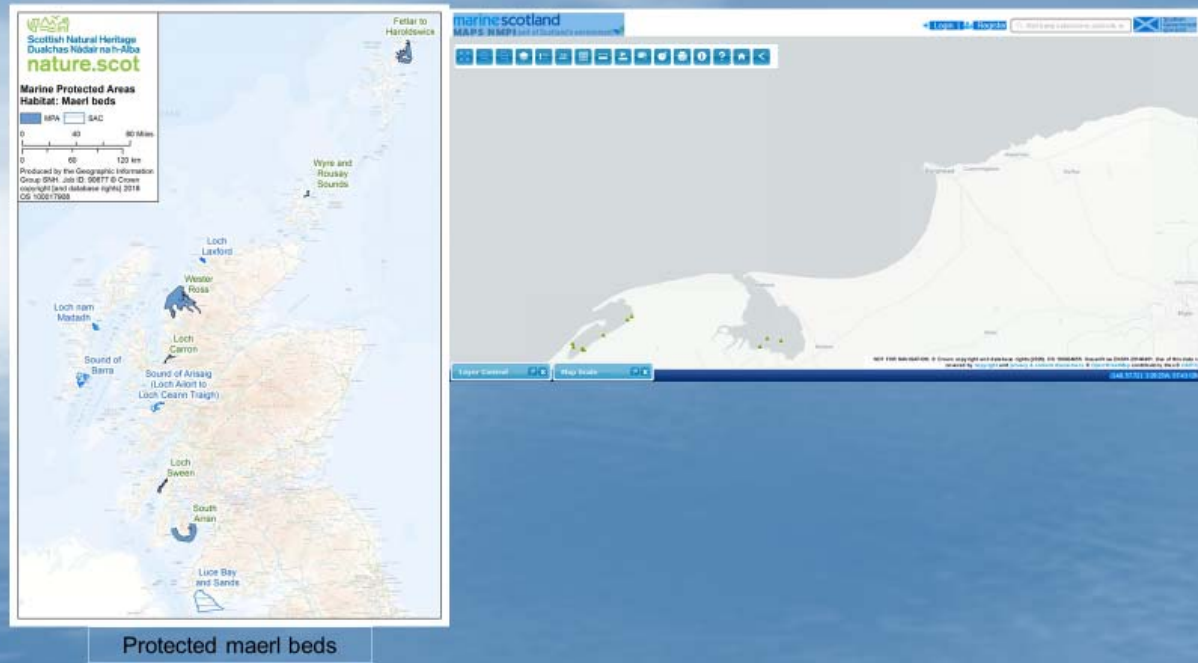
## EMPLOYMENT

- Secondary income for fishermen
- Cooperative model
- Support of HIE
- Teams
- Multiple roles available – Boat work, IT, admin, product development, finance, Marine biology.
- Collaborate with Universities
- Growth of the industry

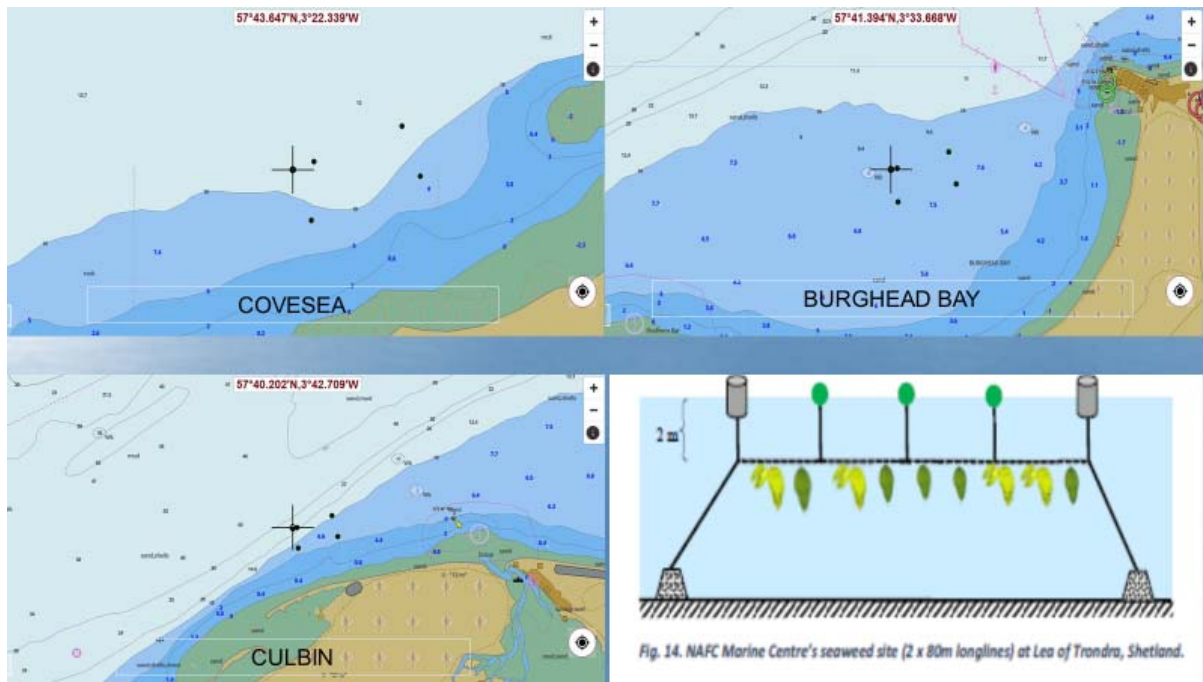
## ENVIRONMENTAL IMPACT

- Avoid kelp dredging
- We are for a sustainable solution
- Organic
- Kelps are keystone species (1, 3)
- Provides habitat and shelter (2)
- Bioremediation (2)
- Carbon sequestration (3)
- Cetaceans – Scottish entanglement alliance (4)
- Noise and pollution – low maintenance
- Biosecurity conscious

- **Annex II species that are a primary reason for selection of this site.** The Moray Firth in north-east Scotland supports the only known resident population of **bottlenose dolphin *Tursiops truncatus*** in the North Sea. The population is estimated to be around 130 individuals (Wilson *et al.* 1999). Dolphins are present all year round. JNCC (1). **The configuration of the kelp farm is designed to avoid entanglement by cetaceans. Our plans have been discussed with Scottish entanglement alliance, no concerns were raised.**
- The Moray Firth attracts the largest British (GB) wintering populations of long-tailed duck, velvet scoter and shag; the third largest population of scaup; and the largest Scottish wintering populations of common scoter and goldeneye. (2) **We will have minimal water based activity during the Winter months.**
- Bathelmic species – Food sources for wildlife. **No dredging will take place in kelp farm areas, thereby having a protective effect on these species.**
- Maerl beds, sea grass - Eelgrass beds grow in shallow coastal areas on sheltered sandy or muddy seabeds, or with maerl from areas exposed at low tides to depths of about 10m (3). **Our activities are primarily 10-15m depth. Fixed moorings cause minimal disturbance to the sea bed. "The Ecological Status of subtidal benthic communities within a commercial kelp farm on the southwest coast of Ireland was not impacted by macroalgal cultivation"** Additionally, there was no effect on the biomass of *Zostera marina*.







## KELP FARM ACTIVITIES

- Land based activities – Sampling and cultivating kelp. Sampling discussed with Marine licencing Scotland. Does not require a licence but The Highland Seaweed co. will do this in an environmentally sensitive way, using sustainable methods. Sampling from local sources only to protect biosecurity and avoid introducing invasive or non-native species.
- Water based activities – Operating in 10-15m water. Moorings placed during the summer and Autumn months, avoiding work in the Winter. Movable anchors which remain in place long term but can be retrieved. No dredging of the sea bed. Putting out seed lines – Autumn. September/October. Checking lines – Visual checks from the land. Use of GPS markers. Once every 4 weeks from the water under normal circumstances (may need to check for storm damage). Harvesting – May-June.



Information provided at the SNH consultation 7<sup>th</sup> April 2020:

## PROTECTED SPECIES

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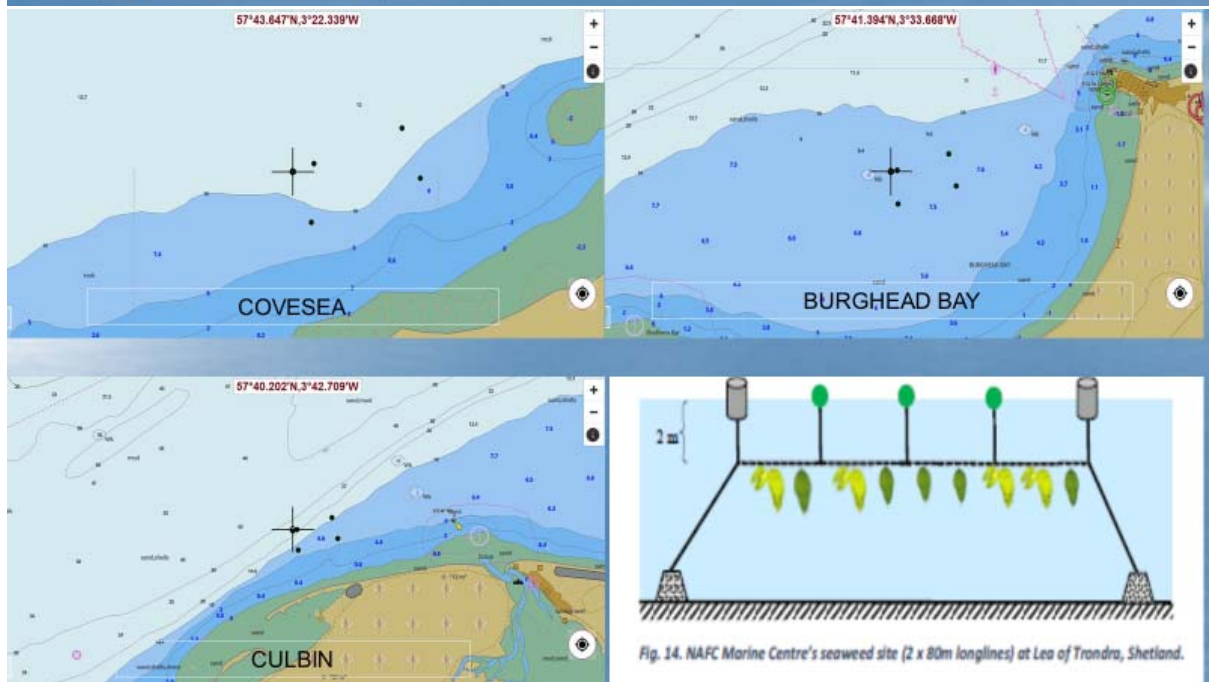
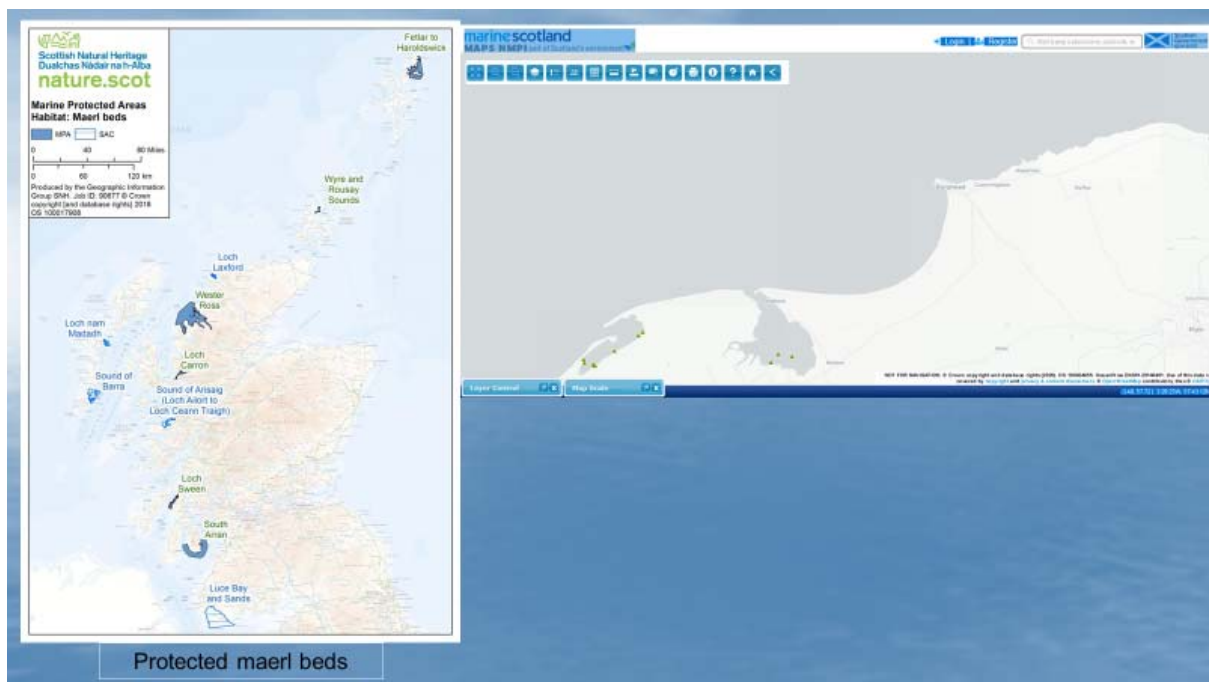
## TITLE AND CONTENT LAYOUT WITH LIST

- Protected areas
  - Protected species
    - Kelp farm plans
      - Kelp farm activities

- Moray Firth Special Area of Conservation (SAC)
- Moray Firth proposed Special Protection Area (pSPA) Moray and Nairn Coast Ramsar site and Culbin Sands



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## KELP FARM ACTIVITIES

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1) Protected areas - Entanglement of bottlenose dolphins and other protected species - The equipment we will use will be of a low risk for entanglement to all sea species as no nets are employed at any point in our projects and our lines are static, running in parallel with rather than perpendicular to the currents and shore. The ropes used will be akin to what is already widely used along our coast for lobster creels. We will perform regular visual checks to ensure that no creature has become entangled. I discussed this particular topic with advisers from both the Scottish entanglement alliance and SAMS. They raised no concerns about our proposed deployment.

2) Maerl/seagrass beds - Our sites will generally be in waters deeper than where seagrass is generally found. Following the research in this area, there appears to be little or no negative impact on benthic species. In fact, the establishment of a kelp farm site could potentially protect that area from the affects of commercial dredging, which are well known to damage benthic communities.

I have included the abstract from a study from the National University of Ireland specifically looking at the impact of a kelp farm on benthic species, which I am happy to share with you.

**"The Ecological Status of subtidal benthic communities within a commercial kelp farm on the southwest coast of Ireland was not impacted by macroalgal cultivation. Additionally, there was no effect on the biomass of *Zostera marina*, a key habitat under the EU Habitats Directive and OSPAR Commission. Sediment grain size and total organic matter (TOM) were influenced by abiotic and biotic aspects of the farm. A temporal effect on univariate and multivariate species data, Infaunal Quality Index (IQI) and *Z. marina* biomass was observed. This effect was likely a community response to high storm disturbance in winter 2013/14. The use of IQI to assess the impact of macroalgal cultivation on benthic communities is a novel approach. This study supports a view that environmental impacts of macroalgal cultivation are relatively benign compared to other forms of aquaculture."**

- 3) Boat disturbance - Our activities do not involve large amounts of work in the Firth. Much of the actual work of the farm takes place on shore. In the Autumn, young seaweed is planted out on ropes which can largely be performed with the boat engine off. The same is true of harvest time in the summer when we harvest. During the growing season, samples from the sites and an in depth look at the equipment are only required every 2 weeks. We will perform more regular visual checks to ensure equipment is in order using a smaller craft and would only require a few minutes. Our impact on wintering wildfowl, seals and cetaceans should therefore be minimal and significantly less than that of other commercial activities in the Firth. I specifically raised the question of entanglement of species such as dolphins, minke whale and basking shark with kelp farm lines in discussions with SAMS and this is not known to be a problem. Again, out lines are static and no nets are involved.
- 
- 4) Biosecurity - This is of the utmost importance to us as prospective farmers and stewards of the local ecosystem. Kelp as you may be aware releases spores to reproduce. Each kelp plant releases millions of spores, meaning that only a tiny amount of material needs to be collected and leaves the rest of the plant unharmed to continue growing. We will only source spores from the local ecosystem to avoid introducing invasive or foreign species. Going forward, we will be able to source spores from our own harvest also.
- 
- 5) Erosion - Research is being performed to look at whether seaweed farms can be used to mitigate coastal erosion. Given our site selection, this would be less relevant at Cove Sea where there is rocky coastline and at Burghead bay, given the breadth of the bay compared to the size of our operation. Our sites will represent only a tiny fraction of the Moray coast. If you are performing research on coastal erosion locally, we would be very interested in collaborating to look at the potentially positive impact of kelp farming - I am aware that there has been significant erosion at Culbin. As our sites are based in 10-15m of water and 1000m offshore at Culbin, it may be that the buffering effects are minimal. It would have no direct impact on land based, wind driven, shifting DUNES.

As well as the presentation below, detailed plans regarding our project were discussed, including the locations of our sites, the size and scale of our intended operations. Our activities that have a bearing on the environment, including site selection, scale, farm configuration and materials used, deployment methods. We also discussed in some detail the activities of a seaweed farm. We looked at the potential impact of or activities in detail on local marine ecosystems. Agreed actions, as a result of this meeting, were that the Highland Seaweed Company would:

Produce a biosecurity policy and

Produce a table of mitigation strategies, which have been appended below. I have also included additional slides which were shared with SNH as further correspondence.

## HABITAT REGULATIONS APPRAISAL

- Habitat regulation appraisal requires specific aspects of potential impact are considered. Extensive reference has been made to the HRA Moray firth guidance. The two chief steps are listed below:
- 1) The HRA process, up to and including appropriate assessment. Is the proposal directly connected with, or necessary to, Natura site management for nature conservation? Yes Is the proposal (either alone or in-combination) likely to have a significant effect (LSE) on a Natura site?
- Applying mitigation; can the proposal be altered to avoid the LSE?
- "There is no standard format for HRA evidence. The exact type of information required varies case by case" We have assessed the potential environmental impact of our project in some detail and have embedded the HRA within this presentation. Below we have outlined considerations of some specific areas.



# HABITAT REGULATION APPRAISAL

1) Protected areas - Entanglement of bottlenose dolphins and other protected species - The equipment we will use will be of a low risk for entanglement to all sea species as no nets are employed at any point in our projects and our lines are static, running in parallel with rather than perpendicular to the currents and shore. The ropes used will be akin to what is already widely used along our coast for lobster creels. We will perform regular visual checks to ensure that no creature has become entangled. I discussed this particular topic with advisers from both the Scottish entanglement alliance and SAMS. They raised no concerns about our proposed deployment.

# HABITAT REGULATION APPRAISAL

- 2) Maerl/seagrass beds - Our sites will generally be in waters deeper than where seagrass is generally found. Following the research in this area, there appears to be little or no negative impact on benthic species. In fact, the establishment of a kelp farm site could potentially protect that area from the affects of commercial dredging, which are well known to damage benthic communities.
- I have included the abstract from a study from the National University of Ireland specifically looking at the impact of a kelp farm on benthic species:
- **"The Ecological Status of subtidal benthic communities within a commercial kelp farm on the southwest coast of Ireland was not impacted by macroalgal cultivation.** Additionally, there was no effect on the biomass of *Zostera marina*, a key habitat under the EU Habitats Directive and OSPAR Commission. Sediment grain size and total organic matter (TOM) were influenced by abiotic and biotic aspects of the farm. A temporal effect on univariate and multivariate species data, Infaunal Quality Index (IQI) and *Z. marina* biomass was observed. This effect was likely a community response to high storm disturbance in winter 2013/14. The use of IQI to assess the impact of macroalgal cultivation on benthic communities is a novel approach. **This study supports a view that environmental impacts of macroalgal cultivation are relatively benign compared to other forms of aquaculture."**
- **Shading** – The amount of shading that occurs is related to stocking densities of cultivated kelp and the size of the plants. The kelp fronds are only of a significant size for 1-2 months of the year as they grow rapidly in early summer. For most of the rest of the year, shading will be much less, after harvesting and when the kelp plants are much smaller for much of it.
- Reference has been made to the SNH interactive map database. All of our sites have been places to avoid any known Maerl beds, eel grass or sea grass.



## HABITAT REGULATION APPRAISAL

3) Boat disturbance – Our Culbin site lies approximately 1km off shore, 2km off shore at Burghead and 500m at Covehead. Our activities do not involve large amounts of work in the Firth. Much of the actual work of the farm takes place on shore. In the Autumn, young seaweed is planted out on ropes which can largely be performed with the boat engine off. The same is true of harvest time in the summer when we harvest. During the growing season, samples from the sites and an in depth look at the equipment are only required every 2 weeks. We will perform more regular visual checks to ensure equipment is in order using a smaller craft and would only require a few minutes. Our impact on wintering wildfowl, seals and cetaceans should therefore be minimal and significantly less than that of other commercial activities in the Firth. I specifically raised the question of entanglement of species such as dolphins, minke whale and basking shark with kelp farm lines in discussions with SAMS and this is not known to be a problem. Again, out lines are static and no nets are involved.

4) Biosecurity - This is of the utmost importance to us as prospective farmers and stewards of the local ecosystem. Kelp as you may be aware releases spores to reproduce. Each kelp plant releases millions of spores, meaning that only a tiny amount of material needs to be collected and leaves the rest of the plant unharmed to continue growing. We will only source spores from the local ecosystem to avoid introducing invasive or foreign species. Going forward, we will be able to source spores from our own harvest also.

5) Erosion - Research is being performed to look at whether seaweed farms can be used to mitigate coastal erosion. Given our site selection, this would be less relevant at Covehead where there is rocky coastline and at Burghead bay, given the breadth of the bay compared to the size of our operation. Our sites will represent only a tiny fraction of the Moray coast. If you are performing research on coastal erosion locally, we would be very interested in collaborating to look at the potentially positive impact of kelp farming - I am aware that there has been significant erosion at Culbin. As our sites are based in approximately 10m of water and 1Km offshore at Culbin, it may be that the buffering effects are minimal. It would have no direct impact on land based, wind driven, shifting dunes.

## HABITAT REGULATION APPRAISAL - QUERIES

•These specific queries were raised by an ornithological specialist from Scottish natural heritage:

•**Fatal entanglement** due to ropes used for the seaweed farm

Information on the exact configuration of ropes/moorings proposed for the site should be supplied with the future application. I do not think that entanglement for birds is likely to

be an issue based on what you described to me of the set up. However, it is important to ensure that appropriate, systematic reporting and monitoring of any instances of

bird entanglement is carried out as part of the condition for this proposal.

**Response:** The risk of entanglement is relatively low, due to the configuration of our site and the equipment being used, as no nets are used. Regular visual checks will be undertaken

from the shore and from the water when required. We will monitor and record any cases of entanglement.

•**Displacement** from the seaweed farm footprint:

The proposed placement of the seaweed farm is within the dive depths of all qualifying species. Furthermore, any of the species could be using the inshore waters where the farm is

proposed, and many of the species preferentially choose shallower, inshore waters to forage. Whilst there is the potential for displacement from the sea surface due to the seaweed

farm, the birds will still be able to access the marine waters and seabed underneath the kelp farm, which I believe will only be growing in the first couple of metres under the sea

surface. Some species, depending on the level of kelp growth and the time of year for harvesting, may even benefit from kelp being present. For example, shags forage amongst and

nearby to wild kelp, due to fish sometimes using kelp for protection.

**Response:** The farmed kelp will be growing in the uppermost 2m of the water column, leaving unimpeded diving access to the sea bed for foraging birds. The schooling fish that often

use kelp farms for shelter may benefit some species, such as the shag and cormorant by providing more habitat for their prey.

# HABITAT REGULATION APPRAISAL

## •Disturbance due to vessels travelling to/from the site.

From the information provided, it seems that the vessels used will be relatively small and only required every 2-3 weeks during the growth period. The divers, Slavonian grebe, red-breasted mergansers and long-tailed ducks are all species with very high to high sensitivity to disturbance. Eider and European shag have medium sensitivity to disturbance.

To mitigate potential impacts of vessel disturbance SNH advises vessels follow the [Scottish Marine Wildlife Watching Code](#) and the [Guide to Best Practice for Watching Marine Wildlife](#)

to minimise disturbance to birds. This includes 1) avoiding driving through rafting birds where practicable and safe to do so, giving them a minimum approach distance of 50m where possible, and 2) travelling at <6 knots (where safe to do so) in the vicinity of birds on the water and shoreline.

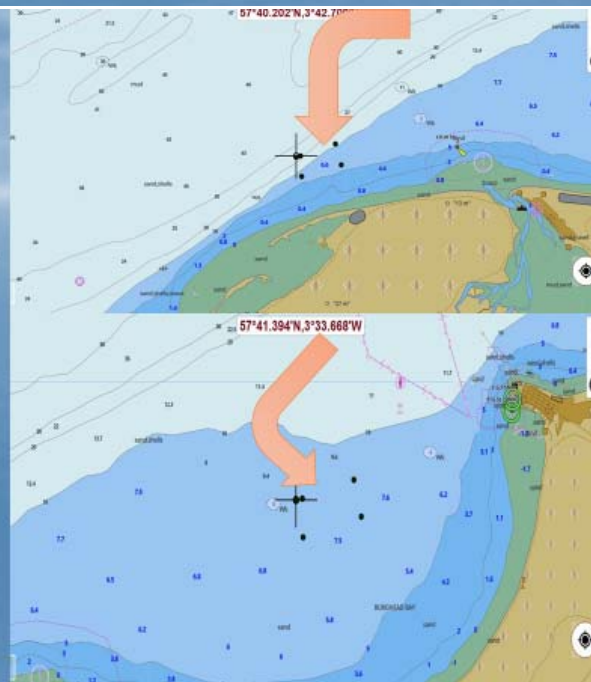
**Response:** As suggested, we will take the below appropriate measures to avoid disturbance. 1) avoiding driving through rafting birds where practicable and safe to do so,

giving them a minimum approach distance of 50m where possible, and 2) travelling at <6 knots (where safe to do so) in the vicinity of birds on the water and shoreline.

Our presence on the water will be minimal for much of the year, requiring on site inspections on a monthly basis during much of the year. We can carry out shore based visual surveys to check on equipment placement, particularly after a storm for instance, to ensure any equipment is still in situ.

## HRA

- Anticipated approach paths to help farm sites. These approaches can be adapted to tide/weather conditions and the presence of any rafting birds, to avoid or minimise disturbance.





# HABITAT REGULATION APPRAISAL

## Sensitive time periods:

Majority of the non-breeding qualifying features are present from mid-September to mid-April. The shags, eiders, and red-breasted mergansers will be present throughout the year.

The flightless moult periods, when birds would find it harder to get away from a vessel, are from February to mid-April for great northern divers and from July-mid-September for eiders.

Construction: ideally, if this could take place in September rather than Oct/Nov as proposed, then that would avoid the majority of the non-breeding period for the qualifying features.

This would also avoid most of the flightless moult period for eiders and all the flightless moult period for great northern divers (species with high sensitivity to disturbance).

**Response:** Our intention is to carry out the majority of our work outside of these more sensitive periods. In particular, we will endeavour to complete construction in September or sooner at our sites.

Harvesting: should this take place in May, as proposed, this would avoid the sensitive time periods for the non-breeding qualifying features. Whilst this would be within the shag

breeding period, the majority of the breeding shag distribution is further north in the Moray Firth pSPA.

**Response:** We will also aim to harvest in May to reduce any potential disturbance.

## Cumulative effects:

This needs assessed as this is for 3 separate areas of kelp farm, meaning there are 3 separate areas where birds could be displaced from foraging habitat or disturbed by vessels.

A phased approach to setting up the seaweed farm might be advisable.

**Response:** We will have a phased expansion at our sites and will be monitoring for potential environmental impacts throughout the process.

# HABITAT REGULATION APPRAISAL

Some research has been carried out looking at the affect of seaweed, natural kelp beds and seaweed farms on wave kinetic energy and current flow:

"Observations show that although total tidal exchange volume remains unchanged, there is a reduction in tidal flow at the surface where kelp is suspended, which causes the maximum flow point to occur below the suspended kelp fronds. The depth between the lower limits of suspended kelp and the seabed will determine where the maximum velocity point will occur as a result of the increased drag by kelp at the surface".

"Careful consideration must be given to the siting of cultivation projects in areas and at times where alterations of natural hydrodynamics could result in significant changes to marine chemistry (e.g., peak biomass would cause greatest friction coefficients), sediment transport and associated biological communities. Risk will most likely increase with larger scale projects and siting in areas important for water exchange, such as the entrance to enclosed water bodies. Assuming sites are well located, negative environmental effects are unlikely at small to medium scales, and it is unlikely that farms of this scale will have the resources to carry out detailed hydrodynamic impact assessments." <https://www.frontiersin.org/articles/10.3389/fmars.2019.00107/full#B71>

"Sediment retention can be positively affected as farmed seaweeds dampen wave energy which may help protect shorelines subject to erosion (Mork, 1996). This phenomenon has however not been observed at the case study site and the role of this function is likely to be site-specific, depending on wave energy and currents as well as the local sensitivity to erosion".  
<https://www.sciencedirect.com/science/article/pii/S0025326X18303126>

The above studies suggest that siting and biomass quantities influence any potential impact of a kelp farm. The above study also outlined that the theoretical impact on sedimentation rates, was *not actually demonstrated in the case study*.

## HABITAT REGULATION APPRAISAL

Our aim would be to mitigate any potential negative impact on coastal erosion patterns at the Culbin site in particular, with a number of measures:

- 1) Reduce stocking densities - We would reduce the density of long lines at the Culbin site to reflect it's more sensitive location, such as 10m spacing between lines rather than 5m.
- 2) Harvest biomass from this site earlier in the growing season as a priority, thus decreasing overall biomass at the site as well as the duration of any potential impact.
- 3) Breaking the farm into a number of sites - This enables a reduction of the impact and any one site. It must be noted that our proposed kelp farm in no way reflects the magnitude of any Asian kelp farm sites and is distinctly different from them, in our broken up format. One site that has been more extensively studied is Sanggou Bay in China. This mixed aquaculture site covers an approximate 80-90 km<sup>2</sup>, and encloses a bay. Our sites, in contrast are 0.5km<sup>2</sup> at Culbin and Burghead bay and 0.125km<sup>2</sup> at Covesea respectively, none of which enclose a bay or inhibit flow to an inlet. Furthermore, these measurements take incorporate the boundaries of the proposed sites, and the actual farmed area within them is very likely to be smaller.
- 4) Site placement - We have selected sites that have good flow rates to make significant sedimentation less likely.
- 5) Our sites are at contours on the sea bed, moving into deeper waters (above 10m depth), allowing currents to move below the kelp farm as indicated in one study.

### 4) Highland Seaweed Company Biosecurity Policy and Habitat regulation appraisal – April 2020

After detailed discussions with Scottish Natural heritage and Marine Licencing Scotland, we have completed a biosecurity policy.

We have referred to three documents in particular, throughout this process:

- Marine biosecurity planning – Identification of best practice: A review
- The Scottish natural heritage Habitat regulation appraisal guidance
- Marine Scotland Guidance on Marine Licensable Activities subject to Pre-Application Consultation

**Purpose of this document** – There is a well documented link between biosecurity issues, such as introducing non-native or invasive species, and negative socio-economic and environmental impact. This awareness is at the core of our business ethos as we intend to be an environmentally benign enterprise. It is crucial that potential biosecurity risks are identified and managed to ensure the local ecosystem is protected.

We have also laid out a habitat regulation appraisal (HRA) below as this is looking at the wider environmental impact of our activities.

**Legislation regarding biosecurity and best practice:**

We have adopted the biosecurity strategy advised in “Marine biosecurity planning – Identification of best practice: A review”, as laid out below. We are aware that there are environmental and legal ramifications regarding biosecurity and have created a policy based on best practice.

For plants, a new offence has been created of planting or causing any plant species to grow in the wild outwith its native range. This offence includes situations where poor biosecurity in relation to site operation and development led to the spread of a non-native plant in the wild.

The Scottish offences in relation to non-native plants and animals are ‘strict liability offences’ so knowledge, intention, recklessness or negligence do not have to be proved. A legal defence that all reasonable steps were taken to prevent the offence and that all due diligence was exercised to avoid committing the offence can be made. The Code of Practice on Non-Native Species sets out in broad terms what ‘reasonable steps’ mean in this context and the advice includes (Box 1).

Box 1. Reasonable steps as set out in the Code of Practice on NNS

**Adopting a precautionary approach and not carrying out operations which might lead to the spread of NNS until there is a clear understanding of the situation.**

**Carrying out risk assessments to understand the risk of spreading a NNS, setting out how to avoid it happening.**

**Seeking advice and following good practice.**

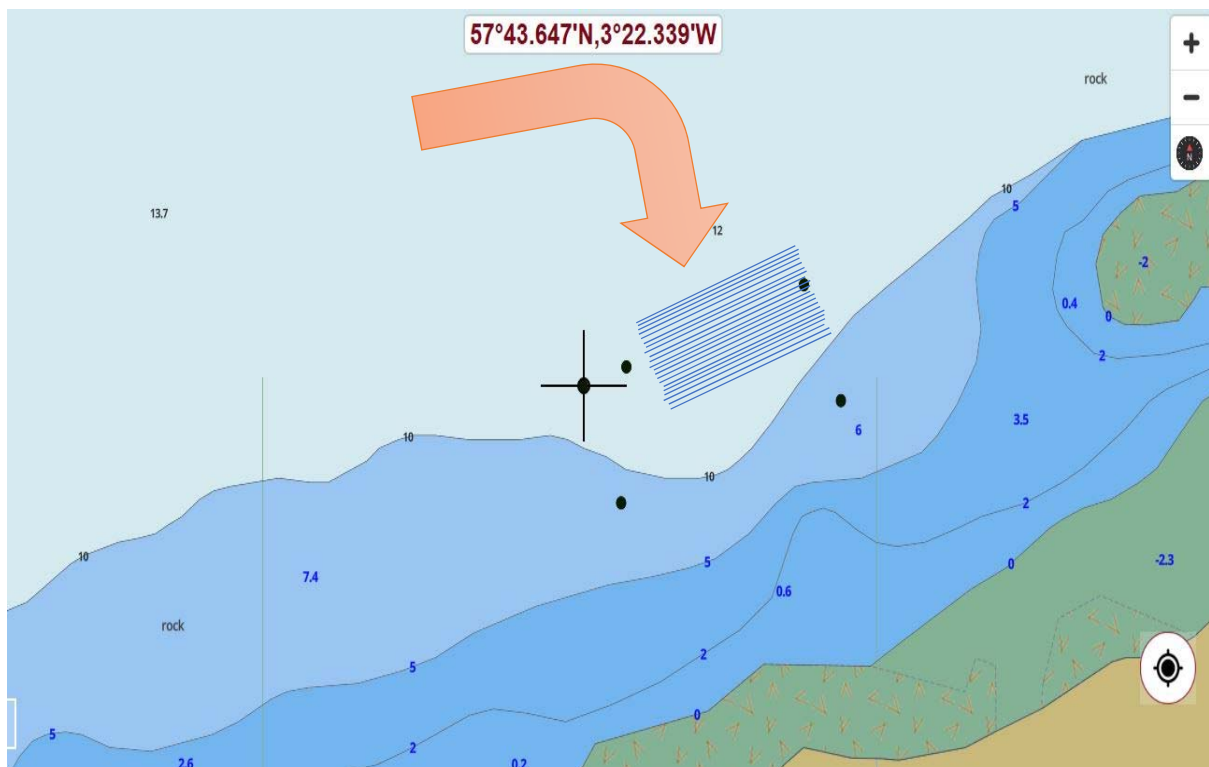
**Reporting the presence of NNS.**

Reference has been made to “The Environmental Liability (Scotland) Regulations (SI 2009/226) (UK Government, 2009a)” and “The revised Scottish Biodiversity Strategy document 2020 Challenge for Scotland's Biodiversity - A Strategy for the conservation and enhancement of biodiversity in Scotland”.

#### **Site Description –**

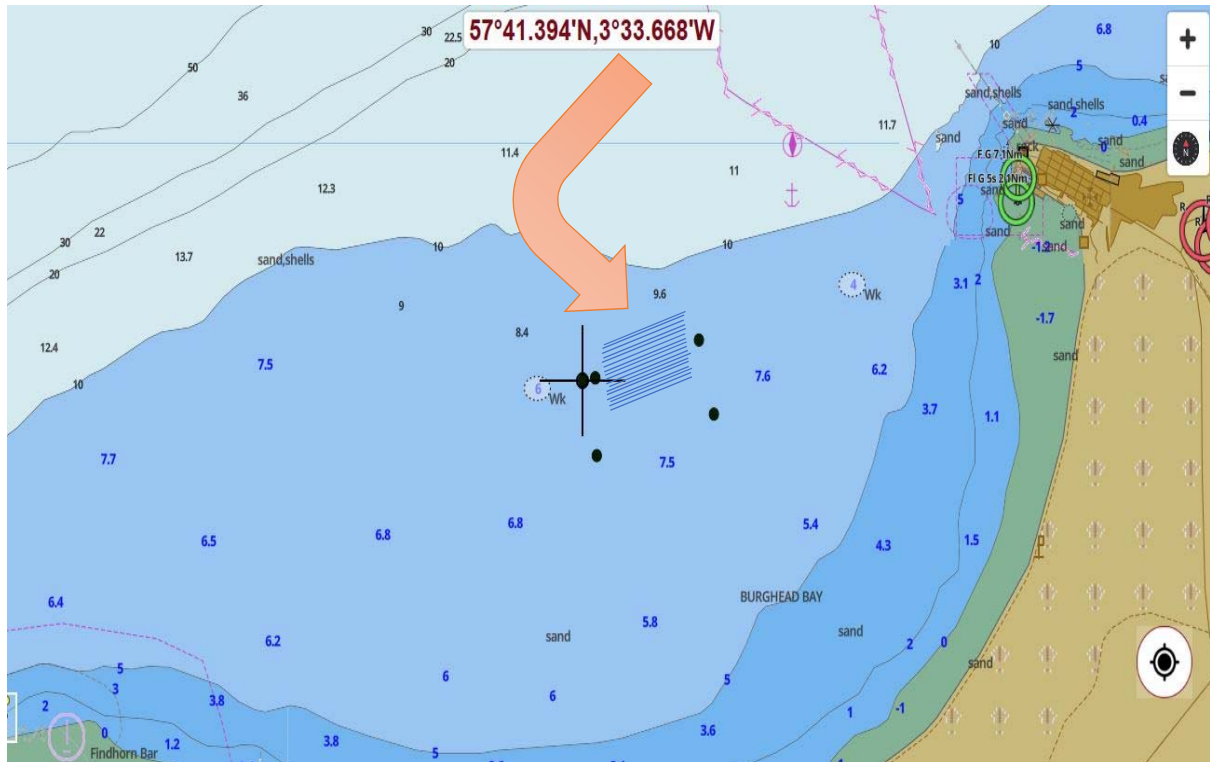
Our activities cover three separate sites along the southern shore of the Moray Firth. The maps indicate the sites and their scale and depth. The arrows indicate our preferred approach paths to the sites to minimise disturbance of sea birds.

Cove sea – 500x250m. Depth 8-12m. This area lies approximately 0.5NM off shore and is over a sandy seabed. It avoids shading the kelp beds that lie further inshore and allows access for creel fishermen access to these areas. This will consist of a series of anchors or concrete moorings, attached to mooring ropes. These mooring ropes will attach to the long lines that are approximately 300-500m long. See diagram below. The long lines will run in parallel to the coast and currents. The area will still be accessible to smaller boats and water craft. There will be spaces 5-10m apart. Eventually, there will be up to 20-40 long lines at this site, though initially much less than this. The configuration of these long lines is indicated on the maps below.

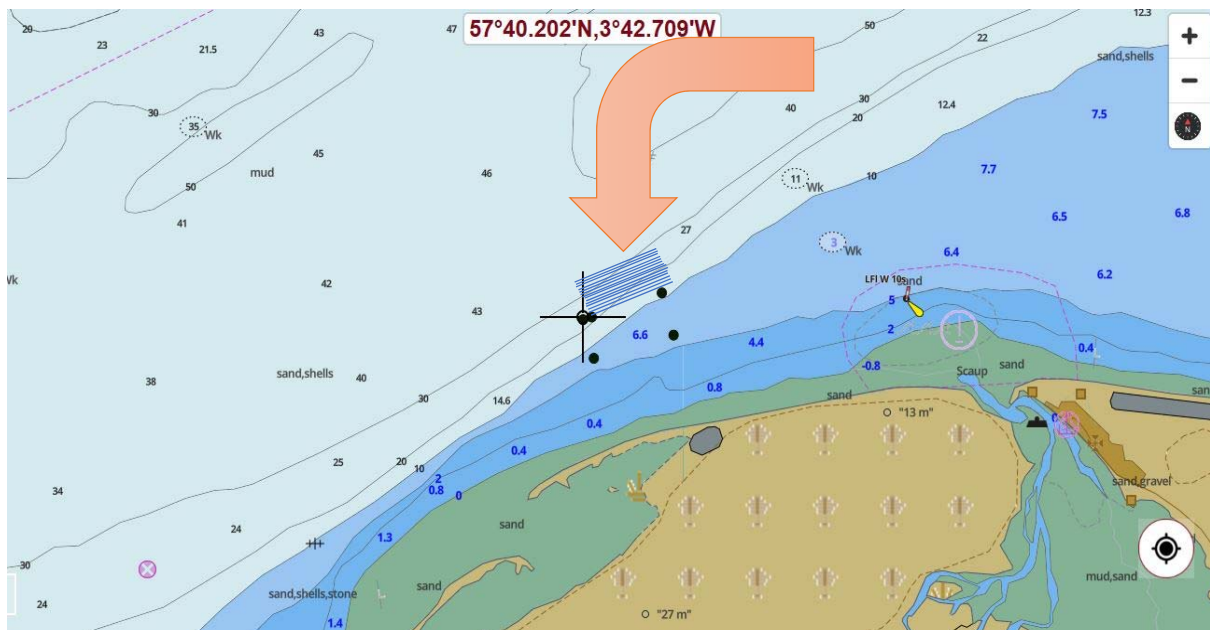


Burghead bay – 1000x500m Depth approximately 10m and lying approximately 1.5NM offshore. We initially plan to place 1x500m line at this site. Once established there may 40-80 1000m long lines placed. The sandy seabed here is not widely colonised by marine algae but the area is used by overwintering birds which require minimal disturbance during the winter months.



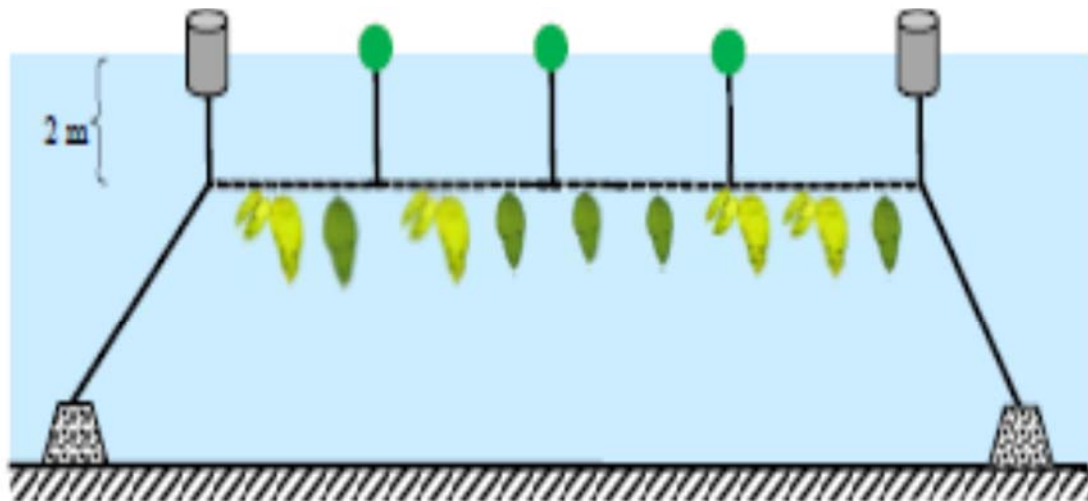


Culbin – 1000x500m. This area lies approximately 1 NM offshore from Culbin sands area of special scientific interest. Due to the nature of the site, and the feedback from Scottish natural heritage, we will place long lines less densely at this site to reduce any potential impact on erosion patterns, with spacing no more than 10-15m between long lines.



Deployment –

The diagram illustrates the configuration of a typical long line. We will use this configuration or very similar, with moorings attached to chains and risers. These then attach to long lines which run approximately 2m below the water surface. Marker buoys will be set at the ends of the long lines and the boundaries of each site. The equipment used is standard to the creel and fisheries industries, consisting of UV stable and hardwearing, marine specific lines, galvanised chains and creel buoys which are already used extensively in the area. The equipment will be suitable for stresses greater than those required, to ensure safety and less likelihood of equipment failure.



*Fig. 14. NAFC Marine Centre's seaweed site (2 x 80m longlines) at Lea of Trondra, Shetland.*

#### ☐ Site Survey –

On site visual surveys have already been undertaken with photos taken. Along with careful consideration of biosecurity issues, laid out below, broader considerations of our activities have been outlined in the form of a habitat regulation appraisal HRA.

#### ☐ Analysis of activities/operations –

Land based activities – Sampling and cultivating kelp. Sampling discussed with Marine licencing Scotland. Does not require a licence but The Highland Seaweed co. will do this in an environmentally sensitive way, using sustainable methods. Sampling from local sources only to protect biosecurity and avoid introducing invasive or non-native species.

Water based activities – Operating in 7-15m water. Moorings placed during the summer and Autumn months, avoiding work in the Winter. Movable anchors which remain in place long term but can be retrieved. No dredging of the sea bed. Putting out seed lines – Autumn. September/October. Checking lines – Visual checks from the land. Use of GPS markers. Once every 4 weeks from the water under normal circumstances (may need to check for storm damage). Harvesting – May-June.



We aim to establish sites at Culbin and Burghead that are 1000x500m and a smaller site at Covesea that is 500x250m. Initially, we will plan to place one test line at each site. We then intend to scale up our operations in steps, with parallel long lines 5-10m apart. Each line will be approximately 500m long.

#### **☑ Early Detection and Surveillance -**

Regular surveillance of our operation sites and equipment will be undertaken to enable early detection of any biosecurity issues.

#### **☑ Pathway recognition/analysis/management –**

As all our algae stock will be from local sources there are three main pathways for potential contaminations with NNS: The establishment of a locally invasive organism in the Moray firth, introducing an NNS from equipment from another location, or transporting a NSS to another location. To manage these potential pathways, we will adopt regular visual and other checks as appropriate to identify any problematic NSS. We will consider the possibility of contamination if transporting equipment from other areas and if appropriate undertake appropriate cleaning or disinfecting, if we are unable to avoid the risk altogether. Likewise, if transporting equipment or material to other sites in a manner that could represent a biosecurity risk, appropriate forms of cleaning, disinfecting will be undertaken if transport cannot be avoided.

#### **☑ Risk assessment/analysis/management**

Risk assessment will be routinely undertaken for all operations pertaining to biosecurity within our operations.

An example risk assessment sheet: For documenting the risk assessment process prior to that activity being undertaken.

Activity (description)

Risks and hazards identified

Potential impact of hazards

Mitigation strategy

Other considerations – containment/reporting etc.

#### **☑ Biosecurity actions to manage risk -**

Risk assessment –

All activities will be risk assessed prior to initiation, if they have a potential impact on biosecurity.

Risk assessment shall be completed in reference to the SNH Marine biosecurity best practice as laid out in commissioned report No. 748 2014 and is detailed below.

An activity will not be carried out until an understanding of the risks and how to avoid them is in place. A documented risk assessment will be completed to all relevant activities.

Reference to expert advice or relevant authority guidance will be sought where needed.

#### Biodiversity -

Consideration: There is a risk of introducing new and invasive species to the area that could disrupt the local ecosystem, local genetic biodiversity and food chains.

#### Mitigation strategies –

We will intentionally avoid the cultivation or contact with non-native marine algae species. We will not introduce any foreign species to the area. All kelp and other seaweed species that are cultivated will be sourced from local stocks. We will source all kelp spores from local kelp beds, generally from within 5-10 miles of our kelp farm sites. All species will be naturally endemic and our primary focus will be of the below species:

*Laminaria digitata*

*Laminaria Hyperborea*

*Saccharina latissimi*

A log book of this process will be kept.

#### Collection –

We will collect reproductive sori (spore producing parts) from a number of different plants within the area to ensure there is a biodiverse stock that is local and adapted to local conditions.

We will source reproductive sori by removing only the distal (end parts) portions of the kelp frond, which leaves the rest of the plant unharmed and will regrow.

These will reflect the genetic diversity the kelp beds that are already endemic in the area.

As local areas with a rocky seabed are already colonised by extensive kelp beds, our activities would not pose a risk of becoming invasive.

A log book of this process will be kept.

Biofouling and non-native species –

All equipment and supplies sources from out with our area of operations will be inspected and, if necessary, cleaned prior to introduction to and use in the local environment.

Any non-native or invasive species that are identified will be noted. An action plan will be put in place and appropriate steps such as destroying any NSS discovered within our area of operations will be undertaken.

A log book of this process will be kept.

Equipment – Any equipment used by the Highland seaweed company will be inspected and cleaned (if necessary) prior to use at another site to avoid spreading spores and potential pathogens to other areas.

A log book of this process will be kept.

Pathogens – Not all pathogens are of equal importance. Kelp stocks will be regularly monitored for signs of disease. Any plants showing signs of disease during the cultivation period will be removed and destroyed.

A log book of this process will be kept.

📋 **Site monitoring** – Visual on-site monitoring will take place at regular intervals from both the shore and from the water and will be documented. These will include visual checks for NNS.

📋 **Containment** - Appropriate steps will be taken to contain any NNS that are identified. Expert advice will be sought where necessary from third parties and the relevant authorities. This will be done in a timely manner to reduce any potential impact. Containment may include removal of NSS and contaminated materials or avoiding the introduction of materials that we believe may pose a biosecurity hazard.

📋 **Rapid response and rapid eradication plans** – In the event of an NNS or biosecurity risk being identified, a rapid response will be formulated in a timely manner with plans to implement an eradication process documented.

📋 **Individual species accounts** – Recording and reporting of NNS will be undertaken appropriately.

📋 **Contingency planning** -

Contingencies include; removal and destruction of any NNS, notifying and recruiting the appropriate bodies in the event of a biosecurity issue, avoiding introducing any organism, materials or equipment which we believe may represent a biosecurity hazard until appropriate mitigation strategies have been implemented.

📌 **Implementation and review** – Regular review of our biosecurity policy and its implementation will be undertaken, at appropriate intervals.

## **Habitat regulation appraisal**

Biosecurity is an important aspect of the activities of an algaculture project. There are however, broader ecological issues that require to be specifically addressed in the form of an HRA. I have included below some of the potential issues raised by SNH adviser Lucy Quinn, who kindly offered her input and advice, particularly with regards to seabird disturbance.

Habitat regulation appraisal requires specific aspects of potential impact are considered. Extensive reference has been made to the HRA Moray firth guidance. The two chief steps are listed below:

1) The HRA process, up to and including appropriate assessment. Is the proposal directly connected with, or necessary to, Natura site management for nature conservation? Is the proposal (either alone or in-combination) likely to have a significant effect (LSE) on a Natura site?

Applying mitigation; can the proposal be altered to avoid the LSE?

“There is no standard format for HRA evidence. The exact type of information required varies case by case” We have assessed the potential environmental impact of our project in some detail and have embedded the HRA within this presentation. Below we have outlined considerations of some specific areas.

## **Entanglement**

-Consideration – There is a risk of entanglement of species such as Dolphins, minke whale, sea birds and seals which are endemic to the area or visitors.

-Mitigation strategies – The equipment we will use will be of a low risk for entanglement to all sea species as no nets are employed at any point in our projects and our lines are static, running in parallel with rather than perpendicular to the currents and shore. The ropes used will be akin to what is already widely used along our coast for lobster creels. We will perform regular visual checks to ensure that no creature has become entangled. The configuration of the kelp farm is designed to avoid entanglement by cetaceans. Our plans have been discussed with Scottish entanglement alliance, no concerns were raised. We also discussed entanglement with an adviser from the Scottish association for marine science SAMS. They raised no concerns about our proposed deployment or configuration. I specifically raised the question of entanglement of species such as dolphins, minke whale and basking shark with kelp farm lines in discussions with SAMS and this is not known to be a common problem. Again, our lines are static and no nets are involved. A log book of any entanglement episodes will be kept and reported.

## Pollution

-Consideration – Our activities have the potential to pollute the coastal waters, having a negative impact on the local ecosystem. Two main sources of pollution need to be considered: Pollution from fuel and the release of plastics into the ocean.

-Mitigation strategies – All fuels will be stored in appropriate containers aboard our work boats, to avoid any potential contamination. The ropes and lines used in the structure of the kelp farm will be of suitable, marine specific type, such as the hardwearing, UV stable ropes and lines used by the fisheries industry.

A log book of this process will be kept.

## Disturbance –

There are a number of species in the Moray Firth that could be negatively impacted by excessive disturbance from the water. Over wintering birds such as long-tailed duck, velvet scoter and shag; the third largest population of scaup; common scoter and goldeneye.

Sensitive time periods:

Majority of the non-breeding qualifying features are present from mid-September to mid-April. The shags, eiders, and red-breasted mergansers will be present throughout the year.

The flightless moult periods, when birds would find it harder to get away from a vessel, are from February to mid-April for great northern divers and from July-mid-September for eiders.

Seals tend to moult during the Spring for Grey seals and Summer for harbour seals.

Mitigation strategies - We will have minimal water based activity during the Winter months.

Our Culbin site lies approximately 1km off shore, 2km off shore at Burghead and 500m at Covesea. Our activities do not involve large amounts of work in the Firth. Much of the actual work of the farm takes place on shore. In the Autumn, young seaweed is planted out on ropes which can largely be performed with the boat engine off. The same is true of harvest time in the summer when we harvest. During the growing season, samples from the sites and an in depth look at the equipment are only required every 2 weeks. We will perform more regular visual checks to ensure equipment is in order using a smaller craft and would only require a few minutes.

Our impact on wintering wildfowl, seals and cetaceans should therefore be minimal and significantly less than that of other commercial activities in the Firth.

The Culbin site has been deliberately placed away from the main seal haul out site, which is 2km West of the site.

Construction:

Ideally, if this could take place in September rather than October/November as proposed, then that would avoid the majority of the non-breeding period for the above species.

This would also avoid most of the flightless moult period for eiders and all the flightless moult period for great northern divers (species with high sensitivity to disturbance).



Our intention is to carry out the majority of our work outside of these more sensitive periods. In particular, we will endeavour to complete construction in September if possible, at our sites.

#### Harvesting:

This should take place in May, as this would avoid the sensitive time periods for most vulnerable species. Whilst this would be within the shag breeding period, the majority of the breeding shag distribution is further north in the Moray Firth pSPA.

#### Cumulative effects:

This needs assessed as this is for 3 separate areas of kelp farm, meaning there are 3 separate areas where birds could be displaced from foraging habitat or disturbed by vessels.

A phased approach to setting up the seaweed farm might be advisable.

Mitigation strategy - We will have a phased expansion at our sites and will be monitoring for potential environmental impacts throughout the process.

#### **Bathelmic species –**

These represent food sources, shelter and habitat for wildlife.

Maerl beds, sea grass - Eelgrass beds grow in shallow coastal areas on sheltered sandy or muddy seabeds, or with maerl from areas exposed at low tides to depths of about 10m. We have discussed the impact of shading with SNH. Drawing information from the SNH website, there are no known maerl or eelgrass beds at any of our sites.

Mitigation strategies - No dredging will take place in kelp farm areas, thereby having a protective effect on these species. Our activities are primarily 7-15m depth, which is at the edge or beyond the limit of natural Maerl and eelgrass bed depths. Fixed moorings cause minimal disturbance to the sea bed.

A study produced by the University of Ireland found "The Ecological Status of subtidal benthic communities within a commercial kelp farm on the southwest coast of Ireland was not impacted by macroalgal cultivation". Additionally, there was no effect on the biomass of *Zostera marina*.

With regards to shading, for the majority of the time, the kelp plants will be very small or not present on the long lines. It is approximately on 2 months of the year, in Spring, that there will be any significant shading. As harvest takes place generally in May, the duration of that shading will be short. Shading for the remaining 10 months of the year will be minimal.

#### **Erosion –**

Considerations - Some research has been carried out looking at the effect of seaweed, natural kelp beds and seaweed farms on wave kinetic energy and current flow:

"Observations show that although total tidal exchange volume remains unchanged, there is a reduction in tidal flow at the surface where kelp is suspended, which causes the maximum flow point to occur below the suspended kelp fronds. The depth between the lower limits of suspended kelp and the seabed will determine where the maximum velocity point will occur as a result of the increased drag by kelp at the surface".

"Careful consideration must be given to the siting of cultivation projects in areas and at times where alterations of natural hydrodynamics could result in significant changes to marine chemistry (e.g., peak biomass would cause greatest friction coefficients), sediment transport and associated biological communities. Risk will most likely increase with larger scale projects and siting in areas important for water exchange, such as the entrance to enclosed water bodies. Assuming sites are well located, **negative environmental effects are unlikely at small to medium scales**, and it is unlikely that farms of this scale will have the resources to carry out detailed hydrodynamic impact assessments."

<https://www.frontiersin.org/articles/10.3389/fmars.2019.00107/full#B71>

"Sediment retention can be positively affected as farmed seaweeds dampen wave energy which may help protect shorelines subject to erosion (Mork, 1996). This phenomenon has however not been observed at the case study site and the role of this function is likely to be site-specific, depending on wave energy and currents as well as the local sensitivity to erosion".

<https://www.sciencedirect.com/science/article/pii/S0025326X18303126>

The above studies suggest that siting and biomass quantities influence any potential impact of a kelp farm. **The above study also outlined that the theoretical impact on sedimentation rates, was not actually demonstrated in the case study.**

Mitigation strategies - Our aim would be to mitigate any potential negative impact on coastal erosion patterns at the Culbin site in particular, with a number of measures:

- 1) Reduce stocking densities - We would reduce the density of long lines at the Culbin site to reflect it's more sensitive location, such as 10m spacing between lines rather than 5m.
- 2) Harvest biomass from this site earlier in the growing season as a priority, thus decreasing overall biomass at the site as well as the duration of any potential impact.
- 3) Breaking the farm into a number of sites - This enables a reduction of the impact and any one site. It must be noted that our proposed kelp farm in no way reflects the magnitude of any Asian kelp farm sites and is distinctly different from them, in our broken up format. One site that has been more extensively studied is Sanggou Bay in China. This mixed aquaculture site covers an approximate 80-90 km<sup>2</sup>, and encloses a bay. Our sites, in contrast are 0.5km<sup>2</sup> at Culbin and Burghhead bay and 0.125km<sup>2</sup> at Covesea respectively, none of which enclose a bay or inhibit flow to an inlet. Furthermore, these measurements take incorporate the boundaries of the poroposed sites, and the actual farmed area within them is very likely to be smaller.

- 4) Site placement - We have selected sites that have good flow rates to make significant sedimentation less likely.
- 5) Our sites are at contours on the sea bed, moving into deeper waters (above 10m depth), allowing currents to move below the kelp farm as indicated in one study.

## Summary

Environmental protection is of the highest concern for us as an ecological business and also highly relevant given that we will be operating in the Moray Firth and within an area of special scientific interest. We have given a lot of consideration to this and have laid out what we hope is a broad and well thought out biosecurity policy and habitat regulation appraisal. We have taken advice from appropriate resources throughout, including advisers withing SNH and SAMS, and drawing information from scientific studies and Kelp farming publications throughout. This policy will be revised with the aim of gaining more “on the ground” information, going forward.

## Contacts with stakeholders, feedback

Notification in local press

Good Morning Liam,

Thanks for you email, we would be able to pop this into the General Notices section of the Forres Gazette, it would be next weeks edition (Wednesday 26th February).

I would suggest that the best size for this amount of text would be 6cm x 2col wide, this would be at a cost of £35+VAT per week.

Please let me know if you would like to proceed with this.

I will look forward to hearing from you.

Kind REgards,

Ellie

Ellie Thompson  
Telesales Executive  
T: [Redacted]  
E: [Redacted]

74-76  
South  
Street  
Elgin  
IV30 1JG

**First Name:** liam richardson

[Redacted]

[Redacted]

**feedback:** Dear Forres Gazette team, I would like to submit the below short announcement in your next issue: There will be a public consultation held to discuss plans for a kelp farm in the Moray Firth. This will be held on Thursday 16th April at 20:00 at the Hive enterprise hub, 567 West Whins, The Park, Findhorn, IV36 3SH. The location is wheelchair accessible. Plans with details will also be displayed at the hive from 6 weeks prior to the meeting. I would like the piece to run for a week. Please let me know what the rates are and what the time frames for publication might be? If you require anything further at this point, please let me know. Many thanks, Liam Richardson

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SO16 7JQ



Liam Richardson [Redacted]

18 Feb 2020,  
15:51

.....

Liam Richardson <highlandseaweed@gmail.com> Mon, 9 Mar, 08:14



to Team

Dear North 58 team,

We would like to make you aware of a public consultation we are holding. The meeting will be held to discuss plans for a kelp farm in the Moray Firth. This will be held on Tuesday 14th April at 18:00 at the Hive enterprise hub, 567 West Whins, The Park, Findhorn, IV36 3SH. The location is wheelchair accessible. Plans with details will also be displayed at the hive from 6 weeks prior to the meeting.

If you have any questions or would like to discuss things further, please let me know.

Many thanks,

Liam Richardson - The Highland Seaweed Company

.....

Liam Richardson <highlandseaweed@gmail.com> Thu, 20 Feb, 06:02

to michael.montague

Dear SEPA team,

We would like to make you aware of a public consultation we are holding. The meeting will be held to discuss plans for a kelp farm in the Moray Firth. This will be held on Tuesday 14th April at 18:00 at the Hive enterprise hub, 567 West Whins, The Park, Findhorn, IV36 3SH. The location is wheelchair accessible. Plans with details will also be displayed at the hive from 6 weeks prior to the meeting.

Please pass this information on to the Elgin SEPA office for their information.

Many thanks,

Liam Richardson - The Highland Seaweed Company

.....



Liam Richardson <highlandseaweed@gmail.com> Thu, 27 Feb, 05:59

to navigation

Dear Northern Lighthouse Board team,

We would like to make you aware of a public consultation we are holding. The meeting will be held to discuss plans for a kelp farm in the Moray Firth. This will be held on Tuesday 14th April at 18:00 at the Hive enterprise hub, 567 West Whins, The Park, Findhorn, IV36 3SH. The location is wheelchair accessible. Plans with details will also be displayed at the hive from 6 weeks prior to the meeting.

Many thanks,

Liam Richardson - The Highland Seaweed Company

.....



Liam Richardson <highlandseaweed@gmail.com> Thu, 27 Feb, 06:00

to navigationsafety

Dear MCA team,

We would like to make you aware of a public consultation we are holding. The meeting will be held to discuss plans for a kelp farm in the Moray Firth. This will be held on Tuesday 14th April at 18:00 at the Hive enterprise hub, 567 West Whins, The Park, Findhorn, IV36 3SH. The location is wheelchair accessible. Plans with details will also be displayed at the hive from 6 weeks prior to the meeting.

Many thanks,

Liam Richardson - The Highland Seaweed Company

.....

including a local eco-tourism company who also run the local marina.

- The Buckie Harbour master
- Any delegate for the relevant marine region or regions, when such delegates have been established under Section 12(1) of the Marine (Scotland) Act 2010.

We have been working closely with Scottish Natural Heritage to ensure that our activities are carried out in an environmentally sensitive way. We are an ecological business so this dovetails nicely with our own aims.

Disturbance to the sea bed will be minimal. The environmental impact of our operation has been carefully considered and detailed in a later section.

The sites have been carefully selected after holding a consultation with local trawl and creel fishermen and other water users, such as a local ecological tourism company, to ensure that our presence is minimised.

Feedback from PAC public consultation 14/04/2020:

Galen Fulford <galen@biomatrixwater.com> Tue, 14 Apr, 20:39



to me

Hello Liam,

Thank you for an informative community meeting regarding you our plans for kelp farming in the Moray Firth.

The locations under application are al well known to me, and I believe kelp faming in these locations would be an ecological and economic asset to the local area in terms of increasing sustainability and profile, not to mention the benefits for marine life around the floating submerged kelp ecosystems that will be established.

It is a telling point that local creel fisherman confirmed that they rely on naturally occurring kelp beds as a foundation species to provide the beneficial habitat for lobster, supporting a long term local traditional livelihood.

Its also interesting that part of the key to the natural kelp beds as I understand it is the rocky substrate facilitating a suitable foot hold for the kelp to grow on. In the case of farming, the rope and buoy structure provides the analogous support structure for the kelp, and I look forward to seeing what other species this will benefit through positive ecological knock on effects. It would be interesting to explore the potential of a small percentage of engineered "Marine Set Aside" allowing a few stands to "Naturally Biofoul" creating a potential "engineered" biodiversity hot spot, and who knows the potential benefits, undoubtedly as diverse as the species inhabiting the ecosystems you will create.

Let us know if Biomatrix can be of assistance, we are progressing with the installation of marine ecosystems in Liverpool in the coming months and are aiming to explore a system of multi species salt water farming to improve food security in inshore and estuarine ecosystems, to improve food security etc, I am sure our paths will cross on the water at some point and I look forward to it.

Thank you again for a well attended and informative meeting, you certainly have our support.

Best wishes,

Galen,

Amanda Haworth <amanda.haworth@findhorn.cc> Tue, 14 Apr,  
21:11

to Göran, me

Thanks for an extremely interesting and informative meeting just now, Liam.

As I said, I'd like to see your business plan and have cc-ed Göran in since he has many decades' experience advising business start-ups in Sweden and internationally.

With very best wishes for the establishment and future of the Highland Seaweed Company,

Amanda

*Amanda Haworth M.A.*

[Redacted]

.....

Subject: Pre-application advice for Moray Firth kelp farm -  
ornithological advice - Lucy Quinn - 01-May-2020



Lucy Quinn  
<Lucy.Quinn@nature.scot>

Mon, 4 May, 09:36 (6 days ago)

to Liam Wright, Kate Thompson

You are viewing an attached message.

Gmail can't verify the authenticity of attached messages.

Hi Liam,

Please see below for initial, pre-application ornithological advice for the proposed Moray Firth kelp farm. I have also had Kate read over it (cc-d in).

#### Summary of recommendations:

- An HRA is required for Moray Firth pSPA.
- Ensure that systematic reporting and monitoring of any bird entanglement is a condition for consent.
- To mitigate potential effects of vessel disturbance we advise: 1) avoiding driving through rafting birds where practicable and safe to do so, giving them a minimum approach distance of 50m where possible, and 2) travelling at <6 knots (where safe to do so) in the vicinity of birds on the water and shoreline.
- We would welcome the proposed vessel management plan that sets out the vessel routes to and from each of the sites.
- It would be good to ensure there is an interim step between the initial ropes being trialled to when the full 25 x 500m ropes are installed, and to review any potential environmental impacts that may have arisen.

I have concentrated my advice for the Moray Firth pSPA, though it is noted that the Moray and Nairn Coast SPA also has ornithological features, some of which will use the nearshore waters.

Moray Firth pSPA (see <https://www.nature.scot/moray-firth-proposed-marine-spa-supporting-documents> for further details):

Qualifying features (non-breeding):

- Great northern diver
- Red-throated diver
- Slavonian grebe
- Common eider
- Common goldeneye
- Common scoter
- Greater scaup
- Long-tailed duck
- Red-breasted merganser
- Velvet scoter

Breeding and non-breeding:

- European shag

Potential impact pathways on the qualifying features of the Moray Firth pSPA are:

1. Fatal **entanglement** due to ropes used for the seaweed farm  
Information on the exact configuration of ropes/moorings proposed for the site should be supplied with the future application. I do not think that entanglement for birds is likely to be an issue based on what you described to me of the set up. However, it is important to ensure that appropriate, systematic reporting and monitoring of any instances of bird entanglement is carried out as part of the condition for this proposal.

2. **Displacement** from the seaweed farm footprint;



The proposed placement of the seaweed farm is within the dive depths of all qualifying species. Furthermore, any of the species could be using the inshore waters where the farm is proposed, and many of the species preferentially choose shallower, inshore waters to forage. Whilst there is the potential for displacement from the sea surface due to the seaweed farm, the birds will still be able to access the marine waters and seabed underneath the kelp farm, which I believe will only be growing in the first couple of metres under the sea surface. Some species, depending on the level of kelp growth and the time of year for harvesting, may even benefit from kelp being present. For example, shags forage amongst and nearby to wild kelp, due to fish sometimes using kelp for protection.

and

### 3. **Disturbance** due to vessels travelling to/from the site.

From the information provided, it seems that the vessels used will be relatively small and only required every 2-3 weeks during the growth period. The divers, Slavonian grebe, red-breasted mergansers and long-tailed ducks are all species with very high to high sensitivity to disturbance. Eider and European shag have medium sensitivity to disturbance. To mitigate potential impacts of vessel disturbance SNH advises vessels follow the Scottish Marine Wildlife Watching Code and the Guide to Best Practice for Watching Marine Wildlife to minimise disturbance to birds. This includes 1) avoiding driving through rafting birds where practicable and safe to do so, giving them a minimum approach distance of 50m where possible, and 2) travelling at <6 knots (where safe to do so) in the vicinity of birds on the water and shoreline.

### Sensitive time periods:

Majority of the non-breeding qualifying features are present from mid-September to mid-April. The shags, eiders, and red-breasted mergansers will be present throughout the year. The flightless moult periods, when birds would find it harder to get away from a vessel, are from February to mid-April for great northern divers and from July-mid-September for eiders.

Construction: ideally, if this could take place in September rather than Oct/Nov as proposed, then that would avoid the majority of the non-breeding period for the qualifying features. This would also avoid most of the flightless moult period for eiders and all the flightless moult period for great northern divers (species with high sensitivity to disturbance).

Harvesting: should this take place in May, as proposed, this would avoid the sensitive time periods for the non-breeding qualifying features. Whilst this would be within the shag breeding period, the majority of the breeding shag distribution is further north in the Moray Firth pSPA.

#### Cumulative effects:

This needs assessed as this is for 3 separate areas of kelp farm, meaning there are 3 separate areas where birds could be displaced from foraging habitat or disturbed by vessels. A phased approach to setting up the seaweed farm might be advisable.

#### Note on bird data:

There is a project currently underway at Moray Firth pSPA for inshore wintering waterfowl. This is being project managed by Kate Thompson and carried out by Jen Graham, our graduate placement student, and also involves work being carried out by a contractor. The work has involved shore-based surveys at various vantage points around the Moray Firth coastline as well as digital aerial surveys. Should you require more information about bird numbers present at particular locations, I advise getting in touch with Kate. Whilst we haven't proposed a desk-based data appraisal for the applicant at this stage, we thought it useful for you to be aware of this project in case it should be of use.

I am happy to discuss anything further should anything require clarification.

Kind regards,

Lucy.

Dr Lucy Quinn | Policy and Advice Officer – Marine Ornithology  
Scottish Natural Heritage | Great Glen House | Leachkin Road |  
Inverness | IV3 8NW | t: 01463 725031 cisco: 7005031 | m:  
07718143074

Dualchas Nàdair na h-  
Alba | Taigh a' Ghlinne Mhòir | Rathad na Leacainn | Inbhir Nis | IV3 8  
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Moray Firth kelp farm proposal - Culbin Sands SSSI - Coastal  
Geomorphology

[Inbox](#)x



Liam Wright

Mon, 4 May, 17:13

Hi Liam, In our initial pre-app advice Shirley highlighted that given the proximity of one of the sites to Culbin Sands SSSI, possible effects on wave attenuati



Liam  
Richardson Tue, 5 May, 07:01

Dear Liam, Thank you very much for your helpful emails. I will respond to both areas of discussion - bird life and coastal erosion, in more detail. To answer yo



Liam  
Wright Thu, 7 May, 15:49 (13 days ago)

Hi Liam, A quick internet search for 'wave attenuation seaweed cultivation' brings up a number of useful studies. These studies present information which may he



Liam Richardson  
<highlandseaweed@gmail.com>

Sun, 10 May, 07:35 (10  
days ago)

to Liam

Dear Liam,

Many thanks for the links provided. The dynamic coast Scotland website and the Frontiers in Marine science article were of particular interest.

As you are aware, some research has been carried out looking at the affect of seaweed, natural kelp beds and seaweed farms on wave kinetic energy and current flow:

"Observations show that although total tidal exchange volume remains unchanged, there is a reduction in tidal flow at the surface where kelp is suspended, which causes the maximum flow point to occur below the suspended kelp fronds. The depth between the lower limits of suspended kelp and the seabed will determine where the maximum velocity point will occur as a result of the increased drag by kelp at the surface".

"Careful consideration must be given to the siting of cultivation projects in areas and at times where alterations of natural hydrodynamics could result in significant changes to marine chemistry (e.g., peak biomass would cause greatest friction coefficients), sediment transport and associated biological communities. Risk will most likely increase with larger scale projects and siting in areas important for water exchange, such as the entrance to enclosed water bodies. Assuming sites are well located, negative environmental effects are unlikely at small to medium scales, and it is unlikely that farms of this scale will have the resources to carry out detailed hydrodynamic impact assessments."



<https://www.frontiersin.org/articles/10.3389/fmars.2019.00107/full#B71>

"Sediment retention can be positively affected as farmed seaweeds dampen wave energy which may help protect shorelines subject to erosion (Mork, 1996). This phenomenon has however not been observed at the case study site and the role of this function is likely to be site-specific, depending on wave energy and currents as well as the local sensitivity to erosion".

<https://www.sciencedirect.com/science/article/pii/S0025326X18303126>

The above studies suggest that siting and biomass quantities play important roles. The above study also outlined that the theoretical impact on sedimentation rates, was not actually demonstrated in the case study.

Our response:

Our aim would be to mitigate any potential negative impact on coastal erosion patterns at the Culbin site in particular, with a number of measures:

- 1) Reduce stocking densities - We would reduce the density of long lines at the Culbin site to reflect it's more sensitive location, such as 10m spacing between lines rather than 5m.
- 2) Harvest biomass from this site earlier in the growing season as a priority, thus decreasing overall biomass at the site as well as the duration of any potential impact.
- 3) Breaking the farm into a number of sites - This enables a reduction of the impact and any one site. It must be noted that our proposed kelp farm in no way reflects the magnitude of any Asian kelp farm sites and is distinctly different from them, in our broken up format.

One site that has been more extensively studied is Sanggou Bay in China. This mixed aquaculture site covers an approximate 80-90 km<sup>2</sup>, and encloses a bay. Our sites, in contrast are 0.5km<sup>2</sup> at Culbin and Burghead bay and 0.125km<sup>2</sup> at Cove sea respectively, none of which enclose a bay or inhibit flow to an inlet. Furthermore, these measurements take incorporate the boundaries of the proposed sites, and the actual farmed area within them is very likely to be smaller.

4) Site placement - We have selected sites that have good flow rates to make significant sedimentation less likely.

5) Our sites are at contours on the sea bed, moving into deeper waters (above 10m depth), allowing currents to move below the kelp farm as indicated in one study.

It may be that SNH policy changes in the future to incorporate mitigation strategies for sites that are at risk of severe erosion as a result of anthropogenic climate change, given what an important issue this is and how directly this will impact areas of the Moray coast.

Many thanks,

Liam Richardson

