



From mountain to sea

Aberdeenshire
COUNCIL



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Image ©NatureScot



Scottish Seaweed Industry

- The Scottish industry is not new but has seen significant growth in recent years.
- Most seaweed harvested and processed in Scotland is wild (not farmed) and there is a limit to sustainable production
- There are significant barriers within the supply chain, specifically in terms of processing capabilities, licensing, and regulation.

What is seaweed cultivation?

Seaweed farming is the practice of cultivating and harvesting seaweeds.

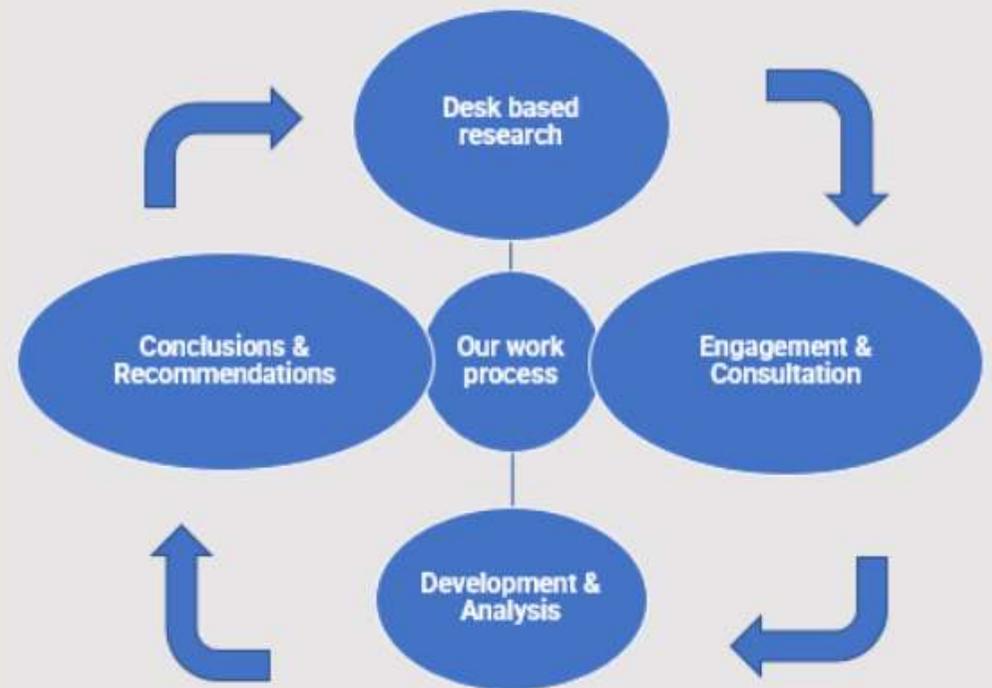
In its simplest form, it consists of the management of naturally found batches – known as wild harvesting.

In its most advanced form, it consists of fully controlling the life cycle of the algae.



Study Overview

- Target species
- Identification of potential sites
- Equipment and costs
- Licensing and Consents
- Timescales
- Routes to market
- Financials / cost benefit analysis
- Local business opportunities
- Case studies of existing operators
- Social license





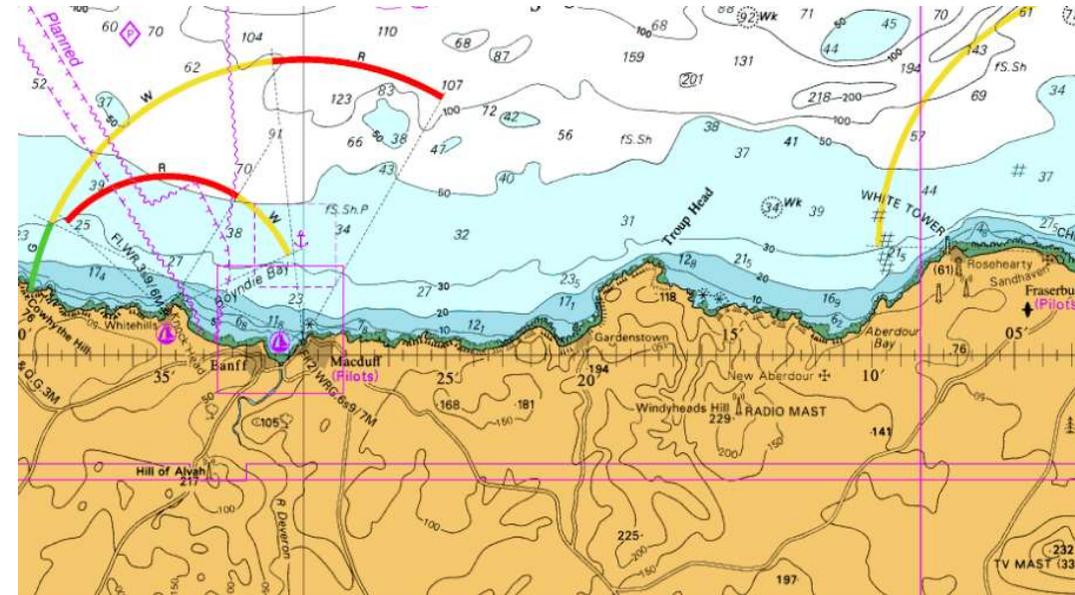
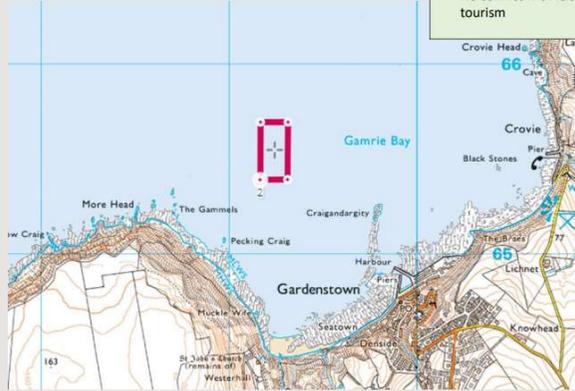
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Conclusions

- Socially beneficial, technically feasible and commercially viable opportunity for seaweed cultivation in Aberdeenshire
- Primary Target Species: *Laminaria saccharina* (Sugar Kelp)
- Human-grade food + animal feed. Seaweed cultivation has low environment impact
- Report includes guide for site selection, licencing, installation and operation
- Opportunities for partnership working- particular with inshore fishermen
- Processing opportunities in existing agricultural/industrial facilities
- Small scale 3000m: £46k set up costs, Medium scale 6000m: £64k set up costs
- Forecast financial payback 3 to 7 years (dependant on price and yield)

Gamrie Bay, Gardenstown

For	Against
<ul style="list-style-type: none"> Sandy, gravelly seabed 15-20m depth of water Lower fishing vessel density More sheltered from prevailing wind and open sea Very close to harbour No conflict with leisure activities/marine tourism 	<ul style="list-style-type: none"> Within the Troup Head SAC but unlikely to be significant development impact 1km from secondary treated WWTW discharge Potentially visible from Seatown and Crovie



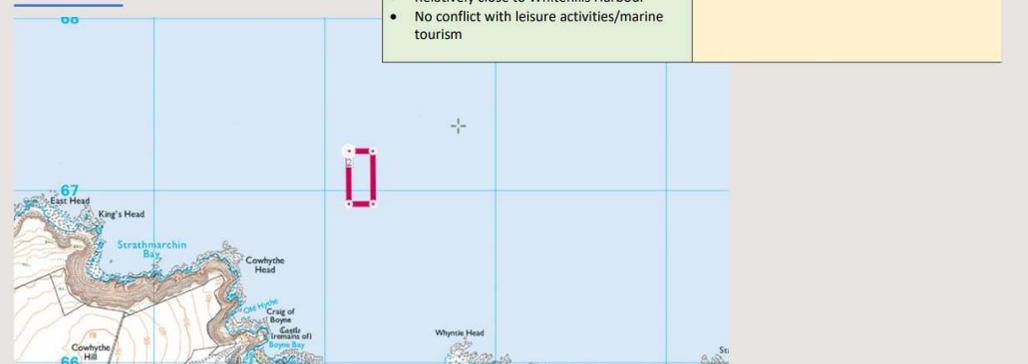
Aberdour Bay

For	Against
<ul style="list-style-type: none"> Sandy, gravelly seabed 15-20m depth of water More sheltered from prevailing wind and open sea No settlements nearby No WWTW or industrial discharges 	<ul style="list-style-type: none"> Within the Troup Head SAC but unlikely to be significant development impact Higher vessel density (safe anchorage) Marine leisure activities (scuba diving) at East end of bay



Boyne Bay, Portsoy

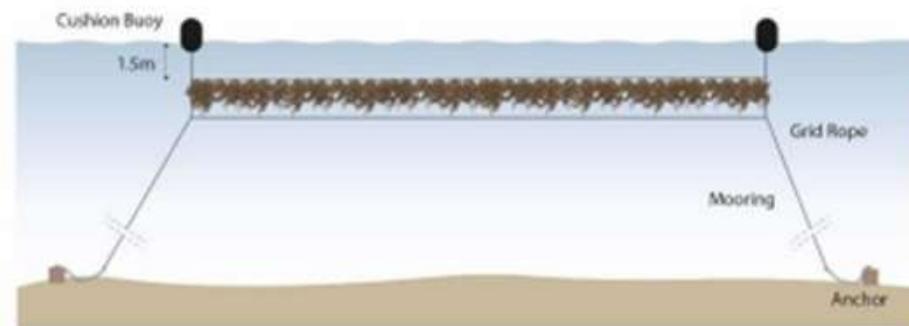
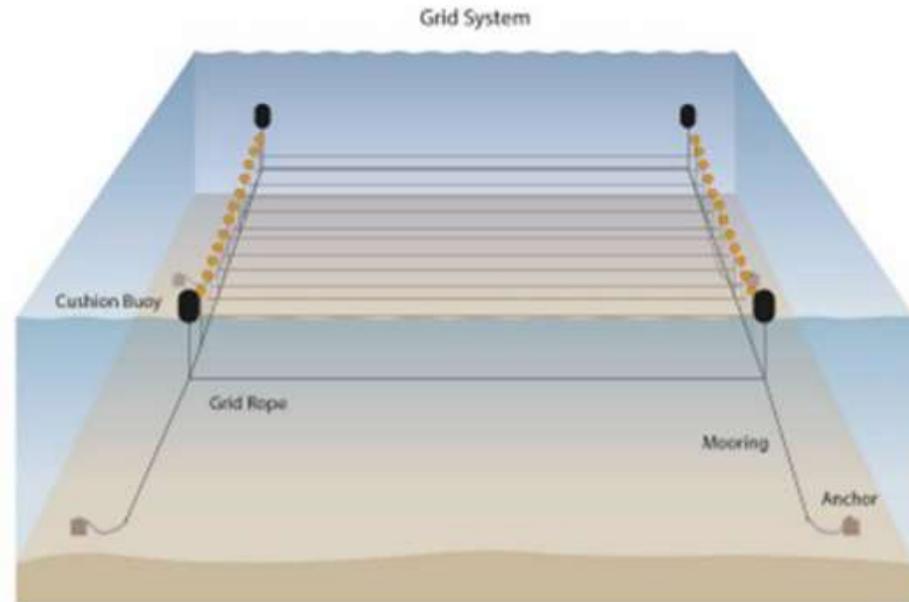
For	Against
<ul style="list-style-type: none"> Sandy, gravelly seabed 15-20m depth of water No protected designations or habitats Lower fishing vessel density Relatively close to Whitehills Harbour No conflict with leisure activities/marine tourism 	<ul style="list-style-type: none"> Less sheltered than other locations but lower wave intensity further West Portsoy harbour itself is tidal and can be difficult to access in certain sea states



Seaweed farm design

Capital Costs

Length of Growing Line	3000	6000
Ropes & Shackles	£3,000	£5,000
Anchors, chain and large cushion buoys	£6,000	£10,000
Small trawl buoys	£1,500	£2,500
Mooring node rings	£4,800	£8,000
Navigation lights (x2)	£2,000	£2,000
Marine safety equipment	£2,500	£2,500
Installation	£12,000	£20,000
Sub Total	£31,800	£50,000
£/m Growing Line	£11	£8





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Next Steps

- Public presentation June 2021
- Follow-up engagement
- Steering Group



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Learning Journey



THE SEAWEED INDUSTRY

Market Opportunities

- Nutraceuticals
- Beauty and Cosmetics
- Food and Drink
- Biofuel
- Fertilisers and Composts
- Environmental Services
- Materials
- Animal Feed



	Determine	Secure	Identify	Transfer	Monitor	Optimize	Process	Ensure
Actions	<ul style="list-style-type: none"> Location Type of farm Species Quantity Source of funding 	<ul style="list-style-type: none"> Crown licence Social licence Reputation Relevant accreditation 	<ul style="list-style-type: none"> Local endemic species Supplier Method 	<ul style="list-style-type: none"> Twine to line Binder seeding Line to farm 	<ul style="list-style-type: none"> Water temperature Salinity Light Nutrients Condition 	<ul style="list-style-type: none"> Harvest technique Timing Speed Biosecurity measures 	<ul style="list-style-type: none"> Dry Ensilage Freeze Extract Purify Fraction 	<ul style="list-style-type: none"> To meet the quality requirements of the market To have a buyer throughout
Constraints	Easy to grow, hard to sell: Ensuring there's a market to sell to before deciding on the species and farm requirements	Community Misunderstanding: Extensive factors to consider, variable costs associated, can take a long time to process	Expensive / Labour Intensive: Biosecurity, sterilisation, and ongoing protection from potential contaminants	Ongoing Optimisation: Finite windows for deployment, risks associated with weather conditions, binder R&D needed	Unforeseen Costs: Farms require ongoing maintenance and can be labour intensive	Timing is Important: Risks associated with biofouling, degradation, and marine pathogens	Major Bottleneck: Many options, all have benefits and pitfalls, optimisation and accreditation required	Knowledge and Network: Having sufficient knowledge of the market and securing a market opportunity
	Pre-licensing	Licensing	Nursery	Deployment	Farm	Harvest	Processing	Market

Photo credit: SAMS/Alasdair O'Dell



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Phase 2 Market & Partner Opportunities



Harvesting
Inshore Fisheries
Opportunity



Processing
Dehydrating
Milling
Mapco/
Agriculture



Food Grade
Product
(Extract)
Brew Dog
Mackies



Animal Feed
(Supplement)
Norvite
Harbro



Bioplastics
Alternative
petroleum based
plastics.
Oceanium



Research &
Development
Universities
Net Zero Projects

Focus Food Grade Product trial





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Next Steps

- Technical trial result due end March 23
- Steering Group
- Confirm who/what
- Initiate Stage 2
- Identify funding opportunities and time scales

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Thank you

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